

Pursuant to the Governor's Executive Order N-29-20, all members of the City Council, as well as the City Administrator, City Attorney and City Clerk will join the meeting via phone/video conference and no teleconference locations are required.

Oakland Police and Fire Retirement Board meetings are being held via Tele-Conference. Please see the agenda to participate in the meeting. For additional information, contact the Retirement Unit by calling (510) 238-6481.



**Retirement Unit  
150 Frank H. Ogawa Plaza  
Oakland, CA 94612**

## **AGENDA**

### **REGULAR MEETING of the AUDIT / OPERATIONS COMMITTEE of the OAKLAND POLICE AND FIRE RETIREMENT SYSTEM ("PFRS")**

**Wednesday, April 28, 2021  
9:30 AM  
Tele-Conference Board Meeting  
via Zoom Webinar**

#### **OBSERVE**

- To observe the meeting by video conference, please click on this link: <https://us02web.zoom.us/i/82880493983> at the noticed meeting time.
- To listen to the meeting by phone, please call the numbers below at the noticed meeting time: Dial (for higher quality, dial a number based on your current location):
  - iPhone one-tap: US: +16699006833, 82880493983# or +13462487799, 82880493983#
  - US: +1 669 900 6833 or +1 346 248 7799 or +1 253 215 8782 or +1 301 715 8592 or +1 312 626 6799 or +1 929 205 6099
  - International numbers available: <https://us02web.zoom.us/u/kctrX35uax>
  - Webinar ID: 828 8049 3983.  
If asked for a participant ID or code, press #.

#### **PUBLIC COMMENTS**

There are three ways to submit public comments.

- eComment. To send your comment directly to staff BEFORE the meeting starts, please email to [mvisaya@oaklandca.gov](mailto:mvisaya@oaklandca.gov) with "PFRS Board Meeting" in the subject line for the corresponding meeting. Please note that eComment submission **closes two (2) hours before posted meeting time**.

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#### **AUDIT COMMITTEE MEMBERS**

**John C. Speakman**  
Chairperson  
**R. Steve Wilkinson**  
Member  
**Kevin Traylor**  
Member

*\*In the event a quorum of the Board participates in the Committee meeting, the meeting is noticed as a Special Meeting of the Board; however, no final Board action can be taken. In the event that the Audit Committee does not reach quorum, this meeting is noticed as an informational meeting between staff and the Chair of the Audit Committee.*

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM  
REGULAR AUDIT COMMITTEE MEETING  
APRIL 28, 2021**

- To comment by Zoom video conference, click the “Raise Your Hand” button to request to speak when Public Comment is being taken on an eligible agenda item at the beginning of the meeting. You will be permitted to speak during your turn, allowed to comment, and after the allotted time, re-muted. Instructions on how to “Raise Your Hand” is available at: <https://support.zoom.us/hc/en-us/articles/205566129> - Raise-Hand-In-Webinar.
- To comment by phone, please call on one of the above listed phone numbers. You will be prompted to “Raise Your Hand” by pressing “\*9” to speak when Public Comment is taken. You will be permitted to speak during your turn, allowed to comment, and after the allotted time, re-muted. Please unmute yourself by pressing \*6.

If you have any questions, please email Maxine Visaya, Administrative Assistant II at [mvisaya@oaklandca.gov](mailto:mvisaya@oaklandca.gov)

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**--- ORDER OF BUSINESS ---**

- 1. Subject:** **Oakland Police and Fire Retirement System (“PFRS”) Audit Committee Meeting Minutes**  
**From:** Staff of the PFRS Board  
**Recommendation:** APPROVE March 31, 2021 Audit Committee Meeting Minutes.
- 2. Subject:** **Administrative Expenses Report**  
**From:** Staff of the PFRS Board  
**Recommendation:** ACCEPT an informational report regarding PFRS administrative expenses as of February 28, 2021.
- 3. REVIEW OF PENDING AUDIT COMMITTEE MEETING AGENDA ITEMS**
- 4. OPEN FORUM**
- 5. FUTURE SCHEDULING**
- 6. ADJOURNMENT**

**PFRS Audit/Operation Committee Regular Meeting Minutes**

**March 31, 2021**

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**AN AUDIT/OPERATIONS COMMITTEE REGULAR MEETING** of the Oakland Police and Fire Retirement System ("PFRS") was held on Wednesday, March 31, 2021 via Zoom Tele-Conference.

Committee Members Present:	<ul style="list-style-type: none"><li>▪ John C. Speakman</li><li>▪ Kevin R. Traylor</li><li>▪ R. Steven Wilkinson</li></ul>	Chairperson Member Member
Additional Attendees:	<ul style="list-style-type: none"><li>▪ David Jones</li><li>▪ Teir Jenkins</li><li>▪ Maxine Visaya</li><li>▪ Jennifer Logue</li></ul>	PFRS Secretary & Plan Administrator PFRS Staff Member PFRS Staff Member PFRS Legal Counsel

The meeting was called to order at 9:32 a.m. PST

- 1. PFRS Audit Committee Meeting Minutes** – Member Traylor made a motion to approve the February 24, 2021 Audit Committee minutes, second by Member Wilkinson. Motion passed.

[SPEAKMAN – Y / WILKINSON – Y / TRAYLOR – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

- 2. Administrative Expenses Report** – Staff Member Jenkins presented an informational report of the PFRS administrative expenditures as of January 31, 2021. PFRS has an approved budget of approximately \$3.5 million and have expensed \$1.2 million to date, leaving 65% of the budget remaining. Cash in Treasury has an approximate balance of \$6.3 million as of January 31, 2021, however a pension payment of \$4.4 million came due on February 1, 2021 and left a residual balance of \$1.8 million. Membership consisted of 744 members, which included 447 Police Members and 297 Fire Members.

**MOTION:** Member Wilkinson made a motion to accept the administrative expenses report and forward to the Full Board for approval, second by Member Traylor. Motion passed.

[SPEAKMAN – Y / WILKINSON – Y / TRAYLOR – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

- 3. Election of a New 5-Year Retired Fire Representative Board Position** – Chairperson Speakman provided an update regarding the expiration of his term and the election for a new 5-Year Retired Fire Representative Board position is underway as PFRS Staff has notified the International Association of Fire Fighters Union, Local 55 President and Retired Member Representative. Member Speakman intends to run again, is in the process of collecting signatures for the nominating form without issue and does not foresee any opposition at this time. Staff Member Jenkins noted that staff has been working with the City Clerk's Office and City Attorney's Office and are moving forward as advised.

**MOTION:** Member Traylor made a motion to accept the informational report regarding the election of a new 5-Year Retired Fire Representative Board position and forward to the Full Board for approval, second by Member Wilkinson. Motion passed.

[SPEAKMAN – ABSTAIN / WILKINSON – Y / TRAYLOR – Y]  
(AYES: 2 / NOES: 0 / ABSTAIN: 1)

**PFRS Audit/Operation Committee Regular Meeting Minutes**

**March 31, 2021**

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4. **Review of Pending Audit Committee Meeting Agenda Items** – Chairperson Speakman noted the 2006 Management Audit remains pending due to COVID-19 restrictions in place and the need for staff to be on-site to review records. Plan Administrator Jones proposed we continue to table this item on a month-to-month basis until the opportunity to complete this task arises. Chairperson Speakman agreed.
5. **Open Forum** – No Report
6. **Future Scheduling** – The next regular Audit/Operations Committee meeting is tentatively scheduled for April 28, 2021.
7. **Adjournment** – Member Traylor made a motion to adjourn, second by Member Wilkinson. Motion passed.

[SPEAKMAN – Y / WILKINSON – Y / TRAYLOR – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

The meeting adjourned at 9:41 a.m. PST

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JOHN C. SPEAKMAN, COMMITTEE CHAIRPERSON

DATE

DRAFT

**Table 1**

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**  
**Administrative Budget Spent to Date (Preliminary)**  
**As of February 28, 2021**

	<b>Approved Budget</b>		<b>February 2021</b>		<b>FYTD</b>		<b>Remaining</b>		<b>Percent Remaining</b>
<b>Internal Administrative Costs</b>									
PFRS Staff Salaries	\$ 1,200,000	\$ 81,232	\$ 717,920	\$ 482,080					40.2%
Board Travel Expenditures	52,500	-	-	52,500					100.0%
Staff Training	20,000	-	110	19,890					99.5%
Staff Training - Tuition Reimbursement	7,500	-	-	7,500					100.0%
Annual Report & Duplicating Services	4,000	-	-	4,000					100.0%
Board Hospitality	3,600	-	-	3,600					100.0%
Payroll Processing Fees	40,000	-	-	40,000					100.0%
Miscellaneous Expenditures	40,000	1,457	8,452	31,548					78.9%
Internal Service Fees (ISF)	88,000	-	56,073	31,927					36.3%
Contract Services Contingency	50,000	-	1,200	48,800					97.6%
<b>Internal Administrative Costs Subtotal :</b>	<b>\$ 1,505,600</b>	<b>\$ 82,689</b>	<b>\$ 783,755</b>	<b>\$ 721,845</b>					<b>47.9%</b>
<b>Actuary and Accounting Services</b>									
Audit	\$ 45,000	\$ -	\$ 45,000	\$ -					0.0%
Actuary	46,500	12,693	18,859	27,642					59.4%
<b>Actuary and Accounting Subtotal:</b>	<b>\$ 91,500</b>	<b>\$ 12,693</b>	<b>\$ 63,859</b>	<b>\$ 27,642</b>					<b>30.2%</b>
<b>Legal Services</b>									
City Attorney Salaries	\$ 188,000	\$ 12,842	\$ 118,985	\$ 69,015					36.7%
Legal Contingency	150,000	-	-	150,000					100.0%
<b>Legal Services Subtotal:</b>	<b>\$ 338,000</b>	<b>\$ 12,842</b>	<b>\$ 118,985</b>	<b>\$ 219,015</b>					<b>64.8%</b>
<b>Investment Services</b>									
Money Manager Fees	\$ 1,353,000	\$ 66,737	\$ 317,700	\$ 1,035,300					76.5%
Custodial Fee	124,000	-	58,250	65,750					53.0%
Investment Consultant	100,000	-	50,000	50,000					50.0%
<b>Investment Subtotal:</b>	<b>\$ 1,577,000</b>	<b>\$ 66,737</b>	<b>\$ 425,950</b>	<b>\$ 1,151,050</b>					<b>73.0%</b>
<b>Total Operating Budget</b>	<b>\$ 3,512,100</b>	<b>\$ 174,961</b>	<b>\$ 1,392,548</b>	<b>\$ 2,119,552</b>					<b>60.35%</b>

**Table 2**

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**

**Cash in Treasury (Fund 7100) - Preliminary**

**As of February 28, 2021**

			<b>February 2021</b>
<b>Beginning Cash as of 1/31/2021</b>		\$	6,341,146
<b>Additions:</b>			
City Pension Contribution - February		\$	3,637,333
Investment Draw		\$	1,000,000
Misc. Receipts			-
<b>Total Additions:</b>		\$	4,637,333
<b>Deductions:</b>			
Pension Payment (January Pension Paid on 2/1/2021)			(4,427,099)
Expenditures Paid			(177,961)
<b>Total Deductions</b>		\$	(4,605,060)
<b>Ending Cash Balance as of 2/28/2021*</b>		\$	<u>6,373,419</u>

\* On 3/1/2021, February pension payment of appx \$4,391,000 will be made leaving a cash balance of \$1,982,000

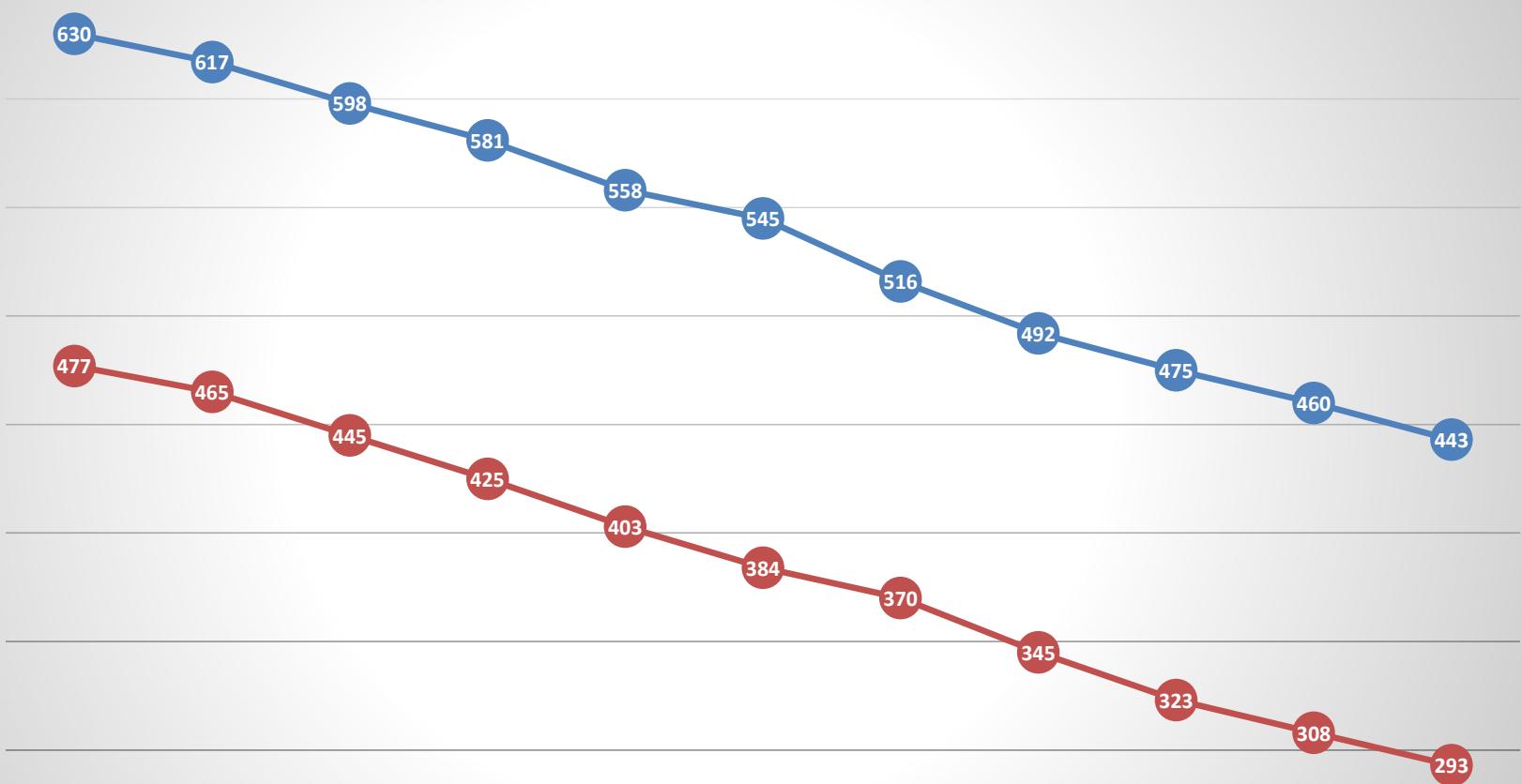
**Table 3**  
**CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**

**Census**  
**As of February 28, 2021**

COMPOSITION	POLICE	FIRE	TOTAL
<b>Retired Member:</b>			
Retiree	321	187	508
Beneficiary	122	106	228
<b>Total Retired Members</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership:</b>	<b>443</b>	<b>293</b>	<b>736</b>

COMPOSITION	POLICE	FIRE	TOTAL
<b>Retired Member:</b>			
Service Retirement	296	148	444
Disability Retirement	135	132	267
Death Allowance	12	13	25
<b>Total Retired Members:</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership as of February 28, 2021:</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership as of June 30, 2020:</b>	<b>460</b>	<b>308</b>	<b>768</b>
<b>Annual Difference:</b>	<b>-17</b>	<b>-15</b>	<b>-32</b>

**Oakland Police and Fire Retirement System**  
**Pension Plan Membership Count**  
**As of February 28, 2021 (FY 2011 - FY 2021)**



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 FYTD
Police	630	617	598	581	558	545	516	492	475	460	443
Fire	477	465	445	425	403	384	370	345	323	308	293
Total	1107	1082	1043	1006	961	929	886	837	798	768	736



# A G E N D A R E P O R T

**TO:** Oakland Police and Fire Retirement Board      **FROM:** David Jones  
Plan Administrator  
**SUBJECT:** Audit Committee Agenda Pending List      **DATE:** April 28, 2021

	SUBJECT	TENTATIVE SCHEDULED MTG DATE	STATUS
1	Staff review of the 2006 Management Audit	TBD	Pending

Respectfully submitted,

David F. Jones  
Plan Administrator  
Oakland Police & Fire Retirement Systems

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**Retirement Unit**  
**150 Frank H. Ogawa Plaza**  
**Oakland, California 94612**

## **AGENDA**

### **INVESTMENT COMMITTEE MEMBERS**

**Jaime T. Godfrey**

Chairperson

**R. Steve Wilkinson**

Member

**Robert W. Nichelini**

Member

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### **REGULAR MEETING of the INVESTMENT AND FINANCIAL MATTERS COMMITTEE of the OAKLAND POLICE AND FIRE RETIREMENT SYSTEM ("PFRS")**

**Wednesday, April 28, 2021**

**10:00 AM**

**Tele-Conference Board Meeting**  
**via Zoom Webinar**

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**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM  
REGULAR INVESTMENT COMMITTEE MEETING  
APRIL 28, 2021**

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- To comment by phone, please call on one of the above listed phone numbers. You will be prompted to “Raise Your Hand” by pressing “\*9” to speak when Public Comment is taken. You will be permitted to speak during your turn, allowed to comment, and after the allotted time, re-muted. Please unmute yourself by pressing \*6.

If you have any questions, please email Maxine Visaya, Administrative Assistant II at [mvisaya@oaklandca.gov](mailto:mvisaya@oaklandca.gov)

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**--- ORDER OF BUSINESS ---**

<b>1. Subject:</b>	<b>Police and Fire Retirement System (“PFRS”) Investment Committee Meeting Minutes</b>
<b>From:</b>	Staff of the PFRS Board
<b>Recommendation:</b>	<b>APPROVE</b> March 31, 2021 Investment Committee Meeting Minutes.
<b>2. Subject:</b>	<b>Prospective Alternative Risk Premia Asset Class Investment Manager Presentations</b>
<b>From:</b>	Meketa Investment Group
<b>Recommendation:</b>	<b>ACCEPT</b> finalists’ presentations from Investment Management Firms seeking to serve as PFRS’ New Alternative Risk Premia Asset Class Investment Manager. <ul style="list-style-type: none"><li>▪ Kepos Capital</li><li>▪ Lombard Odier</li><li>▪ Two Sigma Investments</li></ul>
<b>3. Subject:</b>	<b>Selection of New Alternative Risk Premia Asset Class Investment Manager</b>
<b>From:</b>	Meketa Investment Group
<b>Recommendation:</b>	<b>DISCUSS</b> Investment Management Firm Presentations, <b>SELECT</b> Investment Management Firm to serve as PFRS’ New Alternative Risk Premia Asset Class Investment Manager and <b>RECOMMEND BOARD APPROVAL</b> of Committee’s selection.
<b>4. Subject:</b>	<b>Investment Market Overview as of March 31, 2021</b>
<b>From:</b>	Meketa Investment Group
<b>Recommendation:</b>	<b>ACCEPT</b> informational report regarding the Global Investment Markets as of March 31, 2021.

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM  
REGULAR INVESTMENT COMMITTEE MEETING  
APRIL 28, 2021**

- 5. Subject:** **Preliminary Investment Fund Performance Update as of March 31, 2021**  
**From:** Meketa Investment Group
- 
- Recommendation:** **ACCEPT** informational report regarding the Preliminary Investment Fund Performance update as of March 31, 2021.
- 6. Subject:** **PFRS Investment Managers' Fees**  
**From:** Meketa Investment Group
- 
- Recommendation:** **ACCEPT** informational report regarding a review of current PFRS Investment Managers' Fees.
- 7. Schedule of Pending Investment Committee Meeting Agenda Items**
- 8. Open Forum**
- 9. Future Scheduling**
- 10. Adjournment**

# PFRS Investment & Financial Matters Committee Regular Meeting Minutes

March 31, 2021

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**AN INVESTMENT AND FINANCIAL MATTERS COMMITTEE REGULAR MEETING** of the Oakland Police and Fire Retirement System ("PFRS") was held Wednesday, March 31, 2021 via Zoom Tele-Conference.

Committee Members:	<ul style="list-style-type: none"><li>▪ Jamie T. Godfrey</li><li>▪ R. Steven Wilkinson</li><li>▪ Robert W. Nichelini</li></ul>	<ul style="list-style-type: none"><li>Chairperson</li><li>Member</li><li>Member</li></ul>
Additional Attendees:	<ul style="list-style-type: none"><li>▪ David Jones</li><li>▪ Jennifer Logue</li><li>▪ Teir Jenkins</li><li>▪ Maxine Visaya</li><li>▪ David Sancewich</li><li>▪ Sidney Kawanguzi</li><li>▪ Paola Nealon</li><li>▪ Ben Santonelli</li><li>▪ Jack O'Connor</li><li>▪ Kenzie Wedge</li></ul>	<ul style="list-style-type: none"><li>PFRS Secretary &amp; Plan Administrator</li><li>PFRS Legal Counsel</li><li>PFRS Staff Member</li><li>PFRS Staff Member</li><li>Meketa Investment Group</li><li>Meketa Investment Group</li><li>Meketa Investment Group</li><li>DDJ Capital Investment, LLC</li><li>DDJ Capital Investment, LLC</li><li>DDJ Capital Investment, LLC</li></ul>

The meeting was called to order at 9:37 a.m. PST

1. **Approval of Investment Committee Meeting Minutes** Member Nichelini made a motion to approve the February 24, 2021 Investment Committee Meeting Minutes, as written, second by Member Wilkinson. The motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

2. **Investment Manager Performance Review – DDJ Capital Investment, LLC a PFRS Fixed Income Asset Class Investment Manager** – A presentation was delivered by staff members of DDJ Capital Investment, LLC. Kenzie Wedge provided an overall view of the firm, highlighting their upcoming 25<sup>th</sup> anniversary and no material changes to the organization, material client losses, or personnel changes, aside from the hire of Research Analyst Josh Bansal, have occurred in the past year. Kenzie Wedge and Jack O'Connor presented information on the firm's Diversity and Inclusion practices, highlighting over 65% of the team have been with the firm for more than 5 years and acknowledged such stability makes changing the diversity of staff more challenging. However, in the past five years, 50% of new hires have been minorities and/or women. Ben Santonelli discussed portfolio strategy and performance as of December 31, 2020. The Committee asked questions to foster further discussion on the following topics: Diversity and Inclusion, career development, outreach strategies, and investment strategies. Chairperson Godfrey requested copies of the top responses to the White Paper Challenge, one of DDJ's outreach strategies.

**MOTION:** Member Nichelini made a motion to accept and forward to the Board the informational report presented by DDJ Capital Investment, LLC, second by Member Wilkinson. The motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

# PFRS Investment & Financial Matters Committee Regular Meeting Minutes

March 31, 2021

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3. **Investment Manager Performance Review – DDJ Capital Investment, LLC a PFRS Fixed Income Asset Class Investment Manager** – David Sancewich of Meketa Investment Group provided a brief evaluation regarding the portfolio performance with DDJ Capital Investment, LLC as of December 31, 2020. Meketa recommended removing the firm from Watch Status, as they had no concerns with the investment platform. Member Wilkinson expressed concern the period of improved performance was brief and would like to continue to keep the firm on Watch Status. Chairperson Godfrey inquired how the firm ranked against their peers and S. Kawanguzi provided they are in the 26<sup>th</sup> percentile.

**MOTION:** Member Wilkinson made a motion to recommended Full Board approval to continue to keep DDJ Capital Investment, LLC on Watch Status due to the short period of time of consideration in respect to improved performance, second by Member Nichelini. The motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

4. **Investment Market Overview as of February 28, 2021** – David Sancewich of Meketa Investment Group presented an informational report regarding the Investment Market Overview as of February 28, 2021. D. Sancewich highlighted Market Returns, S & P Equity Valuations, Sector Returns, and the recent U.S. Fiscal Stimulus.

**MOTION:** Member Nichelini made a motion to accept the informational report from Meketa regarding the Investment Market Overview as of February 28, 2021, second by Member Wilkinson. Motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

5. **Preliminary Investment Fund Performance Update as of February 28, 2021** – Sidney Kawanguzi of Meketa Investment Group provided an overview of the informational report regarding the PFRS Preliminary Investment Fund Performance Update as of February 28, 2021. S. Kawanguzi highlighted the Total Plan Allocation vs. Targets and Policy, noting Crisis Risk Offset was not within investment policy range and is being addressed with the ongoing search for Investment Managers to allocate this asset class. S. Kawanguzi also discussed the Asset Class Performance Summary, and Market Overview.

**MOTION:** Member Wilkinson made a motion to accept the informational report from Meketa regarding the Preliminary Investment Fund Performance Update as of February 28, 2021, second by Chairperson Godfrey. Motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

# PFRS Investment & Financial Matters Committee Regular Meeting Minutes

March 31, 2021

Page 3 of 4

6. **\$13.9 Million Drawdown for Fiscal Year 2020/2021 (Quarter Ending June 2021) Member Allowances April 1, 2021 through June 30, 2021** – Sidney Kawanguzi of Meketa Investment Group presented the details of the Meketa report describing the \$13.9 million drawdown of funds, which includes a \$10.9 Million contribution from the City of Oakland and a \$3.0 Million contribution from the PFRS Investment Fund, to pay for the PFRS member retirement allowances to its members for the period of April 1, 2021 through June 30, 2021.

**MOTION:** Member Wilkinson made a motion to accept Meketa's report and recommendation regarding the \$13.9 million drawdown of funds to pay member retirement allowances from April 1, 2021 through June 30, 2021 and recommend Board approval, second by Chairperson Godfrey. Motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3/ NOES: 0/ ABSTAIN: 0)

7. **Select Investment Managers to Invite to Interview to Act as the New PFRS Alternative Risk Premia Asset Class Investment Manager** – David Sancewich of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Alternative Risk Premia Asset Class Strategy. Meketa recommended the following firms to interview as finalist candidates: Kepos Capital, Lombard Odier, and Two Sigma Investments based on the search criteria, further quantitative review, and qualitative consideration. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews.

**MOTION:** Member Wilkinson made a motion to accept Meketa's report and recommendation and recommend Board approval to move forward, second by Chairperson Godfrey. Motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3/ NOES: 0/ ABSTAIN: 0)

8. **Select Investment Managers to Invite to Interview to Act as the New PFRS Systematic Trend Following Asset Class Investment Manager** – David Sancewich of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Systematic Trend Following Asset Class Strategy. Based on the search criteria, further quantitative review, and qualitative consideration, Meketa recommended the following firms to interview as finalist candidates: BH-DG Systematic Trading, Crabel Capital Management, and Verson Investments. Chairperson Godfrey recommended the inclusion of LongTail Alpha as one of the finalist candidates. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews.

**MOTION:** Member Wilkinson made a motion to accept Meketa's report and recommendation with the inclusion of LongTail Alpha as a finalist candidate and recommend Board approval to move forward, second by Chairperson Godfrey. Motion passed.

[GODFREY – Y/ NICHELINI – Y/ WILKINSON – Y]  
(AYES: 3/ NOES: 0/ ABSTAIN: 0)

# PFRS Investment & Financial Matters Committee Regular Meeting Minutes

March 31, 2021

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9. **Informational Report on Defensive Equity Investment Strategy** – Paola Nealon of Meketa Investment Group presented an informational report regarding the Defensive Equity Investment Strategy providing a brief refresher as PFRS moves forward in selecting new managers for consideration in the coming months. P. Nealon defined Defensive Equity, reviewed the rationale for this move, basic concepts, and hallmarks of the strategy.

**MOTION:** Member Wilkinson made a motion to accept the informational report and forward to the Full Board, second by Member Nichelini. Motion passed.

[GODFREY – Y / NICHELINI – Y / WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

10. **Select Investment Managers to Invite to Interview to Act as the New PFRS Defensive Equity Asset Class Investment Manager** – Paola Nealon of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Defensive Equity Asset Class Strategy. Based on the search criteria, further quantitative review, and qualitative consideration, Meketa recommended the following firms to interview as finalist candidates for consideration: Atlanta Capital Management, Eagle Capital, The London Company, and Wellington Management. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews. Chairperson Godfrey requested the list of respondents provided from each Investment Manager candidate search, Alternative Risk Premia, Systematic Trend Following, and Defensive Equity, be ranked according to Meketa's evaluation on strength of product rather than alphabetically.

**MOTION:** Chairperson Godfrey made a motion to accept the Meketa's informational report and recommendation and forward to the Full Board for approval, second by Member Wilkinson. Motion passed.

[GODFREY – Y / NICHELINI – Y / WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

11. **Investment Manager Performance Review Update – Reams Asset Management, A PFRS Core Plus Fixed Income Asset Class Investment Manager** – Sidney Kawanguzi and David Sancewich of Meketa Investment Group provided brief comments on the informational memo provided by Reams Asset Management as follow-up regarding drift and beta trades as requested by Chairperson Godfrey at the previous Investment Committee Meeting. Chairperson Godfrey requested Meketa and Staff work to assess fees charged by Reams and provide an update at a subsequent Board Meeting.

**MOTION:** Chairperson Godfrey made a motion to accept the informational report from Meketa regarding Reams with additional follow-up as to fees charged by Reams, second by Member Wilkinson. Motion passed.

[GODFREY – Y / NICHELINI – Y / WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

**PFRS Investment & Financial Matters Committee Regular Meeting Minutes**

**March 31, 2021**

**Page 5 of 4**

12. **Schedule of Pending Investment Committee Meeting Agenda Items** – David Sancewich presented the 2021 Ongoing Strategic Investment Agenda for discussion. D. Sancewich suggested calendaring of prospective candidate finalists selected for all Investment Strategies presented today. It was agreed to conduct interviews for one asset class per Board Meeting, with further discussion at the April 2021 Investment Committee Agenda Planning Meeting. PFRS Staff Member T. Jenkins noted this approach would push the Manager Update for SGA to July 2021.
13. **Open Forum** – No Report
14. **Future Scheduling** – The next Regular Investment Committee Meeting is tentatively scheduled for April 28, 2021.
15. **Adjournment** – Member Nichelini made a motion to adjourn, second by Member Wilkinson. Motion passed.

[GODFREY – Y / NICHELINI – Y / WILKINSON – Y]  
(AYES: 3 / NOES: 0 / ABSTAIN: 0)

The meeting adjourned at 11:32 a.m. PST

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JAMIE T. GODFREY, COMMITTEE CHAIRPERSON

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DATE

DRAFT



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## Kepos Alternative Risk Premia

April 28, 2021

# Disclosures

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These confidential presentation materials (this "Presentation") are being presented at your specific request on a confidential basis. It is our understanding that you meet the criteria for a "qualified purchaser" under Section 2(a)(51) of the Investment Company Act of 1940, as amended, and are otherwise qualified. The information relates to a potential investment in a vehicle (the "Fund") managed by Kepos Capital LP ("Kepos"). The information in this Presentation is believed accurate and is given only as of the date set forth on the cover and Kepos undertakes no obligation to update such information.

This Presentation is provided for discussion purposes only, is only a summary of certain information, is not complete, does not contain certain material information about the Fund, including important conflicts disclosures and risk factors, and is subject to change without notice.

This Presentation does not constitute an offer to sell or a solicitation of an offer to purchase any security of the Fund. Any such offer or solicitation shall only be made pursuant to—and subject to the terms and conditions contained in—a confidential private placement memorandum of the Fund (and an accompanying subscription agreement), which qualifies in its entirety the information set forth herein, which should be read carefully prior to an investment in the Fund, and which contains additional information about the investment objectives, terms and conditions, tax information and risk disclosures of or relating to the Fund.

An investment in the Fund is not suitable for all investors. Investors must meet certain eligibility requirements and have the financial ability, sophistication, experience and willingness to bear the risks of an investment in the Fund for an extended period of time. An investment in the Fund would be speculative and entails a high degree of risk; no assurance can be given that the Fund's investment objective will be achieved or that investors will receive a return of their capital. Investment losses may occur. Nothing herein is intended to imply that a Fund's investment methodology may be considered "conservative," "safe," "risk free" or "risk averse." The Fund employs leverage and other investment techniques that may increase the volatility of the Fund's performance and increase the Fund's risk of loss. An investment in the Fund will be illiquid as there are significant restrictions on an investor's ability to withdraw, redeem, or transfer interests or shares in the Fund. The Fund involves a complex tax structure, which should be reviewed carefully.

Certain of the information contained in this Presentation represents or is based upon forward-looking statements, which can be identified by the use of forward-looking terminology such as "may", "will", "should", "expect", "anticipate", "target", "project", "estimate", "intend", "continue" or "believe" or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events or results or the actual performance of the Fund may differ materially from those reflected or contemplated in such forward-looking statements. The information contained herein represents management's current expectation of how the Fund will continue to be operated in the near term; however, management's plans and policies in this respect may change in the future. In particular, (i) policies and approaches to portfolio monitoring, risk management, and asset allocation may change in the future without notice and (ii) economic, market and other conditions could cause the Fund to deviate from stated investment objectives and guidelines.

This document is confidential, is intended only for the person to whom it has been provided and under no circumstance may a copy be shown, copied, transmitted, or otherwise given to any person other than the authorized recipient without the prior written consent of Kepos. Notwithstanding anything to the contrary herein, each recipient of this summary may disclose to any and all persons, without limitation of any kind, the tax treatment and tax structure of: (i) the Fund and (ii) any of its transactions, and all materials of any kind (including opinions or other tax analyses) relating to such tax treatment and tax structure. The distribution of the information contained herein in certain jurisdictions may be restricted, and, accordingly, it is the responsibility of any prospective investor to satisfy itself as to compliance with relevant laws and regulations.

PAST PERFORMANCE IS NOT AN INDICATOR OR GUARANTEE OF FUTURE RESULTS. THERE IS NO GUARANTEE THAT THE FUND WILL ACHIEVE COMPARABLE RESULTS TO THOSE SET FORTH IN THIS DOCUMENT OR THAT IT WILL ACHIEVE ITS INVESTMENT OBJECTIVES IN THE FUTURE.

## Organization & Team

- Founded in January 2010 by Mark Carhart, Giorgio De Santis and Bob Litterman
- 40 employees; long history working together; most with profit participation
- ~\$2 billion AUM in alpha and alternative risk premia strategies<sup>1</sup>

## Long History in Asset Allocation & Alternative Risk Premia Research

- Black-Litterman model, 1992<sup>2</sup>
- Carhart four-factor model, 1997<sup>3</sup>
- *Modern Investment Management: An Equilibrium Approach*, 2003<sup>4</sup>
- “Beyond Active Alpha.”<sup>5</sup> Pioneering article on concept of exotic betas, 2008
- “Exotic Beta Revisited.”<sup>6</sup> Won the Graham Dodd Excellence Award, 2014

## Features of a Partnership with Kepos Capital

- **Personalized commitment and focus**
  - We only build liquid alternative strategies and portfolios
- **Thought partnership and transparency**
  - Close collaboration and response to client-specific questions
  - Access to senior investment staff
- **Dedicated management and alignment**
  - US-based, wholly owned by founders and employees

<sup>1</sup> AUM is as of February 28, 2021. <sup>2</sup> Black, Fisher; Litterman, Robert. “Global Portfolio Optimization”. *Financial Analysts Journal*. Vol. 48, Issue 5. September/October 1992. <sup>3</sup> Carhart, Mark M. “On Persistence in Mutual Fund Performance”. *Journal of Finance*. Volume 52, Issue 1, pp. 57-82. March 1997. <sup>4</sup> Litterman, B. & Quantitative Resources Group. (2003). *Modern Investment Management: An Equilibrium Approach* (1<sup>st</sup> ed.). Hoboken, NJ: John Wiley & Sons, Inc. <sup>5</sup> CFA Institute. Vol. 25. No. 1. March 2008. <sup>6</sup> *Financial Analysts Journal*. Vol. 70, Issue 5. November 2014.

## Diversity Representation Survey for Oakland Police and Fire

DATA AS OF 12/31/2020

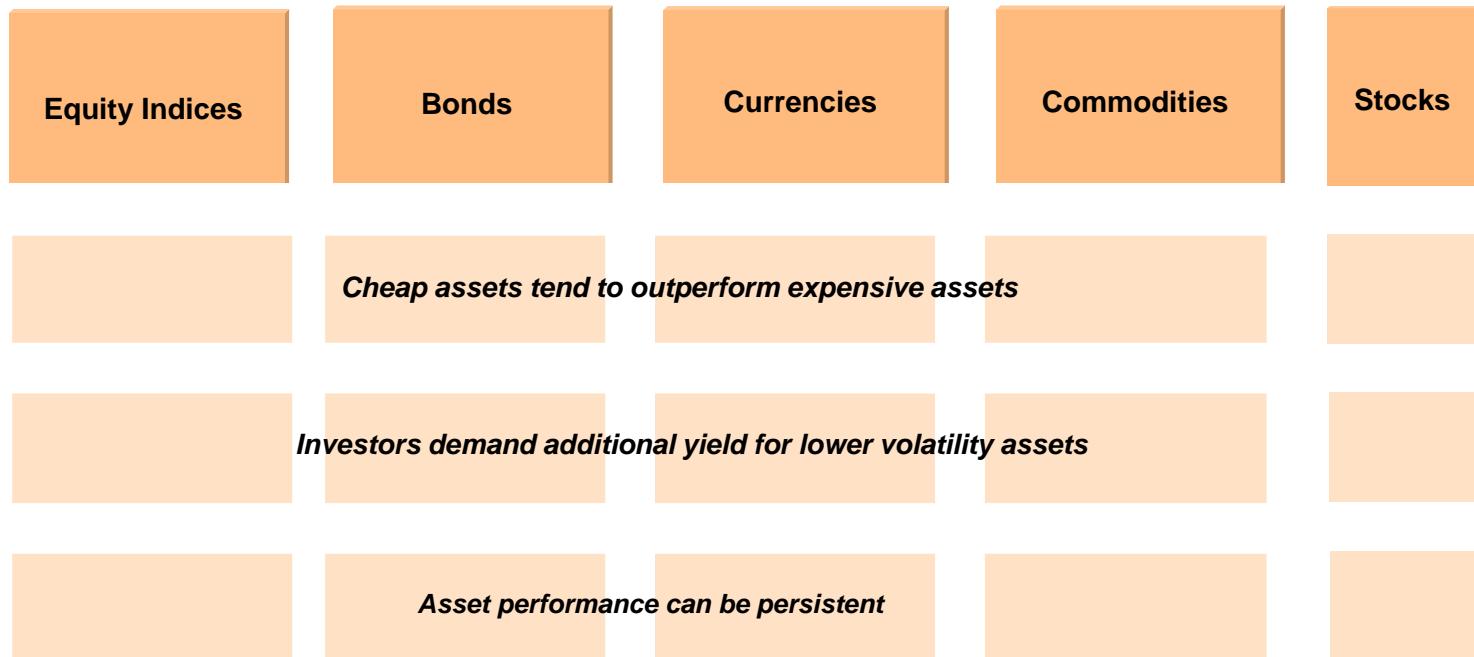
Firm Name	Kepos Capital
Product Name	Kepos Alternative Risk Premia Fund

	Percentage (%) of Board of Directors / Managing Members	Percentage(%) of Firm (Entire Staff)	Percentage (%) of Firm (Investment Professionals)
<b>Race and Ethnicity*</b>			
African American/Black	0%	3%	0%
Asian/Hawaiian/Pacific Islander	0%	25%	25%
Latino/Hispanic	0%	5%	5%
White	100%	68%	70%
American Indian/Alaska Native	0%	0%	0%
Other	0%	0%	0%
<b>Gender</b>			
Male	100%	85%	100%
Female	0%	15%	0%
Non-Identified/Other	0%	0%	0%
	100%	100%	100%
	100%	100%	100%

\* Racial/ethnic categories appear as defined by EEOC guidance.

**Kepos Alternative  
Risk Premia Strategy**  
\$115 Million AUM<sup>1</sup>

- Dynamically managed portfolio of both macro and equity premia
- Excludes macro insurance and directional momentum factors
- Targets 10% annualized volatility and 0.5 Sharpe ratio (net)
- Transparency, attractive liquidity and low cost



<sup>1</sup> AUM is as of February 28, 2021.

## The Goal

- Factors that perform well in the future (not ones that just perform well in backtests)

## Where Do Factors Live?

- Where there are risk transfer opportunities or persistent behavioral biases
- Theory does not identify the individual factors

## Framework for Factor Selection

1. Economically intuitive (necessary, but not sufficient)
2. Demonstrated historical premium in excess of global equity beta
3. Institutional liquidity and capacity
4. Empirically robust
  - Testable on other markets, asset classes, time periods
  - Holds up when specific time periods and markets are excluded (jackknifing)
  - Insensitive to factor definition

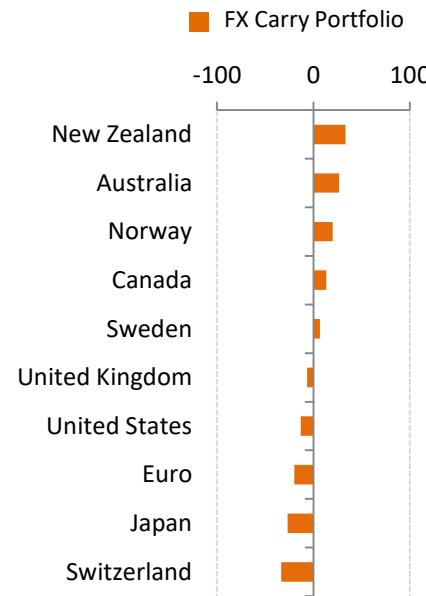
1

Select a characteristic



2

Choose asset weights

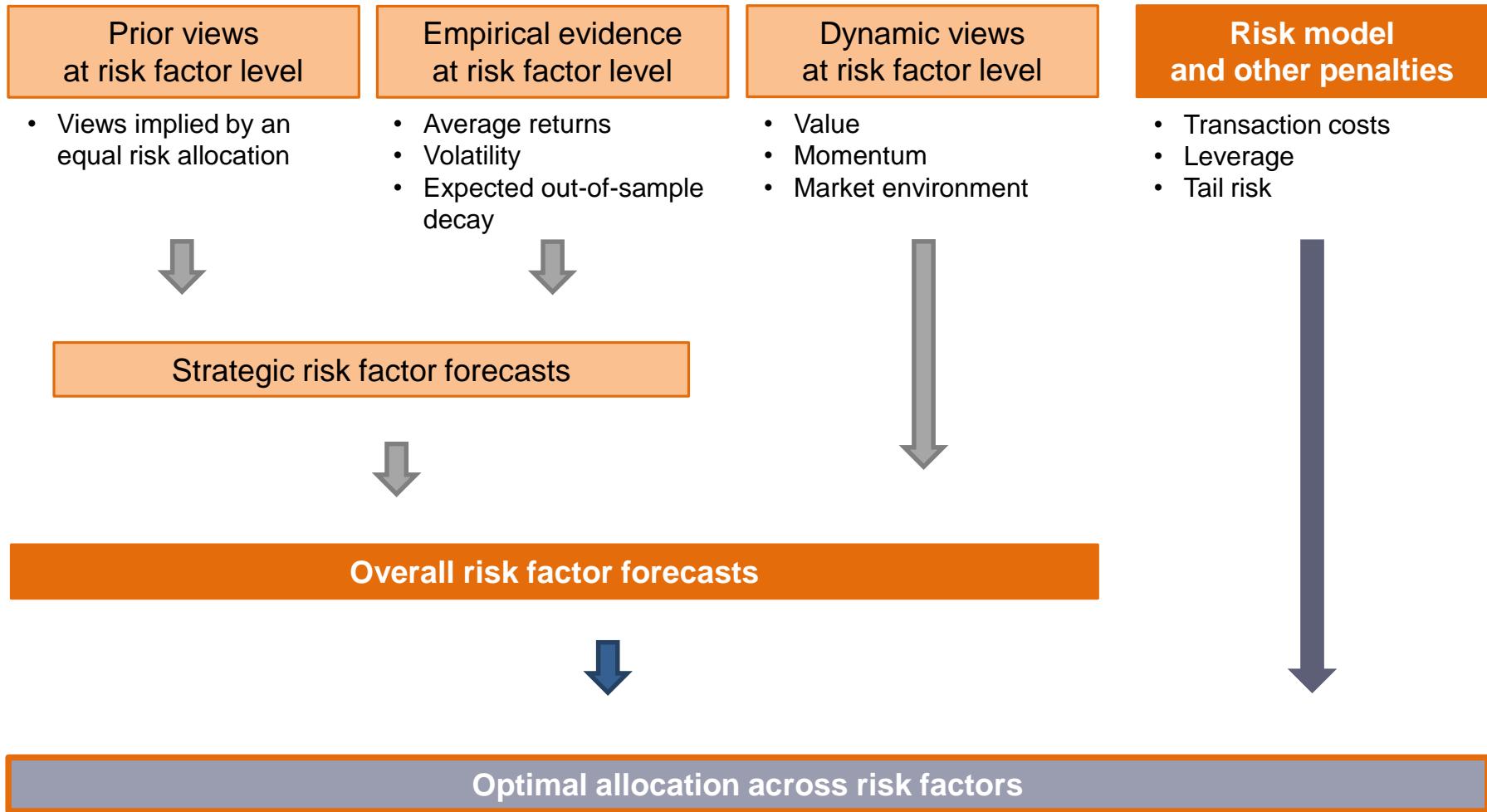


3

Hedge equity beta



For illustrative purposes only. MSCI ACWI is an index designed to measure the broad equity market performance of developed and emerging markets.



## KARP Annualized ITD Gross Performance Attribution<sup>1</sup>

	Single Name Equities	Equity Indices	Bonds	Currencies	Com- modities	<b>TOTAL</b>
Value	-1.71%	-2.00%	1.99%	-0.80%	1.48%	-1.04%
Momentum	-0.38%	1.63%	-0.61%	0.10%	-0.94%	-0.19%
Income	-2.13%	0.45%	1.73%	0.31%	0.04%	0.40%
Quality	0.67%					0.67%
<b>TOTAL</b>	<b>-3.55%</b>	<b>0.09%</b>	<b>3.11%</b>	<b>-0.39%</b>	<b>0.58%</b>	<b>-0.16%</b>

**KARP Net Returns<sup>2</sup>**

Annualized ITD: -1.4%  
2021 YTD: 4.1%

**Realized Correlations SI<sup>3</sup>**

MSCI ACWI: 0.34  
Barclays Agg: 0.01  
VIX: -0.50

**Founder Share Class:**

Class F

**Fees:**

0.70% management fee per year

**Liquidity:**

Monthly with 30 days' notice

<sup>1</sup> Performance shown for Kepos Alternative Risk Premia Fund LP and is through March 31, 2021. Performance attribution figures are estimated, unaudited and subject to subsequent adjustments. The figures stated herein do not include any fees or expenses, which will reduce returns. The performance figures set forth herein are unaudited and have been computed by Kepos Capital LP based on unaudited figures and data. <sup>2</sup> Net performance for KARP imputes the management fee associated with "new-issue" eligible class F shares/interests (i.e., a base 0.70% annual management fee). The above estimate assumes an investment in the applicable fund since inception. Performance includes reinvestment of interest and dividends, if any. <sup>3</sup> Correlations through March 31, 2021. Please see appendix for index definitions. PAST PERFORMANCE IS NOT AN INDICATOR OR GUARANTEE OF FUTURE RESULTS. THERE IS NO GUARANTEE THAT THE FUND WILL ACHIEVE COMPARABLE RESULTS TO THOSE SET FORTH IN THIS DOCUMENT OR THAT IT WILL ACHIEVE ITS INVESTMENT OBJECTIVES IN THE FUTURE.

- Our team has researched and invested in risk factors for 25 years
- Our strategy overweights macro factors that are less crowded and more lowly correlated
- Our firm ethos is built on transparency, alignment, fairness and partnership

## MARK CARHART | CHIEF INVESTMENT OFFICER

Mark Carhart is the Chief Investment Officer and a founding partner of Kepos Capital. Prior to founding Kepos in 2010, Mark was a Partner and the Co-Chief Investment Officer of the Quantitative Investment Strategies Group at Goldman Sachs Asset Management, and prior to GSAM he was an Assistant Professor at the Marshall School of Business at USC and a Senior Fellow at The Financial Institutions Center at The Wharton School. Mark's publications include articles in *The Journal of Finance*, *The Review of Financial Studies* and the *Financial Analysts Journal*, and he received the FAJ's Graham and Dodd Award in 2014. He is also a co-author of Modern Investment Management: An Equilibrium Approach. Mark earned a B.A. from Yale University in 1988, became a CFA Charterholder in 1991 and received his Ph.D. from the University of Chicago Booth School of Business in 1995. He serves on the boards of InTandem Cycling, The International Charter School of NY and Trustee of Convent of the Sacred Heart.

## GIORGIO DE SANTIS | DIRECTOR OF RESEARCH

Giorgio De Santis is the Director of Research and a founding partner of Kepos Capital. Prior to Kepos, Giorgio was a Partner and the co-head of the research team in the Quantitative Investment Strategies Group at Goldman Sachs Asset Management. Prior to Goldman Sachs, he was an Assistant Professor of Finance and Business Economics at the Marshall School of Business at USC. He has published articles in *The Journal of Finance*, the *Journal of Financial Economics*, the *Journal of International Money and Finance*, the *Financial Analysts Journal* and other academic and practitioner journals in finance and economics, and received the FAJ's Graham and Dodd Award in 2014. He has also contributed chapters to several books on investment management and is a co-author of Modern Investment Management: An Equilibrium Approach. Giorgio earned a B.A. from the Libera Universita' Internazionale degli Studi Sociali in Rome in 1984, a M.A. in Economics from the University of Chicago in 1989 and a Ph.D. in Economics from the University of Chicago in 1993.

## BOB LITTERMAN | CHAIRMAN, RISK COMMITTEE

Bob Litterman is the Chairman of the Risk Committee and a founding partner of Kepos Capital. Prior to joining Kepos Capital in 2010, Bob enjoyed a 23-year career at Goldman, Sachs & Co., where he served in research, risk management, investments and thought leadership roles. He oversaw the Quantitative Investment Strategies Group in the Asset Management division. While at Goldman, Bob also spent six years as one of three external advisors to Singapore's Government Investment Corporation (GIC). Bob was named a partner of Goldman Sachs in 1994 and became head of the firm-wide risk function; prior to that role, he was co-head of the Fixed Income Research and Model Development Group with Fischer Black. During his tenure at Goldman, Bob researched and published a number of groundbreaking papers in asset allocation and risk management. He is the co-developer of the Black-Litterman Global Asset Allocation Model, a key tool in investment management, and has co-authored books including The Practice of Risk Management and Modern Investment Management: An Equilibrium Approach (Wiley & Co.). Bob earned a Ph.D. in Economics from the University of Minnesota and a B.S. in Human Biology from Stanford University. He was inducted into *Risk* magazine's Risk Management Hall of Fame and named the 2013 Risk Manager of the Year by the Global Association of Risk Professionals. In 2012, he was the inaugural recipient of the S. Donald Sussman Fellowship at MIT's Sloan School of Management. In 2008, Bob received the Nicholas Molodovsky Award from the CFA Institute Board as well as the International Association of Financial Engineers/SunGard Financial Engineer of the Year Award. Bob serves on a number of boards, including Commonfund, where he was elected Chair in 2014, Options Clearing Corporation, Resources for the Future, Robert Wood Johnson Foundation, World Wildlife Fund and the Sloan Foundation. He is also currently serving as the chair of the CFTC Climate-Related Market Risk Subcommittee.

## MATT DESCHAMPS | CHIEF OPERATING OFFICER

Matt DesChamps is the Chief Operating Officer and a founding partner of Kepos Capital. Prior to Kepos, Matt was a founding Principal of Satellite Asset Management, L.P. and Chair of its Operating Committee. Formerly, Matt worked at Morgan Stanley, where he was an account relationship manager in the equity division, and at Coopers & Lybrand, LLC, where he was a Senior Associate. Matt earned a B.A. from Franklin & Marshall College and an M.B.A. in Finance from the Stern School of Business at New York University in 1999. He is a Certified Public Accountant and a member of The American Institute of Certified Public Accountants. He is a trustee of Franklin & Marshall College, Enveritas and other not-for-profit organizations.

## SIMON RAYKHER | GENERAL COUNSEL AND CHIEF COMPLIANCE OFFICER

Simon Raykher is the General Counsel and Chief Compliance Officer of Kepos Capital. Prior to Kepos, Simon served as General Counsel and Chief Compliance Officer at Lombard Odier Asset Management (USA) Corp, the US asset management subsidiary of one of the oldest and largest private banks in Switzerland. For the previous seven years, he was General Counsel, Chief Compliance Officer and Principal of Satellite Asset Management, L.P. Prior to Satellite, Simon was an attorney with the law firm of Schulte Roth & Zabel LLP. Earlier in his career, he was a prosecutor with the Investigation Division of the New York County District Attorney's office, where he conducted tax fraud and money laundering investigations. Simon started his career as an auditor with Coopers & Lybrand, LLC. Simon earned a B.B.A. and an M.B.A. in Accounting from Pace University in 1990 and a J.D. from Fordham University School of Law in 1995. Simon is an Adjunct Professor of Law at Fordham University School of Law.

## ANDREW MILLER | HEAD OF BUSINESS DEVELOPMENT

Prior to joining Kepos, Andrew was Senior Institutional Investor Relations Manager for Värde Partners. He has spent his entire career in client-facing roles, beginning in 1997 with Invesco Asset Management in Paris. After seven years with Invesco in Europe, he returned to the US where he worked with the firm's Global Structured Products Group and Global Fixed Income team before joining WL Ross & Co in 2006. In 2008, Andrew joined Satellite Asset Management and subsequently was responsible for Business Development for Trafalgar Asset Managers. Andrew is a CFA Charterholder and earned a B.A. from Lawrence University in 1996.

## DAISY CHANG | DIRECTOR OF INVESTOR RELATIONS

Prior to joining Kepos, Daisy worked at Williams-Sonoma, Inc. in the Business Development Group, where she developed and executed internal strategy initiatives as well as managed the cross-brand affiliate marketing program. Previously, Daisy spent four years on the product management team in the Quantitative Investment Strategies Group at Goldman, Sachs & Co., focusing on investor relations. Daisy graduated from the University of Pennsylvania with a B.S. in Economics in 2004.

## OLIVIA VITALI | BUSINESS DEVELOPMENT & INVESTOR RELATIONS

Prior to joining Kepos, Olivia led Investor Relations and Business Development efforts for the quantitative hedge fund business within SECOR Asset Management. She was previously an analyst in the J.P. Morgan Global Wealth Management program, where she spent time on both a client-facing team and an investment due diligence team. Olivia earned a B.B.A. in Finance and International Business from Villanova University in 2014 and is currently pursuing an M.B.A. at New York University Stern School of Business.

# Disclosures and Additional Notes

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In connection with any consideration of an investment in the Fund, prospective investors should be aware of a number of additional general and specific risks (many of which are described in the Fund's private placement memorandum and Kepos Capital's Form ADV), including the following:

**Conflicts of Interest.** The investment manager will be subject to a number of conflicts of interest from time to time, some of which are described in the Fund's private placement memorandum.

**Financing Arrangements.** The use of leverage is integral to many of the Fund's strategies, and the Fund depends on the availability of credit in order to finance its portfolio. The purchase of options, futures, forward contracts, repurchase agreements, reverse repurchase agreements and equity swaps generally involves little or no margin deposit and, therefore, provides substantial leverage. Accordingly, relatively small price movements in these financial instruments may result in immediate and substantial losses to the Fund.

**Model and Data Risk.** Given the complexity of the investments and strategies we manage, we must rely heavily on quantitative models (both proprietary models developed by our personnel, and those supplied by third parties) and information and data supplied by third parties. When these models and data prove to be incorrect, misleading or incomplete, any decisions made in reliance on them expose investors to potential risks. Also, the research and modeling process we engage in is extremely complex and involves financial, economic, econometric and statistical theories, research and modeling; the results of that process must then be translated into computer code. Although we seek to hire individuals skilled in each of these functions and endeavor to provide appropriate levels of oversight, this complexity raises the chances that the finished model may contain one or more errors that could adversely affect performance.

**Obsolescence Risk.** We are unlikely to be successful in managing client accounts unless the assumptions underlying our models are realistic and either remain realistic and relevant in the future or are adjusted to account for changes in the overall market environment. If such assumptions are inaccurate or become inaccurate and are not promptly adjusted, it is likely that profitable trading signals will not be generated.

**Crowding/Convergence.** There is significant competition among quantitatively-focused managers, and our ability to deliver returns for investors that have a low correlation with global aggregate equity markets and other hedge funds is dependent on our ability to employ models that are simultaneously profitable and differentiated from those employed by other managers. To the extent that we are not able to develop sufficiently differentiated models, investors' investment objectives may not be met, irrespective of whether the models are profitable in an absolute sense.

## ***Market Indices Used in Presentation:***

**MSCI ACWI** is an index designed to measure the broad equity market performance of developed and emerging markets.

**Barclays Global Aggregate** provides a broad-based measure of the global investment grade fixed-rate debt markets.

**VIX** is a measure of market expectations of near-term volatility as conveyed by S&P 500 stock index options.

## ***Hedge Fund Indices Used in Presentation:***

**HFRI Global Fund Weighted Composite Index** is an equal-weighted index of over 2,000 single-manager funds with at least \$50 million under management or a 12-month track record.

**HFRI Equity Hedge (Total) Index** is comprised of managers who maintain positions both long and short in primarily equity and equity derivate securities.

**HFRI Relative Value Index** is an index designed to measure managers who maintain positions in which the investment thesis is predicated on realization of a valuation discrepancy in the relationship between multiple securities across asset classes.

**HFRI Event Driven** is a broad measure of managers who maintain positions in companies involved in corporate transactions of a wide variety including but not limited to mergers, restructurings, tender offers, shareholder buybacks, debt exchanges, security issuance or other capital structure adjustments.

**HFRI Macro Index** is a measure of managers whose investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.

References to indices, benchmarks or other measures of relative market performance over a specified period of time are provided for your information only and do not imply that the actual Fund portfolio will achieve similar results. The index composition does not reflect the manner in which a portfolio is constructed; unlike these indices and benchmarks, the Fund's portfolio may contain options (including covered and uncovered puts and calls) and other derivative securities, futures and other commodity interests and currencies, and may include short sales of securities, margin trading, securities of smaller capitalization companies and types of securities that are different than those reflected in these indices and benchmarks, and is not as diversified as these indices and benchmarks. While an adviser seeks to design a portfolio which reflects appropriate risk and return features, portfolio characteristics may deviate from those of the benchmark. Indices are unmanaged and investors cannot invest directly in most indices. The figures for the indices may reflect the reinvestment of dividends but do not reflect the deduction of any fees or expenses which would reduce returns.



**LOMBARD ODIER**  
INVESTMENT MANAGERS

## LOIM ALTERNATIVE RISK PREMIA

Seeking uncorrelated returns with daily liquidity

APRIL 28 2021

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

# Lombard Odier – independent and privately owned

- Lombard Odier was found in 1796. Over the years, it has gone through more than 40 financial crises and wars. This year we celebrate 225 years in business
- The Firm has always been wholly owned by its partners who are responsible for the day-to-day management of the Firm
- We believe this management structure brings tangible benefits for our clients
  - Independent ownership brings an entrepreneurial approach to our business strategy and the ability to take a longer-term outlook
  - Our focus is 100% on our clients rather than shareholders
  - We are able to respond with agility to market events
- We have 14 offices around the world. Our New York office was opened more than 10 years ago and counts 50 employees

## LOMBARD ODIER GROUP

**USD 360 billion<sup>1</sup>**

3 main activities private clients wealth management, institutional clients asset management and banking technology

## LOMBARD ODIER IM: ASSET MANAGEMENT

**USD 71 billion<sup>2</sup>**

Asset management services for institutional clients, third-party distributors and financial intermediaries

## WE ARE ONE OF THE BEST-CAPITALISED BANKS IN THE WORLD

### FITCH RATINGS<sup>1</sup>

**AA-**

Our firm is rated AA- by Fitch – this is the best possible rating for a firm of our size

### TIER 1 RATIO<sup>1</sup>

**29.7%**

Fully-loaded Basel III CET1 ratio

AUM, Fitch Ratings and CET1 fully loaded Basel III capital ratio figures are correct as at 31 December 2020. Lombard Odier Group annual results do not include an additional USD 5.6 billion of assets for Lombard Odier IM (as at 30 June 2020), which result from FINMA reporting requirements.

Awards and ratings may vary without notice.

<sup>1</sup> Assets under administration as at 30 June 2020.

2 · Lombard Odier Investment Managers. Please see important information at the end of the document.

# Lombard Odier at the forefront of sustainable investing



**PRI** Principles for Responsible Investment

**A+**

Strategy & Governance since 2017  
Signatory since 2007

**Certified**  
  
**B Corporation**

**1st**

B Corp certified global wealth and asset manager and 2019 Best for the World Honoree<sup>1</sup>



Part of the  
**Sustainable Markets Initiative**

**Founding Member**

HRH Prince of Wales  
Circular Bioeconomy Alliance  
Natural Capital Investment Alliance



**Partnerships**  
**SYSTEMIQ**

**1st**

Endowed professorship of sustainable finance at any major research university



**febelfin**  
European Commission  
EU Taxonomy aligned

**1st**

Convertible bond fund to gain Febelphin rating and fund aligned with the EU Taxonomy: (Climate Transition)

**Memberships and signatories to sustainability initiatives including:**



**Finance for Biodiversity Pledge**



**UN GLOBAL COMPACT**



**Climate Action 100+**  
Global Investors Driving Business Transition



**TCFD** | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES



**ENERGY TRANSITIONS COMMISSION**



**IIGCC**  
The Institutional Investors Group on Climate Change



**SUSTAINABLE FINANCE GENEVA**  
where finance meets impact



**UNEP FINANCE INITIATIVE**

**PRINCIPLES FOR RESPONSIBLE BANKING**

Source: LOIM. For illustrative purposes only. Awards and ratings may vary without notice. <sup>1</sup>The B Corp certification is one of the world's most advanced ratings for corporate sustainability, issued by B-Lab, a nonprofit organisation based in New York.

3 · Lombard Odier Investment Managers. Please see important information at the end of the document.

# LOIM Inclusion & Diversity (I&D) Steering Committee

## SUSTAINABILITY

We are committed to sustainable investing where we consider and deliver social and environmental benefits, not just financial profit.

### LOIM I&D Steering Committee

**Jean-Pascal Porcherot**  
(Global LOIM Co-Head)  
Sponsor

**Natalia Bucci**  
(Global Co-Head of Convertibles)  
Co-Chairs

**Steve Grobman**  
(Global CRO)  
Co-Chairs

**Rebeca Coriat**  
Voice of CLIC™

#### Recruitment

**Co-Leads**  
Alkesh Gianchandani  
Sheena Shah

#### Advancement

**Co-Leads**  
Helene Harasty  
Samir Jain

#### Culture

**Co-Leads**  
Vicky Parrish  
Pascal Menges

#### Operational

**HR Led**

**Common goal: Representation – retention – equal pay**

# LOIM Inclusion & Diversity mission: Our four pillars

We aim to deliver an employee experience that attracts, develops, and retains diverse talent, to achieve superior results for our investors, business, communities, and commit to our CLIC™ engagement

## Four pillars to drive positive change:



### Recruitment

Making strategic and tactical changes to our recruitment initiatives to significantly increase the diversity of our pipeline when we recruit externally at all levels, from interns to senior hires.



### Advancement

Nurture our internal talent pool and provide equal opportunities to grow and develop at LOIM. This will result in better retention and more diverse representation in Senior and PM roles over time.



### Culture

Walk the talk on holistic CLIC™ engagement, from investment to organizational ethos, by fostering an inclusive, respectful and diverse workplace, where differences are valued and harnessed.



### Operational change

Review and remove potential bias from our HR processes and policies, agree targets for diversity improvement, collect data and monitor our progress: “*what is not measured doesn’t exist*”.

### GOAL & MEASUREMENT:

#### Improve diverse talent

1. Representation
2. Retention
3. Equal pay

# Diversity representation survey for Oakland Police and Fire

Firm name: Lombard Odier Investment Managers

Product name: Alternative Risk Premia Core V10

	Percentage (%) of Board of Directors / managing members	Percentage(%) of firm (entire staff)	Percentage (%) of firm (investment professionals)
<b>Race and ethnicity<sup>1</sup></b>			
African American/Black	0%	11%	0%
Asian/Hawaiian/Pacific Islander	0%	23%	33%
Latino/Hispanic	0%	2%	0%
White	0%	55%	50%
American Indian/Alaska Native	0%	0%	0%
Other	0%	9%	17%
<b>Gender</b>			
Male	86%	68%	82%
Female	14%	32%	18%
Non-identified/other	0%	0%	0%

Source: Data as of 31 March 2021. <sup>1</sup> Racial/ethnic categories appear as defined by EEOC guidance.

6 · Lombard Odier Investment Managers. Please see important information at the end of the document.

## Why work with us

Organization (firm and team) with long term dedication to the space and strategy

- **CLIENT BASE**

- Of our institutional client base, 62% represent pensions from all over the world - the balance are Insurance companies, Treasuries, and Sovereign Wealth Funds
- Specific to ARP, we are working with several US public plans on the solution outlined today, built based on their requirements
- Partnerships are created with our clients via product development, knowledge transfer, external education, and fee alignment

- **TEAM**

- Systematic Asset Management team of 27 investment professionals managing >\$15 BN of AUM
- Dedicated ARP Portfolio Managers have been working together at Lombard Odier for over 13 years
- Client servicing in all time zones across the globe

- **SIZE**

- Firm size is large enough to provide excellent institutional infrastructure and services
- Solutions team is nimble so able to adapt to customers' needs and focused that you will be a most important client

- **SOLUTION**

- Our business has been built one client at a time, structuring solutions based on the objectives and needs of our clients
- Competitive flat fee structure and low expense ratio
- Take on fiduciary responsibility to go after best execution, and can also customize solutions with great flexibility
- Has been vetted, challenged, and accepted by Meketa and their clients

# Alternative Risk Premia – A unique solution in the current environment

Alternative Risk Premia seeks to offer uncorrelated returns with daily liquidity

## ▪ CURRENT INVESTORS DILEMMA

- Traditional risk premia are compressed and expected returns are low
- Fixed Income historical diversification benefits are challenged
- New regulations and intervention by central banks have led to fractured liquidity
- Fee scrutiny has increased

## ▪ THE OBJECTIVE

- Deliver returns uncorrelated to traditional asset classes
- Serve as a diversifier to a global portfolio as well as to other components of the Crisis Risk Offset portfolio
- Offer exposure to multiple Alternative Risk Premia by investing Long/Short across all asset classes via liquid instruments
- Market neutral strategy construction to deliver positive (or negative) returns regardless of market direction

## ▪ THE ALTERNATIVE RISK PREMIA FEATURES

- Premia have a clear investment rationale. They have been proven, tested and are expected to deliver positive returns over the medium to long term.
- Straight forward implementation of the most common as well as innovative risk premia
- Exposure to index level (macro) and single security level (micro) risk premia
- Competitive flat fee structure and low expense ratio
- Daily liquidity

# LOIM Systematic Team and Research capabilities

## RESEARCH AND PORTFOLIO MANAGEMENT

Alternatives	Equities	Multi-Asset	Fixed Income
Laurent Joué	Alexey Medvedev, PhD	Aurèle Storno, CFA	Yannik Zufferey, PhD
Marc Pellaud, PhD	Nicolas Mieszkalski	Alain Forclaz, PhD	Jérôme Collet, PhD
Cesar Moura, PhD	Cheick Dembele	Serge Tabachnik, PhD	Anando Maitra, CFA
Clément Leturgie, CFA	Romeo Brofiga	Sui Kai Wong	Nic Hoogewijs, CFA
Clément Mary-Dauphin	Pascal Menges	François Chareyron Benjamin Meyer Jacqueline Pfenninger	Markus Thöny Maxim Lindqvist Vincent Megard Leslie Leigh
			Jamie Salrt Andre Kayisire

## QUANT PLATFORM

Developing and implementing/executing trading algorithms
Pierre Olivier Trabichet (Chief Technology Officer)

## NEW RISK FACTORS AND POTENTIAL RETURN DRIVERS

ESG factors	Next generation factors (e.g., utilising Artificial Intelligence, Big Data)
Robert De Guigné Nicolas Barben	Foort Hamelink, PhD Qaisar Hasan + Cross systematic team members
Elise Beaufils	Pierre Olivier Trabichet Sameet Desai

## EXTERNAL EXPERTISE

Academic Board
Foort Hamelink, Vrije Universiteit Amsterdam
Pierre Collin-Dufresne, Ecole Polytechnique de Lausanne
Darrell Duffie, Stanford University

# Alternative Risk Premia Portfolio Management Team

Stable team, managing liquid alternative systematic strategies since 2009

TEAM KEY CHARACTERISTICS	 <b>LAURENT JOUÉ</b> Senior Portfolio Manager	 <b>MARC PELLAUD, PHD</b> Senior Portfolio Manager	 <b>CESAR MOURA, PHD</b> Senior Research Analyst
<ul style="list-style-type: none"> <li>■ Integrated Systematic team with a collaborative approach</li> <li>■ 27 professionals managing &gt;USD15bn</li> <li>■ Dedicated ARP Portfolio Managers have been working together at Lombard Odier for over 13 years</li> <li>■ Developed first generation of liquid Hedge Fund replication in 2009</li> <li>■ Developed the LOIM Alternative Risk Premia offering and manage a strategy live since 2014</li> <li>■ ARP team managing over USD1.5bn</li> </ul>	<p>Laurent Joué is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing Alternative Risk Premia and Commodity strategies. He joined LOIM in July 2008. Laurent started his professional career in 2005 at Géa in Paris, the ADI-LODH joint-venture specialized in Hedge Fund multi-management where he worked as an Assistant Portfolio Manager. Before joining the Systematic team in November 2009, he was in the Fund of Hedge Funds Team as a Portfolio Manager.</p>	<p>Marc Pellaud is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, Alternative Risk Premia and Commodity strategies. He is also involved in various research projects for the Systematic Team. He initially joined LOIM in June 2007, managing equity portfolios. Marc earned a PhD in life sciences from the Swiss Federal Institute of Technology in Lausanne (EPFL) in 2007</p>	<p>Cesar Moura is a senior analyst in the Systematic Alternatives team within LOIM. He joined the firm in 2018. Prior to joining, he was Head of Research at Dynamic Capital Management. He spent 10 years at Dynamic leading the quantitative research efforts which were applied to systematic trading. At Dynamic, he developed significant quantitative skills around machine learning, statistics, modelling, and programming. Cesar earned a PhD in theoretical physics from Pierre et Marie Curie University in 2009. He also holds a degree in engineering from the Ecole Polytechnique and a master's degree in physics from the Ecole Normale Supérieure in Paris.</p>



# THE ALTERNATIVE RISK PREMIA PROPOSITION

## BUILDING AN ARP SOLUTION

**LOMBARD ODIER**  
INVESTMENT MANAGERS

# LOIM Alternative Risk Premia investment philosophy and process

LOIM aims at building all weather ARP solutions

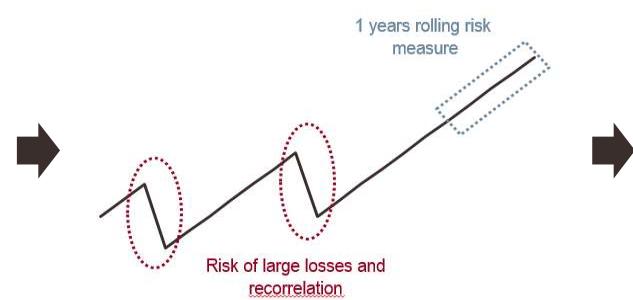
## 1. RESEARCH AND SELECTION

- Alternative Risk Premia are developed in house
- Team avoids overfitting to ensure better understanding of premia
- For risk consideration, the focus is on the most liquid premia
- We aim at including Environmental, Social and Governance (ESG) concerns when possible

EQUITIES		FX	BONDS	COMMODITIES	CREDIT
Beta	Value	Value	Value	Value	
Quality	Size	Carry	Carry	Carry	Carry*
Momentum	Trend	Trend	Trend	Momentum	Trend
Intraday Trend	Volatility				

## 2. COMBINATION

- We recognize 2 main categories of Alternative Risk Premia:
  - Income oriented premia
  - Risk mitigation premia
- We use a proprietary risk measure which accounts for:
  - Short-term as well as long-term metrics
  - Downside potential, diversification benefits and liquidity



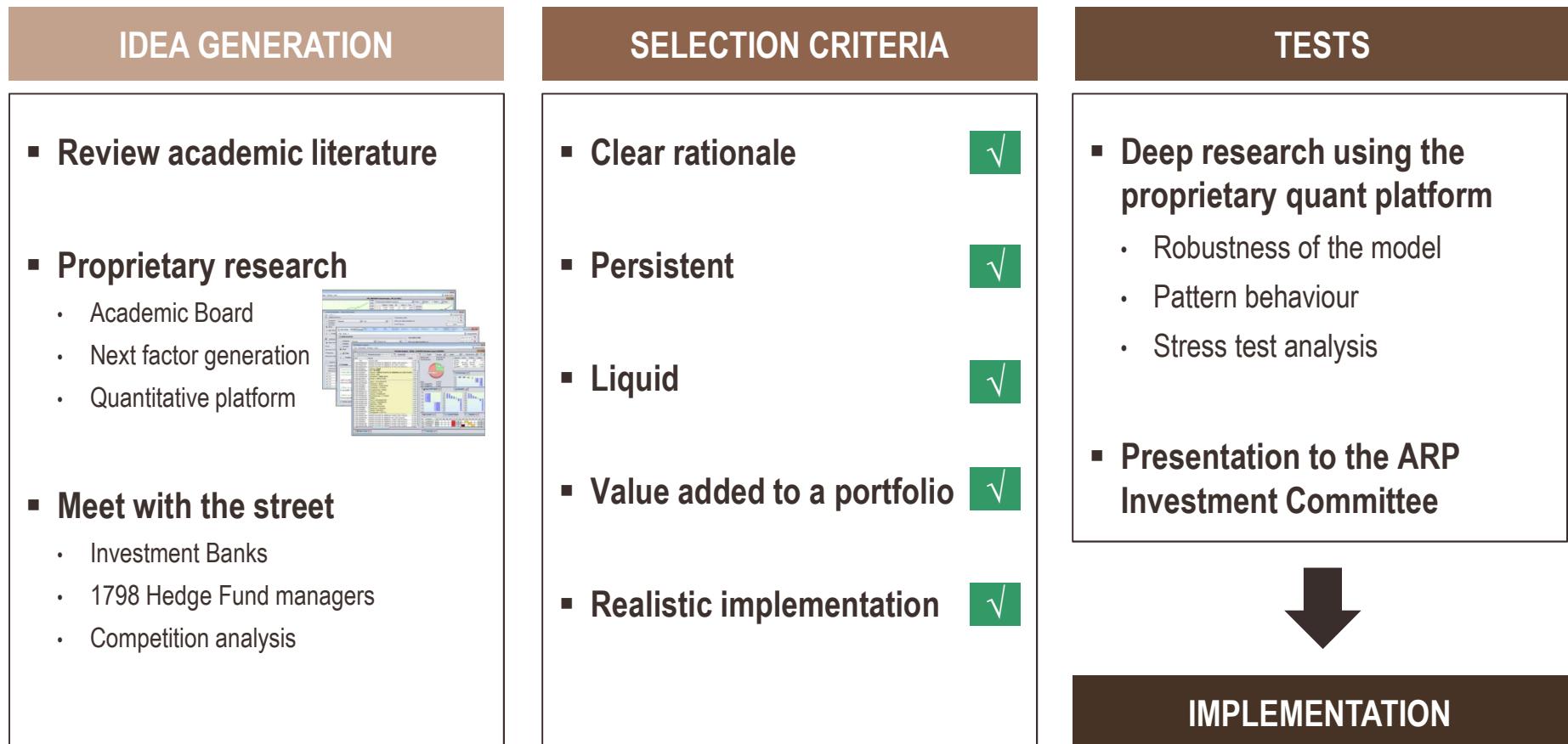
## 3. PORTFOLIO & RISK MANAGEMENT

- Real time monitoring of portfolio
- Complex set of systematic actions including:
  - Portfolio rebalancing
  - Premia rebalancing
  - Risk adjustment
- Multiple risk limits integrated in the model
- Independent Risk Management team replicates the portfolio for control



# Research and selection process

From inception to inclusion



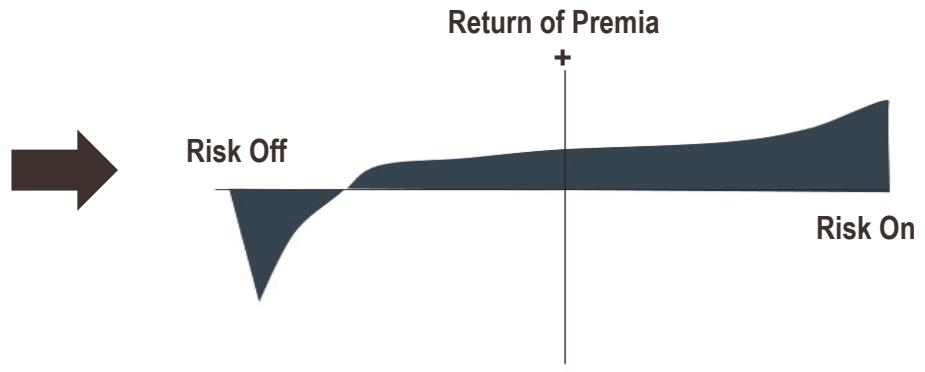
# Multiple premia can be grouped into two categories

These two categories have complementary payoff profiles

## INCOME RISK PREMIA – LEFT TAIL

- Insurance seller profile
- Seeks to deliver stable returns with low volatility
- Typically market neutral strategies
- Can be exposed to large losses notably during risk off periods

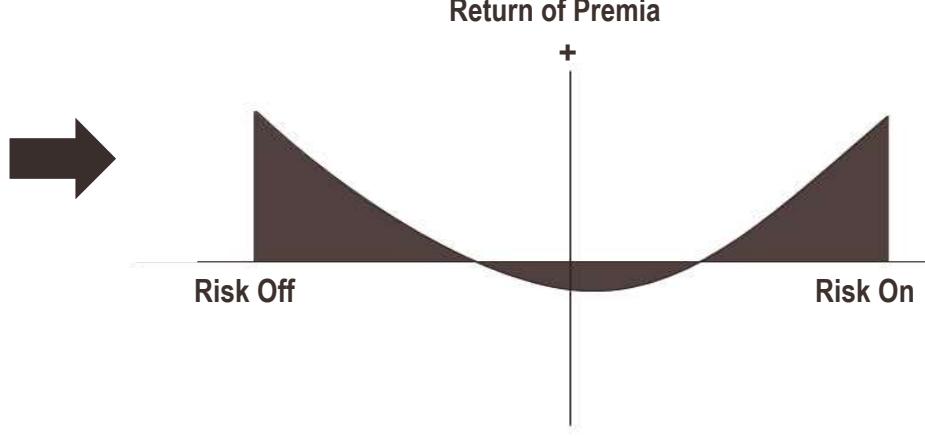
## INCOME RISK PREMIA PROFILE



## RISK MITIGATION PREMIA – RIGHT TAIL

- Insurance buyer profile
- Seeks to deliver higher positive returns in extreme scenarios
- Typically directional strategies
- Can be exposed to smaller losses in trendless markets, but tend to benefit in prolonged trends and/or sharp reversals

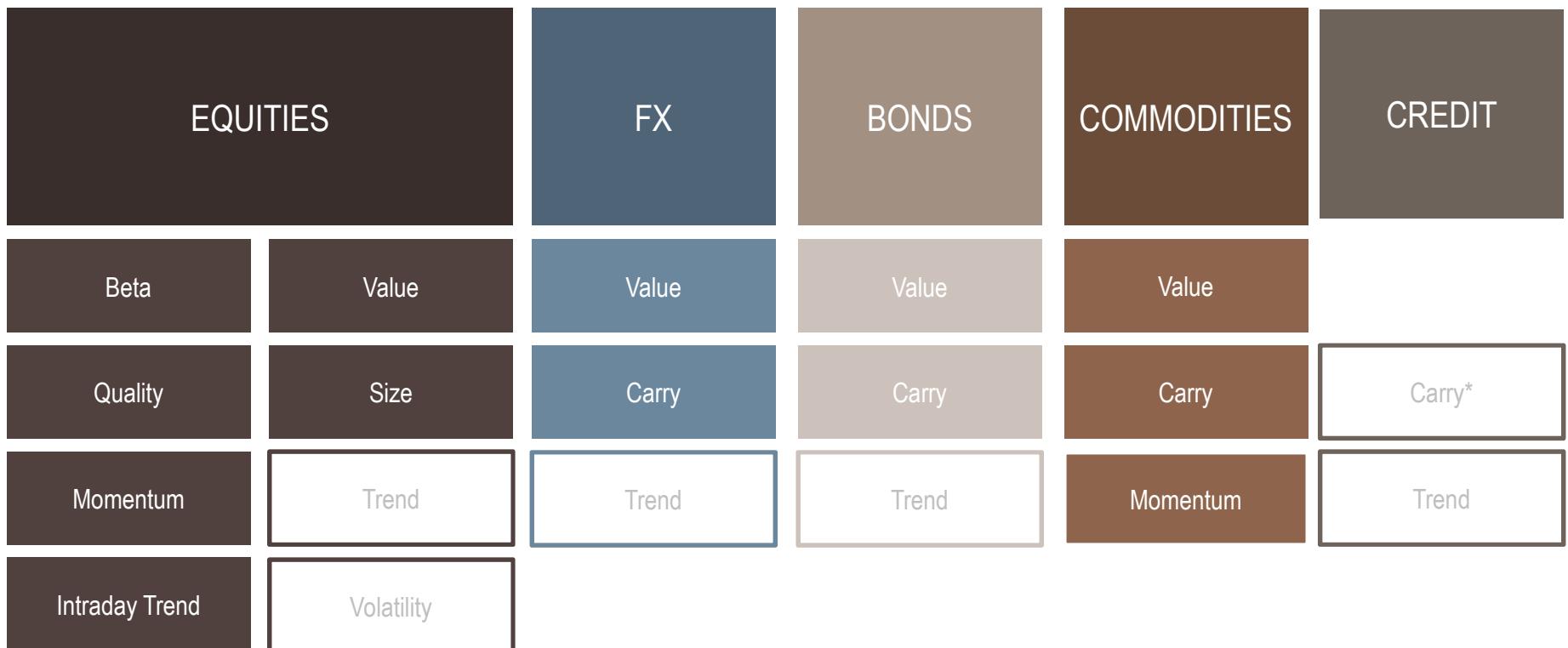
## RISK MITIGATION PREMIA PROFILE



Source LOIM. For illustrative purposes only. Past performance is not a guarantee of future results..

## LOIM Alternative Risk Premia offering

A diversified set of ARP offers attractive portfolio construction tools



Trend premia typically refers to absolute directional long/short positions. Momentum premia typically refers to relative long/short positions on single securities

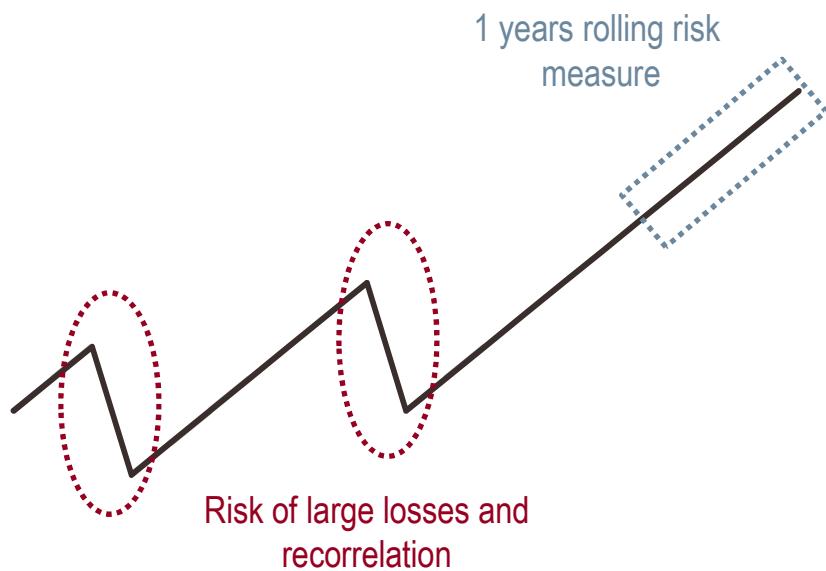
Shaded premia are included in the solution discussed

\*Carry Credit premia has been deactivated due to premia decay

## Portfolio construction – Proprietary risk measure developed for ARP

Our combination process favours stable, uncorrelated and liquid risk premia

TYPICAL INCOME RISK PREMIA RETURN PROFILE



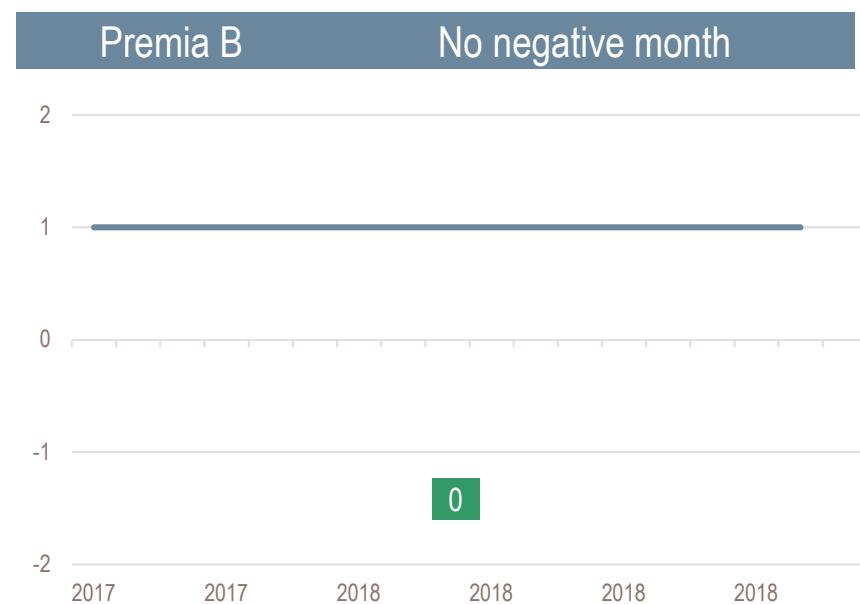
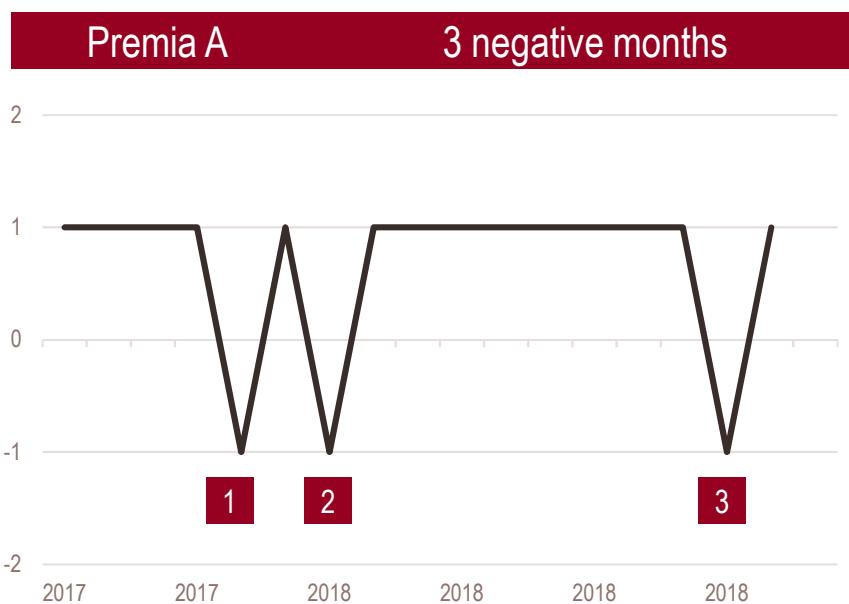
By only using a short-term risk measure, one can miss accounting for risk of large losses and be overexposed to premia which can suffer from gap risk at the worst time

- Volatility is a simplistic risk measure which is not suitable for individual Alternative Risk Premia with non-normal distributions
- Our risk based allocation uses a proprietary risk measure designed specifically for ARP
- This modified 90% Expected Shortfall penalizes premia which, during periods of stress:
  - Suffer from large losses
  - Re-correlate to equities
  - Suffer from liquidity risk

## Portfolio construction – Short term risk measure

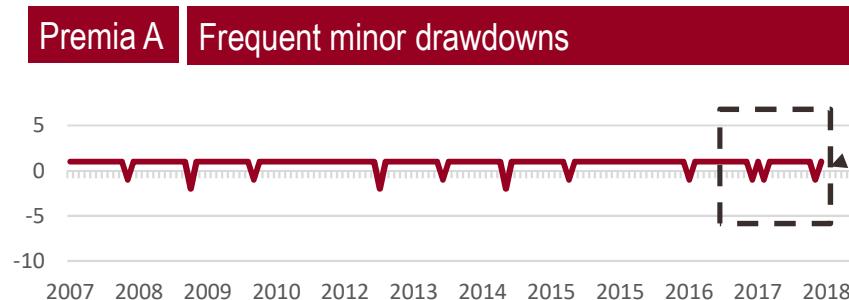
Looking at a short term measure only, Premia A seems riskier than Premia B

- Consider Premia A and Premia B
- Over the last 18 months:
  - Premia A delivered 15 monthly returns of +1% and 3 monthly returns of -1%
  - Premia B delivered 18 monthly returns of +1%

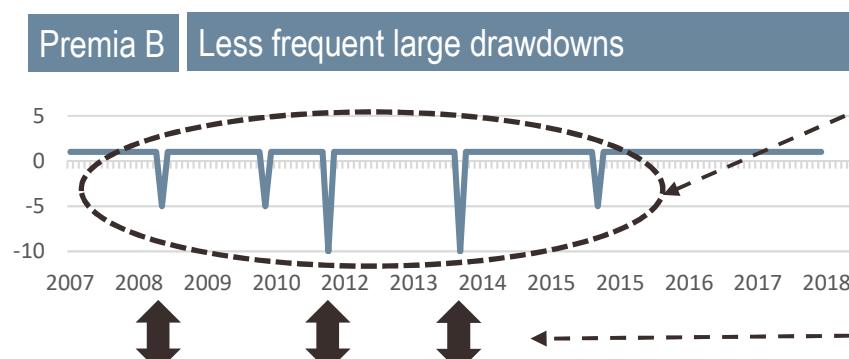


## Portfolio construction – Long term risk measure

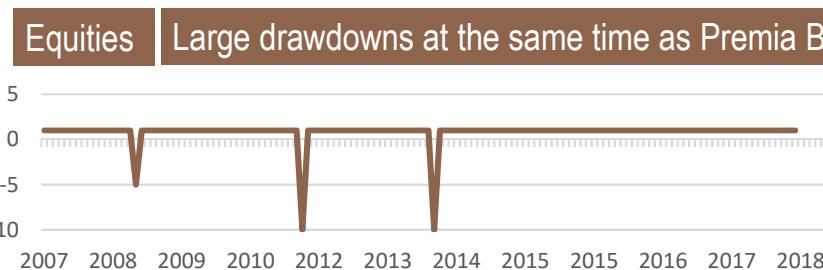
An informed manager needs to look beyond recent performance



On short term performance:  
Favor **Premia B** over **Premia A**



On longer term performance  
**Premia B seems more risky**



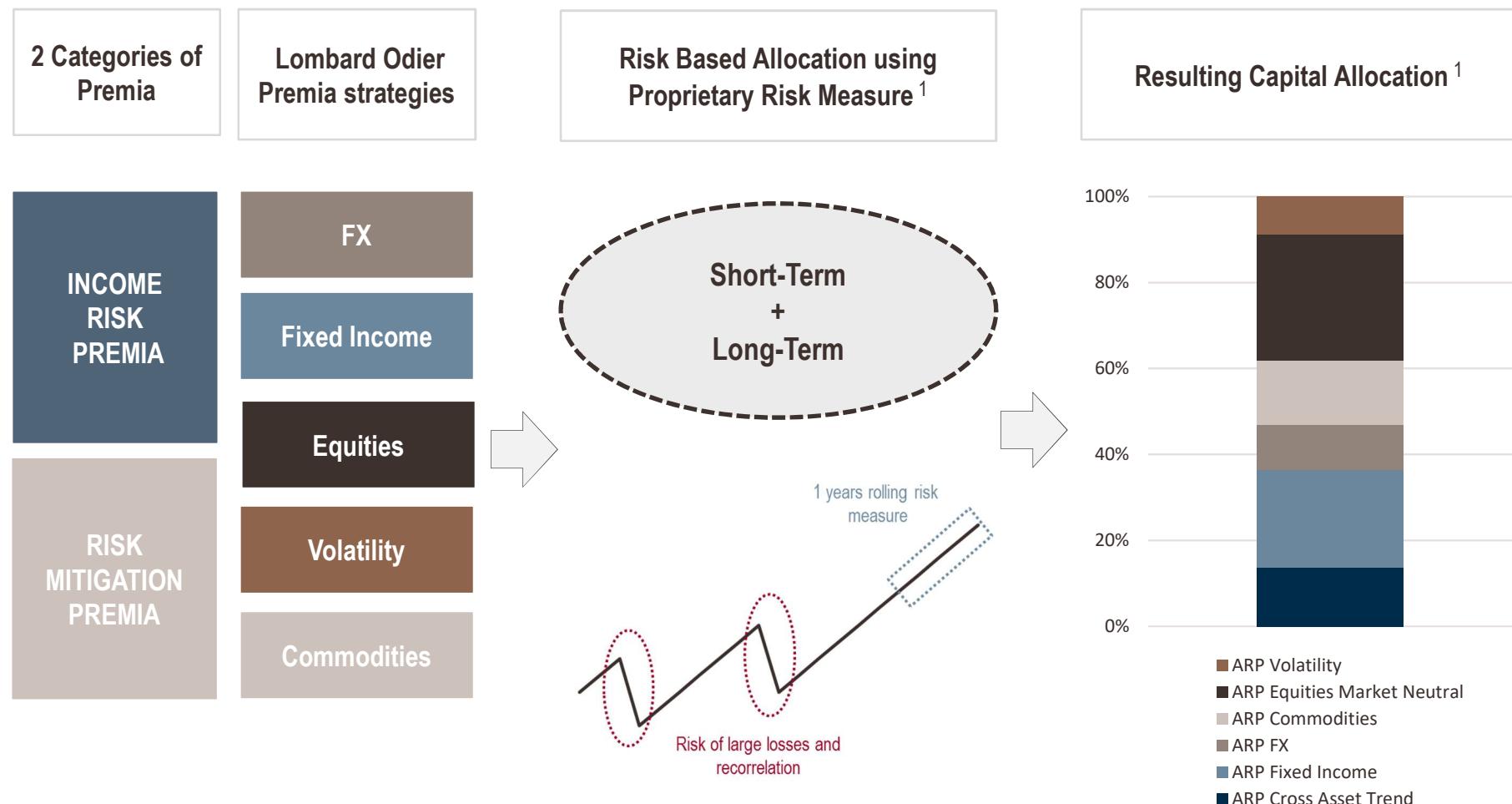
Bigger issue: **Premia B seems to lose at the same time as Equities**



In the end:  
Favor **Premia A** over **Premia B**

# Risk is balanced between categories and then toward strategies

Risk contributions are translated into capital weights. The higher the risk, the lower the allocation.<sup>1</sup>



<sup>1</sup> Note: Example. Allocation is subject to future changes.

Source LOIM. Provided for illustrative purposes only to demonstrate the investment process undertaken by the Manager..

19 · Lombard Odier Investment Managers. Please see important information at the end of the document.

# Investment risk management process

Risk philosophy is strengthened by the combination of two layers of risk management

## INTEGRATED RISK MANAGEMENT

- **First level risk management** performed by portfolio managers on a continuous basis
- **Ongoing daily monitoring** in real time by Portfolio Managers
- **Daily reports** produced to give detailed insight into portfolio exposures, performance contribution and analysis of risk measures
- **Absence of performance fee** prevents extensive risk taking behaviour

## INDEPENDENT RISK MANAGEMENT

- Risk management team is **independent** and has separate reporting lines to the LOIM Managing Partner
- **Dedicated risk manager** in continuous dialog with the investment team
- **Externally and internally developed systems and tools**
- **Disciplined risk-limit framework** tailored to the investment strategy
- **Real-time portfolio/risk monitoring** and automated controls on performance, portfolio exposure, liquidity, etc.
- **Daily reports and periodic analysis** to help portfolio management team align risk with conviction
- **Weekly and ad hoc portfolio reviews** between the Risk team and Portfolio Managers

No representation is made that the Investment Manager's or the Fund's investment process, investment objectives, goals or risk management techniques will or are likely to be achieved or successful or that the Fund or any underlying investment will make any profit or will not sustain losses. An investor is subject to potential loss of his/her investment.

20 · Lombard Odier Investment Managers. Please see important information at the end of the document.



**INCOME ORIENTED RISK PREMIA CORE FOCUS**

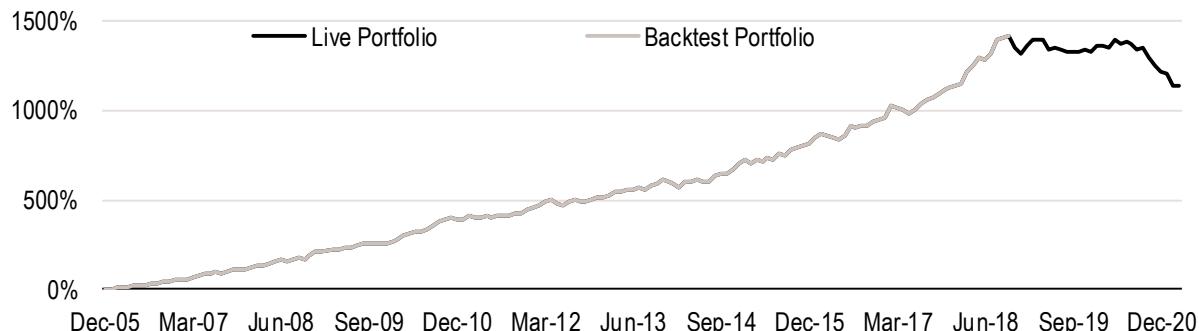
**LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10**

**LOMBARD ODIER**  
INVESTMENT MANAGERS

# LO Funds IV – Alternative Risk Premia Core V10

## Historical performance\*

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – LIVE & BACKTEST PRO-TRACK NET RETURN\*



Annualized - ITD		
Performance Statistics	Backtest	Live
Ann. Return	23,60%	-8,04%
Ann. Volatility	8,1%	8,92%
Sharpe Ratio	2,90	-
Alpha Statistics		
Months up	85%	41%
Maximum monthly gain	8,16%	3,00%
Maximum monthly loss	-3,26%	-5,24%
Max. Drawdown	-5,06%	-19,31%
Recovery Period	In Recov.	In Recov.

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – LIVE PRO-TRACK HISTORICAL NET PERFORMANCE\*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2021	-1.41%	-5.24%	0.44%										-6.16%
2020	2.45%	-0.17%	-0.45%	2.84%	-1.55%	0.59%	-0.32%	-2.22%	0.08%	-3.87%	-2.70%	-2.39%	-7.65%
2019	3.00%	1.86%	-0.16%	0.39%	-3.61%	0.67%	-0.59%	-0.95%	0.09%	0.12%	0.41%	-0.59%	0.49%
2018	-	-	-	-	-	-	-	-	-	-	-4.67%	-1.63%	-6.22%

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – BACKTEST PRO-TRACK HISTORICAL NET PERFORMANCE\*

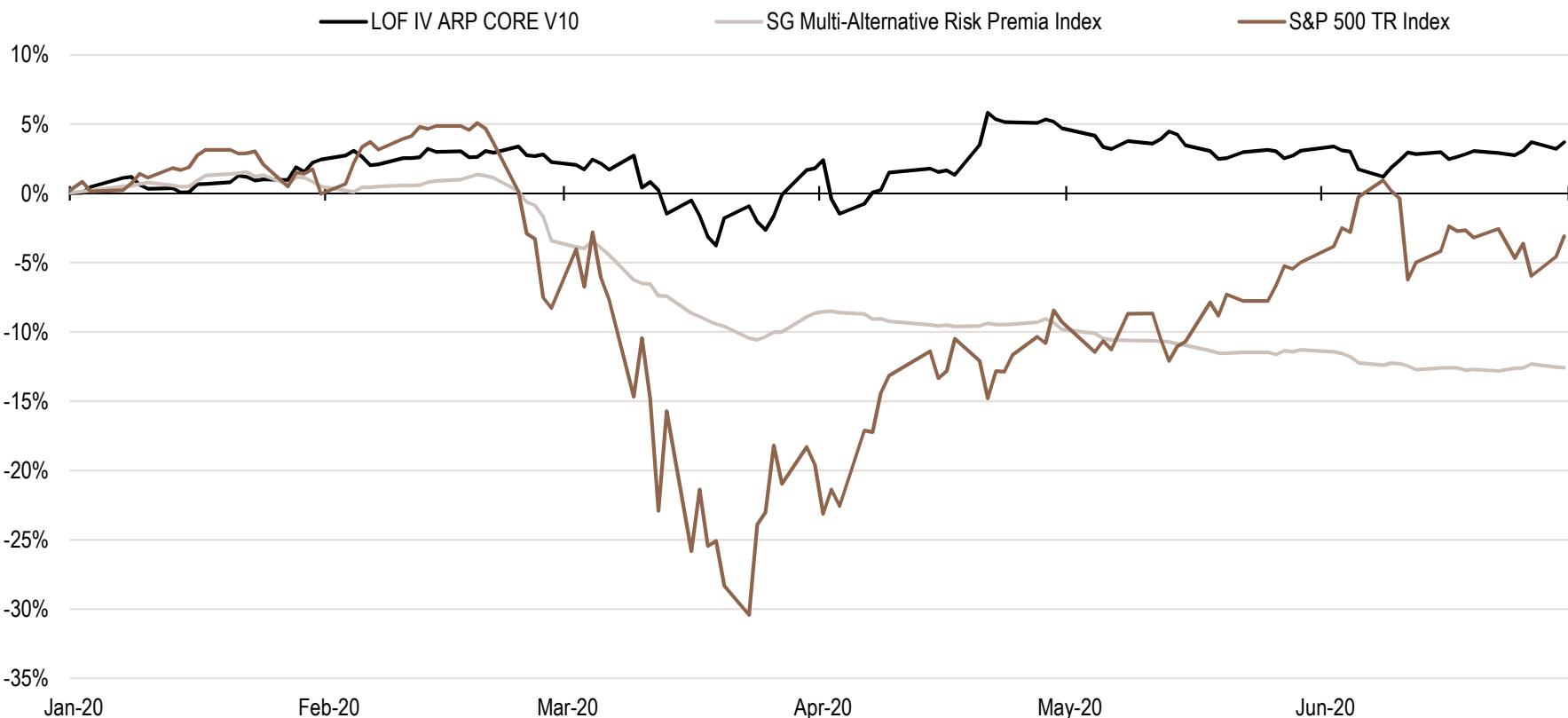
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2018	0.66%	1.56%	4.93%	2.66%	3.43%	-0.94%	2.19%	5.67%	1.09%	0.36%			23.61%
2017	1.50%	6.56%	-1.45%	-0.60%	-2.30%	2.66%	2.40%	1.81%	1.47%	1.40%	2.18%	0.86%	17.47%
2016	2.75%	2.65%	-0.80%	-1.65%	-1.07%	2.77%	5.36%	-0.53%	0.60%	-0.04%	2.08%	1.06%	13.75%
2015	1.57%	-1.91%	2.93%	-2.12%	3.10%	-1.53%	3.91%	-0.63%	3.15%	1.63%	1.61%	1.53%	13.79%
2014	-0.34%	-3.04%	3.47%	0.30%	1.44%	-0.24%	-0.44%	3.93%	2.27%	0.51%	2.32%	4.80%	15.73%
2013	-0.78%	1.81%	4.75%	-1.08%	2.02%	0.36%	1.78%	-2.18%	3.46%	2.41%	2.32%	-1.68%	13.73%
2012	1.26%	2.74%	3.68%	0.93%	-2.35%	-1.73%	2.21%	2.39%	-1.33%	0.32%	1.00%	2.12%	11.62%
2011	0.26%	2.74%	-2.29%	2.02%	0.88%	-2.12%	1.46%	0.97%	0.44%	1.24%	-0.22%	5.67%	11.36%
2010	3.21%	1.66%	4.61%	4.69%	3.43%	-0.58%	1.22%	5.30%	4.36%	3.30%	2.94%	-2.19%	36.71%
2009	-2.07%	1.85%	4.23%	1.33%	3.02%	1.61%	1.38%	3.69%	-0.32%	1.68%	0.07%	-0.09%	17.47%
2008	3.38%	3.19%	2.59%	3.10%	4.32%	4.25%	-3.26%	2.89%	4.45%	-1.51%	8.16%	6.34%	44.54%
2007	3.71%	0.25%	5.60%	6.77%	3.51%	4.52%	0.87%	-2.47%	3.09%	6.26%	-0.73%	4.11%	41.27%
2006	4.14%	3.82%	0.94%	6.39%	3.69%	-0.28%	4.71%	7.54%	0.52%	4.54%	1.60%	6.11%	53.15%

\*Estimated Net performance for the Share Class I-A USD as at 31 March 2021. Performance information shown reflects a combination of (i) backtest pro-forma adjusted net returns from January 2006 to October 2018, (ii) actual returns of the LO Funds IV – Alternative Risk Premia Core V10, I-A USD share class from November 2018 (i.e., the date of its launch) and onwards. This material contains hypothetical (simulated) backtested performance results and other related information ("Hypothetical Results").

Fees: 85bps management fee + 20bps operational costs included in the numbers

# LO Funds IV – Alternative Risk Premia Core V10

H1 2020 performance vs. S&P500



<sup>1</sup> Data shown for the Share Class I-A USD from 1 Jan 2020 to 30 June 2020 to exhibit the performance of the strategy during an equity market correction. Fund inception 31 October 2018.

Source: Bloomberg, Lombard Odier. Performance is shown net of fees including reinvestment of earnings, capital gains, interest and dividends. Source Lombard Odier, figures unaudited. Past performance is not a guarantee of future results. Indices are here for information purpose only.

# LO Funds IV – Alternative Risk Premia Core V10

## Terms

<b>STRATEGY AUM<sup>1</sup></b>	USD 1512 million
<b>INVESTMENT TERMS</b>	
<b>MANAGEMENT FEE</b>	0.80%
<b>DISTRIBUTION FEE</b>	n/a
<b>PERFORMANCE FEE</b>	n/a
<b>LIQUIDITY</b>	Daily
<b>SUBS. &amp; REDEMP. DEADLINE</b>	T-1, 15:00 CET
<b>SUBS. &amp; REDEMP. PAYMENT DATE</b>	T+2
<b>REDEMPTION PENALTIES</b>	n/a
<b>MINIMUM INVESTMENT</b>	USD 1'000'000
<b>REFERENCE CURRENCY</b>	USD

<sup>1</sup> AUM figure as of 28 February 2021. Fund AUM covers all share classes. Strategy AUM relates to the Alternative Risk Premia strategy within LOIM which includes the assets under management of managed accounts as well as the LO Funds–Alternative Risk Premia v300 launched on 13 October 2016, the LO Funds IV–Alternative Risk Premia launched on 27 July 2018 and the LO Funds IV–Alternative Risk Premia Core which launched on 31 October 2018. AUM figures estimated and are represented through assets within one or more, or a combination of private funds, managed accounts, and/or sub-portfolios or allocations. This information is qualified in its entirety by the information contained in the fund's confidential offering documents, including the prospectus or other offering memorandum (collectively, the "Prospectus"). Any offer or solicitation of an investment in the fund may be made only by delivery of the fund's Prospectus to qualified investors. Prospective investors should rely solely on the Prospectus in making any investment decision.



## CONCLUSION

**LOMBARD ODIER**  
INVESTMENT MANAGERS

## Proposed interaction model

- **Monthly reports**
  - Bespoke reporting tailored needs
- **Quarterly investment review**
  - Onsite visits / video-conference per year
- **Specialist meetings**, opportunistic or on demand
  - Equity, fixed income, sustainability, alternative strategies, etc
- **Annual training at LOIM (Transfer of Knowledge)**
  - 1-2 weeks sitting with investment teams (London/Geneva/New York)
  - Catch-up / deep dives with investment specialists
- **On-demand research and reports**
  - Research enhancements, portfolio construction, etc

# Conclusion

## ■ Why work with Lombard Odier as an Asset Manager

- **Respected client base** with global perspective from institutional investors from all over the world
- Business model where a **client driven solution** is the norm
- Strong and **consistent team with collaborative approach** across all systematic and non-systematic teams at Lombard Odier
- Right Size:
  - Large enough firm to provide **excellent institutional infrastructure** and services
  - Nimble team able to adapt to **customers' needs** and assure you that you are an **important client**

## ■ Why Lombard Odier Alternative Risk Premia

- **Dedicated ARP Portfolio Managers** have been working together at Lombard Odier in this space for over 13 years
- Constantly **researching new and innovative strategies** to add to **diversification** and performance rather than increasing leverage
- **Strong focus on liquidity and cost efficiency.** Designed to be especially robust, fee sensitive and flexible
- **Differentiated** in implementation and in type of strategies
- **Unique proprietary risk based framework considering drawdown and correlation risks**
- **Customizing solutions** for the client that provide flexibility in premia selection and volatility level



## APPENDIX

**LOMBARD ODIER**  
INVESTMENT MANAGERS

## Team Overview



**LAURENT JOUÉ**  
Senior Portfolio Manager

Laurent Joué is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing LO Funds—Alternative Risk Premia, LO Funds—Alternative Risk Premia v300, LO Funds—Commodity Risk Premia and LO Funds (CH)—Commodities Risk Parity ex-agri. He joined LOIM in July 2008. He is also involved in various research projects for the Systematic Team. Laurent started his professional career in 2005 at Géa in Paris, the ADI-LODH joint-venture specialized in Hedge Fund multi-management where he worked as an Assistant Portfolio Manager. Before joining the Systematic team in November 2009, he was in the Fund of Hedge Funds Team as a Portfolio Manager. Laurent earned a master's degree in Market Finance from the Institut Supérieur Européen de Gestion in 2005.



**MARC PELLAUD, PHD**  
Senior Portfolio Manager

Marc Pellaud is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing LO Funds—Alternative Risk Premia, LO Funds—Alternative Risk Premia v300, LO Funds—Commodity Risk Premia and LO Funds (CH)—Commodities Risk Parity ex-agri. He is also involved in various research projects for the Systematic Team. He initially joined LOIM in June 2007, managing equity portfolios. Marc earned a PhD in life sciences from the Swiss Federal Institute of Technology in Lausanne (EPFL) in 2007.

## Team Overview



**CESAR MOURA, PHD**  
Senior Research Analyst

Cesar Moura is a senior analyst in the Systematic Alternatives team within LOIM. He joined the firm in 2018. Prior to joining, he was Head of Research at Dynamic Capital Management. He spent 10 years at Dynamic leading the quantitative research efforts which were applied to systematic trading. At Dynamic, he developed significant quantitative skills around machine learning, statistics, modelling, and programming. Cesar earned a PhD in theoretical physics from Pierre et Marie Curie University in 2009. He also holds a degree in engineering from the Ecole Polytechnique and a master's degree in physics from the Ecole Normale Supérieure in Paris.



**CLÉMENT MARY-DAUPHIN**  
Client Portfolio Manager

Clément is the dedicated Product Specialist for LOIM ARP Solutions. Clément is a seasoned financial markets professional with over twelve years' experience in derivatives as a trader, structurer and strategist. Before joining LOIM Clément worked for Natwest Markets in Hong Kong, Tokyo and London. Clément earned a MSc in Risk and Asset Management from EDHEC Business School

## Team Overview



**CLÉMENT LETURGIE, CFA**  
Senior Manager

Clément Leturgie is the head of Product Specialists for the 1798 Alternatives Platform within LOIM Group. He also heads Investor Relation for 1798 in Europe. He joined in May 2010.

Prior to joining, Clément was an assistant portfolio manager for equities, bonds and fund of funds at BNP Paribas. Previously, he was a credit analyst at Credit Agricole in 2007. He began his career working in the aerospace industry in Montreal in 2006.

Clément earned a master's degree in finance from ESCP-Europe in 2010. He also holds a bachelor's degree in Business Management from McGill University in 2006 in Québec and is a CFA Charterholder.



**ALKESH GIANCHANDANI**  
Senior Manager

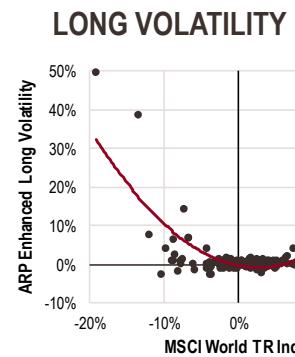
Alkesh Gianchandani is the head of Investor Relations for North America for Lombard Odier Investment Managers, specializing in the 1798 Alternatives Platform. Lombard Odier Investment Managers (LOIM) has over 50 years of experience managing institutional assets, with over USD 60 billion under management. LOIM has developed a world-class infrastructure to support the investment teams and service institutional clients. Prior to LOIM, Alkesh was a Senior Member of the Institutional Sales team and a Lead Product Expert in the Hedge Fund and Alternative Risk Premia business at Deutsche Bank. Prior to Deutsche Bank, Alkesh held senior marketing roles at private equity and hedge funds, focusing on distribution efforts exclusively to Institutional Investors. Alkesh started his Alternatives career by building out the hedge fund business at RiskMetrics Group (now MSCI) and spearheading the work on the HedgePlatform risk transparency reporting services. After RiskMetrics, Alkesh headed up Institutional Sales at Robeco Asset Management. Alkesh is a graduate of New York University (MBA) and Lehigh University (BS).

# LOIM Alternative Risk Premia offering

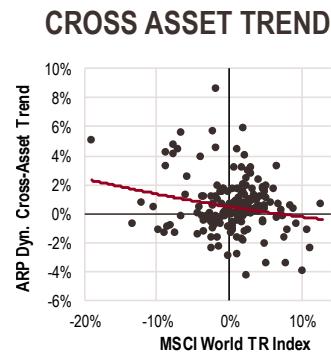
Examples of different categories payoff profiles

## Risk Mitigation Premia

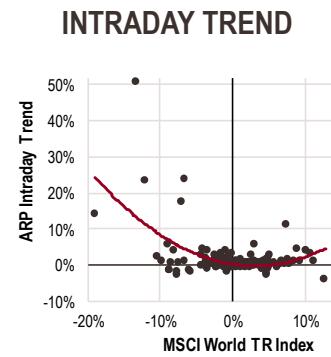
Enhanced  
Long Volatility



Defensive Cross-Asset  
Trend

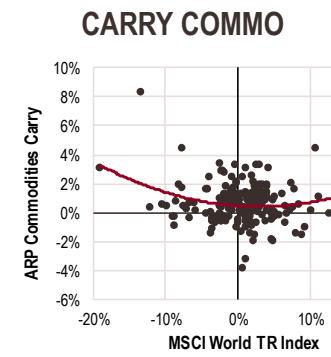


Intraday Trend

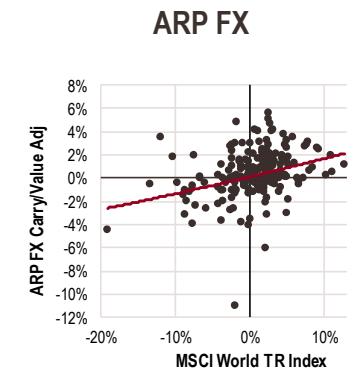


## Diversifying Income Premia

Defensive / Low  
Correlated ARP



Aggressive / Medium to  
high Correlation ARP



Source LOIM.

32 · Lombard Odier Investment Managers. Please see important information at the end of the document.

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## Important information (US 2/2)

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# Two Sigma Risk Premia Strategy

April 28, 2021

Presentation for City of Oakland Police and Fire Retirement System

Roberto Hernandez Raaen – Investor Relations

Renaud Verlaque – Head of Client Portfolio Management



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# Important Information Regarding the Simulated Performance Shown

Two Sigma Risk Premia Strategy performance information included herein seeks to reflect the simulated performance of a hypothetical portfolio focused on liquid risk premia strategies in global equities and futures markets. The simulation was generated at approximated capacity for the period of January 1998 through July 2015 (the "Unadjusted Returns"). The Unadjusted Returns represent simulated trading utilizing a variety of risk premia models across various markets that entered the simulation at different times, as follows: Global Futures, Forwards, and U.S. Equity from 1998, European and Pan-American equity markets from 1999, and Asian equity markets from 2000. The Unadjusted Returns are utilized when discussing risk and performance attribution. Unadjusted Returns utilized herein are presented gross of fees and estimated operating expenses and net of estimated trading expenses. These Unadjusted Returns are modified on a pro-forma basis to adjust performance based on certain historically-perceived variables by subtracting (i) 40% of the average monthly Unadjusted Result for the Equity portion and (ii) 50% of the average monthly Unadjusted Result for the Global Futures and Forwards portion, to derive the "Adjusted Returns." The Adjusted Returns are utilized when discussing simulated performance and correlation to indices. The Adjusted Returns utilized herein are net of a hypothetical 1.3% annualized management fee (accrued and paid monthly in advance), and net of estimated trading expenses, but gross of operating expenses. The simulated performance does not reflect the reinvestment of income.

The simulated performance results shown herein are for illustrative purposes. TSA has worked with its affiliated investment adviser, TSI to engineer certain software that

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**The SG Multi Alternative Risk Premia Index -** The SG Multi Alternative Risk Premia Index represents risk premia managers who employ investment programs diversified across multiple asset classes while utilizing multiple risk premia factors. These managers trade multiple asset classes such as equities, fixed income, currencies, and in many cases commodities, and aim to capture a diversity of discrete risk premia, including most prevalently value, carry, and momentum. These multi-asset, multi-risk premia strategies are typically systematic. Single asset class and risk premia programs are excluded. The SG Multi Alternative Risk Premia Index is an equally weighted, non-investable index of funds. (Source: <https://wholesale.banking.societegenerale.com/en/prime-services-indices/>)

**HFRX Global Hedge Fund Index -** The HFRX Global Hedge Fund Index is designed to be representative of the overall composition of the hedge fund universe. It is comprised of all eligible hedge fund strategies; including but not limited to convertible arbitrage, distressed securities, equity hedge,

equity market neutral, event driven, macro, merger arbitrage, and relative value arbitrage. The strategies are asset weighted based on the distribution of assets in the hedge fund industry. Hedge Fund Research, Inc. (HFR) utilizes a UCITSII compliant methodology to construct the HFRX Hedge Fund Indices. The methodology is based on defined and predetermined rules and objective criteria to select and rebalance components to maximize representation of the Hedge Fund Universe. HFRX Indices utilize state-of-the-art quantitative techniques and analysis; multi-level screening, cluster analysis, Monte-Carlo simulations and optimization techniques ensure that each Index is a pure representation of its corresponding investment focus. (Source: <https://www.hfr.com/hfrx-indices-index-descriptions>)

**MSCI World Net TR Index -** The MSCI World Net TR Index is a broad global equity index that represents large and mid-cap equity performance across 23 developed market countries and covers approximately 85% of the free float-adjusted market capitalization in each country. Net total return indexes reinvest dividends after the deduction of withholding taxes, using (for international indexes) a tax

rate applicable to non-resident institutional investors who do not benefit from double taxation treaties. (Source: <https://www.msci.com/developed-markets>)

**Barclays US Agg -** The Bloomberg Barclays US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate pass-throughs), ABS and CMBS (agency and non-agency). (Source: <https://www.bloomberg.com/markets/rates-bonds/bloomberg-barclays-indices>)

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# Who We Are

## The Science of Intelligent Investing

We are a **financial sciences** company bringing a **scientific approach** to investment management

We use **intelligent computational systems** to implement a process-driven strategy

Our most potent discoveries stem from research and the scientific method, so we focus on **continuous innovation**

We tap the **talents of 1,600+ employees** headquartered in New York with approximately **1,000+ scientists, including 200+ PhDs**, in R&D working collaboratively to create alpha<sup>1</sup>

We manage **\$58 billion of assets** for a global, diversified client base across the Two Sigma Group. This includes \$40.3 billion in absolute return, \$14.5 billion in benchmark-relative, and \$3.1 billion in private investment mandates<sup>2</sup>

1. Employee count is approximate as of April 1, 2021.

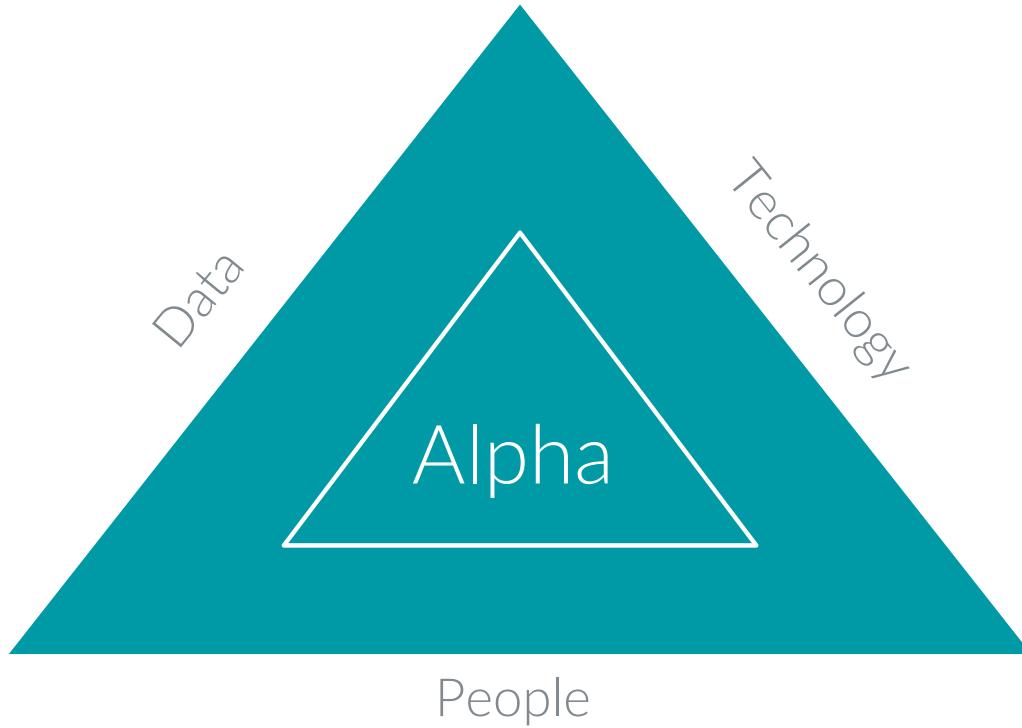
2. AuM is approximate as of April 1, 2021. Beginning August 1, 2020, "Two Sigma Group" AUM includes the AUM of the following affiliated investment managers: Two Sigma Investments, LP ("TSI"), Two Sigma Advisers, LP ("TSA"), Two Sigma China Co., Ltd. ("TSC"), TSPI, LP, and Two Sigma Ventures, LP. Absolute return and benchmark relative assets are managed across TSI, TSA and TSC and reflect the most recently available valuations as of the date of this report and include capital activity as of the first day of the following month. Private investment assets are managed across TSPI, LP and Two Sigma Ventures, LP and reflect the most recently available valuations as of the date of this report and include any unfunded capital commitments. In order to avoid double-counting assets, Two Sigma AUM has been adjusted downward to account for instances where a product advised by one Two Sigma investment manager invests in another product managed by the same, or an affiliated, Two Sigma investment manager.

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# How We Serve Our Investors

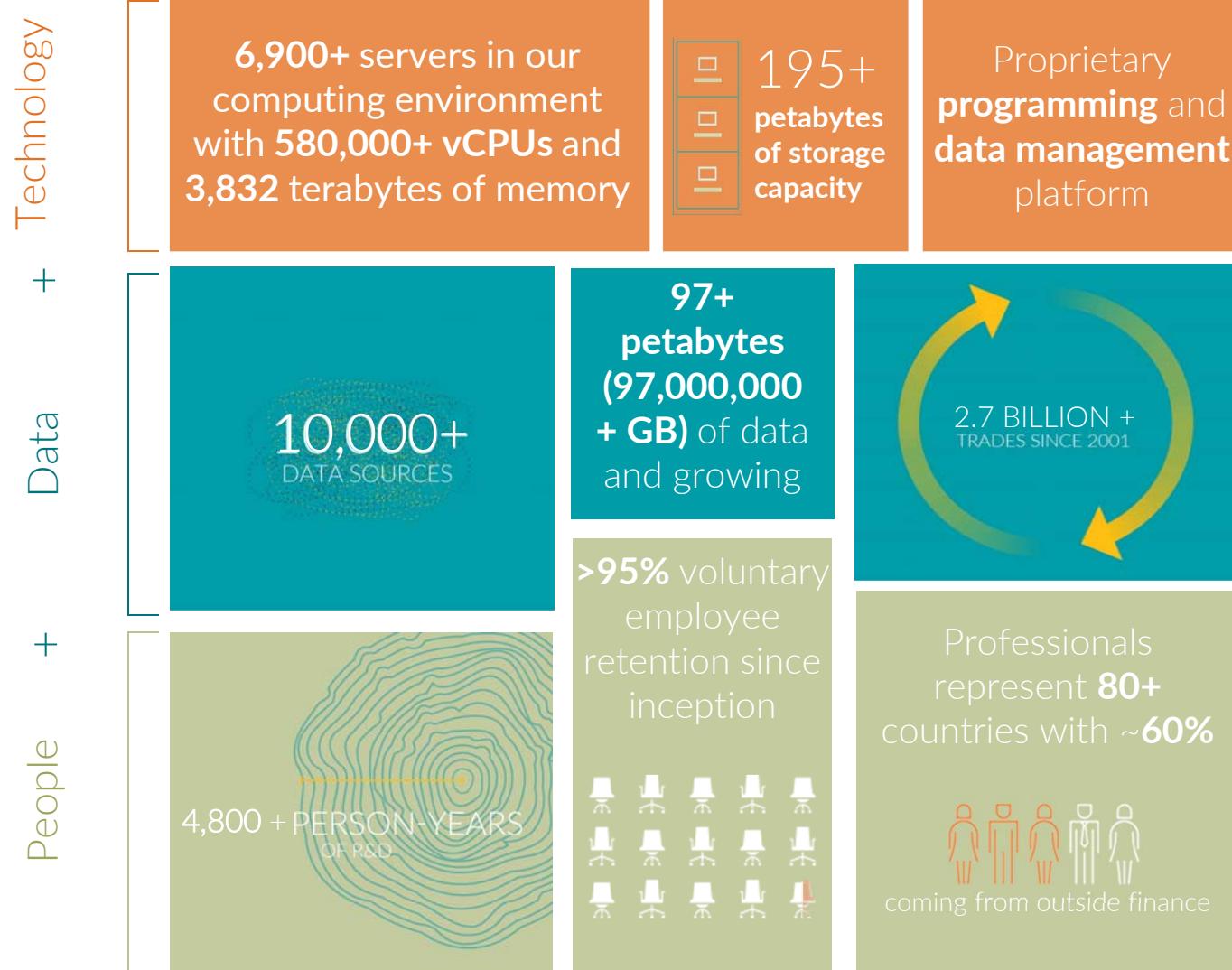
Our unique platform: our scientific approach is made possible by investments in three key areas



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# Where We Are Today



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Two Sigma Risk Premia Strategy

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# Two Sigma's Commitment to Diversity, Equity, & Inclusion

## Diversifying our Talent Base

Regularly participate in diversity-focused conferences and events

- Example: Sponsor of the Grace Hopper Celebration of Women in Computing (GHC) since 2013

Conduct analyses of our recruiting pipelines to better understand and improve pass-through rates for different demographic groups

Engage with external consulting firms to evaluate recruiting processes and identify actionable improvement opportunities

Use a technology solution to help eliminate biased language and create more inclusive job descriptions

Emphasize a transparent candidate experience by adopting pre-defined competency-based techniques and standardized rubrics



# Two Sigma's Commitment to Diversity, Equity, & Inclusion

## Promoting an Inclusive Culture

Established a **Diversity & Inclusion Council** in 2020 to help bring additional executive attention to our efforts

Four Two Sigma **Employee Resource Groups** allow employees to gather together and combine their efforts to **drive positive change**

- Women at Two Sigma (W@TS), founded in 2016
- Bridging Ethnicities at Two Sigma (BE@TS), founded in 2016
- ouTSigma, founded in 2016
- Disability Alliance, founded in 2020

Designed and implemented **Mentorship Programs**

Offer **unconscious bias training** to employees as well as **talks focused on diversity, equity, & inclusion** related topics

Provide robust guidance for how to identify and pursue internal opportunities to help promote career growth, including the ability for employees to **self-nominate for promotion**

Offer a variety of **volunteer opportunities** for employees, including Two Sigma Data Clinic (pro bono data science and engineering support to nonprofits)



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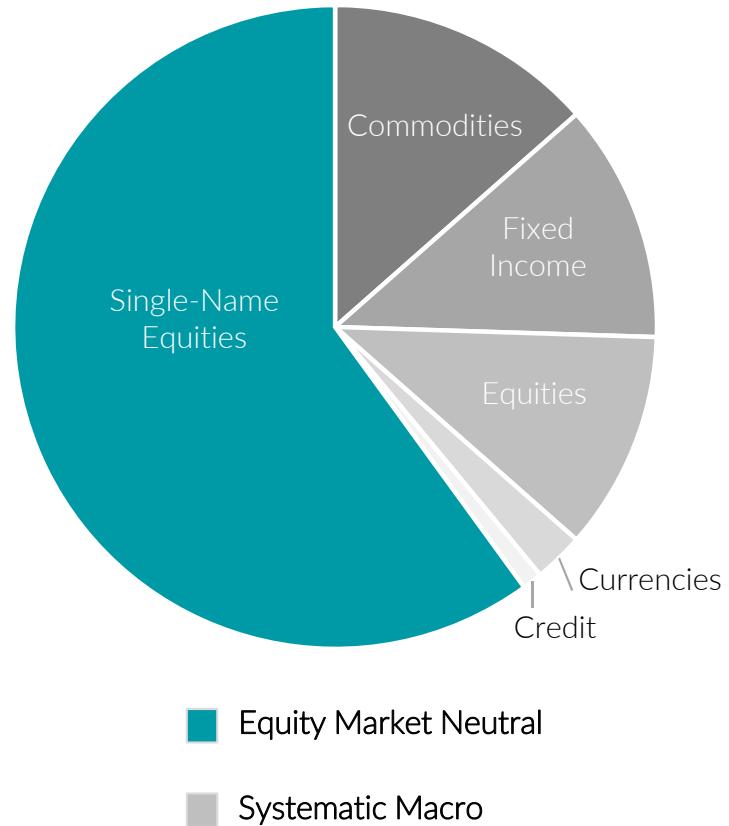


# Two Sigma Risk Premia Strategy Overview

A strategy focused on providing optimal long-term exposure to a mix of canonical, fundamental or behavioral based risks

- ◆ Risk-adjusted returns in liquid markets with **low correlation** to markets and other strategies
- ◆ **Highly diversified** across asset classes, strategies, and styles (e.g., value, momentum, carry, quality, volatility, liquidity, other)
- ◆ Large array of **proprietary models** utilized in a **systematic process**
- ◆ Strategies designed to be **complementary** to each other
- ◆ Utilizes a selection of **longer-term fundamental and technical models** from Two Sigma's common research platform

Expected Attribution of Risk by Asset Class<sup>1</sup>

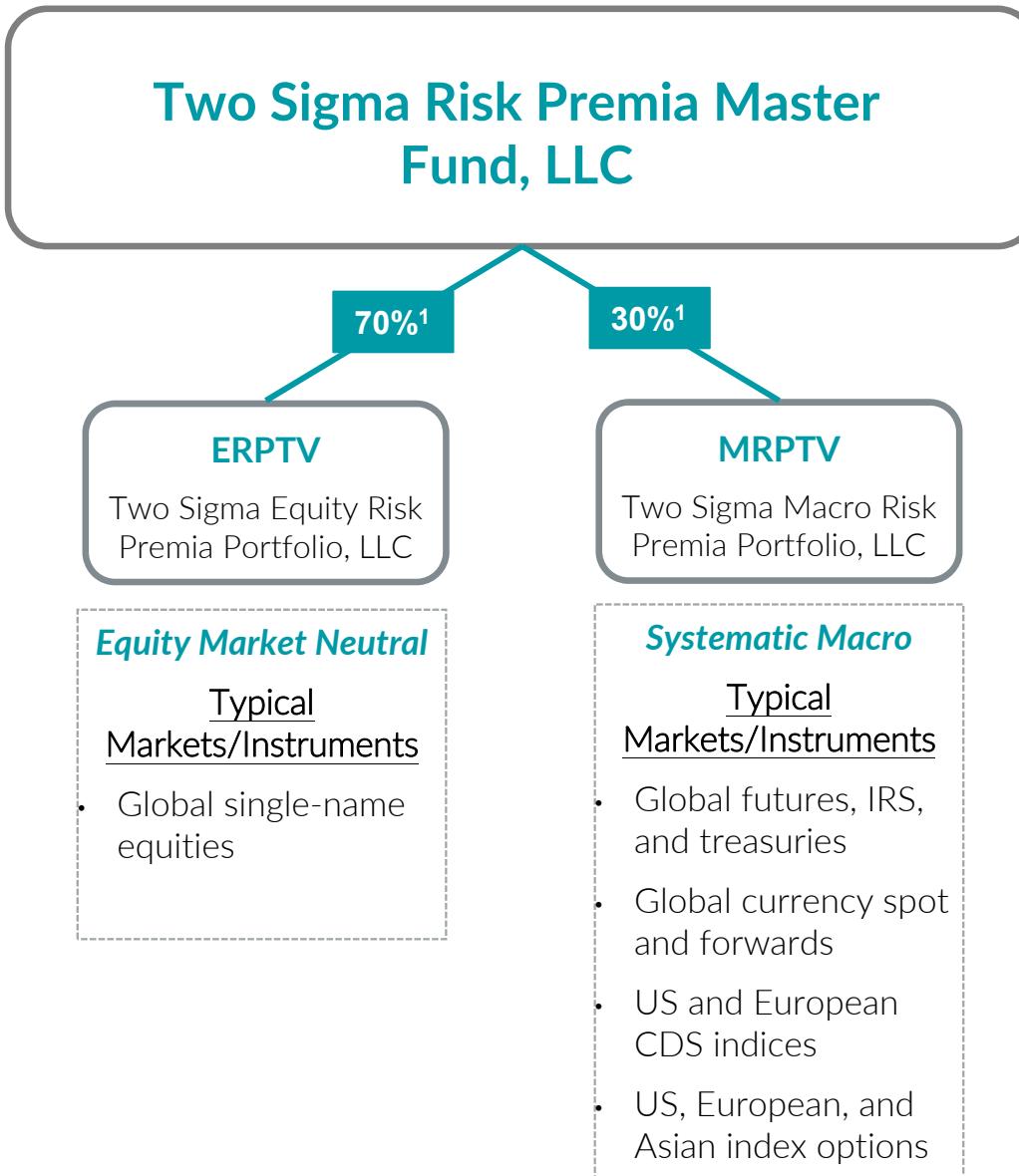


1. Expected risk allocations shown are estimates only and are subject to change at any time.

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# Two Sigma Risk Premia- Trading Vehicle Capital Allocations<sup>1</sup>



1. Capital allocations to each underlying trading vehicle shown are estimates only and are subject to change at any time. Please note that Two Sigma Risk Premia Master Fund, LLC (the "Master Fund") currently allocates approximately 70% of its capital to Two Sigma Equity Risk Premia Portfolio, LLC ("ERPTV") and approximately 30% of its capital to Two Sigma Macro Risk Premia Portfolio, LLC ("MRPTV"), although these percentage allocations are subject to change in the Two Sigma's discretion.

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# Factor Definition Matters

Within the definitions of the “Value” factor, returns diverge, especially in periods of market dislocation. Over time, a carefully constructed portfolio combining select constructions of multiple definitions should outperform any individual approach

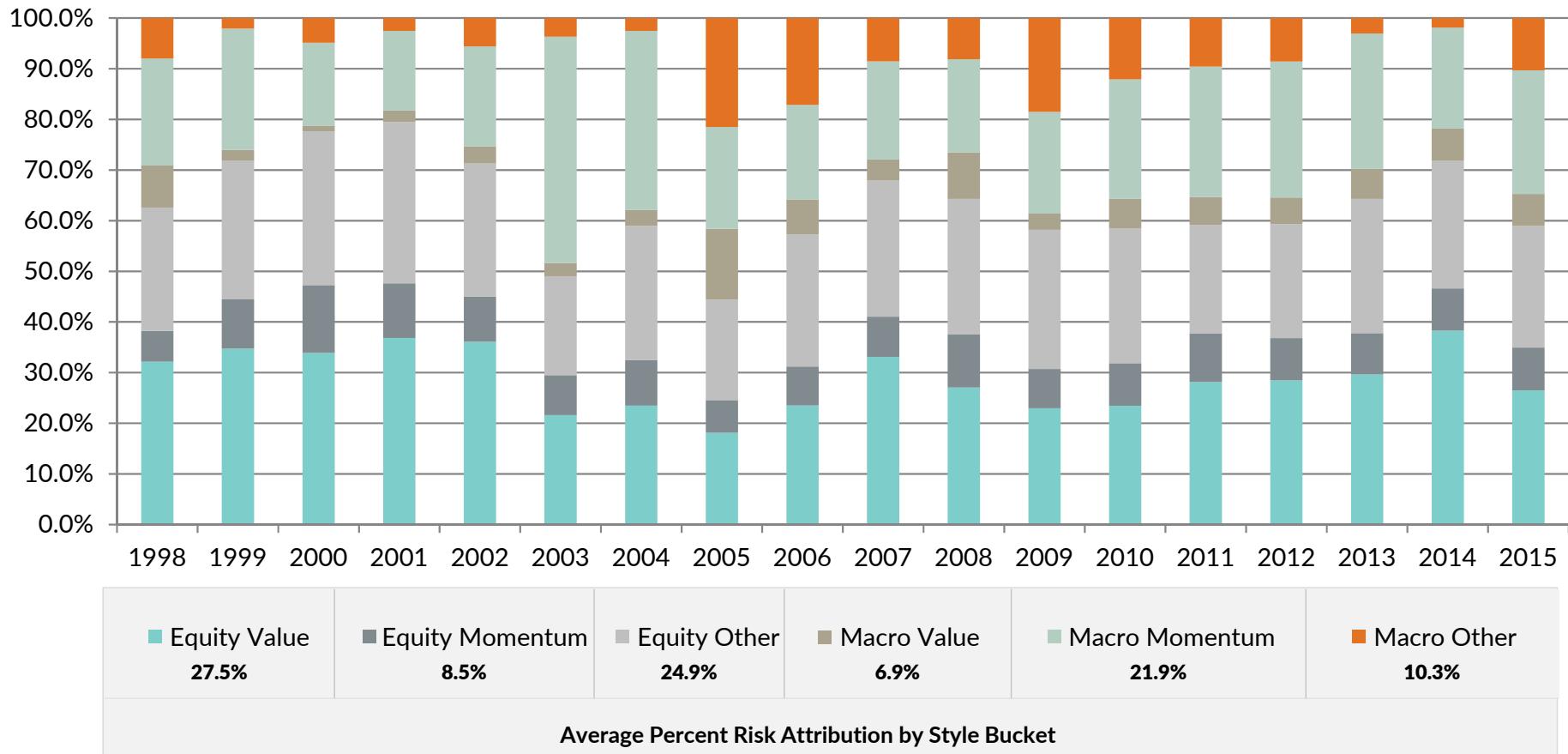


1. Source of analysis is sample data from candidate strategies in a U.S. equity portfolio. Expected performance is an annualized figure calculated after residualizing for risk factors including market, style and industry tilts and excluding all execution costs.

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# Simulated Risk Attribution by Strategy<sup>1</sup>

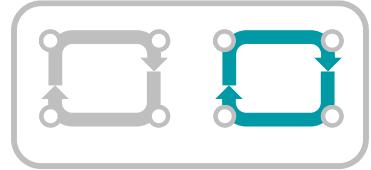


1. Even with careful procedures, simulated results have inherent limitations. Please see page 3 of this presentation for further information regarding the use of simulated results.

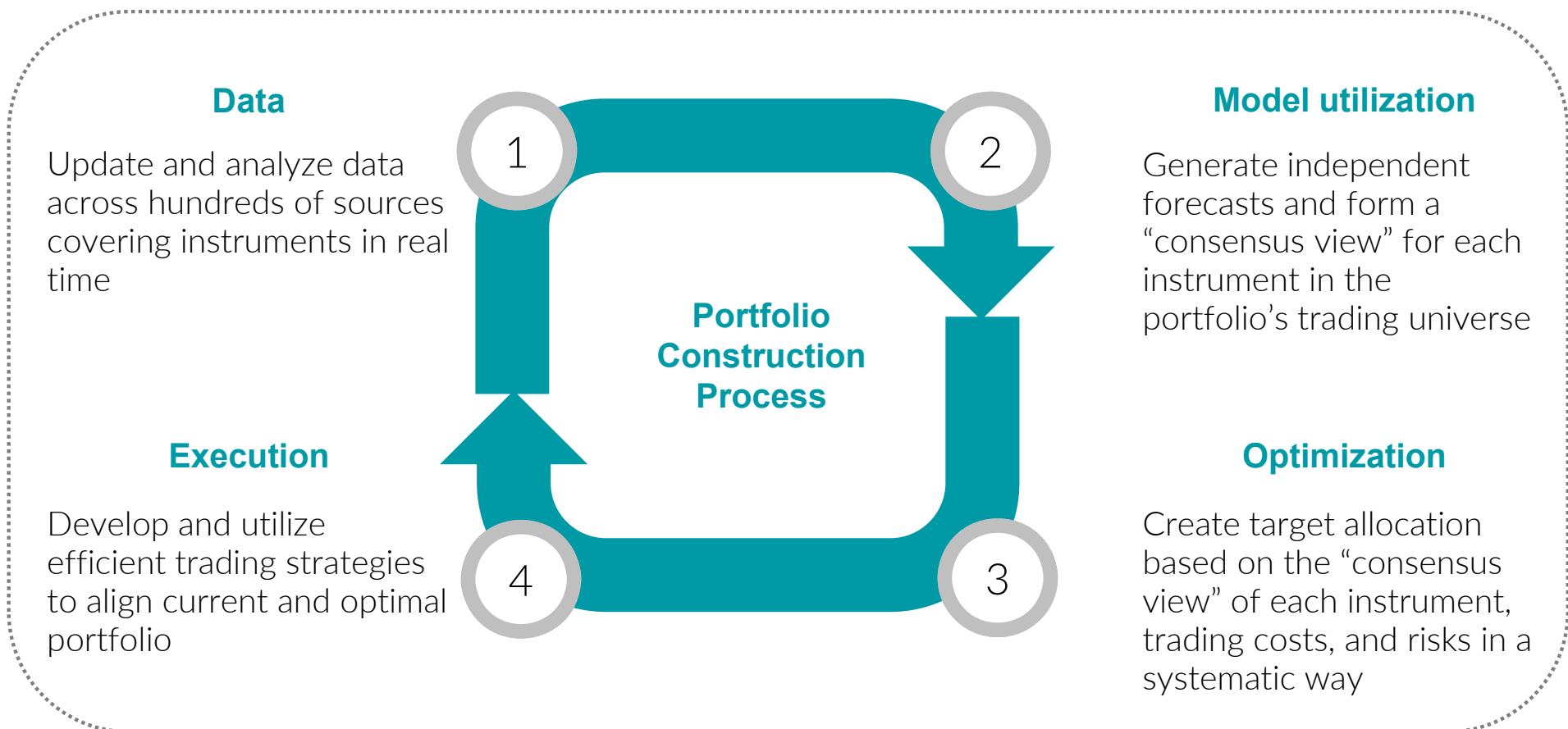
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# Portfolio Construction Process



Portfolio construction is a systematic process that translates information into an “optimal” portfolio in a consistent, repeatable, and scalable way



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# Risk Premia Correlations (August 2015 – March 2021)

	Two Sigma Risk Premia Strategy	SG Multi Alternative Risk Premia Index	HFRX Global Hedge Fund Index	MSCI World TR	Barclays US Agg	Traditional 60/40
Two Sigma Risk Premia Strategy	1.00					
SG Multi Alternative Risk Premia Index	0.52	1.00				
HFRX Global Hedge Fund Index	0.26	0.39	1.00			
MSCI World TR	0.22	0.31	0.72	1.00		
Barclays US Agg	0.12	0.04	-0.09	-0.19	1.00	
Traditional 60/40	0.24	0.32	0.72	0.99	-0.04	1.00

Correlations are computed using daily (net) returns for the life of the Two Sigma Risk Premia strategy (August 3, 2015 – March 31, 2021), except with respect to the SG Multi Alternative Risk Premia Index, which is computed using daily returns since that index's inception in January 2016. The "Traditional 60/40" Index utilizes the daily weighted means of the MSCI World TR Index (60%) and the Barclays US Agg Index (40%). Please see page 3 for important disclosure and disclaimer information relating to the use of these indices, which are provided for illustrative and informational purposes only, as well as for further information concerning the indices used.

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# Risk Premia Performance

## Key Performance Statistics

August 2015 – March 2021 (est.)

### Risk Premia Cayman<sup>1</sup>

### Risk Premia Enhanced Cayman<sup>2</sup>

	2015 Aug - Dec	2016	2017	2018	2019	2020	YTD 2021 March (est.)	Annualized Since Inception August 2015 – March 2021 (est.)	2015 Aug - Dec	2016	2017	2018	2019	2020	YTD 2021 March (est.)	Annualized Since Inception August 2015 – March 2021 (est.)
<b>Net Return</b>	+3.28%	+8.14%	+3.01%	+4.91%	-0.67%	-7.61%	-1.43%	+1.56%	+4.79%	+12.22%	+4.02%	+6.48%	-2.23%	-11.74%	-2.16%	+1.69%
<b>Volatility</b> <small>Annualized Standard Deviation of Monthly Returns</small>								5.21%								7.86%
<b>Sharpe Ratio</b>								0.14								0.13

## Overview<sup>3</sup>

Launch date:

August 1, 2015

Expected Volatility:

Approximately 6.5% annualized (“standard” volatility)  
Approximately 10% annualized (“enhanced” volatility)

Liquidity:

Monthly, with 30 days’ notice

Product Group AuM:<sup>4</sup>

\$3,485 million (as of April 1, 2021)

Leverage Adjusted Product Group AuM:<sup>4</sup>

\$4,886 million (as of April 1, 2021)

1. All return statistics reflect the performance of Two Sigma Risk Premia Cayman Fund, Ltd. (“Risk Premia Cayman”) for the periods referenced and are net of a 1.3% management fee, 0% incentive allocation and all other fund expenses, and reflect the reinvestment of income.

2. All return statistics reflect the performance of Two Sigma Risk Premia Enhanced Cayman Fund, Ltd. (“Risk Premia Enhanced Cayman”) for the periods referenced and are net of a 1.95% management fee, 0% incentive allocation and all other fund expenses, and reflect the reinvestment of income.

3. “Typical” statistics are approximations based on historical data. Such information is not intended to suggest that the investment product always has (or will continue to) perform in such a way.

4. This figure is presented as of April 1, 2021. Product Group AUM is the aggregate AUM of the feeder funds that are invested in Two Sigma Risk Premia Master Fund, LLC (the “Risk Premia Master Fund”). Leverage Adjusted Product Group AUM is the Product Group AUM adjusted to account for the different leverage levels employed by the feeder funds that are invested in the Risk Premia Master Fund.

Additional Performance Notes: Each investor’s rate of return may vary from the performance shown due to, among other things, the timing of capital transactions, if any. In each case, performance statistics are computed using monthly returns.

Refer to Risk Premia Cayman and Risk Premia Enhanced Cayman’s offering materials for a complete description of investment terms and details. Performance statistics are estimated for the most recent month included herein. [Please note that Two Sigma Risk Premia Master Fund, LLC (the “Master Fund”) currently allocates approximately 70% of its capital to Two Sigma Equity Risk Premia Portfolio, LLC (“ERPTV”) and approximately 30% of its capital to Two Sigma Macro Risk Premia Portfolio, LLC (“MRPTV”), although these percentage allocations are subject to change in the Two Sigma’s discretion.]

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For more information, please contact:

**Two Sigma Advisers, LP**

100 Avenue of the Americas

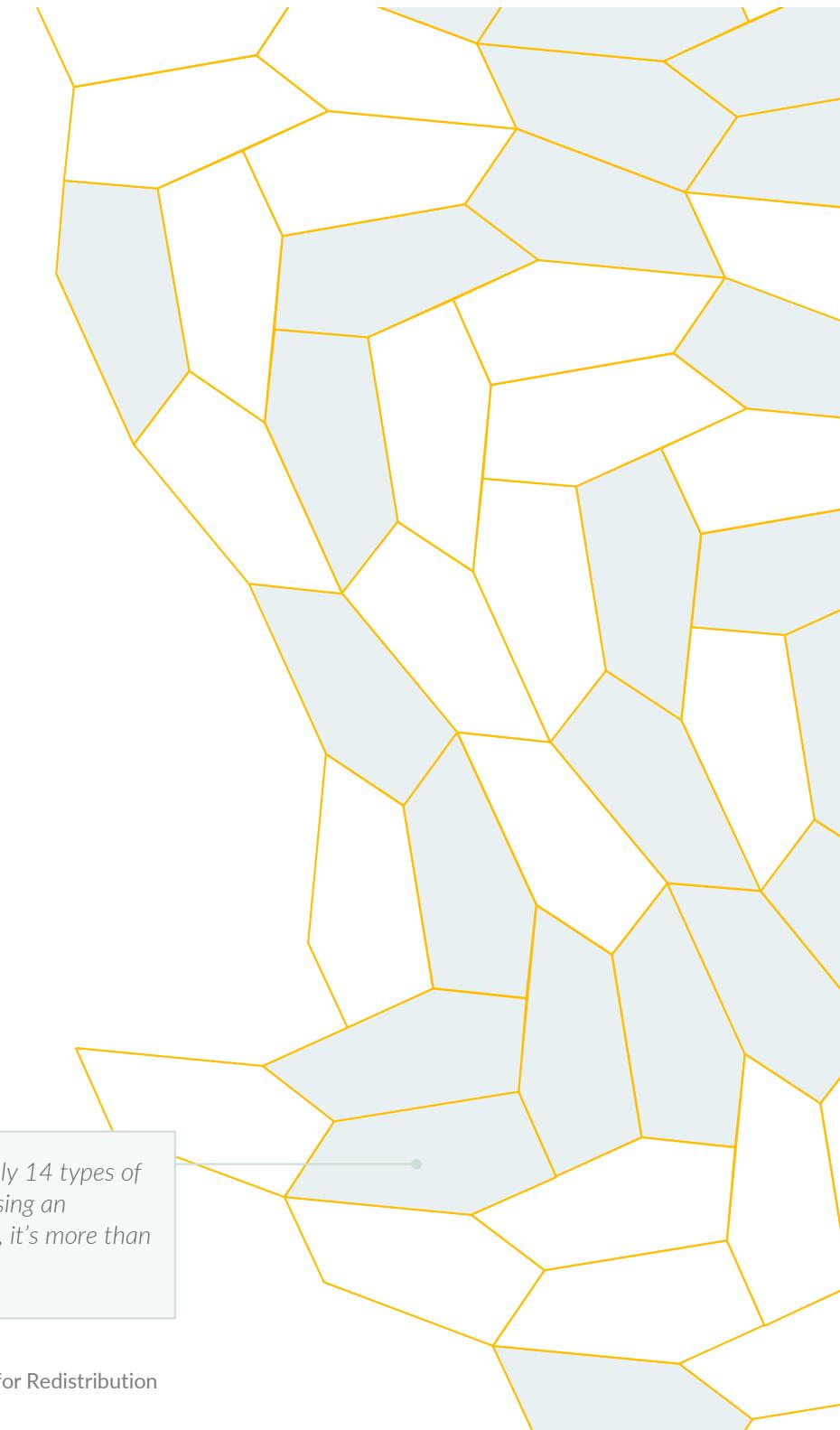
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*i* How many different kinds of convex pentagons exist that can tile a plane? For decades, only 14 types of these elusive, "tessellating" pentagons were known. But in 2015, a team of mathematicians using an algorithm and a cluster of computers found a 15th type—the one shown in this pattern. To us, it's more than just an elegant shape. It's a symbol of discovery.



## MEMORANDUM

**TO:** Oakland Police and Fire Retirement System (OPFRS)  
**FROM:** Meketa Investment Group  
**DATE:** April 28, 2021  
**RE:** Selection of New Alternative Risk Premia Asset Class Investment

---

At the January 2021 meeting, OPFRS directed Meketa to identify high quality managers for consideration as a part of the Crisis Risk Offset class. Specifically to fill the Alternative Risk Premia and Systematic Trend Following components. The two new strategies would serve as a replacement to the original allocation which combined the exposures of the two components into one strategy. Subsequently at the March 2021 meeting, Meketa recommended and the Board approved a recommendation to interview three finalist firms for the Alternative Risk Premia mandate. This document serves to further implement the Board's decision and to provide an overview of the candidates and their strategies.

The three Alternative Risk Premia Finalists candidates are presented below in alphabetical order:

1. Kepos
2. Lombard Odier
3. TwoSigma

All three managers and their products (i) are alternative risk premia strategies, and (ii) possess the abilities to provide OPFRS with the appropriate services. Summaries of each firm are provided on the following page.

Alternative Risk Premia is a key component of the Crisis Risk Offset Class and serves as a diversifier to the rest of the portfolio and other components of the Crisis Risk Offset class. The strategy is expected to provide uncorrelated returns not driven by growth (equity) risk. The managers take long and short positions in liquid futures, forwards, and stock markets. These offsetting long and short positions are used to isolate exposures to a variety of alternative risk premiums which are present in equity, fixed income, currency, and commodity markets. The most common risk premiums include Value, Momentum, Carry, and Defensive. Given their market neutral design these strategies can provide positive (or negative) returns regardless of market direction. For example, if a manager is exposed to the value risk premium in a long / short construct, value stocks just need to decline less (or increase more) than the market, to produce a positive result. Allocations to multiple alternative risk premiums is expected to provide a more robust and smooth return profile than any one in isolation. However, they may suffer during periods of market deleveraging or coincidental premia drawdowns.



## High Level Finalist Overviews

**Kepos**, with approximately \$2.0 billion in total assets, is a systematic investment firm focused largely on alternative risk premia (and related) strategies. The firm also offers shorter-term strategies that are more focused on alpha generation as opposed to risk premia harvesting. Kepos currently manages approximately \$470 million in alternative risk premia strategies. The firm was founded in 2010, is 100% owned by five individuals, and is located in New York, NY. The firm's three founders (Mark Carhart, PhD; Giorgio De Santis, PhD; and Bob Litterman, PhD) are some of the most well renowned researchers, academics, and practitioners in the modern quantitative investing world. Mark Carhart, PhD, is most well-known for conducting the original research on the momentum risk premium in the late 1990s (i.e., Carhart Four-Factor Model). Moreover, the three founders produced one of the seminal papers in the alternative risk premia segment in 2014. Kepos' strategy is focused on harvesting value, carry, and momentum across broad asset classes (e.g., equity, fixed income, currencies, and commodities). The strategy is managed by a team portfolio managers / researchers / analysts (due to the nature of the firm's offerings, these roles are somewhat interchangeable).

**Lombard Odier**, with approximately \$69.4 billion in total assets, is a diversified asset manager with offerings across the global liquid markets (i.e., equities, fixed income, multi-asset, and liquid alternatives). The firm manages roughly \$1.4 billion in alternative risk premia strategies with a total of nearly \$16 billion in systematic strategies managed by the same team. Lombard Odier is based in Geneva, Switzerland and maintains a client service office in New York, NY. Lombard Odier Investment Managers is one of three groups that make up the broader Lombard Odier entity (Lombard Odier Holdings SA). The broader firm is a private bank based in Geneva, Switzerland and is one of the largest banks in Europe. In addition to the institutional assets under management stated above, the firm also manages a large amount (\$200b+) of private client and custody/banking-related assets. The firm is owned by seven partners (seventh generation of owners) and has existed for over 200 years. The firm was an early entrant into the alternative risk premia space with the launch of its first strategy in 2009. This strategy saw a material evolution in 2014 and received its first institutional client in 2015. The proposed strategy is managed by the firm's Systematic Team. In particular, the proposed strategy has two dedicated portfolio managers and dedicated analysts/product specialists. The creation of the strategy, however, has been a collaborative effort across the entire Systematic Team. The two lead portfolio managers have been working together at Lombard for over 10 years.

**TwoSigma**, with approximately \$57.2 billion in total assets, is a large and independent asset management firm with a focus on systematic investing. The firm considers itself a technology firm that applies its insights to finance rather than a traditional asset management firm. They employ over 1,000 people in research and development. The firm was founded by John Overdeck, David Seigel, and Matt Picard. The Risk premia strategy invests across equity and macro signals that include carry, momentum, value, seasonality, low volatility (equity), short interest (equity), safety (macro), and liquidity (macro), among many others. Risk Premia models were carved out from the firm's Absolute Return strategy, with the team selecting models that were "slower" (~1 year horizon) and focused of capturing premias or lasting effects, as opposed to the faster, more idiosyncratic and timing based nature of absolute return models.



## Finalist Summary Comparison

Firm Name	Kepos	Lombard Odier	TwoSigma
Firm Inception	2010	1963 <sup>1</sup>	2001
Firm AUM	~\$2 billion	~\$69 billion	~\$57 billion
Location	New York, NY	Geneva, Switzerland	New York, NY
Total Employees	40	~120	~350+
Strategy Name	Alternative Risk Premia	Alternative Risk Premia Core	SARP
Strategy Inception	10/2018	11/2018	8/2015
Strategy AUM	\$115m (\$470 similar strategies)	~\$1.5 billion	~\$5.1 billion
Trading Similar Strategies Since	2010	2009	2011
Target Volatility	10%	10%	10%
Management Fee	0.70%	0.80%	1.95%
Liquidity	Monthly	Daily	Monthly
Strengths	<ul style="list-style-type: none"><li>Longest track record of managing alternative risk premia strategies</li><li>Pioneers of ARP research and most specifically the Momentum risk premium</li><li>Differentiated risk management process and models</li><li>Product designed specifically to compliment other CRO components</li></ul>	<ul style="list-style-type: none"><li>Long standing firm with a breadth of resources</li><li>Differentiated risk allocation process</li><li>Continual research into new risk premia such as ESG/Carbon</li><li>Product designed specifically to compliment other CRO components</li></ul>	<ul style="list-style-type: none"><li>Most underlying signals / models</li><li>Firm focused on technology and data</li><li>High quality investment team and firm with pedigree and success in the systematic investment space</li><li>Longest live track record of proposed product</li></ul>
Weaknesses	<ul style="list-style-type: none"><li>Attempts to harvest a fewer number of risk premia, which could hurt strategy diversification</li><li>Higher fee, more alpha related products could garner more focus internally</li></ul>	<ul style="list-style-type: none"><li>An investment arm of a large Bank, which could bring headline risk non-related to the investment team and strategy</li><li>Includes other arguably less robust or esoteric risk premia</li></ul>	<ul style="list-style-type: none"><li>Highest proposed fees</li><li>Higher fee, more alpha related products could garner more focus internally</li></ul>

<sup>1</sup> In current form in 2010. Lombard Odier has been managing institutional mandates since 1963, and the origins of Lombard Odier bank date back to 1796.

### Finalist Strategy Components Comparison

Strategy Component Comparison		Kepos	Lombard Odier	TwoSigma
Markets Traded	Equities	✓	✓	✓
	Fixed Income	✓	✓	✓
	Currencies	✓	✓	✓
	Commodities	✓	✓	✓
Risk Premia Harvested	Value	✓	✓	✓
	Momentum	✓	✓	✓
	Carry	✓	✓	✓
	Defensive	X	✓	✓
	Trend	X	X	✓
	Volatility	X	X	✓

RL/DS/SK/jls/db



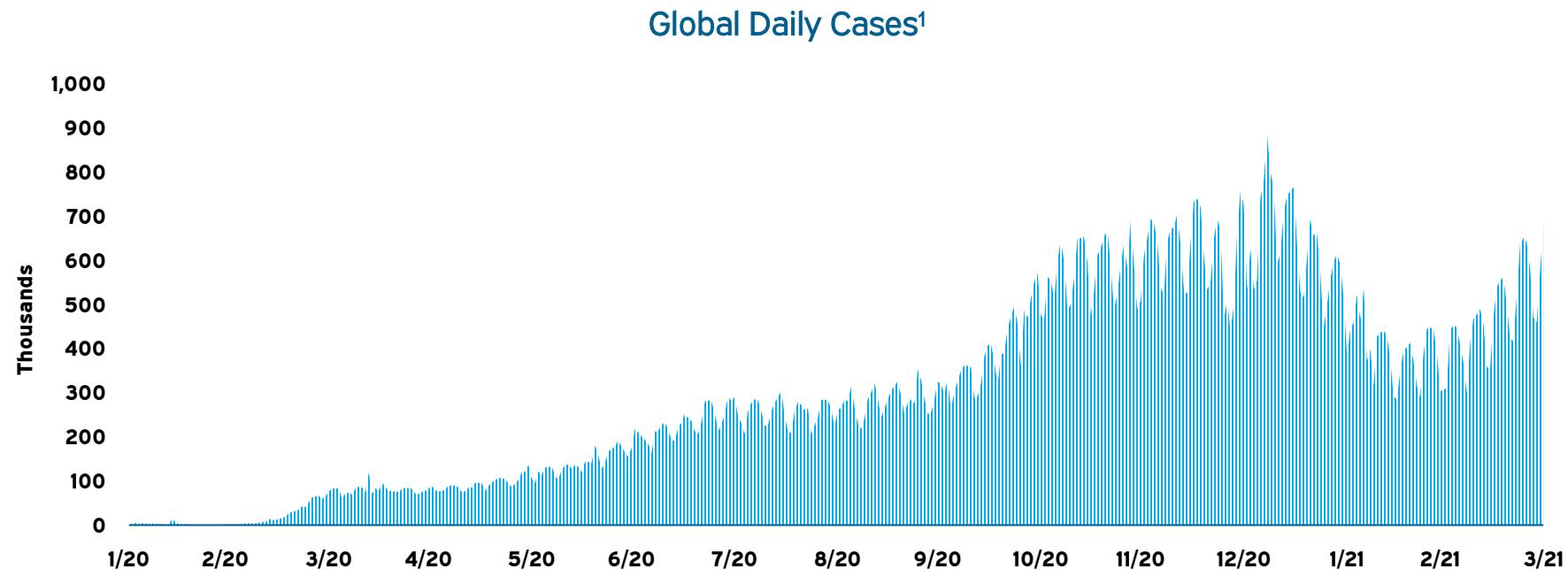
## APPENDIX

Alternative Risk Premia Managers Considered	
1	Kepos
2	Lombard Odier
3	TwoSigma
4	Vensor Investments
5	Aspect
6	AB
7	MAN Solutions
8	Windham
9	PIMCO
10	AQR
11	BlackRock
12	Neuberger Berman
13	Unigestion
14	CdR
15	Voya
16	Bainbridge
17	Boronia
18	Schroders
19	Systematica
20	Credit Suisse
21	ERAAM
22	Franklin Templeton
23	La Francaise
24	Acadian
25	CFM
26	Columbia Threadneedle
27	Deutsche
28	Fulcrum
29	GAM
30	GSAM
31	HSBC
32	Janus
33	JP Morgan
34	Mellon
35	Morgan Stanley
36	One River

# Economic and Market Update

Data as of March 31, 2021



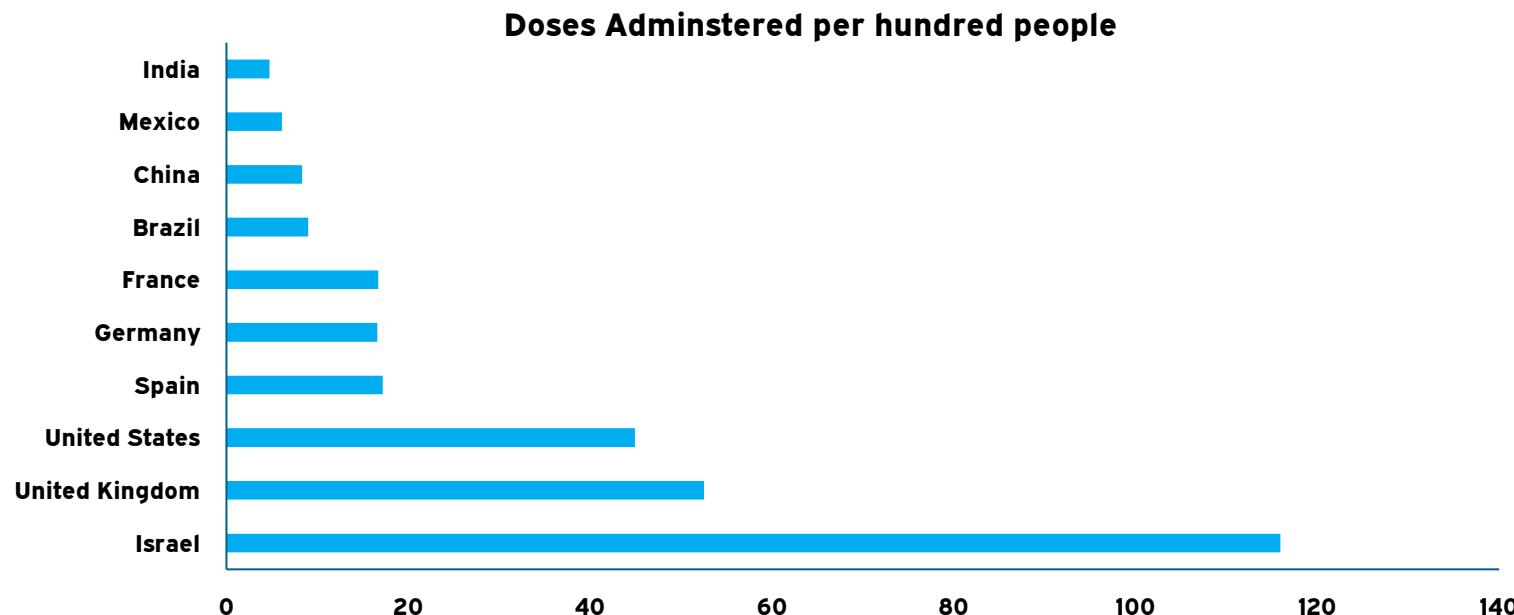


- After peaking in early January at ~858,000, the number of global daily cases steadily declined to ~303,000 at the end of February, before increasing again in March, driven by new variants.
- Looking ahead, the rollout of multiple vaccines continues to gather momentum, with roughly 800 million total doses administered as of mid-April.<sup>2</sup>
- In the US, the Biden administration set a goal of the vaccine being available to the general population by April 19.

<sup>1</sup> Source: Our World in Data. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. <https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/?sref=sA9cMIUe>

### Vaccinations by Country<sup>1</sup>



- Vaccine distribution has ramped up in many countries, including the Pfizer-BioNTech, Moderna, and Johnson & Johnson vaccines in the US. Outside the US, vaccines have also been developed by China, Russia, India, and the UK.
- Some countries have done better with the vaccine rollout, with Israel being at the forefront. The United Kingdom's and the United States' vaccination rates have exceeded many other countries. Early immunization efforts focused on the most vulnerable populations with eligibility expanding recently.

<sup>1</sup> Source: Our World in Data. Data is as of March 31, 2021. Vaccination totals include first and second doses.

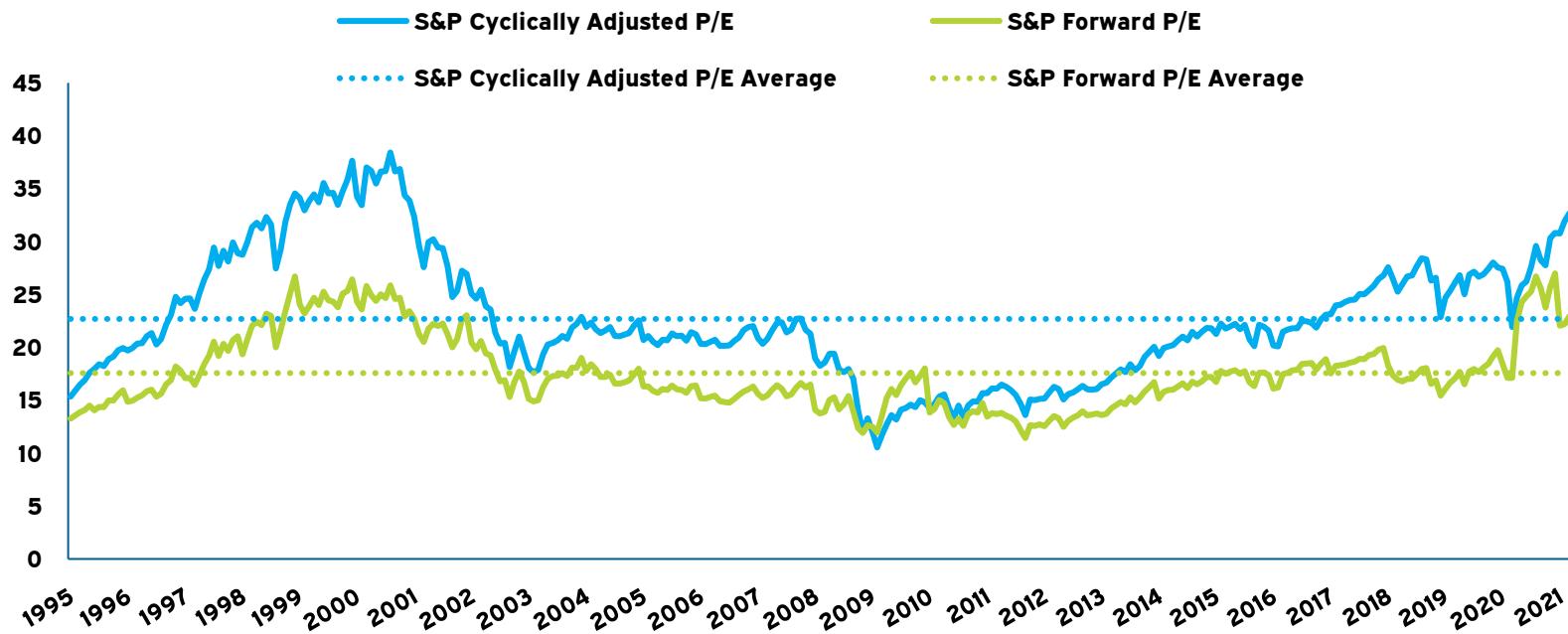
### Market Returns<sup>1</sup>

Indices	March (%)	YTD (%)	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)
S&P 500	4.4	6.2	56.4	16.8	16.3	13.9
MSCI EAFE	2.3	3.5	44.6	6.0	8.9	5.5
MSCI Emerging Markets	-1.5	2.3	58.4	6.5	12.1	3.7
MSCI China	-6.3	-0.4	43.6	8.2	16.1	7.3
Bloomberg Barclays Aggregate	-1.3	-3.4	0.7	4.7	3.1	3.4
Bloomberg Barclays TIPS	-0.2	-1.5	7.5	5.7	3.9	3.4
Bloomberg Barclays High Yield	0.2	0.9	23.7	6.8	8.1	6.5
10-year US Treasury	-3.1	-7.0	-8.1	4.7	1.7	3.7
30-year US Treasury	-6.1	-15.8	-20.6	5.6	2.7	6.5

- Over the last year, global risk assets produced significant returns, largely driven by record fiscal and monetary policy stimulus and positive developments with the COVID-19 vaccine. One-year returns are also being heavily influenced by the roll-off the significant declines in March 2020.
- In March, rising inflation and US economic growth expectations continued to drive longer-dated Treasury yields higher, leading to negative returns across most maturities.
- Equity markets across developed economies showed a notable level of resilience to the tighter financial conditions. Emerging markets were impacted by rising COVID-19 cases and re-shuttering of some economies, as well as rising inflation risks prompting some central banks to consider tightening measures.

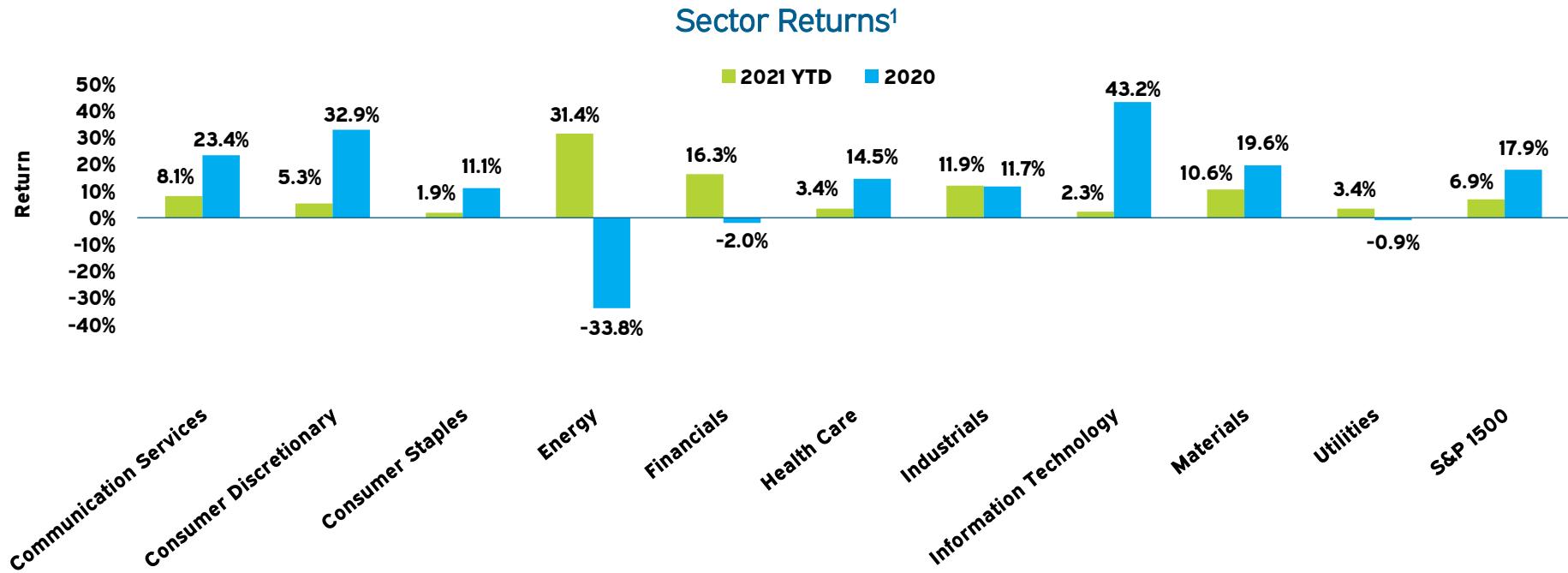
<sup>1</sup> Source: Investment Metrics and Bloomberg. Data is as of March 31, 2021.

### S&P Equity Valuations<sup>1</sup>



- With positive developments regarding COVID-19 vaccines, valuations based on backward-looking earnings rose to levels not seen since 2001.
- By contrast, valuations based on forward-looking earnings recently declined due to continued improvements in earnings expectations. Despite the decline in forward P/E ratios, they remain well above long-term averages.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

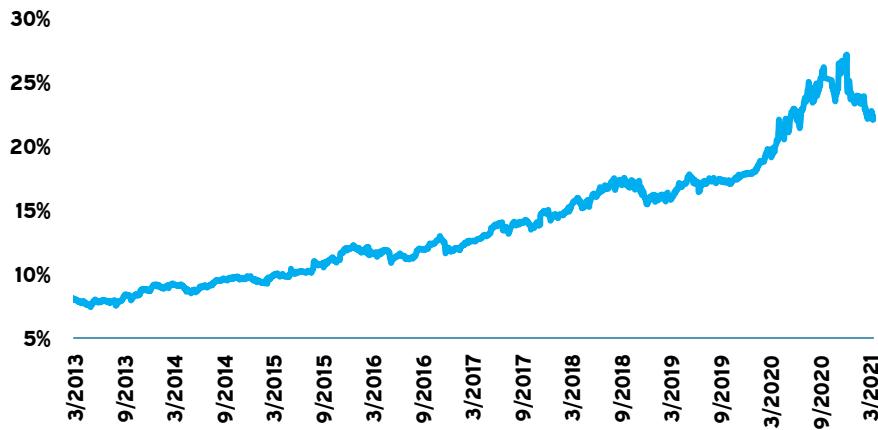


- Cyclical sectors like energy and financials have led the way in 2021, as investors rotate out of the stay-at-home focused companies in the technology sector.
- The recent rotation into value stocks has largely been driven by expectations for the economy to reopen, potentially higher taxes, and rising interest rates. Growth stocks typically produce more of their cash flows further into the future and increased interest rates lead to a larger discounts, reducing present value.
- Energy has been a particular standout this year, supported by record low active rig counts, Saudi Arabia's reductions in output, and expectations of rising demand later in 2021.
- Higher interest rates have benefited lending institutions within the financial sector.

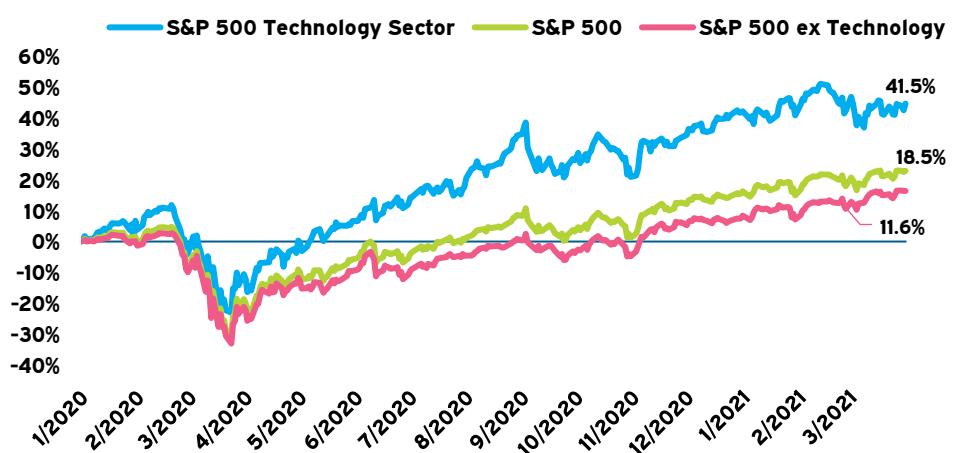
<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021

Growth stocks led the way for most of 2020, but have recently lagged

### FAANG+M Share of S&P 500<sup>1</sup>



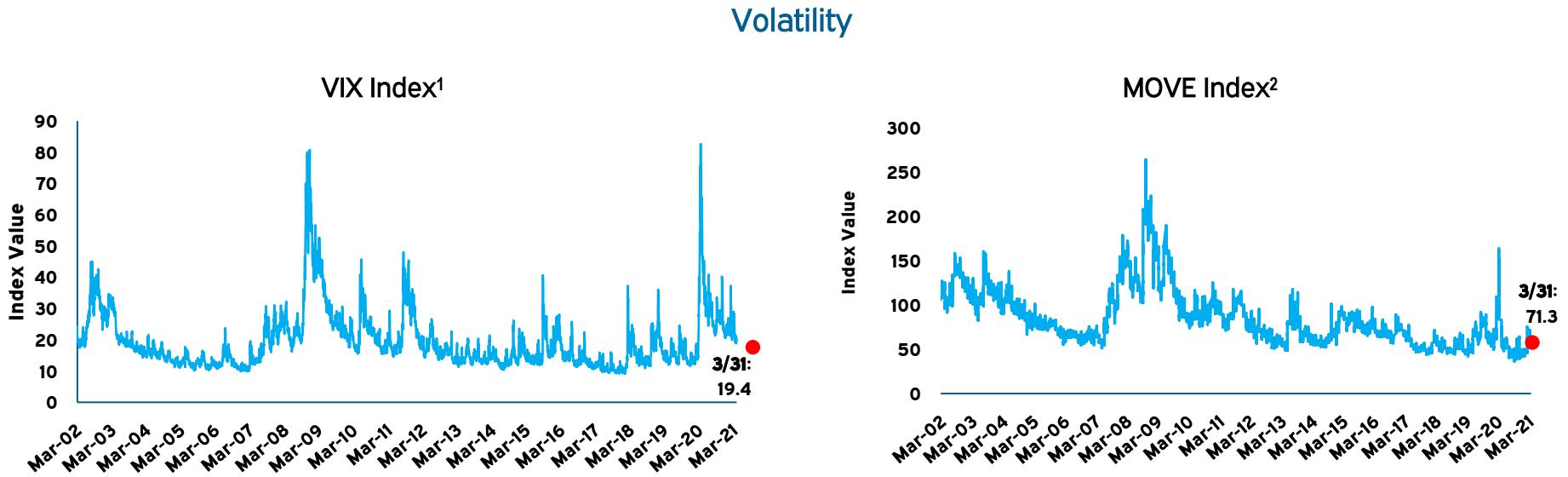
### Returns from Start of 2020 through March 31 2021<sup>2</sup>



- During much of 2020, market gains were driven by a few technology companies that benefited from the stay-at-home environment related to the virus.
- The outsized relative returns of these companies last year caused them to comprise an increasingly large portion of the S&P 500, making their performance going forward impactful to overall market results.
- Recently, their proportion of the index declined as value stocks outpaced growth stocks by over 10% in 2021.

<sup>1</sup> FAANG+M = Facebook, Amazon, Apple, Netflix, Google (Alphabet), and Microsoft. The percentage represents the aggregate market capitalization of the 6 companies compared to the total market capitalization of the S&P 500 as of March 31, 2021.

<sup>2</sup> Each data point represents the price change relative to the 12/31/2019 starting value.



- Equity market volatility, as measured by the VIX, declined over the month to levels last experienced just prior to the spike of market volatility in March 2020.
- Counter to the experience in equity markets, volatility levels within fixed income, as represented by the MOVE index, increased in March due to building expectations for higher growth and inflation. Uncertainty regarding the future path of interest rates could keep fixed income volatility elevated.

<sup>1</sup> Source: Chicago Board of Exchange. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. Data is as of March 31, 2021.

## Key Elements of the Latest Round of US Fiscal Stimulus

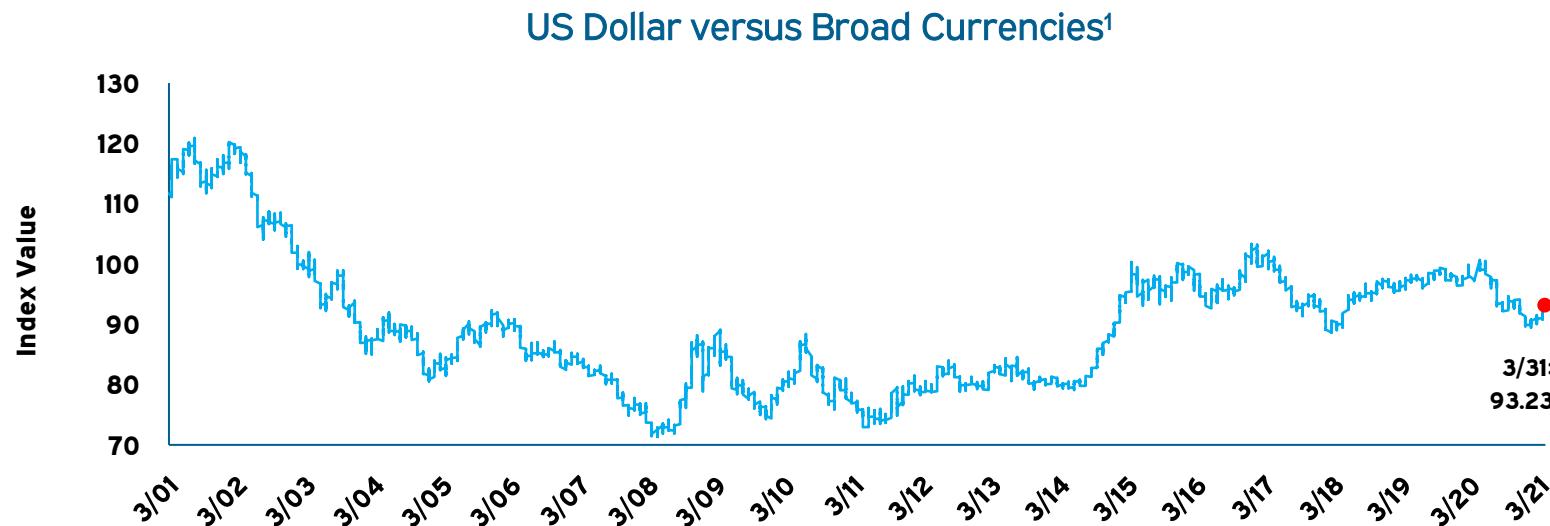
Joint Proposal	
Status	Signed by President Biden on March 11, 2021
Direct Payments	Up to \$1,400 per eligible recipient
Enhanced Unemployment	\$300 per week through September
State & Local Aid	\$360 billion
Vaccines, testing and tracing	\$123 billion
School aid/Education Grants	\$176 billion
Health Insurance Support	\$105 billion
Transportation	\$56 billion
Food / Agriculture aid	\$16 billion
Rental Assistance	\$1 billion
Small Business Assistance	\$59 billion
Total	\$1.9 trillion

- Fiscal stimulus totaling ~\$900 billion, representing the second largest package in history at the time, was finalized in late December 2021.
- President Biden signed an additional \$1.9 trillion stimulus package in March that includes another round of direct payments to individuals, \$300 extra per week in unemployment benefits, and aid to state and local governments.
- Concerns have increased significantly that the historic infusion into the economy could lead to excessive inflation and put pressure on borrowing costs.

### Key Elements of the ~\$2.65 Trillion American Jobs Plan (2021 – 2031)

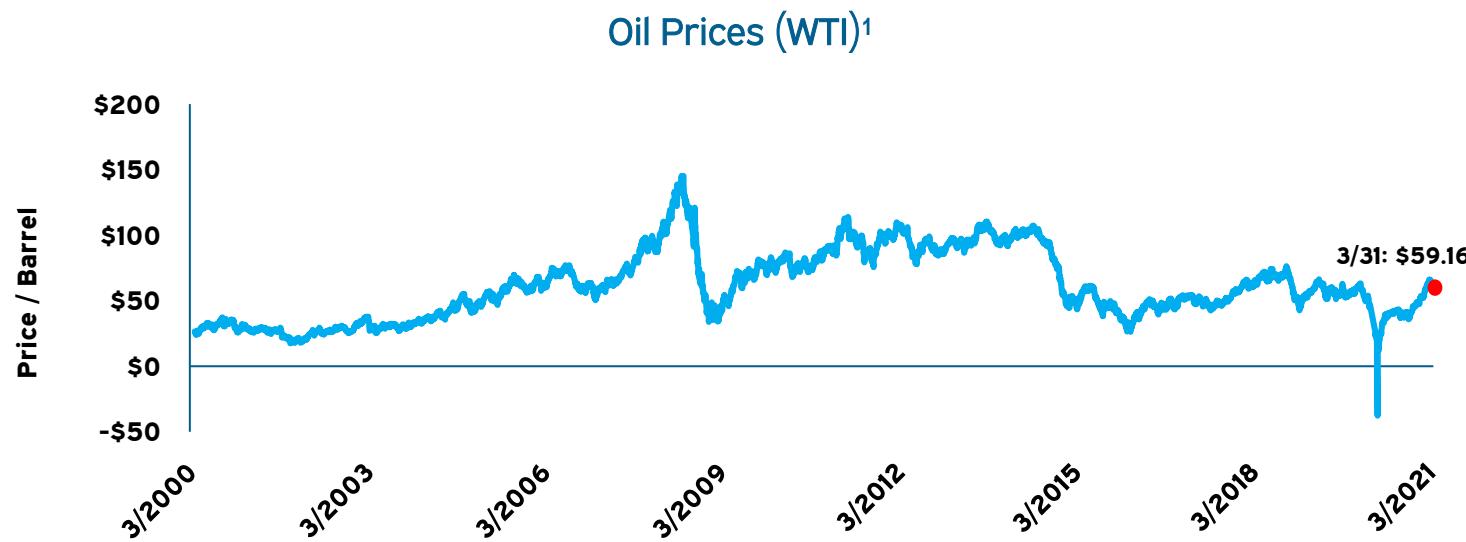
		Key Pillars	Plan Highlights
Key Elements of Proposal \$ Billions			
<b>Transportation Infrastructure</b>	Transportation		<ul style="list-style-type: none"> <li>\$174B to electric vehicles-replacing diesel school buses and transport vehicles</li> <li>\$115B to fix roads and bridges</li> <li>\$165B to the transit system</li> <li>\$80B to Amtrak</li> <li>\$25B to airports</li> <li>\$17B to ports and ferries</li> </ul>
<ul style="list-style-type: none"> <li><b>Broadband, Electrical Grid, and Clean Drinking Water</b></li> <li><b>Caregivers for Elderly &amp; Disabled</b></li> <li><b>Improve Housing Stock, Schools and other Facilities</b></li> <li><b>Clean Energy Tax Credits</b></li> <li><b>Domestic Manufacturing, R&amp;D, and Job Training Initiatives</b></li> </ul>	Quality of life at home: Invest in broadband, the electrical grid, and clean drinking water		<ul style="list-style-type: none"> <li>\$111B on clean water</li> <li>\$100B on broadband networks</li> <li>\$100B on electrical transmission upgrades</li> </ul>
	Improve housing stock, schools, and other facilities		<ul style="list-style-type: none"> <li>\$213B on affordable homes and commercial buildings</li> <li>\$100B on modernizing schools</li> </ul>
	Caregivers for elderly and people with disabilities		<ul style="list-style-type: none"> <li>Improve access to quality, affordable home or community-based care for the elderly</li> <li>Expand the Medicaid program to make more services available</li> <li>It would also boost pay for care workers.</li> </ul>
	Research, development, and manufacturing		<ul style="list-style-type: none"> <li>\$100B for domestic manufacturing and supply chains</li> <li>\$50B to semiconductor manufacturing and research</li> <li>\$100B for worker training and increasing of worker protection</li> </ul>

<sup>1</sup> Dollar amounts are estimates. Source: <https://www.crb.org/blogs/whats-president-bidens-american-jobs-plan>.



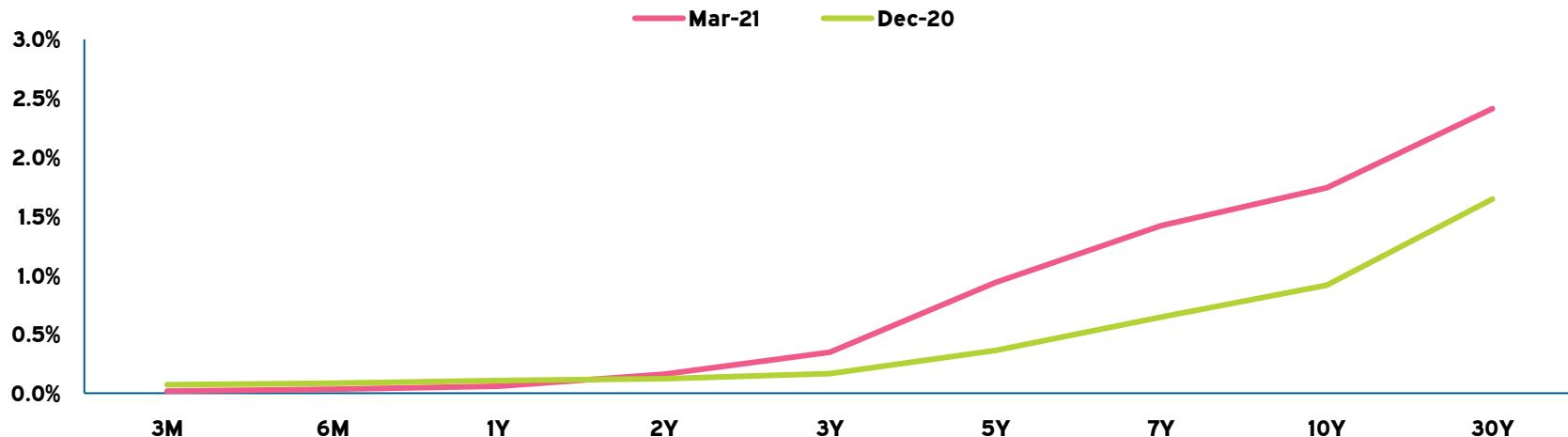
- The US dollar has benefited from higher US growth estimates and rising interest rates. Growth and interest rate differentials have put pressure on emerging market asset prices.
- A stronger US dollar may deepen the US trade deficit and offer a competitive advantage to exporters in Asia and Europe.
- Going forward, the dollar's safe-haven quality and the higher interest rates in the US could continue to provide support.

<sup>1</sup> Source: Bloomberg. Represents the DXY Index. Data is as of March 31, 2021.



- Global oil prices rallied from April 2020 lows, and have recovered to pre-crisis levels.
- In 2020 the collapse in global oil demand led to the shuttering of active drilling in North America and international markets and production capacity has been slow to come back online.
- In a surprise decision, OPEC+ recently announced they would not be increasing production despite signs that the global economy could absorb the additional supply.
- Low production capacity and tight supply may help balance oil markets and drawdown reserves offering support for oil prices as global demand recovers.
- Once reserves are used, and if production remains tight, oil prices could continue to rise, contributing to inflationary pressures, and weighing on the global economic recovery.

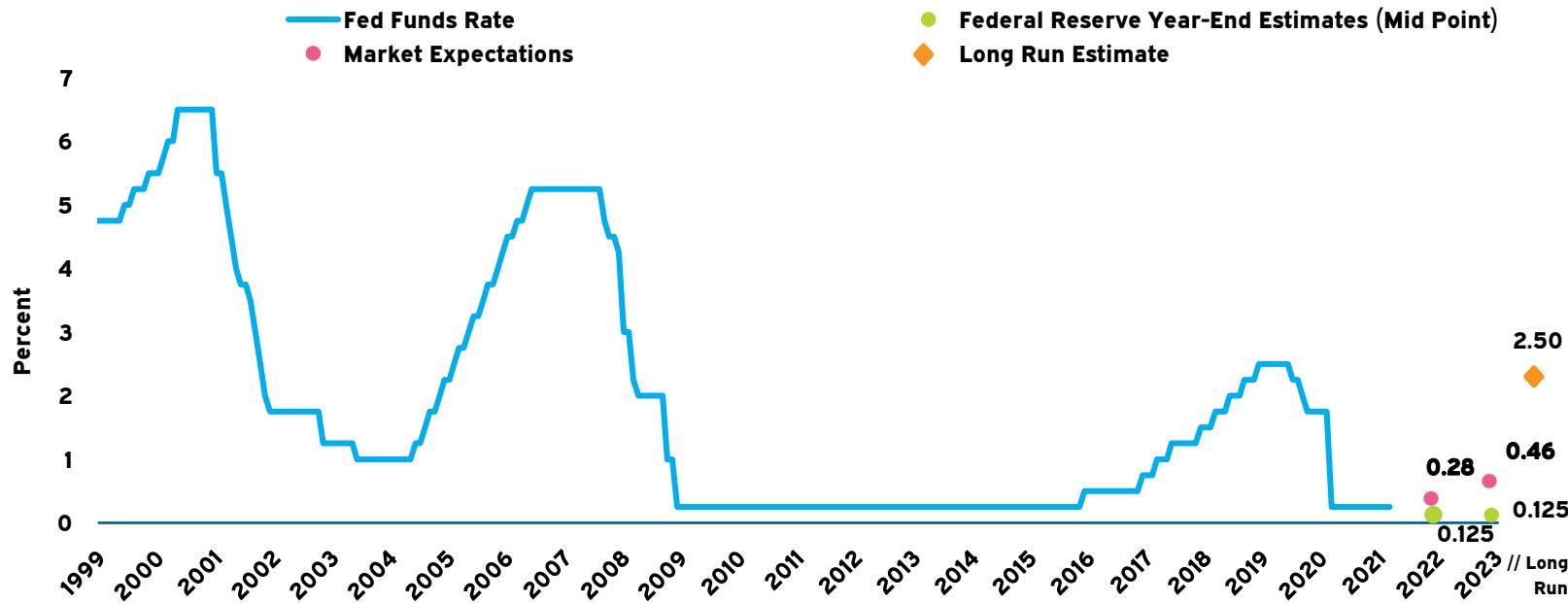
<sup>1</sup> Source: Bloomberg. Represents WTI first available futures contract. Data is as of March 31, 2021.

US Yield Curve Steepens<sup>1</sup>

- The US Treasury yield curve declined materially during 2020, driven by safe-haven demand, Federal Reserve policies (policy rate cuts and the quantitative easing program), and weak US economic fundamentals.
- Thus far in 2021, the curve has steepened on inflation fears related to gradual signs of economic improvement, vaccine developments, and expectations for increased Treasury issuance to support fiscal policy measures.
- Higher yields relative to other countries, and the Fed potentially extending the duration of QE purchases to mitigate tightening financial conditions, could counterbalance steepening trends, but the risk remains that the yield curve could continue to steepen if growth and inflationary pressures build.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

### Dot Plot Continues to Indicate Rate Hikes are Some Time Away<sup>1</sup>



- The FOMC continues to indicate they do not anticipate increasing policy rates for the next few years, as delivered through the FOMC's meeting statements and the supporting Summary of Economic Projections report (aka the "Dot Plot").
- Policy expectations as measured by current asset prices, including fed funds futures, are suggesting more aggressive policy actions, with 1-2 policy rate increases by the end of 2023.

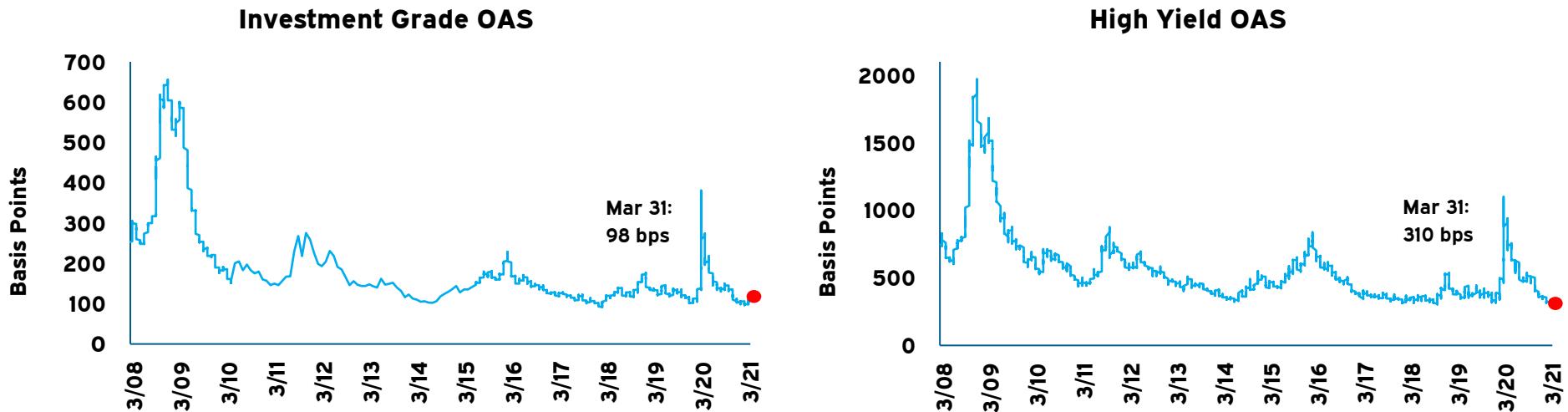
<sup>1</sup> Source: Bloomberg. Data is as of the March 17, 2021 FOMC meeting. Market Expectations reflect Fed Fund Futures



- Inflation breakeven rates declined sharply in early 2020, due to a combination of lower growth and inflation expectations, as well as liquidity dynamics in TIPS during the height of market volatility. Breakeven rates increased as deflationary concerns moderated.
- Inflation expectations have risen abruptly in recent months to slightly above long-term averages, with the vaccine roll-out and expected additional fiscal stimulus as key drivers.
- Looking forward, the track of economic growth and the inflationary effects of the unprecedented US fiscal response will be key issues. Additionally, changes to Fed policy focused on an average inflation target may play a role in the inflation market dynamics going forward.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

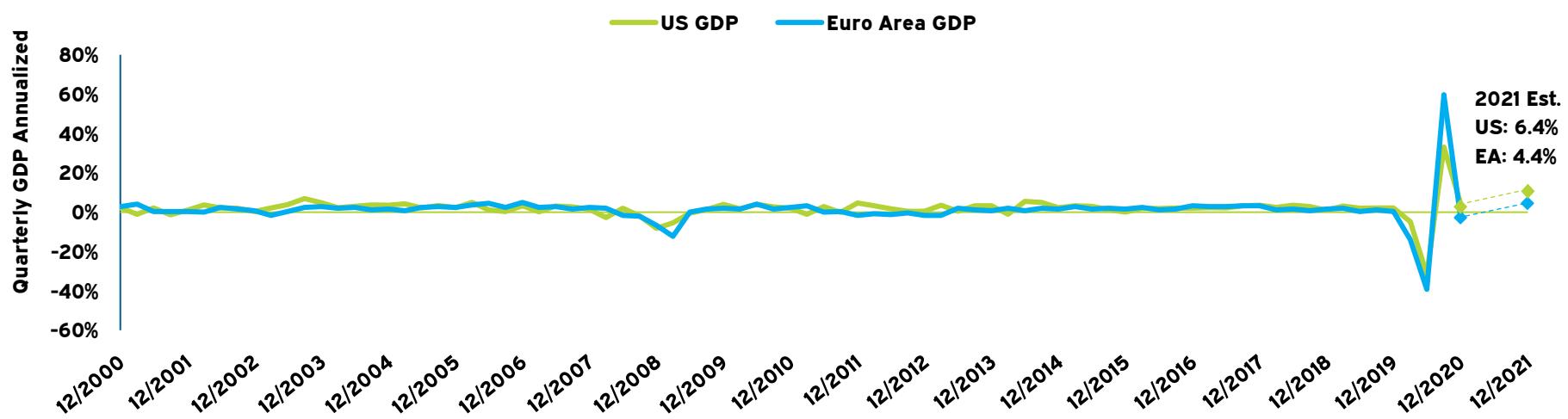
### Credit Spreads (High Yield & Investment Grade)<sup>1</sup>



- Credit spreads (the spread above a comparable maturity Treasury) for investment grade and high yield corporate debt widened sharply at the start of the pandemic as investors sought safety.
- Policy support, the search for yield in the low rate environment, and recent increases in Treasury rates have led to a decline in credit spreads to below long-term averages, particularly for high yield.

<sup>1</sup> Source: Bloomberg. High Yield represents US Corporate High Yield average OAS. Investment grade represents liquid investment grade corporate average OAS. Data is as of March 31, 2021.

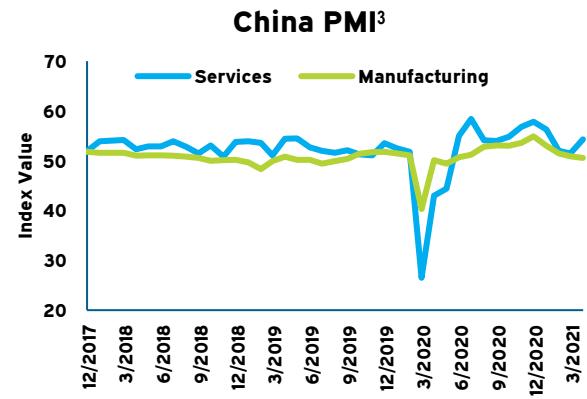
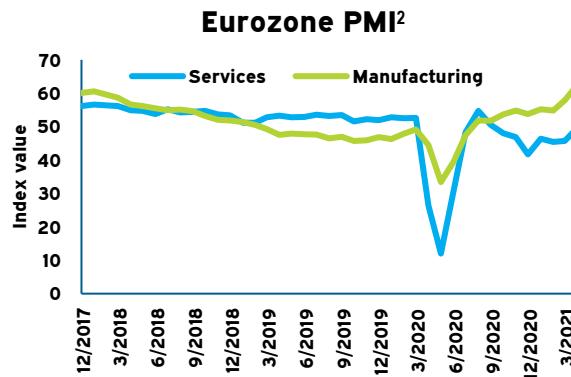
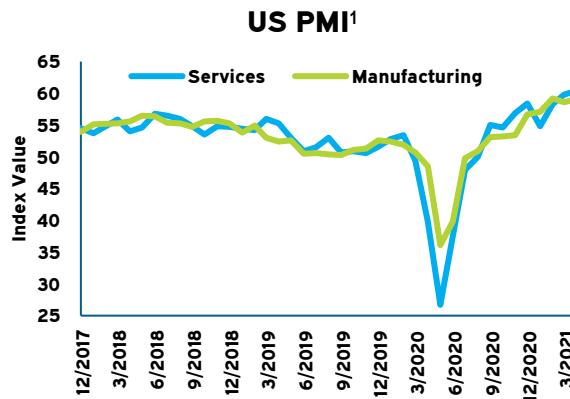
### GDP Data Shows Projected Improvements in 2021<sup>1</sup>



- The global economy faced major recessionary pressures last year, but significant optimism remains for improvements in 2021 as economies are gradually reopening. The IMF is forecasting US 2021 growth at 6.4% and 2022 growth at 3.5%. The IMF has projected 4.4% euro area growth for 2021 and 3.8% in 2022.
- Historic declines in US and European growth during the second quarter were followed by record increases in the third quarter of 2020, due to pent-up demand from the lockdown measures earlier in the year.
- Fourth quarter 2020 US GDP growth was 4.1% (QoQ annualized). Full year US GDP growth declined 2.4%, better than the IMF's forecasted decline of 3.4%.
- In the euro area, increased virus cases and a return to restrictions weighed on fourth quarter growth (-2.8% QoQ annualized). For the year, the euro area economy declined 4.9%, worse than the US, but also ahead of forecasts of a 7.2% decline.

<sup>1</sup> Source: Bloomberg, and IMF; Euro Area figures annualized by Meketa. Projections via April 2021 IMF World Economic Outlook and represent annual numbers.

### Global PMIs



- Purchasing Managers Indices (PMI), based on surveys of private sector companies, initially collapsed across the world to record lows, as closed economies depressed output, new orders, production, and employment.
- Readings below 50 represent contractions across underlying components and are a leading indicator of economic activity, including the future paths of GDP, employment, and industrial production.
- After a period of underperformance, US services and manufacturing are accelerating. In Europe, manufacturing continues to improve, led by Germany, with services lagging given on-going restrictions. After a notable return to full economic activity in the second half of 2020, the Chinese economy has stabilized in positive territory.

<sup>1</sup> Source: Bloomberg. US Markit Services and Manufacturing PMI. Data is as of March 2021.

<sup>2</sup> Source: Bloomberg. Eurozone Markit Services and Manufacturing PMI. Data is as of March 2021.

<sup>3</sup> Source: Bloomberg. Caixin Services and Manufacturing PMI. Data is as of March 2021.

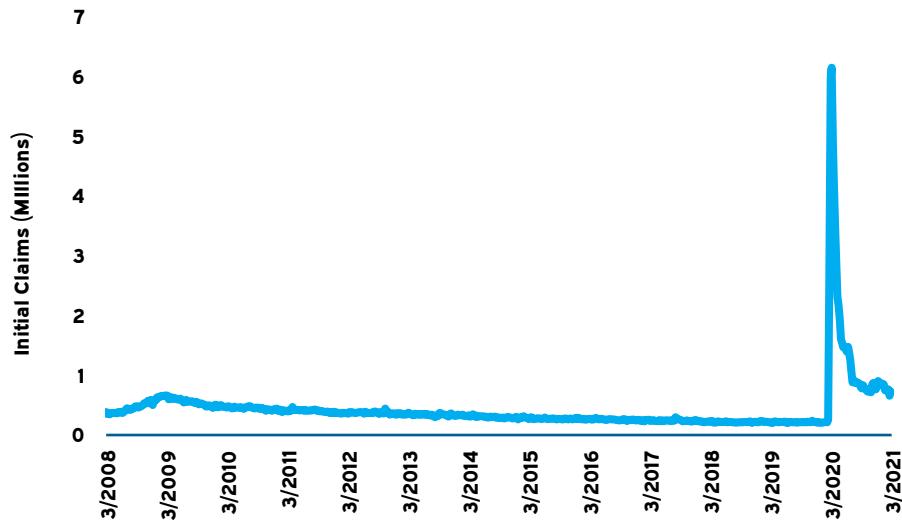


- In March, the unemployment rate (U3) continued its steep decline from the April 2020 peak of 14.7%, falling to 6.0%.
- The broader measure of unemployment (U6) that includes discouraged and underemployed workers is much higher at 10.7%, showing further evidence of the slack in the labor market.
- Despite recent improvements, unemployment levels remain above pre-virus readings and are likely higher than reported, as the total labor force participation rate remains below pre-COVID levels.
- A counterforce to the recent inflation concerns remains the slack in the labor market and corresponding weak wage pressures.

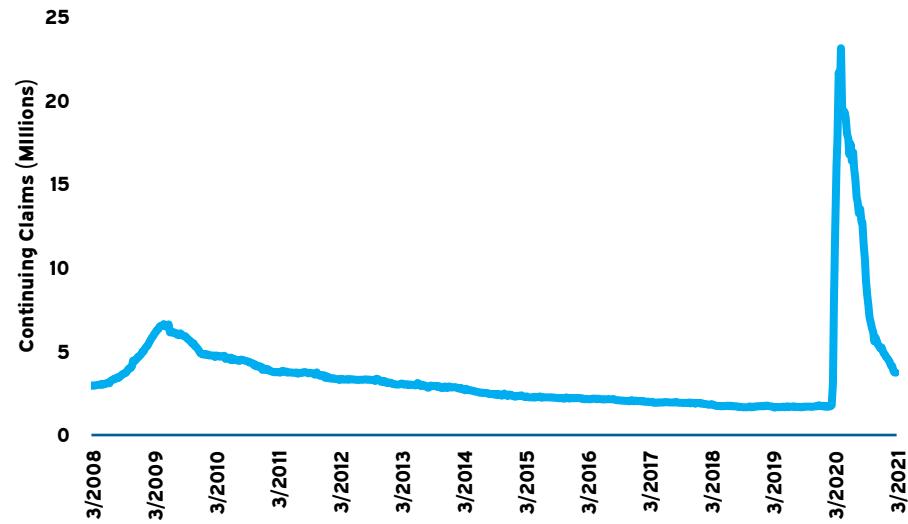
<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

### US Jobless Claims

US Initial Jobless Claims<sup>1</sup>



Continuing Claims<sup>2</sup>

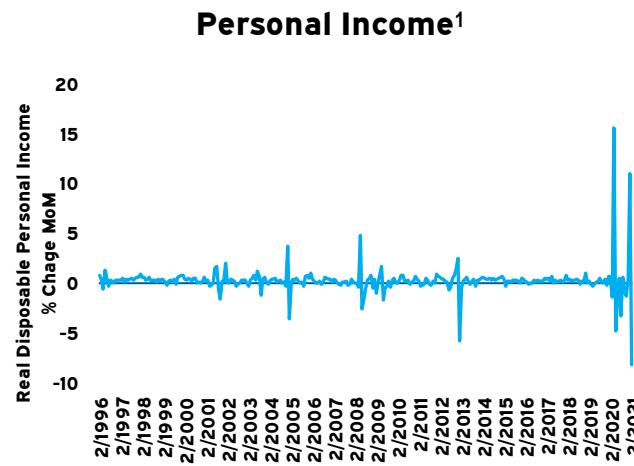


- Since the start of the crisis, ~78 million people filed for initial unemployment. This level is approaching four times the 22 million jobs added since the GFC, highlighting the unprecedented impact of the virus.
- Despite the stabilization in initial jobless claims to below one million per week, levels remain near the worst reading during the Global Financial Crisis.
- Continuing jobless claims (i.e., those currently receiving benefits) have also declined from record levels but remain elevated at 3.7 million.

<sup>1</sup> Source: Bloomberg. First reading of seasonally adjusted initial jobless claims. Data is as of March 26, 2021.

<sup>2</sup> Source: Bloomberg. US Continuing Jobless Claims SA. Data is as of March 26, 2021.

### Savings, Wages and Spending

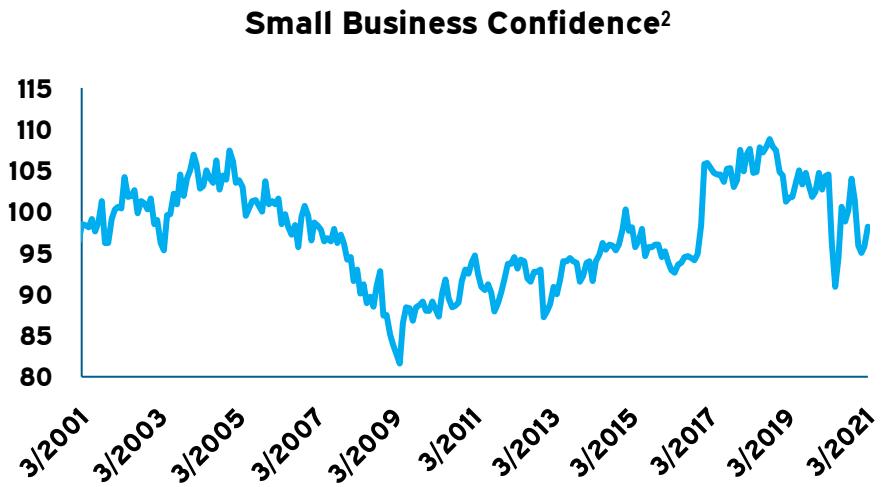
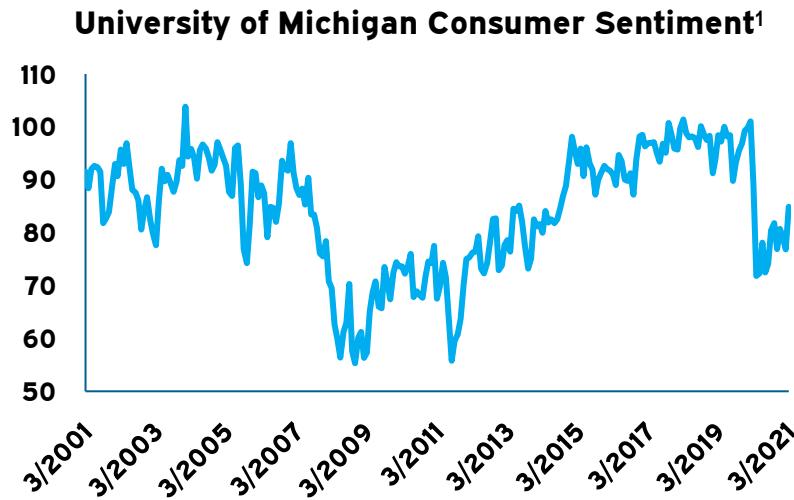


- Fiscal programs including stimulus checks, enhanced unemployment benefits, and loans to small businesses through the Paycheck Protection Program (PPP) have largely supported income levels through the shutdown.
- While estimates of personal income have been extremely volatile since 2020, wage growth has remained relatively stable.
- Despite the income support, the savings rate increased due to the decline in consumer spending, driven by the initial lock-down of the economy, and by uncertainties about the future of the job market and stimulus programs.
- More recently, the savings rate declined from its peak as spending increased with the economy slowly reopening. Going forward, questions remain about how consumers will use the recently approved stimulus programs with concerns over the potential inflationary impacts.

<sup>1</sup> Source: Bloomberg. Latest data is as of February 2021.

<sup>2</sup> Source: Bloomberg. Represents Atlanta FED wage growth tracker. Latest data is as of March 2021.

### Sentiment Indicators

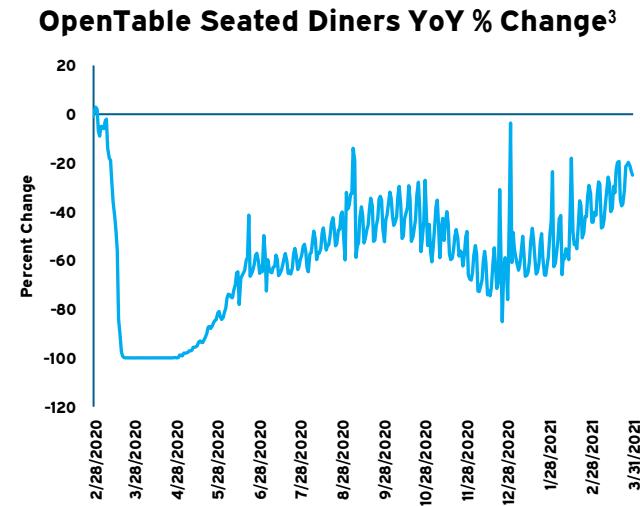
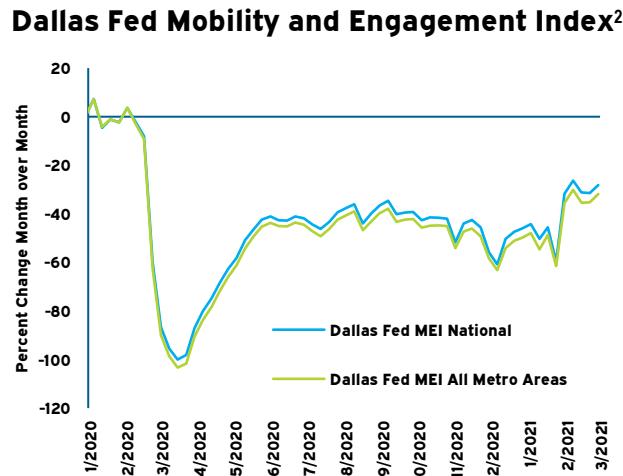
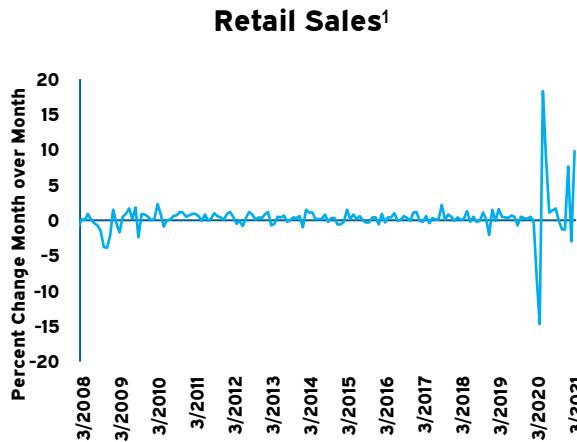


- The attitudes of businesses and consumers are useful indicators of future economic activity.
- Consumer spending comprises close to 70% of US GDP, making the attitudes of consumers an important driver of economic growth. Additionally, small businesses generate around half of US GDP, making sentiment in that segment important.
- Sentiment indicators showed improvements as the economy re-opened, particularly for small businesses. Increasing cases, including from new variants, and the initial slow vaccine rollout have recently weighed on short-term sentiment. This trend could change based on improvements in vaccine distribution and the recent fiscal stimulus.

<sup>1</sup> Source: Bloomberg. University of Michigan Consumer Sentiment Index. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. NFIB Small Business Optimism Index. Data is as of March 31, 2021.

### US Consumers are beginning to venture out again



- There have been improvements in high frequency data, but overall levels remain well below historical averages, and have slowed in some instances given the recent spike in cases.
- Generally, people have become more active as restrictions eased and stores reopened. Retail sales recovered from a record decline with five consecutive months of growth, and notably beat estimates for March as consumers spent recently received stimulus checks.
- Restaurants saw initial improvements before declining with the fall spike in cases and rising again after the holidays. In-store dining has been cited as a key contributor to increases in infections.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021 and represents the US Retail Sales SA MoM%.

<sup>2</sup> Source: Bloomberg. Data is as of March 26, 2021 and represents the deviation from normal mobility behaviors induced by COVID-19 (formerly the "Social Distancing Index"). The index represents a weighted average of various lengths of time that a mobile device, like a cell phone, leaves its "home" or place of residence, and/or how long a device stays at home. A decline in this index represents a mobile device at home for a longer period than average.

<sup>3</sup> Source: Bloomberg. This data shows year-over-year seated diners at restaurants on the OpenTable network across all channels: online reservations, phone reservations, and walk-ins. Only states or cities with 50+ restaurants in the sample are included. All such restaurants on the OpenTable network in either period are included. Data is as of March 31, 2021. Index start date 2/19/20.



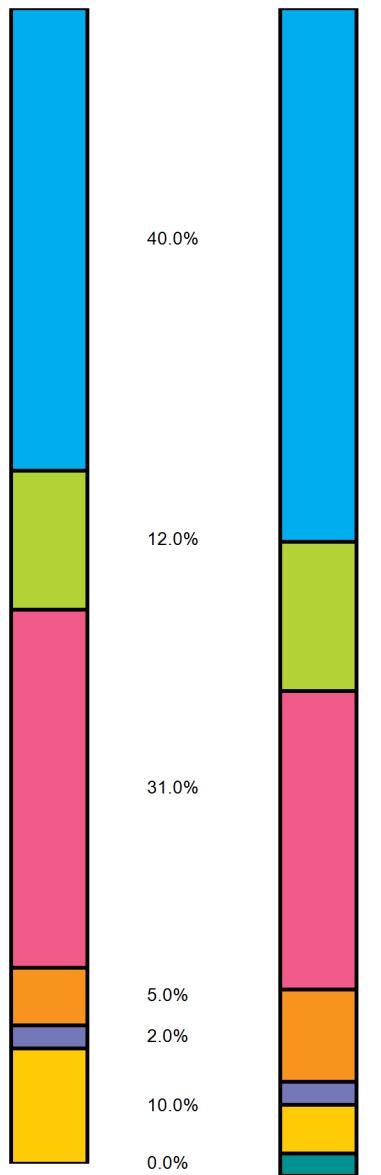
INVESTMENT GROUP

## Oakland Police and Fire Retirement System

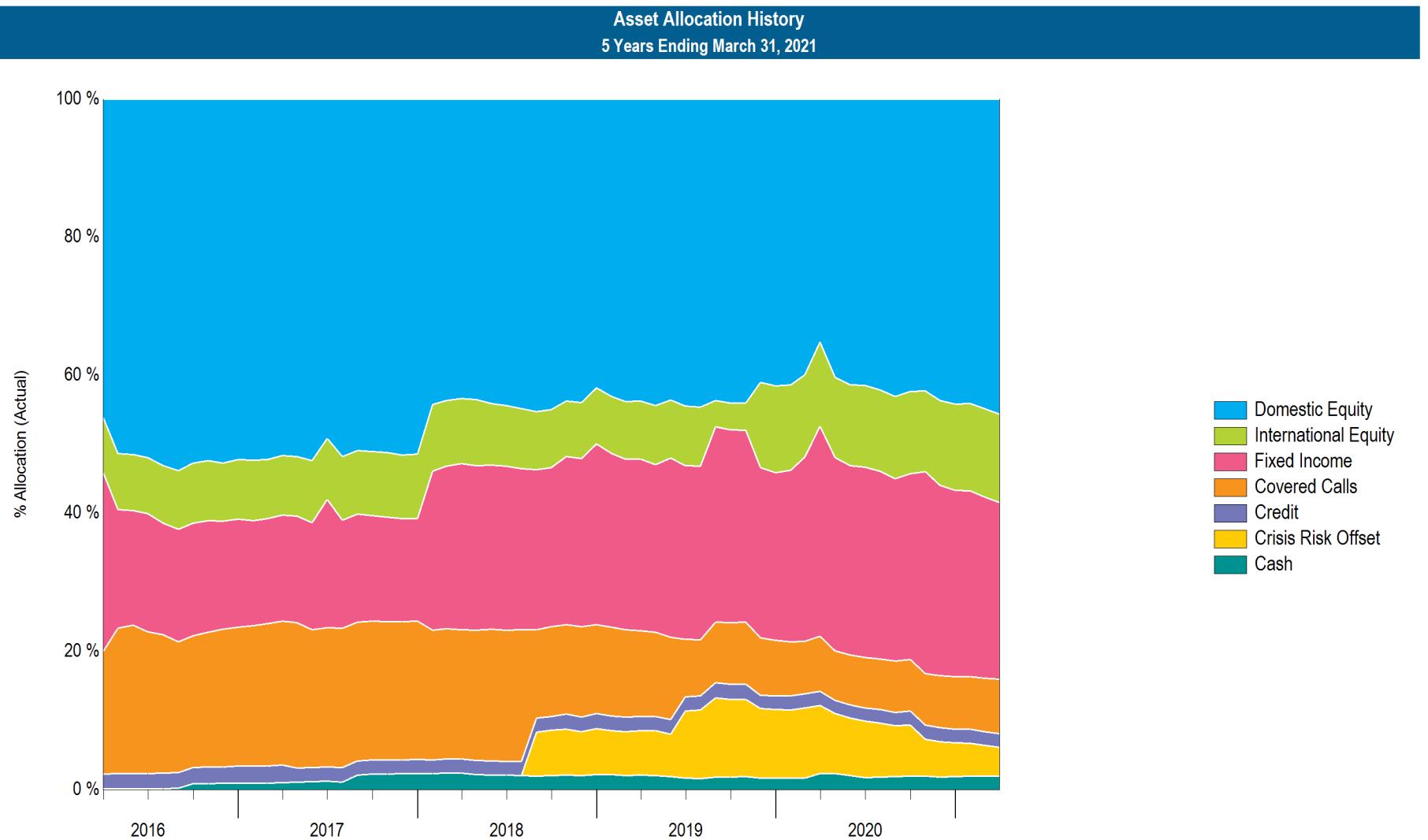
April 28, 2021

March Flash Report

### OPFRS Total Plan As of March 31, 2021



Allocation vs. Targets and Policy						
	Current Balance	Current Allocation	Policy	Difference	Within IPS Range?	
Domestic Equity	\$202,337,790	45.6%	40.0%	5.6%	Yes	
International Equity	\$56,681,628	12.8%	12.0%	0.8%	Yes	
Fixed Income	\$113,419,761	25.6%	31.0%	-5.4%	Yes	
Covered Calls	\$35,002,226	7.9%	5.0%	2.9%	Yes	
Credit	\$8,901,168	2.0%	2.0%	0.0%	Yes	
Crisis Risk Offset	\$18,417,784	4.2%	10.0%	-5.8%	No	
Cash	\$8,540,995	1.9%	0.0%	1.9%	Yes	
<b>Total</b>	<b>\$443,301,351</b>	<b>100.0%</b>	<b>100.0%</b>			



Asset Class Performance Summary												
	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date	
<b>OPFRS Total Plan</b>	<b>443,301,351</b>	<b>100.0</b>	<b>1.8</b>	<b>2.8</b>	<b>18.1</b>	<b>33.6</b>	<b>9.3</b>	<b>10.9</b>	<b>8.2</b>	<b>7.0</b>	<b>Dec-88</b>	
<i>OPFRS Policy Benchmark</i>			<i>1.4</i>	<i>1.8</i>	<i>16.0</i>	<i>30.0</i>	<i>9.4</i>	<i>10.3</i>	<i>7.9</i>	<i>8.4</i>	<i>Dec-88</i>	
<b>Domestic Equity</b>	<b>202,337,790</b>	<b>45.6</b>	<b>3.9</b>	<b>7.3</b>	<b>33.7</b>	<b>63.1</b>	<b>15.5</b>	<b>16.3</b>	<b>13.5</b>	<b>9.4</b>	<b>Jun-97</b>	
<i>Russell 3000 (Blend)</i>			<i>3.6</i>	<i>6.3</i>	<i>33.2</i>	<i>62.5</i>	<i>17.1</i>	<i>16.6</i>	<i>13.8</i>	<i>9.6</i>	<i>Jun-97</i>	
<b>International Equity</b>	<b>56,681,628</b>	<b>12.8</b>	<b>2.0</b>	<b>4.1</b>	<b>25.7</b>	<b>43.0</b>	<b>6.5</b>	<b>10.5</b>	<b>5.9</b>	<b>5.8</b>	<b>Jan-98</b>	
<i>MSCI ACWI ex US (Blend)</i>			<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>	<i>6.0</i>	<i>Jan-98</i>	
<b>Fixed Income</b>	<b>113,419,761</b>	<b>25.6</b>	<b>-1.2</b>	<b>-2.9</b>	<b>0.2</b>	<b>6.1</b>	<b>5.0</b>	<b>4.2</b>	<b>4.1</b>	<b>5.4</b>	<b>Dec-93</b>	
<i>Blmbg BC Universal (Blend)</i>			<i>-1.2</i>	<i>-3.1</i>	<i>-0.8</i>	<i>3.0</i>	<i>4.9</i>	<i>3.6</i>	<i>3.8</i>	<i>5.3</i>	<i>Dec-93</i>	
<b>Credit</b>	<b>8,901,168</b>	<b>2.0</b>	<b>0.9</b>	<b>3.5</b>	<b>19.7</b>	<b>32.7</b>	<b>4.9</b>	<b>8.6</b>	--	<b>6.4</b>	<b>Feb-15</b>	
<i>BBgBarc US High Yield TR</i>			<i>0.1</i>	<i>0.8</i>	<i>12.3</i>	<i>23.7</i>	<i>6.8</i>	<i>8.1</i>	<i>6.5</i>	<i>6.2</i>	<i>Feb-15</i>	
<b>Covered Calls</b>	<b>35,002,226</b>	<b>7.9</b>	<b>4.0</b>	<b>6.2</b>	<b>25.4</b>	<b>45.4</b>	<b>12.3</b>	<b>11.9</b>	--	<b>9.9</b>	<b>Apr-14</b>	
<i>CBOE S&amp;P 500 BuyWrite USD</i>			<i>1.4</i>	<i>2.6</i>	<i>17.5</i>	<i>28.3</i>	<i>4.0</i>	<i>6.2</i>	<i>6.3</i>	<i>5.5</i>	<i>Apr-14</i>	
<b>Crisis Risk Offset</b>	<b>18,417,784</b>	<b>4.2</b>	<b>-5.0</b>	<b>-13.6</b>	<b>-16.6</b>	<b>-18.7</b>	<b>-11.4</b>	--	--	<b>-12.7</b>	<b>Aug-18</b>	
<i>SG Multi Alternative Risk Premia Index</i>			<i>3.6</i>	<i>3.7</i>	<i>1.0</i>	<i>-3.3</i>	--	--	--	<i>-3.9</i>	<i>Aug-18</i>	
<b>Cash</b>	<b>8,540,995</b>	<b>1.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>1.7</b>	<b>1.4</b>	<b>0.7</b>	<b>0.7</b>	<b>Mar-11</b>	
<i>FTSE T-Bill 3 Months TR</i>			<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>0.2</i>	<i>1.5</i>	<i>1.2</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>	

Cash balances held in ETF accounts at the Custodian are reflected in the Cash account market value.

**OPFRS Total Plan As of March 31, 2021**

	Trailing Net Performance												S.I. (%)	S.I. Date
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)				
<b>OPFRS Total Plan</b>	<b>443,301,351</b>	<b>100.0</b>	--	<b>1.8</b>	<b>2.8</b>	<b>18.1</b>	<b>33.6</b>	<b>9.3</b>	<b>10.9</b>	<b>8.2</b>			<b>7.0</b>	<b>Dec-88</b>
<i>OPFRS Policy Benchmark</i>				<i>1.4</i>	<i>1.8</i>	<i>16.0</i>	<i>30.0</i>	<i>9.4</i>	<i>10.3</i>	<i>7.9</i>			<i>8.4</i>	<i>Dec-88</i>
<b>Domestic Equity</b>	<b>202,337,790</b>	<b>45.6</b>	<b>45.6</b>	<b>3.9</b>	<b>7.3</b>	<b>33.7</b>	<b>63.1</b>	<b>15.5</b>	<b>16.3</b>	<b>13.5</b>			<b>9.4</b>	<b>Jun-97</b>
<i>Russell 3000 (Blend)</i>				<i>3.6</i>	<i>6.3</i>	<i>33.2</i>	<i>62.5</i>	<i>17.1</i>	<i>16.6</i>	<i>13.8</i>			<i>9.6</i>	<i>Jun-97</i>
Northern Trust Russell 1000	111,018,819	25.0	54.9	3.8	5.9	31.8	60.5	17.3	16.6	13.9			15.1	Jun-10
<i>Russell 1000</i>				<i>3.8</i>	<i>5.9</i>	<i>31.8</i>	<i>60.6</i>	<i>17.3</i>	<i>16.7</i>	<i>14.0</i>			<i>15.1</i>	<i>Jun-10</i>
EARNEST Partners	44,905,705	10.1	22.2	4.9	9.6	40.5	74.0	18.4	19.3	14.3			11.4	Apr-06
<i>Russell MidCap</i>				<i>2.7</i>	<i>8.1</i>	<i>39.3</i>	<i>73.6</i>	<i>14.7</i>	<i>14.7</i>	<i>12.5</i>			<i>9.8</i>	<i>Apr-06</i>
Vanguard Russell 2000 Value	10,466,133	2.4	5.2	5.5	21.0	64.1	95.0	--	--	--			20.4	Aug-19
<i>Russell 2000 Value</i>				<i>5.2</i>	<i>21.2</i>	<i>65.7</i>	<i>97.1</i>	<i>11.6</i>	<i>13.6</i>	<i>10.1</i>			<i>20.5</i>	<i>Aug-19</i>
Rice Hall James	16,255,728	3.7	8.0	-0.9	8.3	38.6	90.4	11.9	--	--			15.1	Jul-17
<i>Russell 2000 Growth</i>				<i>-3.1</i>	<i>4.9</i>	<i>45.7</i>	<i>90.2</i>	<i>17.2</i>	<i>18.6</i>	<i>13.0</i>			<i>17.4</i>	<i>Jul-17</i>
iShares Edge MSCI Min Vol	19,691,405	4.4	9.7	5.6	2.3	15.7	30.5	--	--	--			30.5	Apr-20
<i>MSCI USA Minimum Volatility GR USD</i>				<i>5.5</i>	<i>2.3</i>	<i>15.7</i>	<i>30.6</i>	<i>12.4</i>	<i>11.9</i>	<i>13.1</i>			<i>30.6</i>	<i>Apr-20</i>
<b>International Equity</b>	<b>56,681,628</b>	<b>12.8</b>	<b>12.8</b>	<b>2.0</b>	<b>4.1</b>	<b>25.7</b>	<b>43.0</b>	<b>6.5</b>	<b>10.5</b>	<b>5.9</b>			<b>5.8</b>	<b>Jan-98</b>
<i>MSCI ACWI ex US (Blend)</i>				<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>			<i>6.0</i>	<i>Jan-98</i>
Vanguard Developed Markets ETF	16,445,220	3.7	29.0	2.3	4.0	26.6	47.5	--	--	--			15.6	Sep-19
<i>FTSE Developed All Cap Ex US TR USD</i>				<i>2.5</i>	<i>4.1</i>	<i>29.3</i>	<i>50.6</i>	<i>6.9</i>	<i>9.1</i>	<i>4.0</i>			<i>17.2</i>	<i>Sep-19</i>
SGA ACWI ex-U.S. Equity	39,826,795	9.0	70.3	1.7	4.1	25.7	42.3	--	--	--			9.4	Dec-19
<i>MSCI ACWI ex USA Gross</i>				<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>			<i>14.8</i>	<i>Dec-19</i>

International equity performance inclusive of residual cash in Fisher and Hansberger transition accounts.

### OPFRS Total Plan As of March 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
<b>Fixed Income</b>	<b>113,419,761</b>	<b>25.6</b>	<b>25.6</b>	<b>-1.2</b>	<b>-2.9</b>	<b>0.2</b>	<b>6.1</b>	<b>5.0</b>	<b>4.2</b>	<b>4.1</b>	<b>5.4</b>	<b>Dec-93</b>
Blmbg BC Universal (Blend)				-1.2	-3.1	-0.8	3.0	4.9	3.6	3.8	5.3	Dec-93
Ramirez	77,199,344	17.4	68.1	-1.2	-2.6	0.5	6.3	4.9	--	--	4.4	Jan-17
BBgBarc US Aggregate TR				-1.2	-3.4	-2.1	0.7	4.7	3.1	3.4	3.8	Jan-17
Reams	28,845,472	6.5	25.4	-1.2	-3.6	0.1	9.1	8.7	5.7	5.2	5.9	Feb-98
Blmbg BC Universal (Blend)				-1.2	-3.1	-0.8	3.0	4.9	3.6	3.8	4.9	Feb-98
iShares Core US Aggregate Bond ETF	7,374,902	1.7	6.5	-1.1	-3.4	--	--	--	--	--	-2.4	Nov-20
BBgBarc US Aggregate TR				-1.2	-3.4	-2.1	0.7	4.7	3.1	3.4	-2.3	Nov-20
<b>Credit</b>	<b>8,901,168</b>	<b>2.0</b>	<b>2.0</b>	<b>0.9</b>	<b>3.5</b>	<b>19.7</b>	<b>32.7</b>	<b>4.9</b>	<b>8.6</b>	--	<b>6.4</b>	<b>Feb-15</b>
BBgBarc US High Yield TR				0.1	0.8	12.3	23.7	6.8	8.1	6.5	6.2	Feb-15
DDJ Capital	8,901,168	2.0	100.0	0.9	3.5	19.7	32.7	4.9	8.6	--	6.4	Feb-15
ICE BofA High Yield Master TR				0.2	0.9	12.5	23.3	6.6	8.0	6.3	6.0	Feb-15
<b>Covered Calls</b>	<b>35,002,226</b>	<b>7.9</b>	<b>7.9</b>	<b>4.0</b>	<b>6.2</b>	<b>25.4</b>	<b>45.4</b>	<b>12.3</b>	<b>11.9</b>	--	<b>9.9</b>	<b>Apr-14</b>
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
Parametric BXM	15,599,360	3.5	44.6	3.5	5.4	21.1	35.6	9.0	9.1	--	7.8	Apr-14
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
Parametric DeltaShift	19,402,866	4.4	55.4	4.4	6.8	29.2	54.6	15.5	14.5	--	12.3	Apr-14
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
<b>Crisis Risk Offset</b>	<b>18,417,784</b>	<b>4.2</b>	<b>4.2</b>	<b>-5.0</b>	<b>-13.6</b>	<b>-16.6</b>	<b>-18.7</b>	<b>-11.4</b>	--	--	<b>-12.7</b>	<b>Aug-18</b>
SG Multi Alternative Risk Premia Index				3.6	3.7	1.0	-3.3	--	--	--	-3.9	Aug-18
Vanguard Long-Term Treasury ETF	18,417,784	4.2	100.0	-5.0	-13.6	-15.8	-16.1	--	--	--	3.0	Jul-19
BBgBarc US Govt Long TR				-5.0	-13.4	-15.8	-15.6	5.8	3.2	6.3	3.0	Jul-19
<b>Cash</b>	<b>8,540,995</b>	<b>1.9</b>	<b>1.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>1.7</b>	<b>1.4</b>	<b>0.7</b>	<b>0.7</b>	<b>Mar-11</b>
FTSE T-Bill 3 Months TR				0.0	0.0	0.1	0.2	1.5	1.2	0.6	0.6	Mar-11
Cash	2,261,995	0.5	26.5	0.0	0.1	0.5	0.6	1.9	1.5	0.8	0.8	Mar-11
FTSE T-Bill 3 Months TR				0.0	0.0	0.1	0.2	1.5	1.2	0.6	0.6	Mar-11
Cash - Treasury	6,279,000	1.4	73.5									

Market value for DDJ Capital is based on manager estimate for the month of March.

Cash balances held in ETF accounts at the Custodian are reflected in the Cash account market value.

	<b>Cash Flow Summary</b>				
	<b>Month to Date</b>				
	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value	
Cash	\$2,112,406	\$149,563	\$26	\$2,261,995	
Cash - Treasury	\$6,357,000	-\$78,000	\$0	\$6,279,000	
DDJ Capital	\$8,821,149	\$0	\$80,019	\$8,901,168	
EARNEST Partners	\$42,793,614	\$0	\$2,112,091	\$44,905,705	
Fisher Transition	\$69,477	\$0	-\$2,271	\$67,206	
Hansberger Transition	\$258,520	\$0	\$83,886	\$342,407	
iShares Core US Aggregate Bond ETF	\$7,481,183	\$0	-\$106,282	\$7,374,902	
iShares Edge MSCI Min Vol	\$18,720,922	\$0	\$970,483	\$19,691,405	
Northern Trust Russell 1000	\$107,960,039	-\$1,000,000	\$4,058,780	\$111,018,819	
Parametric BXM	\$15,074,680	\$0	\$524,681	\$15,599,360	
Parametric DeltaShift	\$18,590,159	\$0	\$812,706	\$19,402,866	
Ramirez	\$78,098,870	\$0	-\$899,526	\$77,199,344	
Reams	\$29,181,745	\$0	-\$336,272	\$28,845,472	
Reams Low Duration	\$44	\$0	\$0	\$44	
Rice Hall James	\$16,404,174	\$0	-\$148,447	\$16,255,728	
Securities Lending Northern Trust	\$0	-\$9,243	\$9,243	\$0	
SGA ACWI ex-U.S. Equity	\$39,142,281	\$0	\$684,514	\$39,826,795	
Vanguard Developed Markets ETF	\$16,076,869	\$0	\$368,352	\$16,445,220	
Vanguard Long-Term Treasury ETF	\$19,396,506	\$0	-\$978,723	\$18,417,784	
Vanguard Russell 2000 Value	\$9,926,350	\$0	\$539,783	\$10,466,133	
<b>Total</b>	<b>\$436,465,988</b>	<b>-\$937,679</b>	<b>\$7,773,042</b>	<b>\$443,301,351</b>	

**Benchmark History**  
**As of March 31, 2021**

Total Plan x Securities Lending x Reams LD Exception Comp

1/1/2019	Present	40% Russell 3000 / 12% MSCI ACWI ex USA Gross / 33% BBgBarc US Universal TR / 5% CBOE BXN / 6.7% SG Multi Alternative Risk Premia Index / 3.3% BBgBarc US Treasury Long TR
5/1/2016	12/31/2018	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 20% CBOE BXN
10/1/2015	4/30/2016	43% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 15% CBOE BXN / 10% CPI - All Urban Consumers (unadjusted) +3%
1/1/2014	9/30/2015	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 10% CBOE BXN / 10% CPI - All Urban Consumers (unadjusted) +3%
3/1/2013	12/31/2013	40% Russell 3000 / 10% MSCI ACWI ex USA Gross / 17% BBgBarc US Universal TR / 33% ICE BofA 3M US Treasury TR USD
8/1/2012	2/28/2013	20% Russell 3000 / 7% MSCI ACWI ex USA Gross / 18% BBgBarc US Universal TR / 55% ICE BofA 3M US Treasury TR USD
10/1/2007	7/31/2012	53% Russell 3000 / 17% MSCI ACWI ex USA Gross / 30% BBgBarc US Universal TR
4/1/2006	9/30/2007	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% BBgBarc US Universal TR
1/1/2005	3/31/2006	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% BBgBarc US Aggregate TR
4/1/1998	12/31/2004	50% BBgBarc US Aggregate TR / 10% Russell 1000 / 20% Russell 1000 Value / 5% Russell MidCap / 15% MSCI EAFE
9/1/1988	3/31/1998	40% S&P 500 / 55% BBgBarc US Aggregate TR / 5% FTSE T-Bill 3 Months TR

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM", "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

**MEMORANDUM**

**TO:** Oakland Police and Fire Retirement System (OPFRS)  
**FROM:** Meketa Investment Group  
**DATE:** April 28, 2021  
**RE:** Manager Fee Comparison

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**Summary**

Meketa conducted a fee analysis of OPFRS current public market investment managers and reviewed the reasonableness of their management fees. To evaluate each manager's fee, Meketa considered the following:

- (i) fees of managers of similar size managed in the same style and
- (ii) the structure of the account.

**Finding<sup>1</sup>**

Generally, OPFRS public market manager fees are highly competitive for the size and type of each mandate. For OPFRS, 8 of its 14 public fund managers/ strategies rank in median or better (lowest fees), representing approximately 79% of the total assets reviewed as of December 31, 2020. Three of OPFRS fourteen public market managers, Rice Hall James, SGA, and the DDJ High Yield/Bank Loan strategy, currently ranks in the 4th quartile (highest fees). Meketa would note that DDJ was compared to the broad High yield universe. The other two strategies- Covered Calls, both managed by Parametric do not have a broad enough peer universe for fees comparison.

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<sup>1</sup> Values used for Brown Advisory and Wellington are estimates based on the market value of funding sources as of 3/31/2021. Both manager mandates were funded at the beginning of April 2021.



Investment Manager Fees Review						
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee	Fee Rank	Median Fee
<b>Total Plan</b>		<b>\$443,301,351</b>	<b>\$1,262,332</b>	<b>0.29%</b>		
<b>Domestic Equity</b>		<b>\$202,337,790</b>	<b>\$561,932</b>	<b>0.28%</b>		
Northern Trust Russell 1000	0.02% of Assets	\$11,018,819	\$22,204	0.02%	1	0.06%
	1.00% of First 10.0 Mil, <sup>ii</sup>					
EARNEST Partners	0.75% of Next 15.0 Mil, <sup>ii</sup>	\$44,905,705	\$331,934	0.74%		0.81%
	0.60% Thereafter				25	
Brown Advisory	0.85% of Assets	\$10,466,133	\$88,962	0.85%	34	0.95%
Rice Hall James	1.00% of Assets	\$16,255,728	\$162,557	1.00%	80	0.90%
iShares Edge MSCI Min Vol	0.15% of Assets	\$19,691,405	\$29,537	0.15%	8	0.48%
<b>International Equity</b>		<b>\$56,681,628</b>	<b>\$346,750</b>	<b>0.62%</b>		
Vanguard Developed Markets ETF	0.05% of Assets	\$16,445,220	\$8,223	0.05%	1	0.12%
SGA ACWI ex-U.S. Equity	0.85% of Assets	\$39,826,795	\$338,528	0.85%	79	0.72%
<b>Fixed Income</b>		<b>\$113,419,761</b>	<b>\$215,040</b>	<b>0.19%</b>		
Ramirez	0.20% of Assets	\$77,199,344	\$154,399	0.20%	3	0.30%
Reams	0.20% of Assets	\$28,845,472	\$57,691	0.20%	3	0.30%
Wellington Core Bond <sup>ii</sup>	0.12% of Assets	\$7,374,902	\$8,850	0.12%	3	0.30%
<b>Credit</b>		<b>\$8,901,168</b>	<b>\$57,858</b>	<b>0.65%</b>		
DDJ Capital	0.65% of Assets	\$8,901,168	\$57,858	0.65%	80	0.55%
<b>Covered Calls</b>		<b>\$35,002,226</b>	<b>\$71,544</b>	<b>0.20%</b>		
	0.30% of First 0.0 Mil, <sup>ii</sup>					
Parametric BXM	0.25% of Next 0.0 Mil, <sup>ii</sup>	\$15,599,360	\$27,344	0.18%		
	0.20% of Next 0.0 Mil, <sup>ii</sup>					
	0.18% Thereafter					
	0.39% of First 0.0 Mil, <sup>ii</sup>					
Parametric DeltaShift	0.33% of Next 0.0 Mil, <sup>ii</sup>	\$19,402,866	\$44,200	0.23%		
	0.26% of Next 0.0 Mil, <sup>ii</sup>					
	0.23% Thereafter					
<b>Crisis Risk Offset</b>		<b>\$18,417,784</b>	<b>\$9,209</b>	<b>0.05%</b>		
Vanguard Long-Term Treasury ETF	0.05% of Assets	\$18,417,784	\$9,209	0.05%	1	0.20%
<b>Cash</b>		<b>\$8,540,995</b>	<b>\$0</b>	<b>0.00%</b>		
Cash		\$2,261,995				
Cash - Treasury		\$6,279,000				
<b>Total</b>		<b>\$442,891,738</b>	<b>\$1,262,332</b>	<b>0.29%</b>		

DS/jls

## MEMORANDUM

**TO:** Oakland Police and Fire Retirement System (OPFRS)  
**FROM:** David Sancewich, Paola Nealon, Sidney Kawanguzi, Meketa Investment Group  
**DATE:** April 28, 2021  
**RE:** 2021 Ongoing Strategic Investment Agenda

On an ongoing (monthly) basis, Meketa develops a list of projects that we expect to work closely with OPFRS to complete throughout the calendar year (see table below). In an attempt to coordinate the scheduling of these tasks, this memo details a Preliminary Investment Project Agenda by calendaring and prioritizing the expected tasks and deliverables that would be required to fulfill the Agenda. Meketa welcomes any suggestions and/or modifications to the proposed timeline.

### 2021 Preliminary Investment Project Agenda

Expected Completion Date	Task
May 2021	<ul style="list-style-type: none"><li>Quarterly Performance Report (1Q 2021)</li><li>Systematic Trend Following Manager Search Interviews</li></ul>
June 2021	<ul style="list-style-type: none"><li>Cash Flow Report (3Q 2021)</li><li>Defensive Equity Search Interviews</li><li>Educational Item: SPACs</li><li>2021 Asset Liability Review</li></ul>
July 2021	<ul style="list-style-type: none"><li>Flash Performance (2Q2021)</li><li>Manager Update: SGA</li><li>Manager Update: Rice Hall &amp; James</li></ul>
August 2021	<ul style="list-style-type: none"><li>Quarterly Performance Report (2Q 2021)</li><li>Manager Update: Northern Trust R1000</li><li>Contract Renewal: Northern Trust</li><li>Educational Item: Cryptocurrency</li></ul>
September 2021	<ul style="list-style-type: none"><li>Cash Flow Report (4Q 2021)</li><li>Educational Item: Transition from fossil fuels/ ESG Trends</li><li>Thermal Coal List Update: 2021</li></ul>



October 2021

- Flash Performance (3Q2021)
- Manager Update: Ramirez
- Contract Renewal: Ramirez

November 2021

- Quarterly Performance Report (3Q 2021)
- Educational Item: Developments in ESG
- Manager Update (and contract renewal)- Parametric

December 2021

- Cash Flow Report (1Q 2022)
- Flash performance- November

**Bold** are priority strategic items.

This agenda includes only major strategic items. Meketa also expects to work with the Staff and Board to complete more routine tasks and projects, as expected.

DS/PN/SK/jls

Pursuant to the Governor's Executive Order N-29-20, all members of the City Council, as well as the City Administrator, City Attorney and City Clerk will join the meeting via phone/video conference and no teleconference locations are required.

Oakland Police and Fire Retirement Board meetings are being held via Tele-Conference. Please see the agenda to participate in the meeting. For additional information, contact the Retirement Unit by calling (510) 238-6481



**Retirement Unit  
150 Frank H. Ogawa Plaza  
Oakland, California 94612**

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Member

# **AGENDA**

## **REGULAR MEETING of the BOARD OF ADMINISTRATION of the OAKLAND POLICE AND FIRE RETIREMENT SYSTEM ("PFRS")**

**Wednesday, April 28, 2021  
12:00 PM  
Tele-Conference Board Meeting  
via Zoom Webinar**

### **OBserve**

- To observe the meeting by video conference, please click on this link: <https://us02web.zoom.us/j/82880493983> at the noticed meeting time.
- To listen to the meeting by phone, please call the numbers below at the noticed meeting time: Dial (for higher quality, dial a number based on your current location):
  - iPhone one-tap: US: +16699006833, 82880493983# or +13462487799, 82880493983#
  - US: +1 669 900 6833 or +1 346 248 7799 or +1 253 215 8782 or +1 301 715 8592 or +1 312 626 6799 or +1 929 205 6099
  - International numbers available: <https://us02web.zoom.us/u/kctrX35uax>
- Webinar ID: 828 8049 3983.  
If asked for a participant ID or code, press #.

### **PUBLIC COMMENTS**

There are three ways to submit public comments.

- eComment. To send your comment directly to staff BEFORE the meeting starts, please email to [mvisaya@oaklandca.gov](mailto:mvisaya@oaklandca.gov) with "PFRS Board Meeting" in the subject line for the corresponding meeting. Please note that eComment submission **closes two (2) hours before posted meeting time**.

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM  
REGULAR BOARD MEETING  
APRIL 28, 2021**

- To comment by Zoom video conference, click the “Raise Your Hand” button to request to speak when Public Comment is being taken on an eligible agenda item at the beginning of the meeting. You will be permitted to speak during your turn, allowed to comment, and after the allotted time, re-muted. Instructions on how to “Raise Your Hand” is available at: <https://support.zoom.us/hc/en-us/articles/205566129> - Raise-Hand-In-Webinar.
- To comment by phone, please call on one of the above listed phone numbers. You will be prompted to “Raise Your Hand” by pressing “\*9” to speak when Public Comment is taken. You will be permitted to speak during your turn, allowed to comment, and after the allotted time, re-muted. Please unmute yourself by pressing \*6.

If you have any questions, please email Maxine Visaya, Administrative Assistant II at [mvisaya@oaklandca.gov](mailto:mvisaya@oaklandca.gov).

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**- - - ORDER OF BUSINESS - - -**

- A. Subject:** **Police and Fire Retirement System (“PFRS”) Board Meeting Minutes**  
**From:** Staff of the PFRS Board  
**Recommendation:** APPROVE March 31, 2021 PFRS Board Meeting Minutes.
- B. AUDIT & OPERATIONS COMMITTEE AGENDA – APRIL 28, 2021**
- B1. Subject:** **Administrative Expenses Report**  
**From:** Staff of the PFRS Board  
**Recommendation:** ACCEPT informational report regarding PFRS administrative expenses as of February 28, 2021.
- C. INVESTMENT & FINANCIAL MATTERS COMMITTEE AGENDA – APRIL 28, 2021**
- C1. Subject:** **Selection of New Alternative Risk Premia Asset Class Investment Manager**  
**From:** Meketa Investment Group  
**Recommendation:** RECEIVE report summarizing presentations at the Investment Committee Meeting from prospective Investment Management Firms seeking to serve as PFRS’ New Alternative Risk Premia Asset Class Investment Manager; DISCUSS and APPROVE Investment Committee’s recommendation of new Alternative Risk Premia Asset Class Investment Manager.
  - Kepos Capital
  - Lombard Odier
  - Two Sigma Investments

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C2.	<b>Subject:</b> <b>From:</b> <b>Recommendation:</b>	<b>Investment Market Overview as of March 31, 2021</b> Meketa Investment Group <b>ACCEPT</b> informational report regarding the Global Investment Markets as of March 31, 2021.						
C3.	<b>Subject:</b> <b>From:</b> <b>Recommendation:</b>	<b>Preliminary Investment Fund Performance Update as of March 31, 2021</b> Meketa Investment Group <b>ACCEPT</b> informational report regarding the Preliminary Investment Fund Performance update as of March 31, 2021.						
C4.	<b>Subject:</b> <b>From:</b> <b>Recommendation:</b>	<b>PFRS Investment Managers' Fees</b> Meketa Investment Group <b>ACCEPT</b> informational report regarding a review of current PFRS Investment Managers' Fees.						
D.	<b>Subject:</b> <b>From:</b> <b>Recommendation:</b>	<b>Resolution No. 8014 Resolution Expressing Appreciation for Board Member Margaret O'Brien</b> Staff of the PFRS Board <b>APPROVE</b> Resolution No. 8014 – Resolution expressing appreciation for Margaret O'Brien's loyal service, dedication and valuable contribution as a member of the Oakland Police And Fire Retirement System Board Of Administration And Chairperson of the Ad Hoc Committee for the Oakland Police And Fire Retirement Systems 2026 Actuarial Funding Date.						
E.	<b>Subject:</b> <b>From:</b> <b>Recommendation:</b>	<b>Member Resolutions No. 8015 – 8016</b> Staff of the PFRS Board <b>APPROVE</b> Member Resolutions No. 8015 – 8016						
E1.	<b>Resolution No. 8015</b>	Resolution approving death benefit payments and directing warrants thereunder in the total sum of \$1,000.00 payable to the beneficiary of the following deceased member of the Police and Fire Retirement System: <ul style="list-style-type: none"><li>▪ Steven H. Todar</li></ul>						
E2.	<b>Resolution No. 8016</b>	Resolution fixing the monthly allowance of surviving spouse of the following retired member of the Police and Fire Retirement System in the amount indicated: <table><thead><tr><th><u>Deceased Member</u></th><th><u>Surviving Spouse</u></th><th><u>Monthly Allowance</u></th></tr></thead><tbody><tr><td>▪ Artis S. Wiseman</td><td>Shirley R. Wiseman</td><td>\$4,005.33</td></tr></tbody></table>	<u>Deceased Member</u>	<u>Surviving Spouse</u>	<u>Monthly Allowance</u>	▪ Artis S. Wiseman	Shirley R. Wiseman	\$4,005.33
<u>Deceased Member</u>	<u>Surviving Spouse</u>	<u>Monthly Allowance</u>						
▪ Artis S. Wiseman	Shirley R. Wiseman	\$4,005.33						

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM  
REGULAR BOARD MEETING  
APRIL 28, 2021**

- F. NEW BUSINESS**
- G. OPEN FORUM**
- H. FUTURE SCHEDULING**
- I. ADJOURNMENT**

# PFRS Board Regular Meeting Minutes

March 31, 2021

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**A REGULAR BOARD MEETING** of the Oakland Police and Fire Retirement System ("PFRS") was held on Wednesday, March 31, 2021 via Zoom Tele-Conference.

Board Members:

- Walter L. Johnson President
- Jaime T. Godfrey Vice President
- Margaret O'Brien Member
- Robert W. Nichelini Member
- John C. Speakman Member
- Kevin R. Traylor Member
- R. Steven Wilkinson Member

Additional Attendees:

- David F. Jones PFRS Secretary & Plan Administrator
- Jennifer Logue PFRS Legal Counsel
- Teir Jenkins PFRS Staff Member
- Maxine Visaya PFRS Staff Member
- David Sancewich Meketa Investment Group
- Paola Nealon Meketa Investment Group

The meeting was called to order at 12:01 p.m. PST

- A. PFRS Board Meeting Minutes** – Member Nichelini made a motion to approve the February 24, 2021 Regular Board Minutes, second by Member Traylor. The motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

**B. AUDIT AND OPERATIONS COMMITTEE AGENDA – MARCH 31, 2021**

- B1. Administrative Expenses Report** – PFRS Staff Member Jenkins presented an informational report of the PFRS administrative expenditures as of January 31, 2021. PFRS has an approved budget of approximately \$3.5 million and have expensed \$1.2 million to date, leaving 65% of the budget remaining. Cash in Treasury has an approximate balance of \$6.3 million as of January 31, 2021, however a pension payment of \$4.4 million came due on February 1, 2021 and left a residual balance of \$1.8 million. Membership consisted of 744 members, which included 447 Police Members and 297 Fire Members.

**MOTION:** Member Speakman made a motion to accept the administrative expenses report as of January 31, 2021, second by Member Traylor. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

## PFRS Board Regular Meeting Minutes

March 31, 2021

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- B2. Election of a New 5-Year Retired Fire Representative Board Position** – Member Speakman provided an update regarding the expiration of his term and the election for a new 5-Year Retired Fire Representative Board position is underway as PFRS Staff has notified the International Association of Fire Fighters Union, Local 55 President and Retired Member Representative. Member Speakman intends to run again, is in the process of collecting signatures for the nominating form without issue and does not foresee any opposition at this time. Member Speakman noted that staff has been working with the City Clerk's Office and City Attorney's Office and are moving forward as advised.

**MOTION:** Member Speakman made a motion to accept the informational report, second by Member Nichelini. Motion Passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – ABSTAIN / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 6 / NOES: 0 / ABSTAIN: 1)

### **C. INVESTMENT & FINANCIAL MATTERS COMMITTEE AGENDA – MARCH 31, 2021**

- C1. Investment Manager Performance Review – DDJ Capital Investment, LLC a PFRS Fixed Income Asset Class Investment Manager** – Vice President Godfrey provided a summary of the presentation from Kenzie Wedge, Jack O'Connor, and Ben Santonelli of DDJ Capital Investment, LLC regarding the performance review. Topics of the presentation highlighted: overall performance, upcoming 25-year anniversary, a spirited discussion on Diversity and Inclusion, their work with the Posse Foundation, establishment of a Diversity Council this past June to assist moving forward with work on diversity, aside from a few new hires in the last two years there have been no material changes to the organization, and assets under management (AUM) have grown during the last year. Vice President Godfrey noted that performance improved since being placed on Watch Status, but only for a short period of time, and as a result we are going to continue Watch Status. David Sancewich of Meketa Investment Group agreed with Vice President Godfrey's comments with nothing further to add.

**MOTION:** Vice President Godfrey made a motion to accept the informational report from DDJ Capital Investment, LLC regarding the performance review, second by Member Speakman. Motion Passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C2. Investment Manager Performance Review – DDJ Capital Investment, LLC a PFRS Fixed Income Asset Class Investment Manager** – Plan Administrator Jones noted for the record the Agenda incorrectly identified the report from Parametric Portfolio Associates, LLC and is from DDJ Capital Investment, LLC. Vice President Godfrey noted they have improved performance; however, it has only been for a short period of time and recommended maintaining Watch Status.

**MOTION:** Vice President Godfrey made a motion to continue DDJ Capital Investment, LLC on Watch Status due to performance, second by Member Speakman. Motion Passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

**PFRS Board Regular Meeting Minutes**

**March 31, 2021**

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- C3. Investment Market Overview as of February 28, 2021** – David Sancewich of Meketa Investment Group provided an informational report regarding the Investment Market Overview as of February 28, 2021. D. Sancewich highlighted Market Returns, Sector Returns, and the U.S. Treasury Yield Curve.

**MOTION:** Vice President Godfrey made a motion to approve the report regarding the Investment Market Overview as of February 28, 2021 provided by Meketa Investment Group, second by Member Traylor. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C4. Preliminary Investment Fund Performance Update as of February 28, 2021** – David Sancewich of Meketa Investment Group provide a summary of the Preliminary Investment Fund Performance Update as of February 28, 2021. D. Sancewich drew attention to the Crisis Risk Offset portfolio not being within investment policy statement (IPS) range and noting it is driven by the return of assets from Parametric Portfolio Assets, LLC, noting Meketa is aware and monitoring the situation. We are in the process of reallocating to two new managers for this asset class and addressing this as we move forward with the two new searches. D. Sancewich also reviewed the total plan asset class performance summary.

**MOTION:** Vice President Godfrey made a motion to accept the informational report from Meketa regarding the Preliminary Investment Fund Performance Update as of February 28, 2021, second by Member Traylor. Motion Passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C5. \$13.9 Million Drawdown for Fiscal Year 2020/2021 (Quarter Ending June 2021) Member Allowances April 1, 2021 through June 30, 2021** – Vice President Godfrey presented the details of the Meketa report describing the \$13.9 million drawdown of funds, which includes a \$10.9 Million contribution from the City of Oakland and a \$3.0 Million contribution from the PFRS Investment Fund out of Northern Trust, to pay for the PFRS member retirement allowances to its members for the period of April 1, 2021 through June 30, 2021.

**MOTION:** Vice President Godfrey made a motion to accept Meketa's recommendation of \$13.9 million drawdown of funds, which includes a \$10.9 Million contribution from the City of Oakland and a \$3.0 Million contribution from the PFRS Investment Fund out of Northern Trust, to pay the PFRS member retirement allowances for the period of April 1, 2021 through June 30 2021, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

## PFRS Board Regular Meeting Minutes

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- C6. Select Investment Managers to Invite to Interview to Act as the New PFRS Alternative Risk Premia Asset Class Investment Manager** – David Sancewich of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Alternative Risk Premia Asset Class Strategy. Meketa recommended the following firms to interview as finalist candidates: Kepos Capital, Lombard Odier, and Two Sigma Investments based on the search criteria, further quantitative review, and qualitative consideration. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews. Vice President Godfrey requested Meketa rank the managers from all three searches and provide the information at subsequent Board Meetings.

**MOTION:** Vice President Godfrey made a motion to accept the informational report and move forward with Meketa's recommendation regarding Investment Manager interviews for the Alternative Risk Premia Investment Strategy, second by Member Wilkinson. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C7. Select Investment Managers to Invite to Interview to Act as the New PFRS Systematic Trend Following Asset Class Investment Manager** – David Sancewich of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Systematic Trend Following Asset Class Strategy. Based on the search criteria, further quantitative review, and qualitative consideration, Meketa recommended the following firms to interview as finalist candidates: BH-DG Systematic Trading, Crabel Capital Management, and Verson Investments. D. Sancewich noted the Investment Committee approved a motion to include LongTail Alpha in the finalist candidates. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews.

**MOTION:** Vice President Godfrey made a motion to accept Meketa's report and recommendation regarding the four Investment Manager interviews for the Systematic Trend Following Investment Strategy, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C8. Informational Report Regarding Defensive Equity Investment Strategy** – Paola Nealon of Meketa Investment Group presented an informational report regarding the Defensive Equity Investment Strategy providing a brief refresher as PFRS moves forward in selecting new managers for consideration in the coming months. P. Nealon defined Defensive Equity, reviewed the rationale for this move, basic concepts, and hallmarks of the strategy.

**MOTION:** Member Nichelini made a motion to accept the informational report regarding the Defensive Equity Investment Strategy, second by Vice President Godfrey. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

**PFRS Board Regular Meeting Minutes**

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- C9. Select Investment Managers to Invite to Interview to Act as the New PFRS Defensive Equity Asset Class Investment Manager** – Paola Nealon of Meketa Investment Group provided a summary regarding the process and criteria utilized in the search for an Investment Manager to implement the Defensive Equity Asset Class Investment Strategy. Based on the search criteria, further quantitative review, and qualitative consideration. Meketa recommended the following firms to interview as finalist candidates for consideration: Atlanta Capital Management, Eagle Capital, The London Company, and Wellington Management. Further detailed information on performance, risk and return, organizational structure, and diversity statistics of the approved firms will be presented at the next step of interviews.

**MOTION:** Member Nichelini made a motion to accept the informational report and move forward with Meketa's recommendation regarding the Defensive Equity Asset Class Investment Strategy, second by Vice President Godfrey. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

- C10. Investment Manager Performance Review Update – Reams Asset Management, a PFRS Core Plus Fixed Income Asset Class Investment** – David Sancewich of Meketa Investment Group provided brief comments on the informational memo provided by Reams Asset Management as follow-up regarding drift between Core and Core-Plus mandates and beta trades as requested by Chairperson Godfrey at the previous Investment Committee Meeting. Meketa and Staff will work to assess fees currently charged by Reams in comparison to the universe and provide an update at a subsequent Board Meeting as requested by the Investment Committee. Vice President Godfrey requested Meketa perform a fee evaluation for all Investment Managers in the portfolio and bring the findings back to the Board.

**MOTION:** Vice President Godfrey made a motion to accept the informational report from Meketa regarding Reams with additional follow-up as to fees charged by Reams, second by Member Speakman. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

# PFRS Board Regular Meeting Minutes

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## D. Member Resolutions No. 8012 – 8013

**D1.** **Resolution No. 8012** – Resolution Approving Death Benefit Payments and Directing Warrants Thereunder in the Total Sum of \$1,000.00 Payable to the Beneficiary of the following Deceased Members of the Police and Fire Retirement System:

- Edward Connolly
- Norman S. Faix
- Thomas R. Hardy
- Peder N. Jacobson
- James K. McArthur
- Paddy J. McGrew
- James A. Powers
- Lawrence E. Ross

**MOTION:** Member Speakman made a motion to approve Resolution No. 8012, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

**D2.** **Resolution No. 8013** – Resolution Fixing the Monthly Allowances of Surviving Spouses of the following Retired Members of the Police and Fire Retirement System in the amounts indicated:

<u>Deceased Members</u>	<u>Surviving Spouses</u>	<u>Monthly Allowance</u>
John H. Korte	Lois Korte	\$5,920.32
Vaune V. Dillman	Barbara M. Dillman	\$3,979.50
Robert A. Heritage	Shirley Heritage	\$4,618.95
James A. Kennemore	Carol Susan Kennemore	\$4,931.55
Jerry Kramer	Joan Kramer	\$4,622.07
Elmer E. Pruitt	Etta Pruitt	\$3,852.28

**MOTION:** Member Speakman made a motion to approve Resolution No. 8013, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

**E. New Business** – Vice President Godfrey inquired if the City has had discussions regarding re-opening and how future board Meetings might be structured and if we will be able to continue meeting via Zoom. Vice President Godfrey took notice of the efficiency of the current format and suggested meeting in-person biannually. Plan Administrator Jones reported there have been no discussions yet, but will provide an update on any movement. President Johnson agreed with Vice President Godfrey's comments and asked Members to take the matter into consideration as things move forward.

**PFRS Board Regular Meeting Minutes**

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- F. Open Forum** – President Johnson notified the Board today is Member O'Brien's last Board Meeting and expressed appreciation for her attitude to get things done and her work on the Ad Hoc Committee and bring closure to a lot of the discussion centered around our unfunded liability. President Johnson wished her well, emphasized she was a strong asset, and wished to invite Member O'Brien to the April 2021 Board Meeting to accept a Resolution of Member Appreciation. Member O'Brien thanked President Johnson for his kind words and assured the Board they will have another strong asset to sit on the Board. Plan Administrator Jones echoed President Johnson's sentiments and thanked Member O'Brien for her work on the Board. Plan Administrator Jones announced the incoming Board Member will be the new Director of Finance, Erin Roseman. There was also discussion around requirements and compliance with the mandatory ethics training every two years. Some members have completed the training multiple times, in various formats, and are very familiar with the policy. As there has been no change to the material presented brings into question the necessity and frequency of repeating the training. Plan Administrator Jones will convey the Board's thoughts to the Ethics Commission.
- G. Future Scheduling** – The next Regular Board Meeting is scheduled for Wednesday, April 28, 2021 with a tentative start time of 12:00 p.m. PST.
- H. Adjournment** – Vice President Godfrey made a motion to adjourn, second by Member O'Brien. Motion passed.

[JOHNSON – Y / GODFREY – Y / O'BRIEN – Y / NICHELINI – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]  
(AYES: 7 / NOES: 0 / ABSTAIN: 0)

The meeting adjourned at 12:58 p.m. PST

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DAVID F. JONES, SECRETARY

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DATE

**Table 1**

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**  
**Administrative Budget Spent to Date (Preliminary)**  
**As of February 28, 2021**

	<b>Approved Budget</b>		<b>February 2021</b>		<b>FYTD</b>		<b>Remaining</b>		<b>Percent Remaining</b>
<b>Internal Administrative Costs</b>									
PFRS Staff Salaries	\$ 1,200,000	\$ 81,232	\$ 717,920	\$ 482,080					40.2%
Board Travel Expenditures	52,500	-	-	52,500					100.0%
Staff Training	20,000	-	110	19,890					99.5%
Staff Training - Tuition Reimbursement	7,500	-	-	7,500					100.0%
Annual Report & Duplicating Services	4,000	-	-	4,000					100.0%
Board Hospitality	3,600	-	-	3,600					100.0%
Payroll Processing Fees	40,000	-	-	40,000					100.0%
Miscellaneous Expenditures	40,000	1,457	8,452	31,548					78.9%
Internal Service Fees (ISF)	88,000	-	56,073	31,927					36.3%
Contract Services Contingency	50,000	-	1,200	48,800					97.6%
<b>Internal Administrative Costs Subtotal :</b>	<b>\$ 1,505,600</b>	<b>\$ 82,689</b>	<b>\$ 783,755</b>	<b>\$ 721,845</b>					<b>47.9%</b>
<b>Actuary and Accounting Services</b>									
Audit	\$ 45,000	\$ -	\$ 45,000	\$ -					0.0%
Actuary	46,500	12,693	18,859	27,642					59.4%
<b>Actuary and Accounting Subtotal:</b>	<b>\$ 91,500</b>	<b>\$ 12,693</b>	<b>\$ 63,859</b>	<b>\$ 27,642</b>					<b>30.2%</b>
<b>Legal Services</b>									
City Attorney Salaries	\$ 188,000	\$ 12,842	\$ 118,985	\$ 69,015					36.7%
Legal Contingency	150,000	-	-	150,000					100.0%
<b>Legal Services Subtotal:</b>	<b>\$ 338,000</b>	<b>\$ 12,842</b>	<b>\$ 118,985</b>	<b>\$ 219,015</b>					<b>64.8%</b>
<b>Investment Services</b>									
Money Manager Fees	\$ 1,353,000	\$ 66,737	\$ 317,700	\$ 1,035,300					76.5%
Custodial Fee	124,000	-	58,250	65,750					53.0%
Investment Consultant	100,000	-	50,000	50,000					50.0%
<b>Investment Subtotal:</b>	<b>\$ 1,577,000</b>	<b>\$ 66,737</b>	<b>\$ 425,950</b>	<b>\$ 1,151,050</b>					<b>73.0%</b>
<b>Total Operating Budget</b>	<b>\$ 3,512,100</b>	<b>\$ 174,961</b>	<b>\$ 1,392,548</b>	<b>\$ 2,119,552</b>					<b>60.35%</b>

**Table 2**

**OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**

**Cash in Treasury (Fund 7100) - Preliminary**

**As of February 28, 2021**

**February 2021**

<b>Beginning Cash as of 1/31/2021</b>	\$	6,341,146
<b>Additions:</b>		
City Pension Contribution - February	\$	3,637,333
Investment Draw	\$	1,000,000
Misc. Receipts		-
<b>Total Additions:</b>	\$	4,637,333
<b>Deductions:</b>		
Pension Payment (January Pension Paid on 2/1/2021)		(4,427,099)
Expenditures Paid		(177,961)
<b>Total Deductions</b>	\$	(4,605,060)
<b>Ending Cash Balance as of 2/28/2021*</b>	\$	<u>6,373,419</u>

\* On 3/1/2021, February pension payment of appx \$4,391,000 will be made leaving a cash balance of \$1,982,000

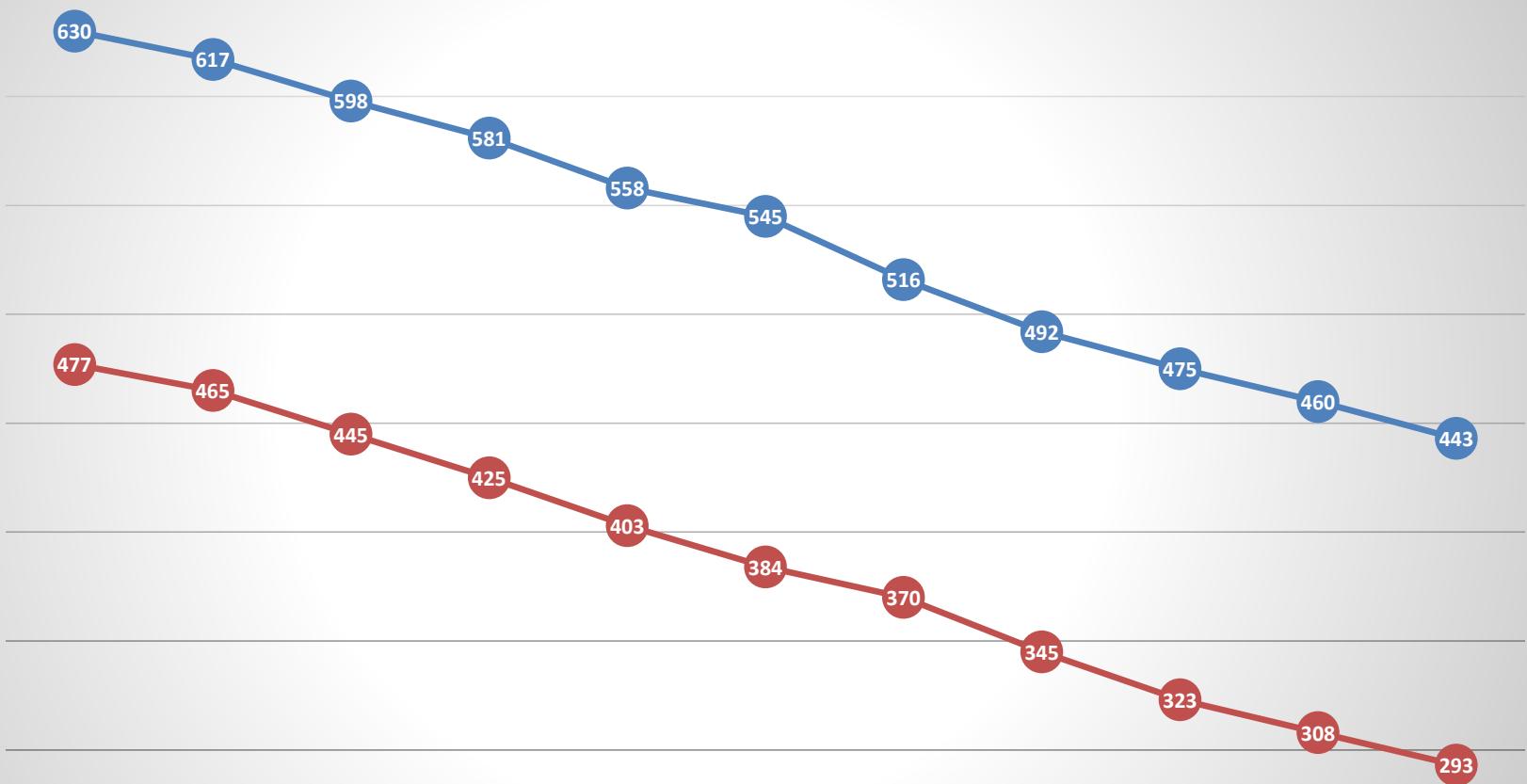
**Table 3**  
**CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM**

**Census**  
**As of February 28, 2021**

COMPOSITION	POLICE	FIRE	TOTAL
<b>Retired Member:</b>			
Retiree	321	187	508
Beneficiary	122	106	228
<b>Total Retired Members</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership:</b>	<b>443</b>	<b>293</b>	<b>736</b>

COMPOSITION	POLICE	FIRE	TOTAL
<b>Retired Member:</b>			
Service Retirement	296	148	444
Disability Retirement	135	132	267
Death Allowance	12	13	25
<b>Total Retired Members:</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership as of February 28, 2021:</b>	<b>443</b>	<b>293</b>	<b>736</b>
<b>Total Membership as of June 30, 2020:</b>	<b>460</b>	<b>308</b>	<b>768</b>
<b>Annual Difference:</b>	<b>-17</b>	<b>-15</b>	<b>-32</b>

**Oakland Police and Fire Retirement System**  
**Pension Plan Membership Count**  
**As of February 28, 2021 (FY 2011 - FY 2021)**



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 FYTD
Police	630	617	598	581	558	545	516	492	475	460	443
Fire	477	465	445	425	403	384	370	345	323	308	293
Total	1107	1082	1043	1006	961	929	886	837	798	768	736

## MEMORANDUM

**TO:** Oakland Police and Fire Retirement System (OPFRS)  
**FROM:** Meketa Investment Group  
**DATE:** April 28, 2021  
**RE:** Selection of New Alternative Risk Premia Asset Class Investment

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At the January 2021 meeting, OPFRS directed Meketa to identify high quality managers for consideration as a part of the Crisis Risk Offset class. Specifically to fill the Alternative Risk Premia and Systematic Trend Following components. The two new strategies would serve as a replacement to the original allocation which combined the exposures of the two components into one strategy. Subsequently at the March 2021 meeting, Meketa recommended and the Board approved a recommendation to interview three finalist firms for the Alternative Risk Premia mandate. This document serves to further implement the Board's decision and to provide an overview of the candidates and their strategies.

The three Alternative Risk Premia Finalists candidates are presented below in alphabetical order:

1. Kepos
2. Lombard Odier
3. TwoSigma

All three managers and their products (i) are alternative risk premia strategies, and (ii) possess the abilities to provide OPFRS with the appropriate services. Summaries of each firm are provided on the following page.

Alternative Risk Premia is a key component of the Crisis Risk Offset Class and serves as a diversifier to the rest of the portfolio and other components of the Crisis Risk Offset class. The strategy is expected to provide uncorrelated returns not driven by growth (equity) risk. The managers take long and short positions in liquid futures, forwards, and stock markets. These offsetting long and short positions are used to isolate exposures to a variety of alternative risk premiums which are present in equity, fixed income, currency, and commodity markets. The most common risk premiums include Value, Momentum, Carry, and Defensive. Given their market neutral design these strategies can provide positive (or negative) returns regardless of market direction. For example, if a manager is exposed to the value risk premium in a long / short construct, value stocks just need to decline less (or increase more) than the market, to produce a positive result. Allocations to multiple alternative risk premiums is expected to provide a more robust and smooth return profile than any one in isolation. However, they may suffer during periods of market deleveraging or coincidental premia drawdowns.



## High Level Finalist Overviews

**Kepos**, with approximately \$2.0 billion in total assets, is a systematic investment firm focused largely on alternative risk premia (and related) strategies. The firm also offers shorter-term strategies that are more focused on alpha generation as opposed to risk premia harvesting. Kepos currently manages approximately \$470 million in alternative risk premia strategies. The firm was founded in 2010, is 100% owned by five individuals, and is located in New York, NY. The firm's three founders (Mark Carhart, PhD; Giorgio De Santis, PhD; and Bob Litterman, PhD) are some of the most well renowned researchers, academics, and practitioners in the modern quantitative investing world. Mark Carhart, PhD, is most well-known for conducting the original research on the momentum risk premium in the late 1990s (i.e., Carhart Four-Factor Model). Moreover, the three founders produced one of the seminal papers in the alternative risk premia segment in 2014. Kepos' strategy is focused on harvesting value, carry, and momentum across broad asset classes (e.g., equity, fixed income, currencies, and commodities). The strategy is managed by a team portfolio managers / researchers / analysts (due to the nature of the firm's offerings, these roles are somewhat interchangeable).

**Lombard Odier**, with approximately \$69.4 billion in total assets, is a diversified asset manager with offerings across the global liquid markets (i.e., equities, fixed income, multi-asset, and liquid alternatives). The firm manages roughly \$1.4 billion in alternative risk premia strategies with a total of nearly \$16 billion in systematic strategies managed by the same team. Lombard Odier is based in Geneva, Switzerland and maintains a client service office in New York, NY. Lombard Odier Investment Managers is one of three groups that make up the broader Lombard Odier entity (Lombard Odier Holdings SA). The broader firm is a private bank based in Geneva, Switzerland and is one of the largest banks in Europe. In addition to the institutional assets under management stated above, the firm also manages a large amount (\$200b+) of private client and custody/banking-related assets. The firm is owned by seven partners (seventh generation of owners) and has existed for over 200 years. The firm was an early entrant into the alternative risk premia space with the launch of its first strategy in 2009. This strategy saw a material evolution in 2014 and received its first institutional client in 2015. The proposed strategy is managed by the firm's Systematic Team. In particular, the proposed strategy has two dedicated portfolio managers and dedicated analysts/product specialists. The creation of the strategy, however, has been a collaborative effort across the entire Systematic Team. The two lead portfolio managers have been working together at Lombard for over 10 years.

**TwoSigma**, with approximately \$57.2 billion in total assets, is a large and independent asset management firm with a focus on systematic investing. The firm considers itself a technology firm that applies its insights to finance rather than a traditional asset management firm. They employ over 1,000 people in research and development. The firm was founded by John Overdeck, David Seigel, and Matt Picard. The Risk premia strategy invests across equity and macro signals that include carry, momentum, value, seasonality, low volatility (equity), short interest (equity), safety (macro), and liquidity (macro), among many others. Risk Premia models were carved out from the firm's Absolute Return strategy, with the team selecting models that were "slower" (~1 year horizon) and focused of capturing premias or lasting effects, as opposed to the faster, more idiosyncratic and timing based nature of absolute return models.



## Finalist Summary Comparison

Firm Name	Kepos	Lombard Odier	TwoSigma
Firm Inception	2010	1963 <sup>1</sup>	2001
Firm AUM	~\$2 billion	~\$69 billion	~\$57 billion
Location	New York, NY	Geneva, Switzerland	New York, NY
Total Employees	40	~120	~350+
Strategy Name	Alternative Risk Premia	Alternative Risk Premia Core	SARP
Strategy Inception	10/2018	11/2018	8/2015
Strategy AUM	\$115m (\$470 similar strategies)	~\$1.5 billion	~\$5.1 billion
Trading Similar Strategies Since	2010	2009	2011
Target Volatility	10%	10%	10%
Management Fee	0.70%	0.80%	1.95%
Liquidity	Monthly	Daily	Monthly
Strengths	<ul style="list-style-type: none"><li>Longest track record of managing alternative risk premia strategies</li><li>Pioneers of ARP research and most specifically the Momentum risk premium</li><li>Differentiated risk management process and models</li><li>Product designed specifically to compliment other CRO components</li></ul>	<ul style="list-style-type: none"><li>Long standing firm with a breadth of resources</li><li>Differentiated risk allocation process</li><li>Continual research into new risk premia such as ESG/Carbon</li><li>Product designed specifically to compliment other CRO components</li></ul>	<ul style="list-style-type: none"><li>Most underlying signals / models</li><li>Firm focused on technology and data</li><li>High quality investment team and firm with pedigree and success in the systematic investment space</li><li>Longest live track record of proposed product</li></ul>
Weaknesses	<ul style="list-style-type: none"><li>Attempts to harvest a fewer number of risk premia, which could hurt strategy diversification</li><li>Higher fee, more alpha related products could garner more focus internally</li></ul>	<ul style="list-style-type: none"><li>An investment arm of a large Bank, which could bring headline risk non-related to the investment team and strategy</li><li>Includes other arguably less robust or esoteric risk premia</li></ul>	<ul style="list-style-type: none"><li>Highest proposed fees</li><li>Higher fee, more alpha related products could garner more focus internally</li></ul>

<sup>1</sup> In current form in 2010. Lombard Odier has been managing institutional mandates since 1963, and the origins of Lombard Odier bank date back to 1796.

### Finalist Strategy Components Comparison

Strategy Component Comparison		Kepos	Lombard Odier	TwoSigma
Markets Traded	Equities	✓	✓	✓
	Fixed Income	✓	✓	✓
	Currencies	✓	✓	✓
	Commodities	✓	✓	✓
Risk Premia Harvested	Value	✓	✓	✓
	Momentum	✓	✓	✓
	Carry	✓	✓	✓
	Defensive	X	✓	✓
	Trend	X	X	✓
	Volatility	X	X	✓

RL/DS/SK/jls/db



## APPENDIX

Alternative Risk Premia Managers Considered	
1	Kepos
2	Lombard Odier
3	TwoSigma
4	Vensor Investments
5	Aspect
6	AB
7	MAN Solutions
8	Windham
9	PIMCO
10	AQR
11	BlackRock
12	Neuberger Berman
13	Unigestion
14	CdR
15	Voya
16	Bainbridge
17	Boronia
18	Schroders
19	Systematica
20	Credit Suisse
21	ERAAM
22	Franklin Templeton
23	La Francaise
24	Acadian
25	CFM
26	Columbia Threadneedle
27	Deutsche
28	Fulcrum
29	GAM
30	GSAM
31	HSBC
32	Janus
33	JP Morgan
34	Mellon
35	Morgan Stanley
36	One River



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## Kepos Alternative Risk Premia

April 28, 2021

# Disclosures

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These confidential presentation materials (this "Presentation") are being presented at your specific request on a confidential basis. It is our understanding that you meet the criteria for a "qualified purchaser" under Section 2(a)(51) of the Investment Company Act of 1940, as amended, and are otherwise qualified. The information relates to a potential investment in a vehicle (the "Fund") managed by Kepos Capital LP ("Kepos"). The information in this Presentation is believed accurate and is given only as of the date set forth on the cover and Kepos undertakes no obligation to update such information.

This Presentation is provided for discussion purposes only, is only a summary of certain information, is not complete, does not contain certain material information about the Fund, including important conflicts disclosures and risk factors, and is subject to change without notice.

This Presentation does not constitute an offer to sell or a solicitation of an offer to purchase any security of the Fund. Any such offer or solicitation shall only be made pursuant to—and subject to the terms and conditions contained in—a confidential private placement memorandum of the Fund (and an accompanying subscription agreement), which qualifies in its entirety the information set forth herein, which should be read carefully prior to an investment in the Fund, and which contains additional information about the investment objectives, terms and conditions, tax information and risk disclosures of or relating to the Fund.

An investment in the Fund is not suitable for all investors. Investors must meet certain eligibility requirements and have the financial ability, sophistication, experience and willingness to bear the risks of an investment in the Fund for an extended period of time. An investment in the Fund would be speculative and entails a high degree of risk; no assurance can be given that the Fund's investment objective will be achieved or that investors will receive a return of their capital. Investment losses may occur. Nothing herein is intended to imply that a Fund's investment methodology may be considered "conservative," "safe," "risk free" or "risk averse." The Fund employs leverage and other investment techniques that may increase the volatility of the Fund's performance and increase the Fund's risk of loss. An investment in the Fund will be illiquid as there are significant restrictions on an investor's ability to withdraw, redeem, or transfer interests or shares in the Fund. The Fund involves a complex tax structure, which should be reviewed carefully.

Certain of the information contained in this Presentation represents or is based upon forward-looking statements, which can be identified by the use of forward-looking terminology such as "may", "will", "should", "expect", "anticipate", "target", "project", "estimate", "intend", "continue" or "believe" or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events or results or the actual performance of the Fund may differ materially from those reflected or contemplated in such forward-looking statements. The information contained herein represents management's current expectation of how the Fund will continue to be operated in the near term; however, management's plans and policies in this respect may change in the future. In particular, (i) policies and approaches to portfolio monitoring, risk management, and asset allocation may change in the future without notice and (ii) economic, market and other conditions could cause the Fund to deviate from stated investment objectives and guidelines.

This document is confidential, is intended only for the person to whom it has been provided and under no circumstance may a copy be shown, copied, transmitted, or otherwise given to any person other than the authorized recipient without the prior written consent of Kepos. Notwithstanding anything to the contrary herein, each recipient of this summary may disclose to any and all persons, without limitation of any kind, the tax treatment and tax structure of: (i) the Fund and (ii) any of its transactions, and all materials of any kind (including opinions or other tax analyses) relating to such tax treatment and tax structure. The distribution of the information contained herein in certain jurisdictions may be restricted, and, accordingly, it is the responsibility of any prospective investor to satisfy itself as to compliance with relevant laws and regulations.

PAST PERFORMANCE IS NOT AN INDICATOR OR GUARANTEE OF FUTURE RESULTS. THERE IS NO GUARANTEE THAT THE FUND WILL ACHIEVE COMPARABLE RESULTS TO THOSE SET FORTH IN THIS DOCUMENT OR THAT IT WILL ACHIEVE ITS INVESTMENT OBJECTIVES IN THE FUTURE.

## Organization & Team

- Founded in January 2010 by Mark Carhart, Giorgio De Santis and Bob Litterman
- 40 employees; long history working together; most with profit participation
- ~\$2 billion AUM in alpha and alternative risk premia strategies<sup>1</sup>

## Long History in Asset Allocation & Alternative Risk Premia Research

- Black-Litterman model, 1992<sup>2</sup>
- Carhart four-factor model, 1997<sup>3</sup>
- *Modern Investment Management: An Equilibrium Approach*, 2003<sup>4</sup>
- “Beyond Active Alpha.”<sup>5</sup> Pioneering article on concept of exotic betas, 2008
- “Exotic Beta Revisited.”<sup>6</sup> Won the Graham Dodd Excellence Award, 2014

## Features of a Partnership with Kepos Capital

- **Personalized commitment and focus**
  - We only build liquid alternative strategies and portfolios
- **Thought partnership and transparency**
  - Close collaboration and response to client-specific questions
  - Access to senior investment staff
- **Dedicated management and alignment**
  - US-based, wholly owned by founders and employees

<sup>1</sup> AUM is as of February 28, 2021. <sup>2</sup> Black, Fisher; Litterman, Robert. “Global Portfolio Optimization”. *Financial Analysts Journal*. Vol. 48, Issue 5. September/October 1992. <sup>3</sup> Carhart, Mark M. “On Persistence in Mutual Fund Performance”. *Journal of Finance*. Volume 52, Issue 1, pp. 57-82. March 1997. <sup>4</sup> Litterman, B. & Quantitative Resources Group. (2003). *Modern Investment Management: An Equilibrium Approach* (1<sup>st</sup> ed.). Hoboken, NJ: John Wiley & Sons, Inc. <sup>5</sup> CFA Institute. Vol. 25. No. 1. March 2008. <sup>6</sup> *Financial Analysts Journal*. Vol. 70, Issue 5. November 2014.

## Diversity Representation Survey for Oakland Police and Fire

DATA AS OF 12/31/2020

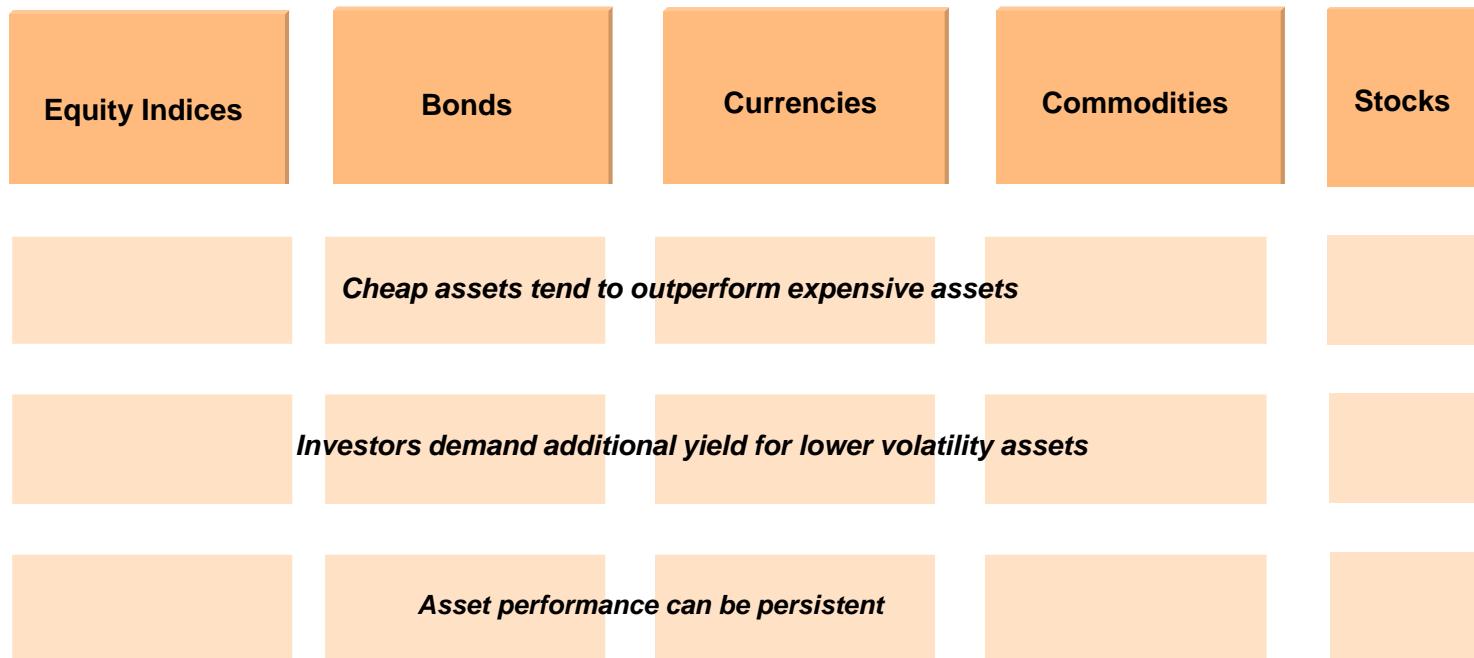
Firm Name	Kepos Capital
Product Name	Kepos Alternative Risk Premia Fund

	Percentage (%) of Board of Directors / Managing Members	Percentage(%) of Firm (Entire Staff)	Percentage (%) of Firm (Investment Professionals)
<b>Race and Ethnicity*</b>			
African American/Black	0%	3%	0%
Asian/Hawaiian/Pacific Islander	0%	25%	25%
Latino/Hispanic	0%	5%	5%
White	100%	68%	70%
American Indian/Alaska Native	0%	0%	0%
Other	0%	0%	0%
<b>Gender</b>			
Male	100%	85%	100%
Female	0%	15%	0%
Non-Identified/Other	0%	0%	0%
	100%	100%	100%
	100%	100%	100%

\* Racial/ethnic categories appear as defined by EEOC guidance.

**Kepos Alternative  
Risk Premia Strategy**  
\$115 Million AUM<sup>1</sup>

- Dynamically managed portfolio of both macro and equity premia
- Excludes macro insurance and directional momentum factors
- Targets 10% annualized volatility and 0.5 Sharpe ratio (net)
- Transparency, attractive liquidity and low cost



<sup>1</sup> AUM is as of February 28, 2021.

## The Goal

- Factors that perform well in the future (not ones that just perform well in backtests)

## Where Do Factors Live?

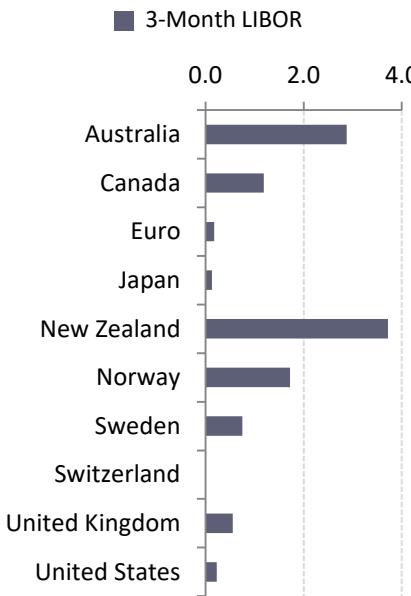
- Where there are risk transfer opportunities or persistent behavioral biases
- Theory does not identify the individual factors

## Framework for Factor Selection

1. Economically intuitive (necessary, but not sufficient)
2. Demonstrated historical premium in excess of global equity beta
3. Institutional liquidity and capacity
4. Empirically robust
  - Testable on other markets, asset classes, time periods
  - Holds up when specific time periods and markets are excluded (jackknifing)
  - Insensitive to factor definition

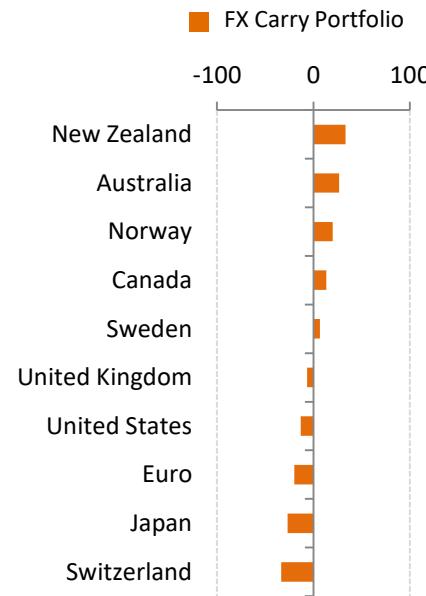
1

Select a characteristic



2

Choose asset weights

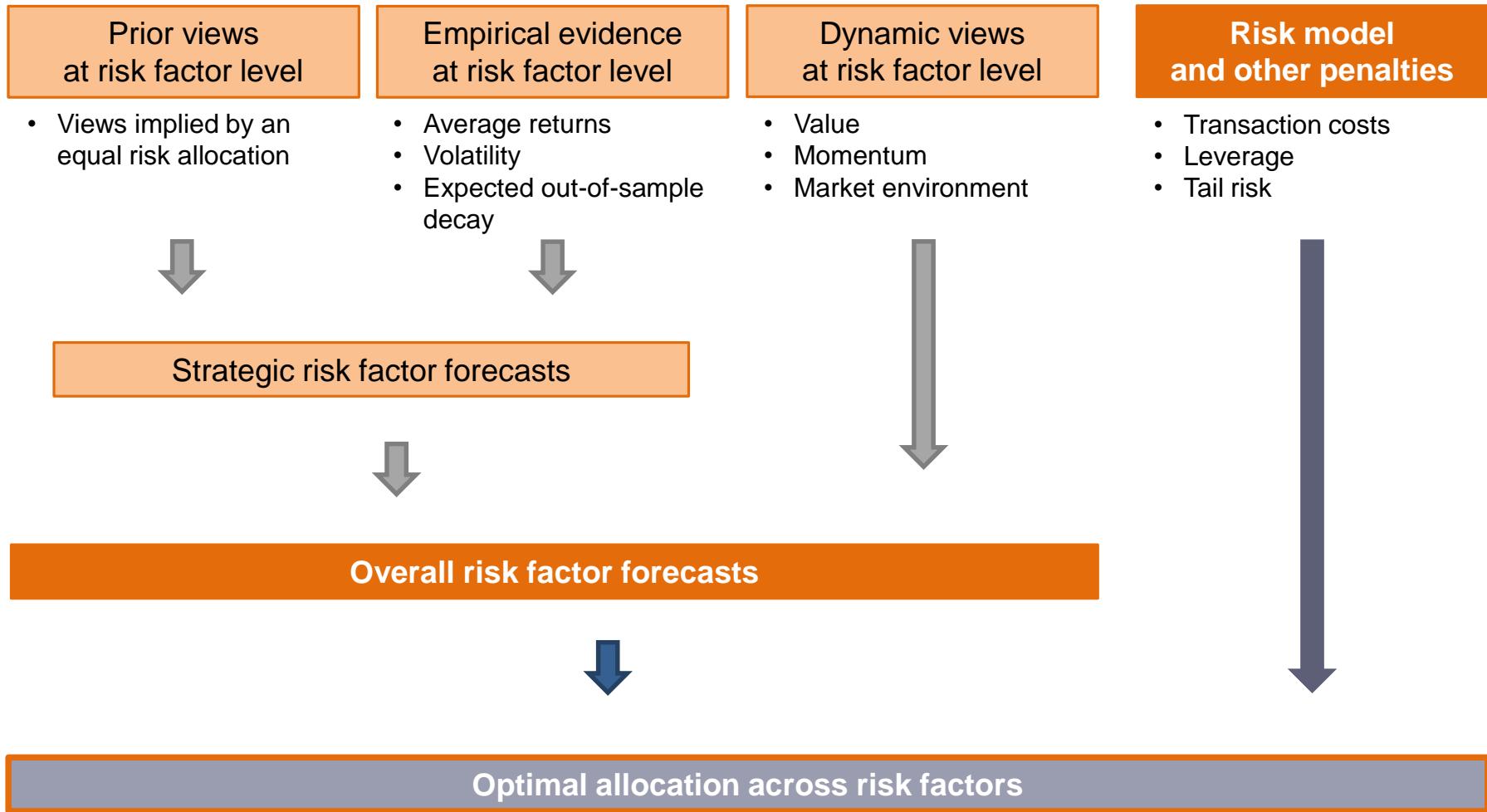


3

Hedge equity beta



For illustrative purposes only. MSCI ACWI is an index designed to measure the broad equity market performance of developed and emerging markets.



## KARP Annualized ITD Gross Performance Attribution<sup>1</sup>

	Single Name Equities	Equity Indices	Bonds	Currencies	Com- modities	<b>TOTAL</b>
Value	-1.71%	-2.00%	1.99%	-0.80%	1.48%	-1.04%
Momentum	-0.38%	1.63%	-0.61%	0.10%	-0.94%	-0.19%
Income	-2.13%	0.45%	1.73%	0.31%	0.04%	0.40%
Quality	0.67%					0.67%
<b>TOTAL</b>	<b>-3.55%</b>	<b>0.09%</b>	<b>3.11%</b>	<b>-0.39%</b>	<b>0.58%</b>	<b>-0.16%</b>

**KARP Net Returns<sup>2</sup>**

Annualized ITD: -1.4%  
2021 YTD: 4.1%

**Realized Correlations SI<sup>3</sup>**

MSCI ACWI: 0.34  
Barclays Agg: 0.01  
VIX: -0.50

**Founder Share Class:**

Class F

**Fees:**

0.70% management fee per year

**Liquidity:**

Monthly with 30 days' notice

<sup>1</sup> Performance shown for Kepos Alternative Risk Premia Fund LP and is through March 31, 2021. Performance attribution figures are estimated, unaudited and subject to subsequent adjustments. The figures stated herein do not include any fees or expenses, which will reduce returns. The performance figures set forth herein are unaudited and have been computed by Kepos Capital LP based on unaudited figures and data. <sup>2</sup> Net performance for KARP imputes the management fee associated with "new-issue" eligible class F shares/interests (i.e., a base 0.70% annual management fee). The above estimate assumes an investment in the applicable fund since inception. Performance includes reinvestment of interest and dividends, if any. <sup>3</sup> Correlations through March 31, 2021. Please see appendix for index definitions. PAST PERFORMANCE IS NOT AN INDICATOR OR GUARANTEE OF FUTURE RESULTS. THERE IS NO GUARANTEE THAT THE FUND WILL ACHIEVE COMPARABLE RESULTS TO THOSE SET FORTH IN THIS DOCUMENT OR THAT IT WILL ACHIEVE ITS INVESTMENT OBJECTIVES IN THE FUTURE.

- Our team has researched and invested in risk factors for 25 years
- Our strategy overweights macro factors that are less crowded and more lowly correlated
- Our firm ethos is built on transparency, alignment, fairness and partnership

## MARK CARHART | CHIEF INVESTMENT OFFICER

Mark Carhart is the Chief Investment Officer and a founding partner of Kepos Capital. Prior to founding Kepos in 2010, Mark was a Partner and the Co-Chief Investment Officer of the Quantitative Investment Strategies Group at Goldman Sachs Asset Management, and prior to GSAM he was an Assistant Professor at the Marshall School of Business at USC and a Senior Fellow at The Financial Institutions Center at The Wharton School. Mark's publications include articles in *The Journal of Finance*, *The Review of Financial Studies* and the *Financial Analysts Journal*, and he received the FAJ's Graham and Dodd Award in 2014. He is also a co-author of Modern Investment Management: An Equilibrium Approach. Mark earned a B.A. from Yale University in 1988, became a CFA Charterholder in 1991 and received his Ph.D. from the University of Chicago Booth School of Business in 1995. He serves on the boards of InTandem Cycling, The International Charter School of NY and Trustee of Convent of the Sacred Heart.

## GIORGIO DE SANTIS | DIRECTOR OF RESEARCH

Giorgio De Santis is the Director of Research and a founding partner of Kepos Capital. Prior to Kepos, Giorgio was a Partner and the co-head of the research team in the Quantitative Investment Strategies Group at Goldman Sachs Asset Management. Prior to Goldman Sachs, he was an Assistant Professor of Finance and Business Economics at the Marshall School of Business at USC. He has published articles in *The Journal of Finance*, the *Journal of Financial Economics*, the *Journal of International Money and Finance*, the *Financial Analysts Journal* and other academic and practitioner journals in finance and economics, and received the FAJ's Graham and Dodd Award in 2014. He has also contributed chapters to several books on investment management and is a co-author of Modern Investment Management: An Equilibrium Approach. Giorgio earned a B.A. from the Libera Universita' Internazionale degli Studi Sociali in Rome in 1984, a M.A. in Economics from the University of Chicago in 1989 and a Ph.D. in Economics from the University of Chicago in 1993.

## BOB LITTERMAN | CHAIRMAN, RISK COMMITTEE

Bob Litterman is the Chairman of the Risk Committee and a founding partner of Kepos Capital. Prior to joining Kepos Capital in 2010, Bob enjoyed a 23-year career at Goldman, Sachs & Co., where he served in research, risk management, investments and thought leadership roles. He oversaw the Quantitative Investment Strategies Group in the Asset Management division. While at Goldman, Bob also spent six years as one of three external advisors to Singapore's Government Investment Corporation (GIC). Bob was named a partner of Goldman Sachs in 1994 and became head of the firm-wide risk function; prior to that role, he was co-head of the Fixed Income Research and Model Development Group with Fischer Black. During his tenure at Goldman, Bob researched and published a number of groundbreaking papers in asset allocation and risk management. He is the co-developer of the Black-Litterman Global Asset Allocation Model, a key tool in investment management, and has co-authored books including The Practice of Risk Management and Modern Investment Management: An Equilibrium Approach (Wiley & Co.). Bob earned a Ph.D. in Economics from the University of Minnesota and a B.S. in Human Biology from Stanford University. He was inducted into *Risk* magazine's Risk Management Hall of Fame and named the 2013 Risk Manager of the Year by the Global Association of Risk Professionals. In 2012, he was the inaugural recipient of the S. Donald Sussman Fellowship at MIT's Sloan School of Management. In 2008, Bob received the Nicholas Molodovsky Award from the CFA Institute Board as well as the International Association of Financial Engineers/SunGard Financial Engineer of the Year Award. Bob serves on a number of boards, including Commonfund, where he was elected Chair in 2014, Options Clearing Corporation, Resources for the Future, Robert Wood Johnson Foundation, World Wildlife Fund and the Sloan Foundation. He is also currently serving as the chair of the CFTC Climate-Related Market Risk Subcommittee.

## MATT DESCHAMPS | CHIEF OPERATING OFFICER

Matt DesChamps is the Chief Operating Officer and a founding partner of Kepos Capital. Prior to Kepos, Matt was a founding Principal of Satellite Asset Management, L.P. and Chair of its Operating Committee. Formerly, Matt worked at Morgan Stanley, where he was an account relationship manager in the equity division, and at Coopers & Lybrand, LLC, where he was a Senior Associate. Matt earned a B.A. from Franklin & Marshall College and an M.B.A. in Finance from the Stern School of Business at New York University in 1999. He is a Certified Public Accountant and a member of The American Institute of Certified Public Accountants. He is a trustee of Franklin & Marshall College, Enveritas and other not-for-profit organizations.

## SIMON RAYKHER | GENERAL COUNSEL AND CHIEF COMPLIANCE OFFICER

Simon Raykher is the General Counsel and Chief Compliance Officer of Kepos Capital. Prior to Kepos, Simon served as General Counsel and Chief Compliance Officer at Lombard Odier Asset Management (USA) Corp, the US asset management subsidiary of one of the oldest and largest private banks in Switzerland. For the previous seven years, he was General Counsel, Chief Compliance Officer and Principal of Satellite Asset Management, L.P. Prior to Satellite, Simon was an attorney with the law firm of Schulte Roth & Zabel LLP. Earlier in his career, he was a prosecutor with the Investigation Division of the New York County District Attorney's office, where he conducted tax fraud and money laundering investigations. Simon started his career as an auditor with Coopers & Lybrand, LLC. Simon earned a B.B.A. and an M.B.A. in Accounting from Pace University in 1990 and a J.D. from Fordham University School of Law in 1995. Simon is an Adjunct Professor of Law at Fordham University School of Law.

## ANDREW MILLER | HEAD OF BUSINESS DEVELOPMENT

Prior to joining Kepos, Andrew was Senior Institutional Investor Relations Manager for Värde Partners. He has spent his entire career in client-facing roles, beginning in 1997 with Invesco Asset Management in Paris. After seven years with Invesco in Europe, he returned to the US where he worked with the firm's Global Structured Products Group and Global Fixed Income team before joining WL Ross & Co in 2006. In 2008, Andrew joined Satellite Asset Management and subsequently was responsible for Business Development for Trafalgar Asset Managers. Andrew is a CFA Charterholder and earned a B.A. from Lawrence University in 1996.

## DAISY CHANG | DIRECTOR OF INVESTOR RELATIONS

Prior to joining Kepos, Daisy worked at Williams-Sonoma, Inc. in the Business Development Group, where she developed and executed internal strategy initiatives as well as managed the cross-brand affiliate marketing program. Previously, Daisy spent four years on the product management team in the Quantitative Investment Strategies Group at Goldman, Sachs & Co., focusing on investor relations. Daisy graduated from the University of Pennsylvania with a B.S. in Economics in 2004.

## OLIVIA VITALI | BUSINESS DEVELOPMENT & INVESTOR RELATIONS

Prior to joining Kepos, Olivia led Investor Relations and Business Development efforts for the quantitative hedge fund business within SECOR Asset Management. She was previously an analyst in the J.P. Morgan Global Wealth Management program, where she spent time on both a client-facing team and an investment due diligence team. Olivia earned a B.B.A. in Finance and International Business from Villanova University in 2014 and is currently pursuing an M.B.A. at New York University Stern School of Business.

# Disclosures and Additional Notes

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In connection with any consideration of an investment in the Fund, prospective investors should be aware of a number of additional general and specific risks (many of which are described in the Fund's private placement memorandum and Kepos Capital's Form ADV), including the following:

**Conflicts of Interest.** The investment manager will be subject to a number of conflicts of interest from time to time, some of which are described in the Fund's private placement memorandum.

**Financing Arrangements.** The use of leverage is integral to many of the Fund's strategies, and the Fund depends on the availability of credit in order to finance its portfolio. The purchase of options, futures, forward contracts, repurchase agreements, reverse repurchase agreements and equity swaps generally involves little or no margin deposit and, therefore, provides substantial leverage. Accordingly, relatively small price movements in these financial instruments may result in immediate and substantial losses to the Fund.

**Model and Data Risk.** Given the complexity of the investments and strategies we manage, we must rely heavily on quantitative models (both proprietary models developed by our personnel, and those supplied by third parties) and information and data supplied by third parties. When these models and data prove to be incorrect, misleading or incomplete, any decisions made in reliance on them expose investors to potential risks. Also, the research and modeling process we engage in is extremely complex and involves financial, economic, econometric and statistical theories, research and modeling; the results of that process must then be translated into computer code. Although we seek to hire individuals skilled in each of these functions and endeavor to provide appropriate levels of oversight, this complexity raises the chances that the finished model may contain one or more errors that could adversely affect performance.

**Obsolescence Risk.** We are unlikely to be successful in managing client accounts unless the assumptions underlying our models are realistic and either remain realistic and relevant in the future or are adjusted to account for changes in the overall market environment. If such assumptions are inaccurate or become inaccurate and are not promptly adjusted, it is likely that profitable trading signals will not be generated.

**Crowding/Convergence.** There is significant competition among quantitatively-focused managers, and our ability to deliver returns for investors that have a low correlation with global aggregate equity markets and other hedge funds is dependent on our ability to employ models that are simultaneously profitable and differentiated from those employed by other managers. To the extent that we are not able to develop sufficiently differentiated models, investors' investment objectives may not be met, irrespective of whether the models are profitable in an absolute sense.

## ***Market Indices Used in Presentation:***

**MSCI ACWI** is an index designed to measure the broad equity market performance of developed and emerging markets.

**Barclays Global Aggregate** provides a broad-based measure of the global investment grade fixed-rate debt markets.

**VIX** is a measure of market expectations of near-term volatility as conveyed by S&P 500 stock index options.

## ***Hedge Fund Indices Used in Presentation:***

**HFRI Global Fund Weighted Composite Index** is an equal-weighted index of over 2,000 single-manager funds with at least \$50 million under management or a 12-month track record.

**HFRI Equity Hedge (Total) Index** is comprised of managers who maintain positions both long and short in primarily equity and equity derivate securities.

**HFRI Relative Value Index** is an index designed to measure managers who maintain positions in which the investment thesis is predicated on realization of a valuation discrepancy in the relationship between multiple securities across asset classes.

**HFRI Event Driven** is a broad measure of managers who maintain positions in companies involved in corporate transactions of a wide variety including but not limited to mergers, restructurings, tender offers, shareholder buybacks, debt exchanges, security issuance or other capital structure adjustments.

**HFRI Macro Index** is a measure of managers whose investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.

References to indices, benchmarks or other measures of relative market performance over a specified period of time are provided for your information only and do not imply that the actual Fund portfolio will achieve similar results. The index composition does not reflect the manner in which a portfolio is constructed; unlike these indices and benchmarks, the Fund's portfolio may contain options (including covered and uncovered puts and calls) and other derivative securities, futures and other commodity interests and currencies, and may include short sales of securities, margin trading, securities of smaller capitalization companies and types of securities that are different than those reflected in these indices and benchmarks, and is not as diversified as these indices and benchmarks. While an adviser seeks to design a portfolio which reflects appropriate risk and return features, portfolio characteristics may deviate from those of the benchmark. Indices are unmanaged and investors cannot invest directly in most indices. The figures for the indices may reflect the reinvestment of dividends but do not reflect the deduction of any fees or expenses which would reduce returns.



**LOMBARD ODIER**  
INVESTMENT MANAGERS

## LOIM ALTERNATIVE RISK PREMIA

Seeking uncorrelated returns with daily liquidity

APRIL 28 2021

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

# Lombard Odier – independent and privately owned

- Lombard Odier was found in 1796. Over the years, it has gone through more than 40 financial crises and wars. This year we celebrate 225 years in business
- The Firm has always been wholly owned by its partners who are responsible for the day-to-day management of the Firm
- We believe this management structure brings tangible benefits for our clients
  - Independent ownership brings an entrepreneurial approach to our business strategy and the ability to take a longer-term outlook
  - Our focus is 100% on our clients rather than shareholders
  - We are able to respond with agility to market events
- We have 14 offices around the world. Our New York office was opened more than 10 years ago and counts 50 employees

## LOMBARD ODIER GROUP

**USD 360 billion<sup>1</sup>**

3 main activities private clients wealth management, institutional clients asset management and banking technology

## LOMBARD ODIER IM: ASSET MANAGEMENT

**USD 71 billion<sup>2</sup>**

Asset management services for institutional clients, third-party distributors and financial intermediaries

## WE ARE ONE OF THE BEST-CAPITALISED BANKS IN THE WORLD

### FITCH RATINGS<sup>1</sup>

**AA-**

Our firm is rated AA- by Fitch – this is the best possible rating for a firm of our size

### TIER 1 RATIO<sup>1</sup>

**29.7%**

Fully-loaded Basel III CET1 ratio

AUM, Fitch Ratings and CET1 fully loaded Basel III capital ratio figures are correct as at 31 December 2020. Lombard Odier Group annual results do not include an additional USD 5.6 billion of assets for Lombard Odier IM (as at 30 June 2020), which result from FINMA reporting requirements.

Awards and ratings may vary without notice.

<sup>1</sup> Assets under administration as at 30 June 2020.

2 · Lombard Odier Investment Managers. Please see important information at the end of the document.

# Lombard Odier at the forefront of sustainable investing



**PRI** Principles for Responsible Investment

**A+**

Strategy & Governance since 2017  
Signatory since 2007

**Certified**  
  
**B Corporation**

**1st**

B Corp certified global wealth and asset manager and 2019 Best for the World Honoree<sup>1</sup>



Part of the  
**Sustainable Markets Initiative**

**Founding Member**

HRH Prince of Wales  
Circular Bioeconomy Alliance  
Natural Capital Investment Alliance



**Partnerships**  
**SYSTEMIQ**

**1st**

Endowed professorship of sustainable finance at any major research university



**febelfin**  
European Commission  
EU Taxonomy aligned

**1st**

Convertible bond fund to gain Febelphin rating and fund aligned with the EU Taxonomy: (Climate Transition)

**Memberships and signatories to sustainability initiatives including:**



**Finance for Biodiversity Pledge**



**UN GLOBAL COMPACT**



**Climate Action 100+**  
Global Investors Driving Business Transition



**TCFD** | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES



**ENERGY TRANSITIONS COMMISSION**



**IIGCC**  
The Institutional Investors Group on Climate Change



**SUSTAINABLE FINANCE GENEVA**  
where finance meets impact



**UNEP FINANCE INITIATIVE**

**PRINCIPLES FOR RESPONSIBLE BANKING**

Source: LOIM. For illustrative purposes only. Awards and ratings may vary without notice. <sup>1</sup>The B Corp certification is one of the world's most advanced ratings for corporate sustainability, issued by B-Lab, a nonprofit organisation based in New York.

3 · Lombard Odier Investment Managers. Please see important information at the end of the document.

# LOIM Inclusion & Diversity (I&D) Steering Committee

## SUSTAINABILITY

We are committed to sustainable investing where we consider and deliver social and environmental benefits, not just financial profit.

### LOIM I&D Steering Committee

**Jean-Pascal Porcherot**  
(Global LOIM Co-Head)  
Sponsor

**Natalia Bucci**  
(Global Co-Head of Convertibles)  
Co-Chairs

**Steve Grobman**  
(Global CRO)  
Co-Chairs

**Rebeca Coriat**  
Voice of CLIC™

#### Recruitment

**Co-Leads**  
Alkesh Gianchandani  
Sheena Shah

#### Advancement

**Co-Leads**  
Helene Harasty  
Samir Jain

#### Culture

**Co-Leads**  
Vicky Parrish  
Pascal Menges

#### Operational

**HR Led**

**Common goal: Representation – retention – equal pay**

# LOIM Inclusion & Diversity mission: Our four pillars

We aim to deliver an employee experience that attracts, develops, and retains diverse talent, to achieve superior results for our investors, business, communities, and commit to our CLIC™ engagement

## Four pillars to drive positive change:



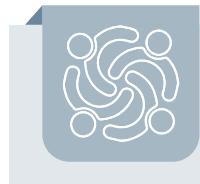
### Recruitment

Making strategic and tactical changes to our recruitment initiatives to significantly increase the diversity of our pipeline when we recruit externally at all levels, from interns to senior hires.



### Advancement

Nurture our internal talent pool and provide equal opportunities to grow and develop at LOIM. This will result in better retention and more diverse representation in Senior and PM roles over time.



### Culture

Walk the talk on holistic CLIC™ engagement, from investment to organizational ethos, by fostering an inclusive, respectful and diverse workplace, where differences are valued and harnessed.



### Operational change

Review and remove potential bias from our HR processes and policies, agree targets for diversity improvement, collect data and monitor our progress: “*what is not measured doesn’t exist*”.

### GOAL & MEASUREMENT:

#### Improve diverse talent

1. Representation
2. Retention
3. Equal pay

# Diversity representation survey for Oakland Police and Fire

Firm name: Lombard Odier Investment Managers

Product name: Alternative Risk Premia Core V10

	Percentage (%) of Board of Directors / managing members	Percentage(%) of firm (entire staff)	Percentage (%) of firm (investment professionals)
<b>Race and ethnicity<sup>1</sup></b>			
African American/Black	0%	11%	0%
Asian/Hawaiian/Pacific Islander	0%	23%	33%
Latino/Hispanic	0%	2%	0%
White	0%	55%	50%
American Indian/Alaska Native	0%	0%	0%
Other	0%	9%	17%
<b>Gender</b>			
Male	86%	68%	82%
Female	14%	32%	18%
Non-identified/other	0%	0%	0%

Source: Data as of 31 March 2021. <sup>1</sup> Racial/ethnic categories appear as defined by EEOC guidance.

6 · Lombard Odier Investment Managers. Please see important information at the end of the document.

## Why work with us

Organization (firm and team) with long term dedication to the space and strategy

- **CLIENT BASE**

- Of our institutional client base, 62% represent pensions from all over the world - the balance are Insurance companies, Treasuries, and Sovereign Wealth Funds
- Specific to ARP, we are working with several US public plans on the solution outlined today, built based on their requirements
- Partnerships are created with our clients via product development, knowledge transfer, external education, and fee alignment

- **TEAM**

- Systematic Asset Management team of 27 investment professionals managing >\$15 BN of AUM
- Dedicated ARP Portfolio Managers have been working together at Lombard Odier for over 13 years
- Client servicing in all time zones across the globe

- **SIZE**

- Firm size is large enough to provide excellent institutional infrastructure and services
- Solutions team is nimble so able to adapt to customers' needs and focused that you will be a most important client

- **SOLUTION**

- Our business has been built one client at a time, structuring solutions based on the objectives and needs of our clients
- Competitive flat fee structure and low expense ratio
- Take on fiduciary responsibility to go after best execution, and can also customize solutions with great flexibility
- Has been vetted, challenged, and accepted by Meketa and their clients

# Alternative Risk Premia – A unique solution in the current environment

Alternative Risk Premia seeks to offer uncorrelated returns with daily liquidity

## ▪ CURRENT INVESTORS DILEMMA

- Traditional risk premia are compressed and expected returns are low
- Fixed Income historical diversification benefits are challenged
- New regulations and intervention by central banks have led to fractured liquidity
- Fee scrutiny has increased

## ▪ THE OBJECTIVE

- Deliver returns uncorrelated to traditional asset classes
- Serve as a diversifier to a global portfolio as well as to other components of the Crisis Risk Offset portfolio
- Offer exposure to multiple Alternative Risk Premia by investing Long/Short across all asset classes via liquid instruments
- Market neutral strategy construction to deliver positive (or negative) returns regardless of market direction

## ▪ THE ALTERNATIVE RISK PREMIA FEATURES

- Premia have a clear investment rationale. They have been proven, tested and are expected to deliver positive returns over the medium to long term.
- Straight forward implementation of the most common as well as innovative risk premia
- Exposure to index level (macro) and single security level (micro) risk premia
- Competitive flat fee structure and low expense ratio
- Daily liquidity

# LOIM Systematic Team and Research capabilities

## RESEARCH AND PORTFOLIO MANAGEMENT

Alternatives	Equities	Multi-Asset	Fixed Income
Laurent Joué	Alexey Medvedev, PhD	Aurèle Storno, CFA	Yannik Zufferey, PhD
Marc Pellaud, PhD	Nicolas Mieszkalski	Alain Forclaz, PhD	Jérôme Collet, PhD
Cesar Moura, PhD	Cheick Dembele	Serge Tabachnik, PhD	Anando Maitra, CFA
Clément Leturgie, CFA	Romeo Brofiga	Sui Kai Wong	Nic Hoogewijs, CFA
Clément Mary-Dauphin	Pascal Menges	François Chareyron Benjamin Meyer Jacqueline Pfenninger	Markus Thöny Maxim Lindqvist Vincent Megard Leslie Leigh
			Jamie Salrt Andre Kayisire

## QUANT PLATFORM

Developing and implementing/executing trading algorithms
Pierre Olivier Trabichet (Chief Technology Officer)

## NEW RISK FACTORS AND POTENTIAL RETURN DRIVERS

ESG factors	Next generation factors (e.g., utilising Artificial Intelligence, Big Data)
Robert De Guigné  Nicolas Barben	Foort Hamelink, PhD  Qaisar Hasan  + Cross systematic team members
Elise Beaufils	Pierre Olivier Trabichet  Sameet Desai

## EXTERNAL EXPERTISE

Academic Board
Foort Hamelink, Vrije Universiteit Amsterdam
Pierre Collin-Dufresne, Ecole Polytechnique de Lausanne
Darrell Duffie, Stanford University

# Alternative Risk Premia Portfolio Management Team

Stable team, managing liquid alternative systematic strategies since 2009

TEAM KEY CHARACTERISTICS		LAURENT JOUÉ Senior Portfolio Manager		MARC PELLAUD, PHD Senior Portfolio Manager		CESAR MOURA, PHD Senior Research Analyst
<ul style="list-style-type: none"> <li>■ Integrated Systematic team with a collaborative approach</li> <li>■ 27 professionals managing &gt;USD15bn</li> <li>■ Dedicated ARP Portfolio Managers have been working together at Lombard Odier for over 13 years</li> <li>■ Developed first generation of liquid Hedge Fund replication in 2009</li> <li>■ Developed the LOIM Alternative Risk Premia offering and manage a strategy live since 2014</li> <li>■ ARP team managing over USD1.5bn</li> </ul>		<p>Laurent Joué is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing Alternative Risk Premia and Commodity strategies. He joined LOIM in July 2008. Laurent started his professional career in 2005 at Géa in Paris, the ADI-LODH joint-venture specialized in Hedge Fund multi-management where he worked as an Assistant Portfolio Manager. Before joining the Systematic team in November 2009, he was in the Fund of Hedge Funds Team as a Portfolio Manager.</p>		<p>Marc Pellaud is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, Alternative Risk Premia and Commodity strategies. He is also involved in various research projects for the Systematic Team. He initially joined LOIM in June 2007, managing equity portfolios. Marc earned a PhD in life sciences from the Swiss Federal Institute of Technology in Lausanne (EPFL) in 2007</p>		<p>Cesar Moura is a senior analyst in the Systematic Alternatives team within LOIM. He joined the firm in 2018. Prior to joining, he was Head of Research at Dynamic Capital Management. He spent 10 years at Dynamic leading the quantitative research efforts which were applied to systematic trading. At Dynamic, he developed significant quantitative skills around machine learning, statistics, modelling, and programming. Cesar earned a PhD in theoretical physics from Pierre et Marie Curie University in 2009. He also holds a degree in engineering from the Ecole Polytechnique and a master's degree in physics from the Ecole Normale Supérieure in Paris.</p>



# THE ALTERNATIVE RISK PREMIA PROPOSITION

## BUILDING AN ARP SOLUTION

**LOMBARD ODIER**  
INVESTMENT MANAGERS

# LOIM Alternative Risk Premia investment philosophy and process

LOIM aims at building all weather ARP solutions

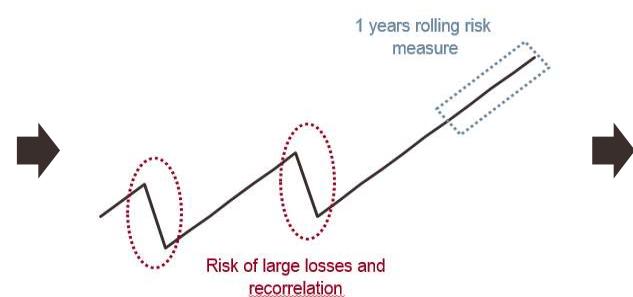
## 1. RESEARCH AND SELECTION

- Alternative Risk Premia are developed in house
- Team avoids overfitting to ensure better understanding of premia
- For risk consideration, the focus is on the most liquid premia
- We aim at including Environmental, Social and Governance (ESG) concerns when possible

EQUITIES		FX	BONDS	COMMODITIES	CREDIT
Beta	Value	Value	Value	Value	
Quality	Size	Carry	Carry	Carry	Carry*
Momentum	Trend	Trend	Trend	Momentum	Trend
Intraday Trend	Volatility				

## 2. COMBINATION

- We recognize 2 main categories of Alternative Risk Premia:
  - Income oriented premia
  - Risk mitigation premia
- We use a proprietary risk measure which accounts for:
  - Short-term as well as long-term metrics
  - Downside potential, diversification benefits and liquidity



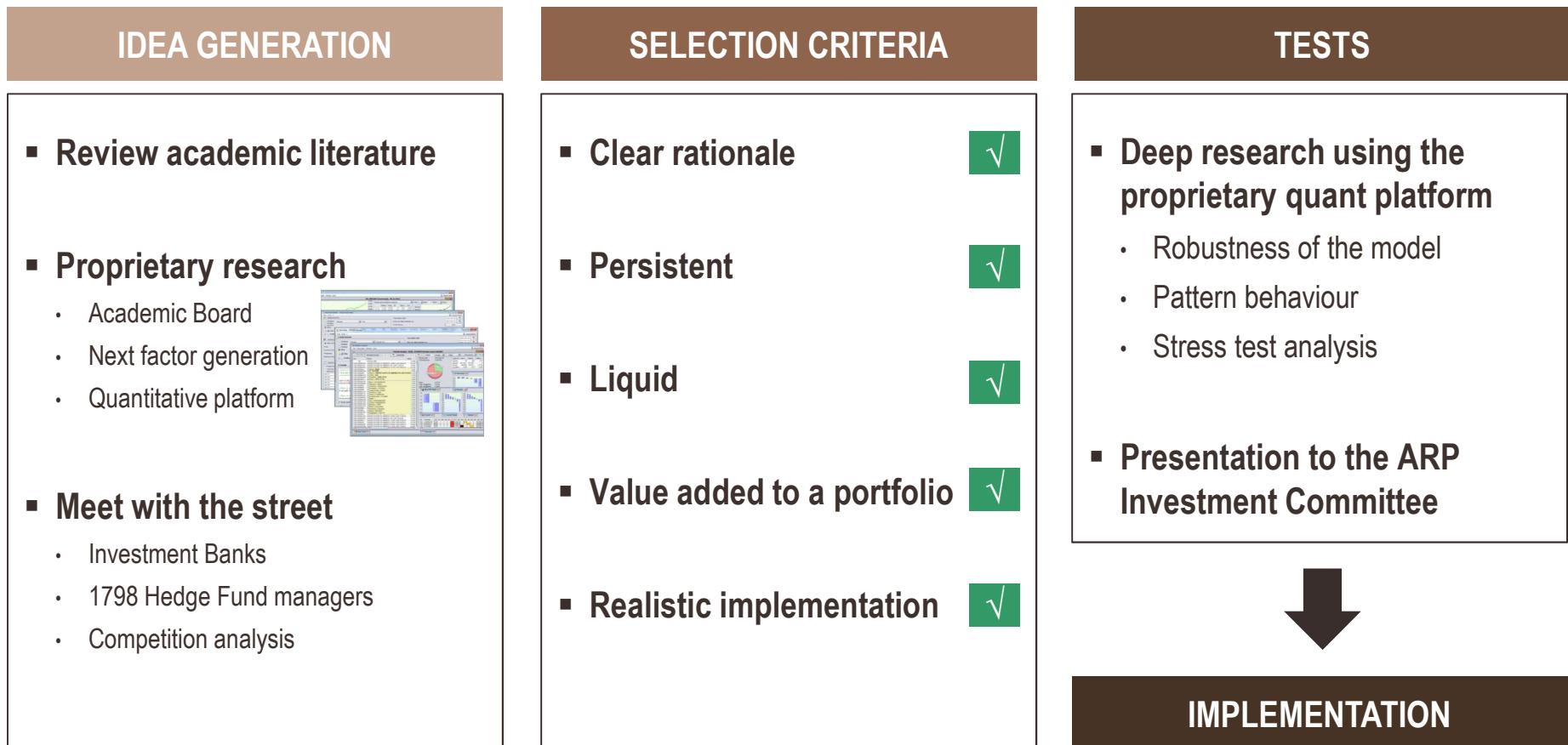
## 3. PORTFOLIO & RISK MANAGEMENT

- Real time monitoring of portfolio
- Complex set of systematic actions including:
  - Portfolio rebalancing
  - Premia rebalancing
  - Risk adjustment
- Multiple risk limits integrated in the model
- Independent Risk Management team replicates the portfolio for control



# Research and selection process

From inception to inclusion



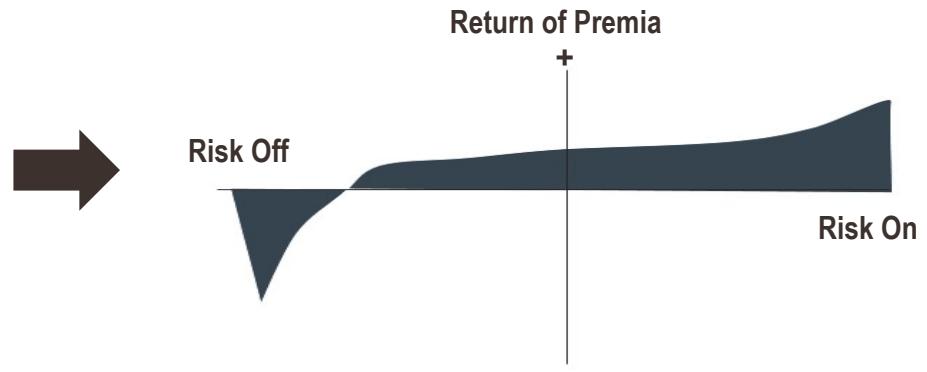
## Multiple premia can be grouped into two categories

These two categories have complementary payoff profiles

### INCOME RISK PREMIA – LEFT TAIL

- Insurance seller profile
- Seeks to deliver stable returns with low volatility
- Typically market neutral strategies
- Can be exposed to large losses notably during risk off periods

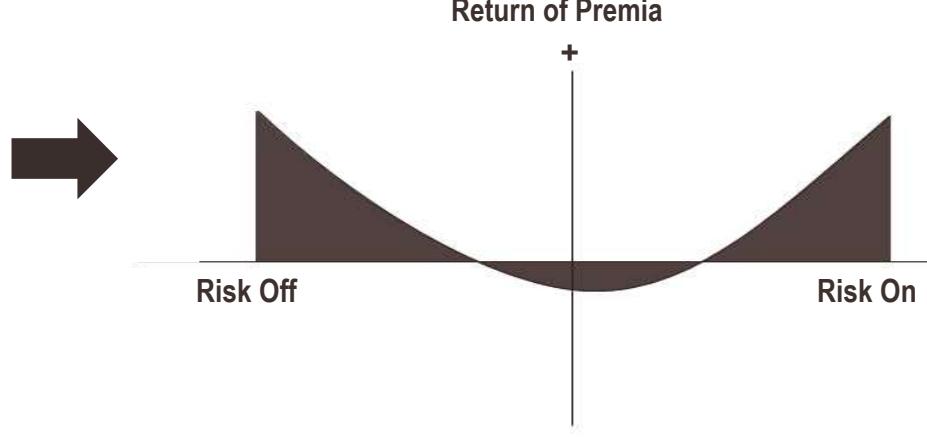
### INCOME RISK PREMIA PROFILE



### RISK MITIGATION PREMIA – RIGHT TAIL

- Insurance buyer profile
- Seeks to deliver higher positive returns in extreme scenarios
- Typically directional strategies
- Can be exposed to smaller losses in trendless markets, but tend to benefit in prolonged trends and/or sharp reversals

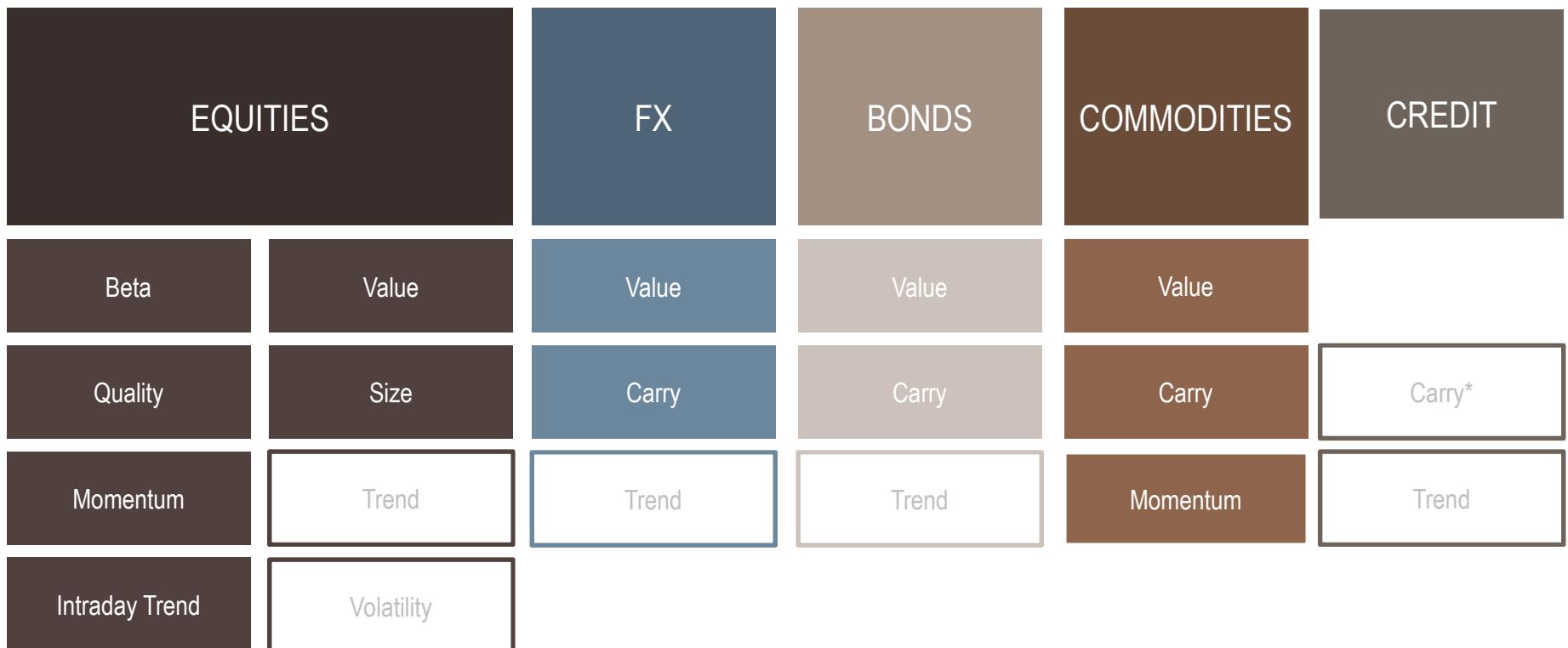
### RISK MITIGATION PREMIA PROFILE



Source LOIM. For illustrative purposes only. Past performance is not a guarantee of future results..

## LOIM Alternative Risk Premia offering

A diversified set of ARP offers attractive portfolio construction tools



Trend premia typically refers to absolute directional long/short positions. Momentum premia typically refers to relative long/short positions on single securities

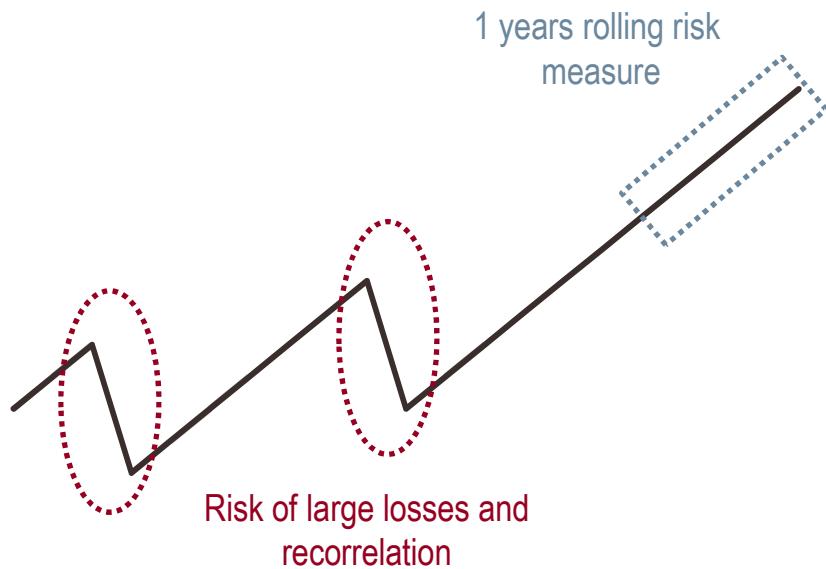
Shaded premia are included in the solution discussed

\*Carry Credit premia has been deactivated due to premia decay

## Portfolio construction – Proprietary risk measure developed for ARP

Our combination process favours stable, uncorrelated and liquid risk premia

### TYPICAL INCOME RISK PREMIA RETURN PROFILE



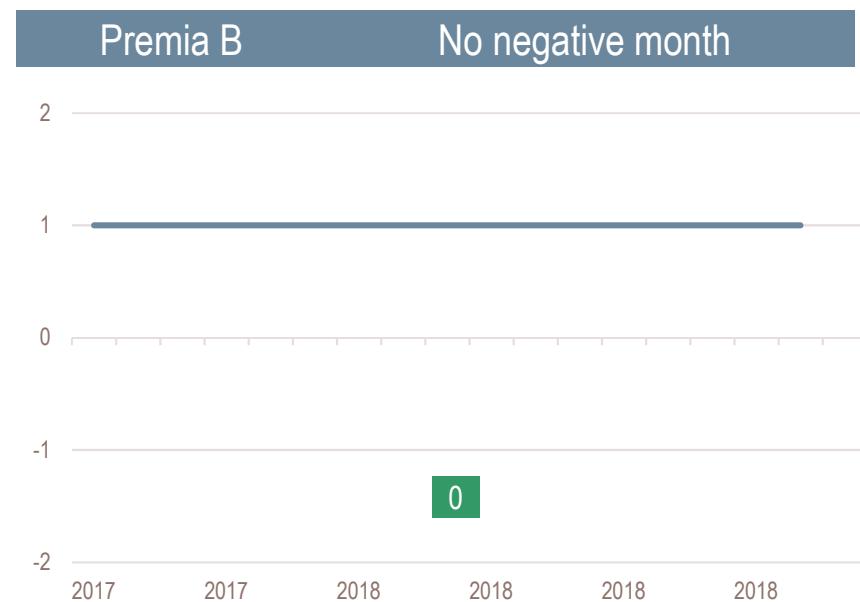
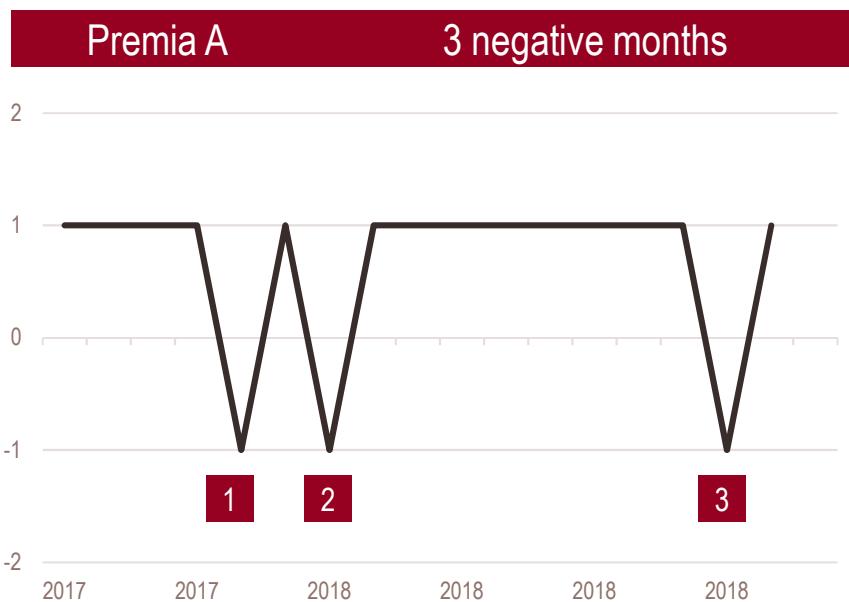
- Volatility is a simplistic risk measure which is not suitable for individual Alternative Risk Premia with non-normal distributions
- Our risk based allocation uses a proprietary risk measure designed specifically for ARP
- This modified 90% Expected Shortfall penalizes premia which, during periods of stress:
  - Suffer from large losses
  - Re-correlate to equities
  - Suffer from liquidity risk

By only using a short-term risk measure, one can miss accounting for risk of large losses and be overexposed to premia which can suffer from gap risk at the worst time

## Portfolio construction – Short term risk measure

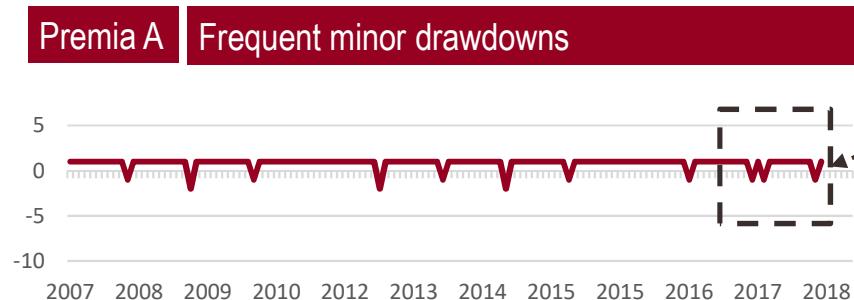
Looking at a short term measure only, Premia A seems riskier than Premia B

- Consider Premia A and Premia B
- Over the last 18 months:
  - Premia A delivered 15 monthly returns of +1% and 3 monthly returns of -1%
  - Premia B delivered 18 monthly returns of +1%

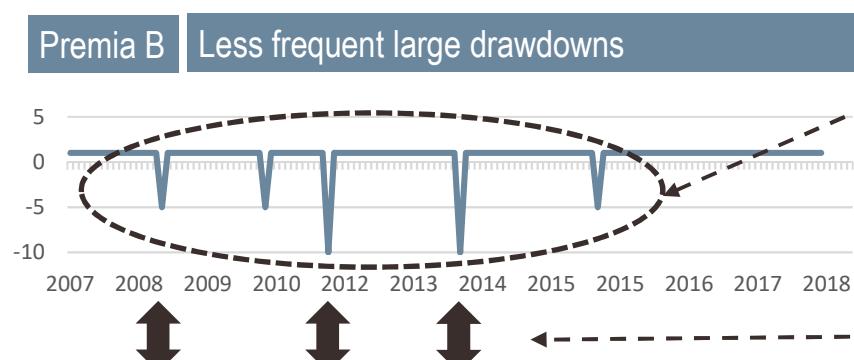


## Portfolio construction – Long term risk measure

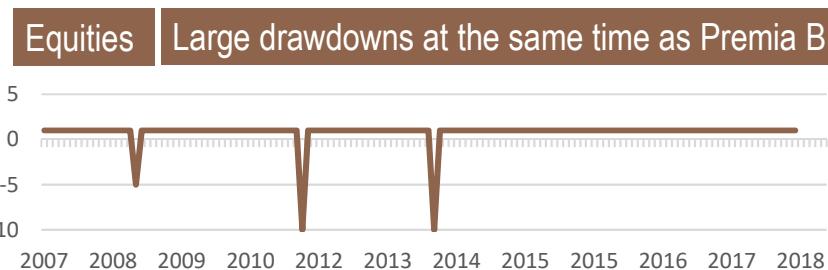
An informed manager needs to look beyond recent performance



On short term performance:  
Favor **Premia B** over **Premia A**



On longer term performance  
**Premia B seems more risky**



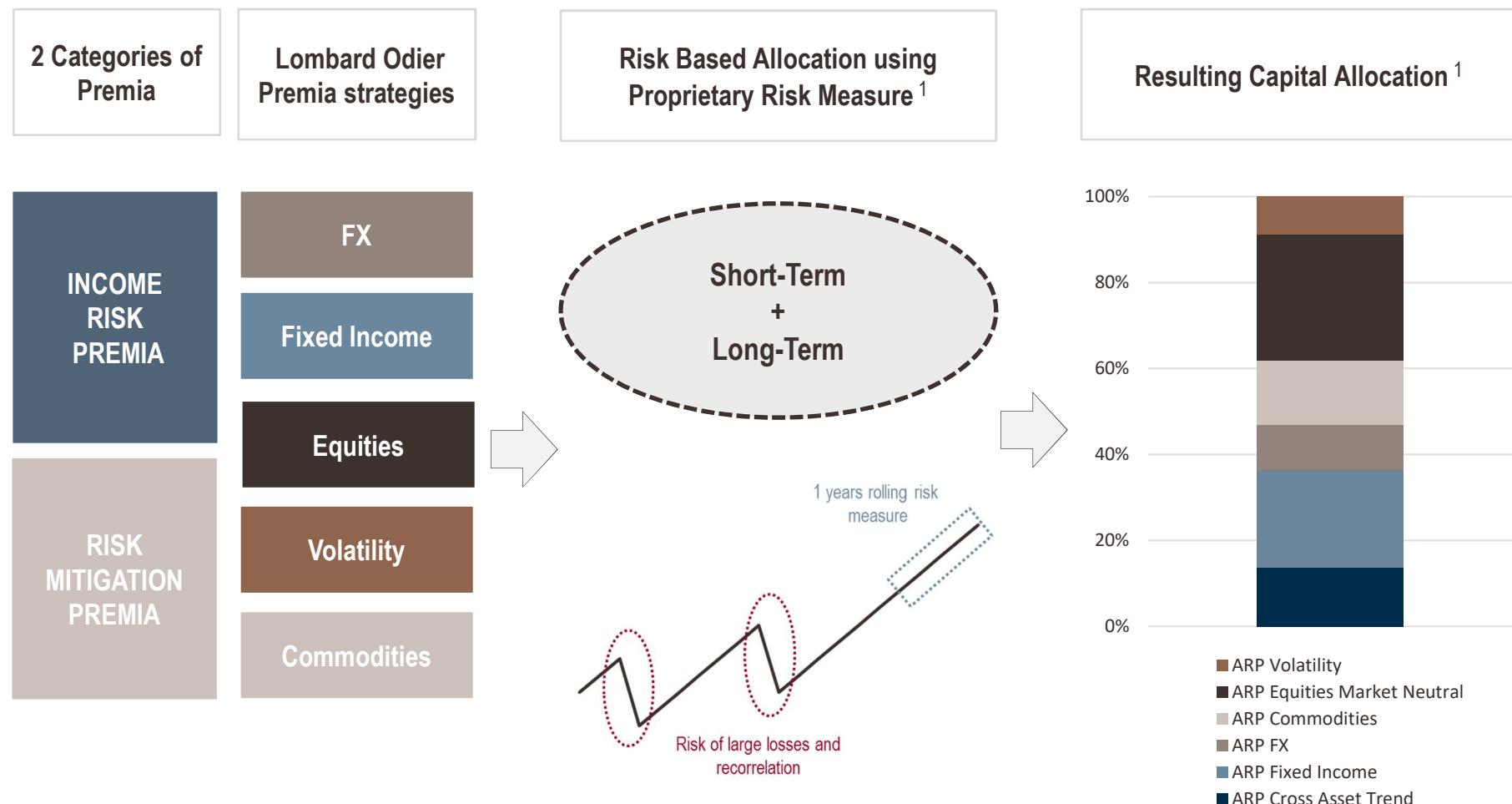
Bigger issue: **Premia B seems to lose at the same time as Equities**



In the end:  
Favor **Premia A** over **Premia B**

# Risk is balanced between categories and then toward strategies

Risk contributions are translated into capital weights. The higher the risk, the lower the allocation.<sup>1</sup>



<sup>1</sup> Note: Example. Allocation is subject to future changes.

Source LOIM. Provided for illustrative purposes only to demonstrate the investment process undertaken by the Manager..

# Investment risk management process

Risk philosophy is strengthened by the combination of two layers of risk management

## INTEGRATED RISK MANAGEMENT

- **First level risk management** performed by portfolio managers on a continuous basis
- **Ongoing daily monitoring** in real time by Portfolio Managers
- **Daily reports** produced to give detailed insight into portfolio exposures, performance contribution and analysis of risk measures
- **Absence of performance fee** prevents extensive risk taking behaviour

## INDEPENDENT RISK MANAGEMENT

- Risk management team is **independent** and has separate reporting lines to the LOIM Managing Partner
- **Dedicated risk manager** in continuous dialog with the investment team
- **Externally and internally developed systems and tools**
- **Disciplined risk-limit framework** tailored to the investment strategy
- **Real-time portfolio/risk monitoring** and automated controls on performance, portfolio exposure, liquidity, etc.
- **Daily reports and periodic analysis** to help portfolio management team align risk with conviction
- **Weekly and ad hoc portfolio reviews** between the Risk team and Portfolio Managers

No representation is made that the Investment Manager's or the Fund's investment process, investment objectives, goals or risk management techniques will or are likely to be achieved or successful or that the Fund or any underlying investment will make any profit or will not sustain losses. An investor is subject to potential loss of his/her investment.

20 · Lombard Odier Investment Managers. Please see important information at the end of the document.



**INCOME ORIENTED RISK PREMIA CORE FOCUS**

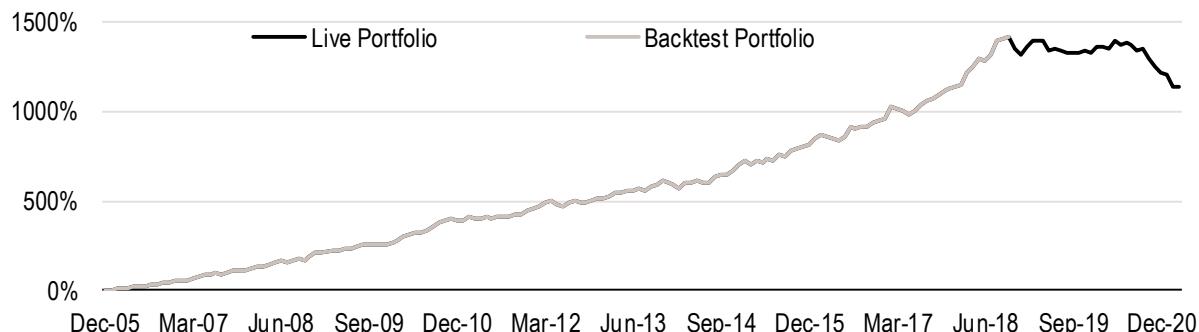
**LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10**

**LOMBARD ODIER**  
INVESTMENT MANAGERS

# LO Funds IV – Alternative Risk Premia Core V10

## Historical performance\*

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – LIVE & BACKTEST PRO-TRACK NET RETURN\*



Annualized - ITD		
Performance Statistics	Backtest	Live
Ann. Return	23,60%	-8,04%
Ann. Volatility	8,1%	8,92%
Sharpe Ratio	2,90	-
Alpha Statistics		
Months up	85%	41%
Maximum monthly gain	8,16%	3,00%
Maximum monthly loss	-3,26%	-5,24%
Max. Drawdown	-5,06%	-19,31%
Recovery Period	In Recov.	In Recov.

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – LIVE PRO-TRACK HISTORICAL NET PERFORMANCE\*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2021	-1.41%	-5.24%	0.44%										-6.16%
2020	2.45%	-0.17%	-0.45%	2.84%	-1.55%	0.59%	-0.32%	-2.22%	0.08%	-3.87%	-2.70%	-2.39%	-7.65%
2019	3.00%	1.86%	-0.16%	0.39%	-3.61%	0.67%	-0.59%	-0.95%	0.09%	0.12%	0.41%	-0.59%	0.49%
2018	-	-	-	-	-	-	-	-	-	-	-4.67%	-1.63%	-6.22%

### LO FUNDS IV – ALTERNATIVE RISK PREMIA CORE V10 – BACKTEST PRO-TRACK HISTORICAL NET PERFORMANCE\*

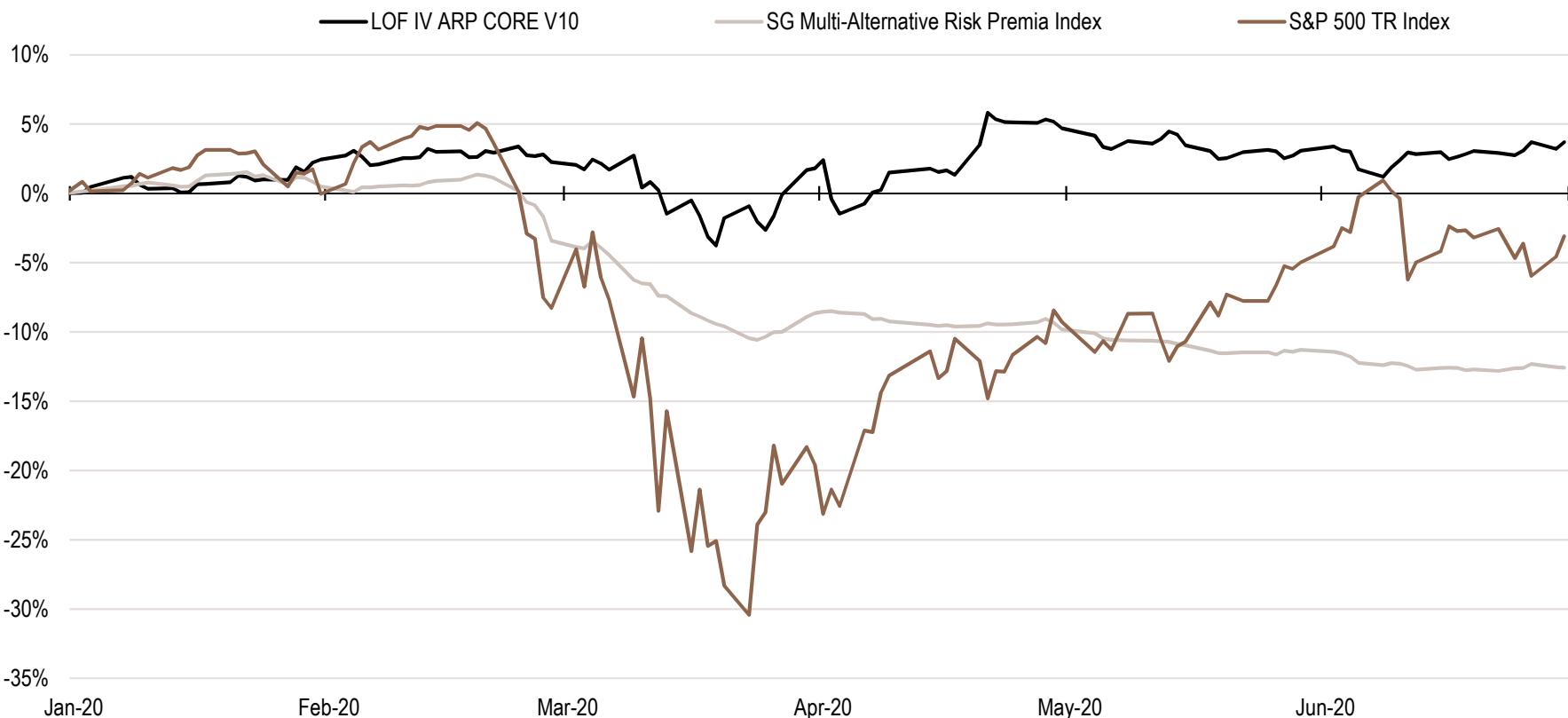
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2018	0.66%	1.56%	4.93%	2.66%	3.43%	-0.94%	2.19%	5.67%	1.09%	0.36%			23.61%
2017	1.50%	6.56%	-1.45%	-0.60%	-2.30%	2.66%	2.40%	1.81%	1.47%	1.40%	2.18%	0.86%	17.47%
2016	2.75%	2.65%	-0.80%	-1.65%	-1.07%	2.77%	5.36%	-0.53%	0.60%	-0.04%	2.08%	1.06%	13.75%
2015	1.57%	-1.91%	2.93%	-2.12%	3.10%	-1.53%	3.91%	-0.63%	3.15%	1.63%	1.61%	1.53%	13.79%
2014	-0.34%	-3.04%	3.47%	0.30%	1.44%	-0.24%	-0.44%	3.93%	2.27%	0.51%	2.32%	4.80%	15.73%
2013	-0.78%	1.81%	4.75%	-1.08%	2.02%	0.36%	1.78%	-2.18%	3.46%	2.41%	2.32%	-1.68%	13.73%
2012	1.26%	2.74%	3.68%	0.93%	-2.35%	-1.73%	2.21%	2.39%	-1.33%	0.32%	1.00%	2.12%	11.62%
2011	0.26%	2.74%	-2.29%	2.02%	0.88%	-2.12%	1.46%	0.97%	0.44%	1.24%	-0.22%	5.67%	11.36%
2010	3.21%	1.66%	4.61%	4.69%	3.43%	-0.58%	1.22%	5.30%	4.36%	3.30%	2.94%	-2.19%	36.71%
2009	-2.07%	1.85%	4.23%	1.33%	3.02%	1.61%	1.38%	3.69%	-0.32%	1.68%	0.07%	-0.09%	17.47%
2008	3.38%	3.19%	2.59%	3.10%	4.32%	4.25%	-3.26%	2.89%	4.45%	-1.51%	8.16%	6.34%	44.54%
2007	3.71%	0.25%	5.60%	6.77%	3.51%	4.52%	0.87%	-2.47%	3.09%	6.26%	-0.73%	4.11%	41.27%
2006	4.14%	3.82%	0.94%	6.39%	3.69%	-0.28%	4.71%	7.54%	0.52%	4.54%	1.60%	6.11%	53.15%

\*Estimated Net performance for the Share Class I-A USD as at 31 March 2021. Performance information shown reflects a combination of (i) backtest pro-forma adjusted net returns from January 2006 to October 2018, (ii) actual returns of the LO Funds IV – Alternative Risk Premia Core V10, I-A USD share class from November 2018 (i.e., the date of its launch) and onwards. This material contains hypothetical (simulated) backtested performance results and other related information ("Hypothetical Results").

Fees: 85bps management fee + 20bps operational costs included in the numbers

# LO Funds IV – Alternative Risk Premia Core V10

H1 2020 performance vs. S&P500



<sup>1</sup> Data shown for the Share Class I-A USD from 1 Jan 2020 to 30 June 2020 to exhibit the performance of the strategy during an equity market correction. Fund inception 31 October 2018.

Source: Bloomberg, Lombard Odier. Performance is shown net of fees including reinvestment of earnings, capital gains, interest and dividends. Source Lombard Odier, figures unaudited. Past performance is not a guarantee of future results. Indices are here for information purpose only.

# LO Funds IV – Alternative Risk Premia Core V10

## Terms

<b>STRATEGY AUM<sup>1</sup></b>	USD 1512 million
<b>INVESTMENT TERMS</b>	
<b>MANAGEMENT FEE</b>	0.80%
<b>DISTRIBUTION FEE</b>	n/a
<b>PERFORMANCE FEE</b>	n/a
<b>LIQUIDITY</b>	Daily
<b>SUBS. &amp; REDEMP. DEADLINE</b>	T-1, 15:00 CET
<b>SUBS. &amp; REDEMP. PAYMENT DATE</b>	T+2
<b>REDEMPTION PENALTIES</b>	n/a
<b>MINIMUM INVESTMENT</b>	USD 1'000'000
<b>REFERENCE CURRENCY</b>	USD

<sup>1</sup> AUM figure as of 28 February 2021. Fund AUM covers all share classes. Strategy AUM relates to the Alternative Risk Premia strategy within LOIM which includes the assets under management of managed accounts as well as the LO Funds–Alternative Risk Premia v300 launched on 13 October 2016, the LO Funds IV–Alternative Risk Premia launched on 27 July 2018 and the LO Funds IV–Alternative Risk Premia Core which launched on 31 October 2018. AUM figures estimated and are represented through assets within one or more, or a combination of private funds, managed accounts, and/or sub-portfolios or allocations. This information is qualified in its entirety by the information contained in the fund's confidential offering documents, including the prospectus or other offering memorandum (collectively, the "Prospectus"). Any offer or solicitation of an investment in the fund may be made only by delivery of the fund's Prospectus to qualified investors. Prospective investors should rely solely on the Prospectus in making any investment decision.



CONCLUSION

**LOMBARD ODIER**  
INVESTMENT MANAGERS

## Proposed interaction model

- **Monthly reports**
  - Bespoke reporting tailored needs
- **Quarterly investment review**
  - Onsite visits / video-conference per year
- **Specialist meetings**, opportunistic or on demand
  - Equity, fixed income, sustainability, alternative strategies, etc
- **Annual training at LOIM (Transfer of Knowledge)**
  - 1-2 weeks sitting with investment teams (London/Geneva/New York)
  - Catch-up / deep dives with investment specialists
- **On-demand research and reports**
  - Research enhancements, portfolio construction, etc

# Conclusion

## ■ Why work with Lombard Odier as an Asset Manager

- **Respected client base** with global perspective from institutional investors from all over the world
- Business model where a **client driven solution** is the norm
- Strong and **consistent team with collaborative approach** across all systematic and non-systematic teams at Lombard Odier
- Right Size:
  - Large enough firm to provide **excellent institutional infrastructure** and services
  - Nimble team able to adapt to **customers' needs** and assure you that you are an **important client**

## ■ Why Lombard Odier Alternative Risk Premia

- **Dedicated ARP Portfolio Managers** have been working together at Lombard Odier in this space for over 13 years
- Constantly **researching new and innovative strategies** to add to **diversification** and performance rather than increasing leverage
- **Strong focus on liquidity and cost efficiency.** Designed to be especially robust, fee sensitive and flexible
- **Differentiated** in implementation and in type of strategies
- **Unique proprietary risk based framework considering drawdown and correlation risks**
- **Customizing solutions** for the client that provide flexibility in premia selection and volatility level



## APPENDIX

**LOMBARD ODIER**  
INVESTMENT MANAGERS

## Team Overview



**LAURENT JOUÉ**  
Senior Portfolio Manager

Laurent Joué is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing LO Funds—Alternative Risk Premia, LO Funds—Alternative Risk Premia v300, LO Funds—Commodity Risk Premia and LO Funds (CH)—Commodities Risk Parity ex-agri. He joined LOIM in July 2008. He is also involved in various research projects for the Systematic Team. Laurent started his professional career in 2005 at Géa in Paris, the ADI-LODH joint-venture specialized in Hedge Fund multi-management where he worked as an Assistant Portfolio Manager. Before joining the Systematic team in November 2009, he was in the Fund of Hedge Funds Team as a Portfolio Manager. Laurent earned a master's degree in Market Finance from the Institut Supérieur Européen de Gestion in 2005.



**MARC PELLAUD, PHD**  
Senior Portfolio Manager

Marc Pellaud is a Senior Portfolio Manager in the Systematic Alternatives team within LOIM, managing LO Funds—Alternative Risk Premia, LO Funds—Alternative Risk Premia v300, LO Funds—Commodity Risk Premia and LO Funds (CH)—Commodities Risk Parity ex-agri. He is also involved in various research projects for the Systematic Team. He initially joined LOIM in June 2007, managing equity portfolios. Marc earned a PhD in life sciences from the Swiss Federal Institute of Technology in Lausanne (EPFL) in 2007.

## Team Overview



**CESAR MOURA, PHD**  
Senior Research Analyst

Cesar Moura is a senior analyst in the Systematic Alternatives team within LOIM. He joined the firm in 2018. Prior to joining, he was Head of Research at Dynamic Capital Management. He spent 10 years at Dynamic leading the quantitative research efforts which were applied to systematic trading. At Dynamic, he developed significant quantitative skills around machine learning, statistics, modelling, and programming. Cesar earned a PhD in theoretical physics from Pierre et Marie Curie University in 2009. He also holds a degree in engineering from the Ecole Polytechnique and a master's degree in physics from the Ecole Normale Supérieure in Paris.



**CLÉMENT MARY-DAUPHIN**  
Client Portfolio Manager

Clément is the dedicated Product Specialist for LOIM ARP Solutions. Clément is a seasoned financial markets professional with over twelve years' experience in derivatives as a trader, structurer and strategist. Before joining LOIM Clément worked for Natwest Markets in Hong Kong, Tokyo and London. Clément earned a MSc in Risk and Asset Management from EDHEC Business School

## Team Overview



**CLÉMENT LETURGIE, CFA**  
Senior Manager

Clément Leturgie is the head of Product Specialists for the 1798 Alternatives Platform within LOIM Group. He also heads Investor Relation for 1798 in Europe. He joined in May 2010.

Prior to joining, Clément was an assistant portfolio manager for equities, bonds and fund of funds at BNP Paribas. Previously, he was a credit analyst at Credit Agricole in 2007. He began his career working in the aerospace industry in Montreal in 2006.

Clément earned a master's degree in finance from ESCP-Europe in 2010. He also holds a bachelor's degree in Business Management from McGill University in 2006 in Québec and is a CFA Charterholder.



**ALKESH GIANCHANDANI**  
Senior Manager

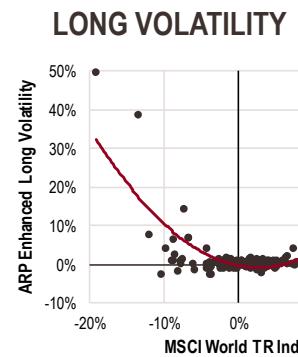
Alkesh Gianchandani is the head of Investor Relations for North America for Lombard Odier Investment Managers, specializing in the 1798 Alternatives Platform. Lombard Odier Investment Managers (LOIM) has over 50 years of experience managing institutional assets, with over USD 60 billion under management. LOIM has developed a world-class infrastructure to support the investment teams and service institutional clients. Prior to LOIM, Alkesh was a Senior Member of the Institutional Sales team and a Lead Product Expert in the Hedge Fund and Alternative Risk Premia business at Deutsche Bank. Prior to Deutsche Bank, Alkesh held senior marketing roles at private equity and hedge funds, focusing on distribution efforts exclusively to Institutional Investors. Alkesh started his Alternatives career by building out the hedge fund business at RiskMetrics Group (now MSCI) and spearheading the work on the HedgePlatform risk transparency reporting services. After RiskMetrics, Alkesh headed up Institutional Sales at Robeco Asset Management. Alkesh is a graduate of New York University (MBA) and Lehigh University (BS).

# LOIM Alternative Risk Premia offering

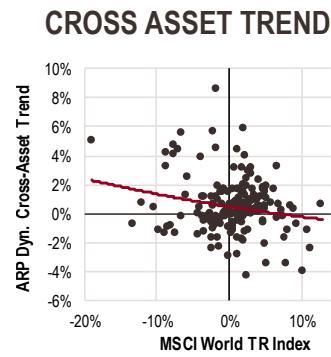
Examples of different categories payoff profiles

## Risk Mitigation Premia

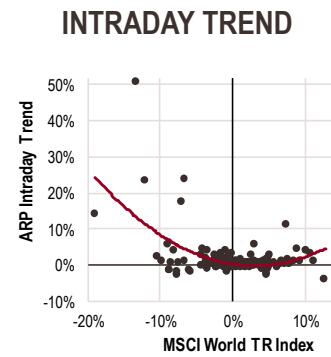
Enhanced  
Long Volatility



Defensive Cross-Asset  
Trend

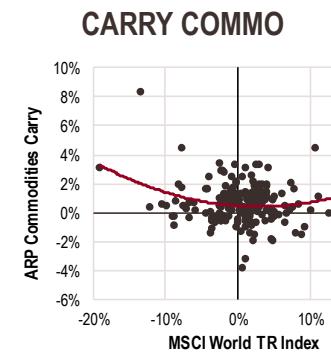


Intraday Trend

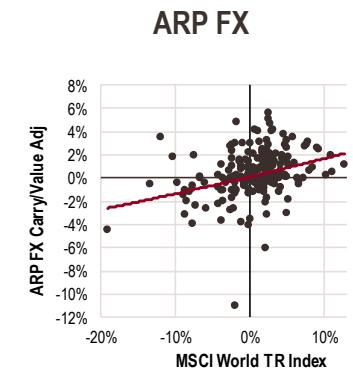


## Diversifying Income Premia

Defensive / Low  
Correlated ARP



Aggressive / Medium to  
high Correlation ARP



Source LOIM.

32 · Lombard Odier Investment Managers. Please see important information at the end of the document.

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# Two Sigma Risk Premia Strategy

April 28, 2021

Presentation for City of Oakland Police and Fire Retirement System

Roberto Hernandez Raaen – Investor Relations

Renaud Verlaque – Head of Client Portfolio Management



[www.twosigma.com](http://www.twosigma.com)

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# Important Information Regarding the Simulated Performance Shown

Two Sigma Risk Premia Strategy performance information included herein seeks to reflect the simulated performance of a hypothetical portfolio focused on liquid risk premia strategies in global equities and futures markets. The simulation was generated at approximated capacity for the period of January 1998 through July 2015 (the "Unadjusted Returns"). The Unadjusted Returns represent simulated trading utilizing a variety of risk premia models across various markets that entered the simulation at different times, as follows: Global Futures, Forwards, and U.S. Equity from 1998, European and Pan-American equity markets from 1999, and Asian equity markets from 2000. The Unadjusted Returns are utilized when discussing risk and performance attribution. Unadjusted Returns utilized herein are presented gross of fees and estimated operating expenses and net of estimated trading expenses. These Unadjusted Returns are modified on a pro-forma basis to adjust performance based on certain historically-perceived variables by subtracting (i) 40% of the average monthly Unadjusted Result for the Equity portion and (ii) 50% of the average monthly Unadjusted Result for the Global Futures and Forwards portion, to derive the "Adjusted Returns." The Adjusted Returns are utilized when discussing simulated performance and correlation to indices. The Adjusted Returns utilized herein are net of a hypothetical 1.3% annualized management fee (accrued and paid monthly in advance), and net of estimated trading expenses, but gross of operating expenses. The simulated performance does not reflect the reinvestment of income.

The simulated performance results shown herein are for illustrative purposes. TSA has worked with its affiliated investment adviser, TSI to engineer certain software that

attempts to simulate the trading patterns that would have resulted had TSA utilized certain quantitative trading models over the period of January 1, 1998 through July 2015. These simulated results should not be relied upon.

These simulated results are based largely on historical information available from certain proprietary databases of Two Sigma compiled, in part, from multiple commercially available data sources, as well as certain assumptions made by Two Sigma about, among other things, trade execution, financing and market impact costs. While Two Sigma has expended considerable efforts attempting to clean and cross-check these inputs, Two Sigma cannot and has not independently verified the accuracy or completeness of such information, nor have the results of the simulation been independently verified or audited. Should any information used in the above simulation prove to be inaccurate, the simulated results themselves may be inaccurate. Two Sigma makes no representation or warranty regarding the accuracy, relevance, or completeness of any information received from such sources.

The simulated strategy's settings or investment methodology may not be representative of any future portfolio due to, among other things, the addition or deletion of trading models, changes in optimization settings, changes in model weightings and other variables. Certain factors will likely cause the simulations to generate better performance than live trading of the associated strategy. In fact, simulated results have many inherent limitations. In particular, simulated results are often prepared with the benefit of hindsight, meaning models

utilized in these simulations may have been developed explicitly with the benefit of data from the time period covered by these simulations. Additionally, simulated results do not involve financial risk or reflect actual trading under actual market conditions and do not reflect the ability to withstand losses or to adhere to an investment program despite trading losses. The simulation was also performed using only a finite number of variables. The actual performance of any trading program TSA ultimately elects to employ in the future will from time to time be dependent on, and influenced by, any number of factors, many of which (i) have not been taken into account in performing the simulation; (ii) are inherently difficult to quantify; and (iii) are outside of TSA's control. Due to the nature of simulations, it is likely that actual trading performance will be materially lower than the simulated performance set forth herein.

Simulations were run using Two Sigma's tradable universe of global futures, currencies, and equities that met proprietary inclusion criteria intended to foster, among other goals, adequate liquidity and issuer uniqueness, as well as a number of other goals. The tradable universe of global futures, currencies and equities, as well as trading models used by Two Sigma have evolved and are likely to continue to evolve over time. There can be no assurance that the trading program pursued by TSA on behalf of any of its investment products in actual trading will be the same or substantially the same as the ones that were subjected to the above simulation. Future performance may be affected by existing and/or new events or factors, which may or may not have played any material role in the past. Therefore no assurance or guarantee can be given that the

actual trading results achieved using those strategies and/or models employed during this simulation, and/or others that are being used and/or may be used in the future, are or will be as successful and/or achieve the same results as those presented above. PAST PERFORMANCE, ESPECIALLY SIMULATED PERFORMANCE, IS NOT AN INDICATOR OR GUARANTEE OF FUTURE RESULTS. The results of the simulation are being provided to you by TSA solely to assist you in considering your potential interest in making an investment in a potential future investment product to be managed by TSA.

An investment in any investment product is speculative and involves significant risk, including the risk of a total loss of capital. Opportunities for withdrawal or transfer of interests in a strategy may be limited and therefore an investor may not have access to its capital when it desires.

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## Notes on Indices Referenced In This Presentation

Index and other strategy returns referenced in this presentation are for comparison and informational purposes only. The returns of any product managed by Two Sigma will differ from the performance of the indices or strategy to which a given comparison is made because, among other things, the Two Sigma Risk Premia Strategy is an actively managed investment strategy that does not (and will not) attempt to replicate the performance of a referenced index or other strategy, is expected to engage in a variety of investment strategies (that may not be part of a comparison index or strategy) and is generally subject to different expense ratios and expenses not reflected in a comparison index and/or strategy (including, in the case of index comparisons, management fees, incentive compensation, administration fees, operating expenses and transaction costs). References to a particular index or strategy should not, on their own, be taken to imply that the Two Sigma Risk Premia Strategy will necessarily be comparable to such index or strategy either in composition or element of risk. In addition, due to voluntary reporting and other inclusion criteria used in the construction of indices, actual returns of referenced indices may be higher or lower than shown. Descriptions of specific referenced

indices and strategies are included.

**The SG Multi Alternative Risk Premia Index** - The SG Multi Alternative Risk Premia Index represents risk premia managers who employ investment programs diversified across multiple asset classes while utilizing multiple risk premia factors. These managers trade multiple asset classes such as equities, fixed income, currencies, and in many cases commodities, and aim to capture a diversity of discrete risk premia, including most prevalently value, carry, and momentum. These multi-asset, multi-risk premia strategies are typically systematic. Single asset class and risk premia programs are excluded. The SG Multi Alternative Risk Premia Index is an equally weighted, non-investable index of funds. (Source: <https://wholesale.banking.societegenerale.com/en/prime-services-indices/>)

**HFRX Global Hedge Fund Index** - The HFRX Global Hedge Fund Index is designed to be representative of the overall composition of the hedge fund universe. It is comprised of all eligible hedge fund strategies; including but not limited to convertible arbitrage, distressed securities, equity hedge,

equity market neutral, event driven, macro, merger arbitrage, and relative value arbitrage. The strategies are asset weighted based on the distribution of assets in the hedge fund industry. Hedge Fund Research, Inc. (HFR) utilizes a UCITSII compliant methodology to construct the HFRX Hedge Fund Indices. The methodology is based on defined and predetermined rules and objective criteria to select and rebalance components to maximize representation of the Hedge Fund Universe. HFRX Indices utilize state-of-the-art quantitative techniques and analysis; multi-level screening, cluster analysis, Monte-Carlo simulations and optimization techniques ensure that each Index is a pure representation of its corresponding investment focus. (Source: <https://www.hfr.com/hfrx-indices-index-descriptions>)

**MSCI World Net TR Index** - The MSCI World Net TR Index is a broad global equity index that represents large and mid-cap equity performance across 23 developed market countries and covers approximately 85% of the free float-adjusted market capitalization in each country. Net total return indexes reinvest dividends after the deduction of withholding taxes, using (for international indexes) a tax

rate applicable to non-resident institutional investors who do not benefit from double taxation treaties. (Source: <https://www.msci.com/developed-markets>)

**Barclays US Agg** - The Bloomberg Barclays US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate pass-throughs), ABS and CMBS (agency and non-agency). (Source: <https://www.bloomberg.com/markets/rates-bonds/bloomberg-barclays-indices>)

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# Who We Are

## The Science of Intelligent Investing

We are a **financial sciences** company bringing a **scientific approach** to investment management

We use **intelligent computational systems** to implement a process-driven strategy

Our most potent discoveries stem from research and the scientific method, so we focus on **continuous innovation**

We tap the **talents of 1,600+ employees** headquartered in New York with approximately **1,000+ scientists, including 200+ PhDs**, in R&D working collaboratively to create alpha<sup>1</sup>

We manage **\$58 billion of assets** for a global, diversified client base across the Two Sigma Group. This includes \$40.3 billion in absolute return, \$14.5 billion in benchmark-relative, and \$3.1 billion in private investment mandates<sup>2</sup>

1. Employee count is approximate as of April 1, 2021.

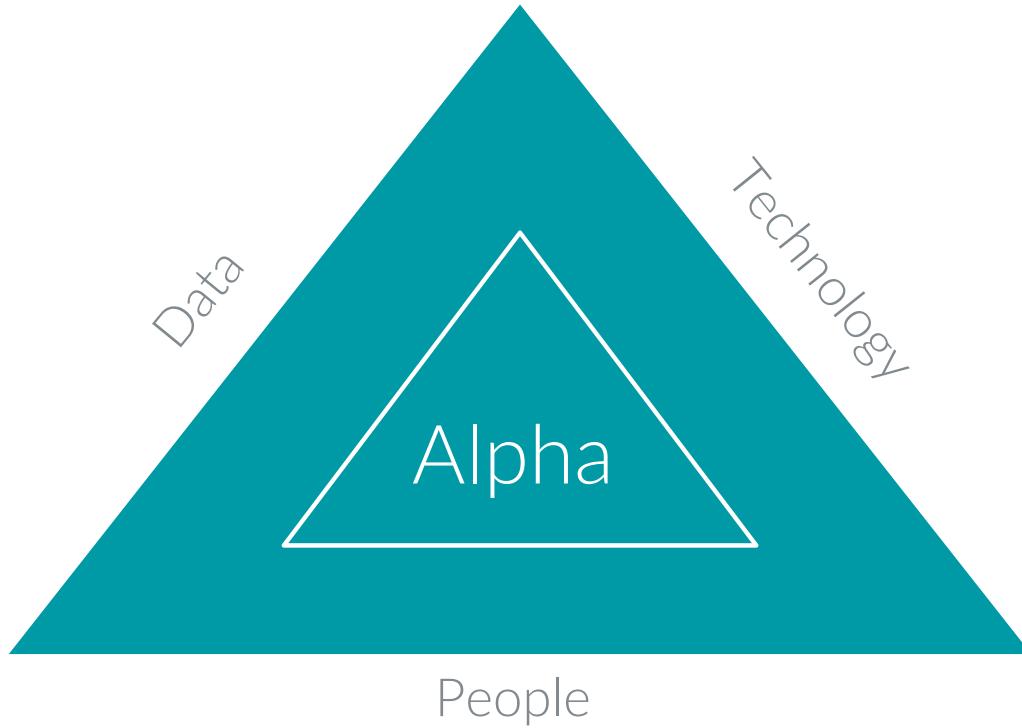
2. AuM is approximate as of April 1, 2021. Beginning August 1, 2020, "Two Sigma Group" AUM includes the AUM of the following affiliated investment managers: Two Sigma Investments, LP ("TSI"), Two Sigma Advisers, LP ("TSA"), Two Sigma China Co., Ltd. ("TSC"), TSPI, LP, and Two Sigma Ventures, LP. Absolute return and benchmark relative assets are managed across TSI, TSA and TSC and reflect the most recently available valuations as of the date of this report and include capital activity as of the first day of the following month. Private investment assets are managed across TSPI, LP and Two Sigma Ventures, LP and reflect the most recently available valuations as of the date of this report and include any unfunded capital commitments. In order to avoid double-counting assets, Two Sigma AUM has been adjusted downward to account for instances where a product advised by one Two Sigma investment manager invests in another product managed by the same, or an affiliated, Two Sigma investment manager.

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# How We Serve Our Investors

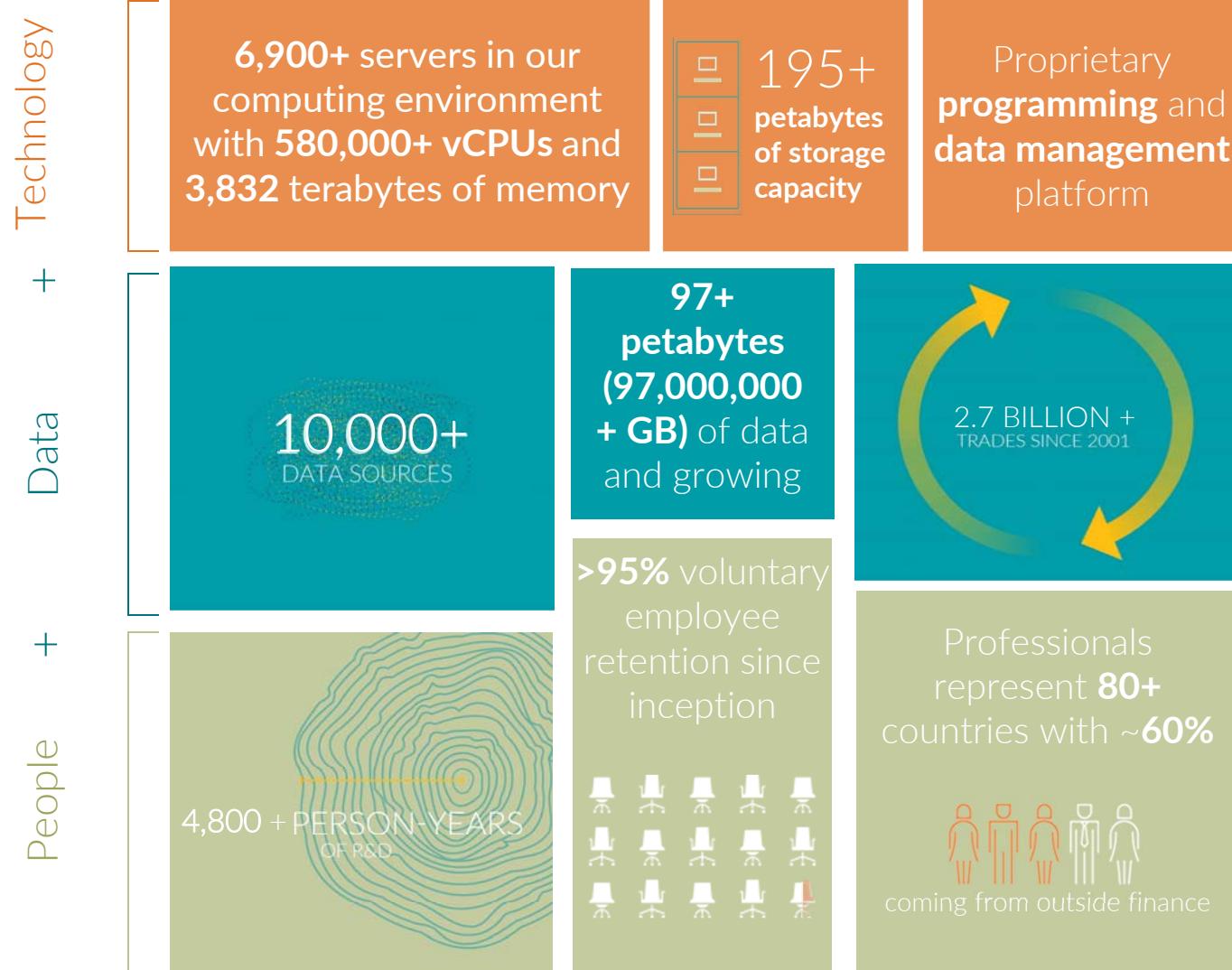
Our unique platform: our scientific approach is made possible by investments in three key areas



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# Where We Are Today



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# Two Sigma's Commitment to Diversity, Equity, & Inclusion

## Diversifying our Talent Base

Regularly participate in diversity-focused conferences and events

- Example: Sponsor of the Grace Hopper Celebration of Women in Computing (GHC) since 2013

Conduct analyses of our recruiting pipelines to better understand and improve pass-through rates for different demographic groups

Engage with external consulting firms to evaluate recruiting processes and identify actionable improvement opportunities

Use a technology solution to help eliminate biased language and create more inclusive job descriptions

Emphasize a transparent candidate experience by adopting pre-defined competency-based techniques and standardized rubrics



# Two Sigma's Commitment to Diversity, Equity, & Inclusion

## Promoting an Inclusive Culture

Established a **Diversity & Inclusion Council** in 2020 to help bring additional executive attention to our efforts

Four Two Sigma **Employee Resource Groups** allow employees to gather together and combine their efforts to **drive positive change**

- Women at Two Sigma (W@TS), founded in 2016
- Bridging Ethnicities at Two Sigma (BE@TS), founded in 2016
- ouTSigma, founded in 2016
- Disability Alliance, founded in 2020

Designed and implemented **Mentorship Programs**

Offer **unconscious bias training** to employees as well as **talks focused on diversity, equity, & inclusion** related topics

Provide robust guidance for how to identify and pursue internal opportunities to help promote career growth, including the ability for employees to **self-nominate for promotion**

Offer a variety of **volunteer opportunities** for employees, including Two Sigma Data Clinic (pro bono data science and engineering support to nonprofits)



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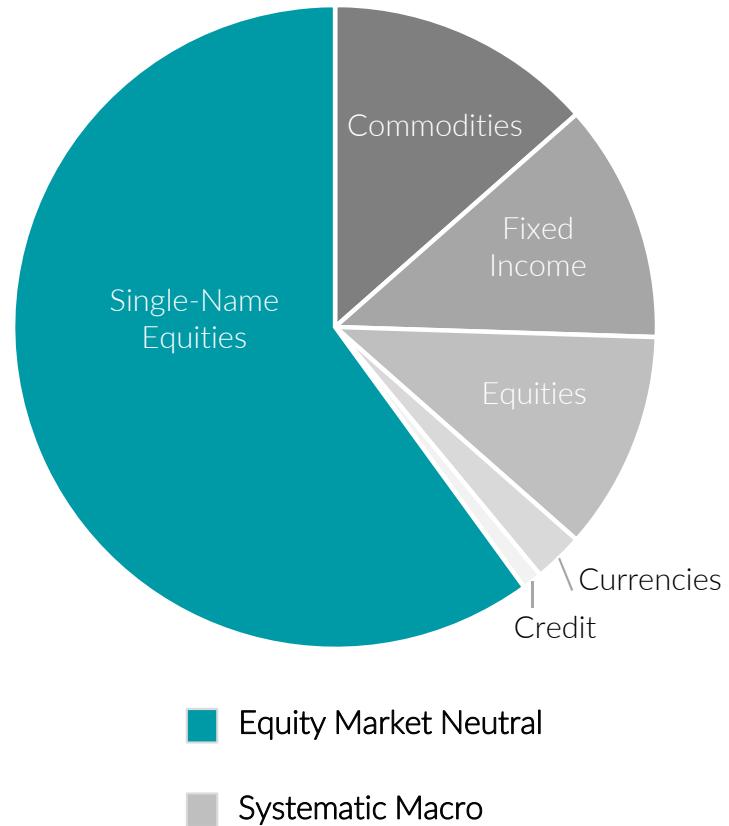


# Two Sigma Risk Premia Strategy Overview

A strategy focused on providing optimal long-term exposure to a mix of canonical, fundamental or behavioral based risks

- ◆ Risk-adjusted returns in liquid markets with **low correlation** to markets and other strategies
- ◆ **Highly diversified** across asset classes, strategies, and styles (e.g., value, momentum, carry, quality, volatility, liquidity, other)
- ◆ Large array of **proprietary models** utilized in a **systematic process**
- ◆ Strategies designed to be **complementary** to each other
- ◆ Utilizes a selection of **longer-term fundamental and technical models** from Two Sigma's common research platform

Expected Attribution of Risk by Asset Class<sup>1</sup>

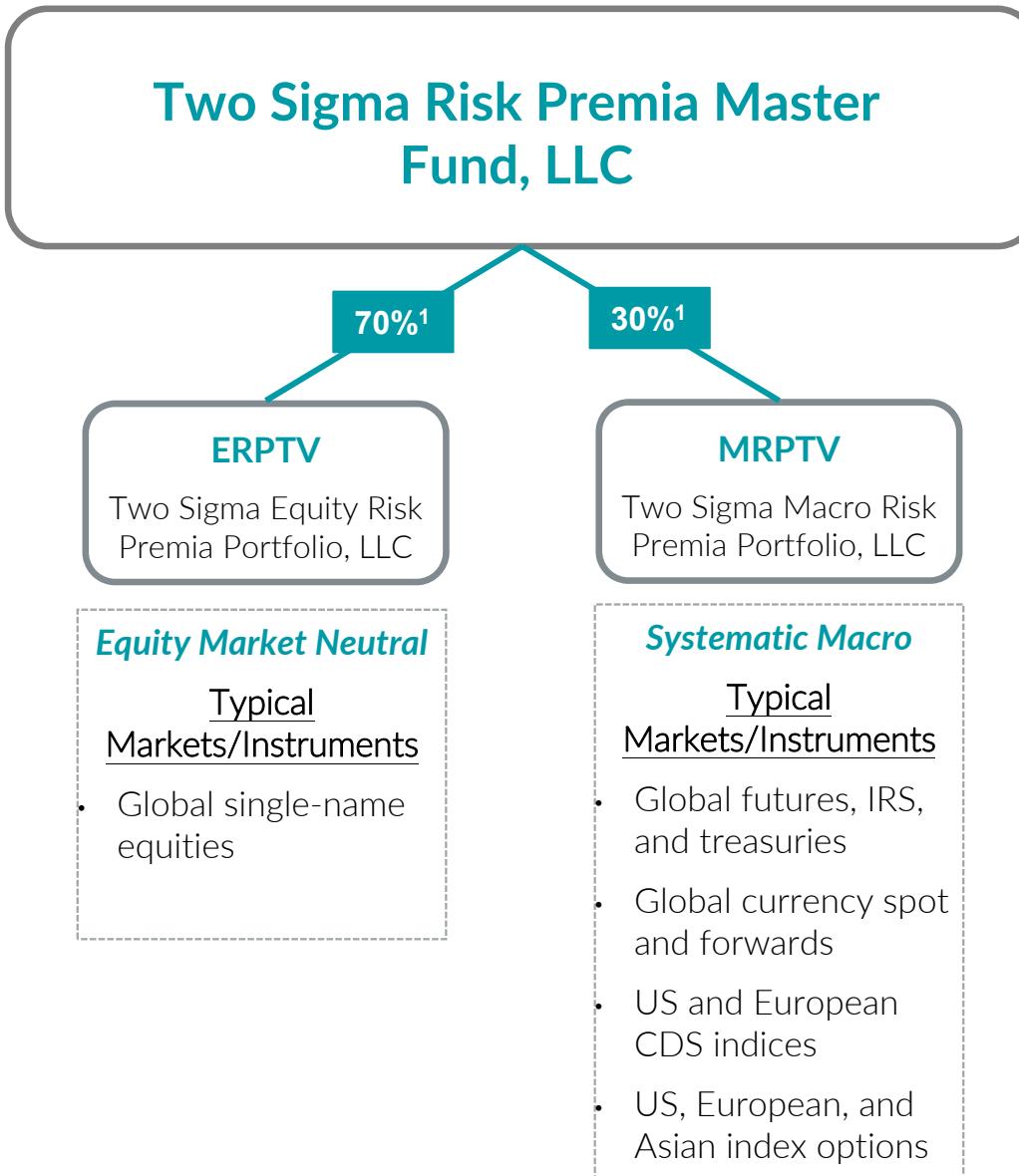


1. Expected risk allocations shown are estimates only and are subject to change at any time.

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# Two Sigma Risk Premia- Trading Vehicle Capital Allocations<sup>1</sup>



1. Capital allocations to each underlying trading vehicle shown are estimates only and are subject to change at any time. Please note that Two Sigma Risk Premia Master Fund, LLC (the "Master Fund") currently allocates approximately 70% of its capital to Two Sigma Equity Risk Premia Portfolio, LLC ("ERPTV") and approximately 30% of its capital to Two Sigma Macro Risk Premia Portfolio, LLC ("MRPTV"), although these percentage allocations are subject to change in the Two Sigma's discretion.

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# Factor Definition Matters

Within the definitions of the “Value” factor, returns diverge, especially in periods of market dislocation. Over time, a carefully constructed portfolio combining select constructions of multiple definitions should outperform any individual approach

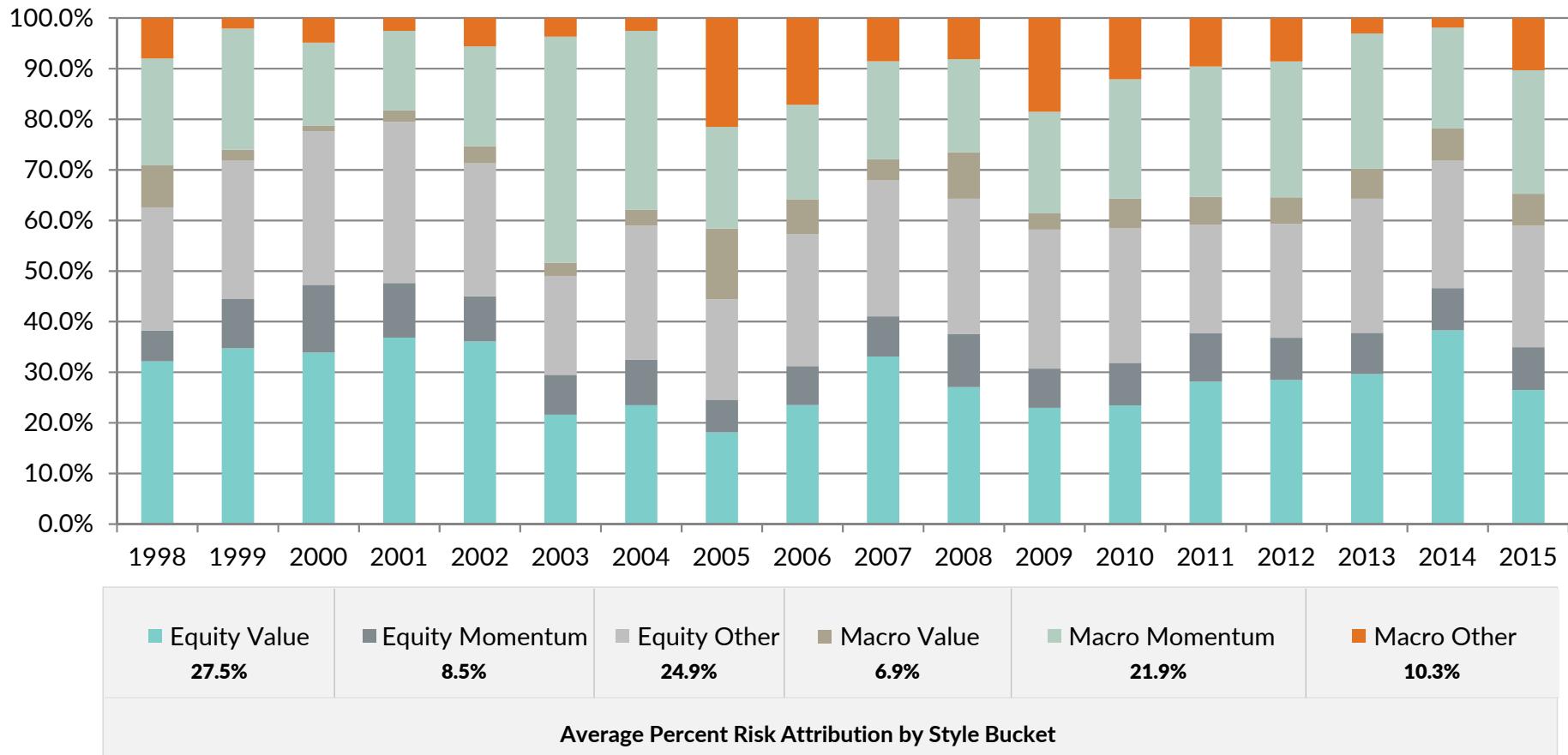


1. Source of analysis is sample data from candidate strategies in a U.S. equity portfolio. Expected performance is an annualized figure calculated after residualizing for risk factors including market, style and industry tilts and excluding all execution costs.

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# Simulated Risk Attribution by Strategy<sup>1</sup>

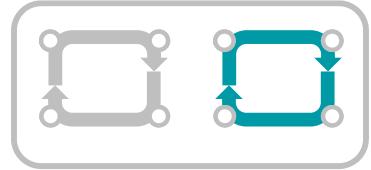


1. Even with careful procedures, simulated results have inherent limitations. Please see page 3 of this presentation for further information regarding the use of simulated results.

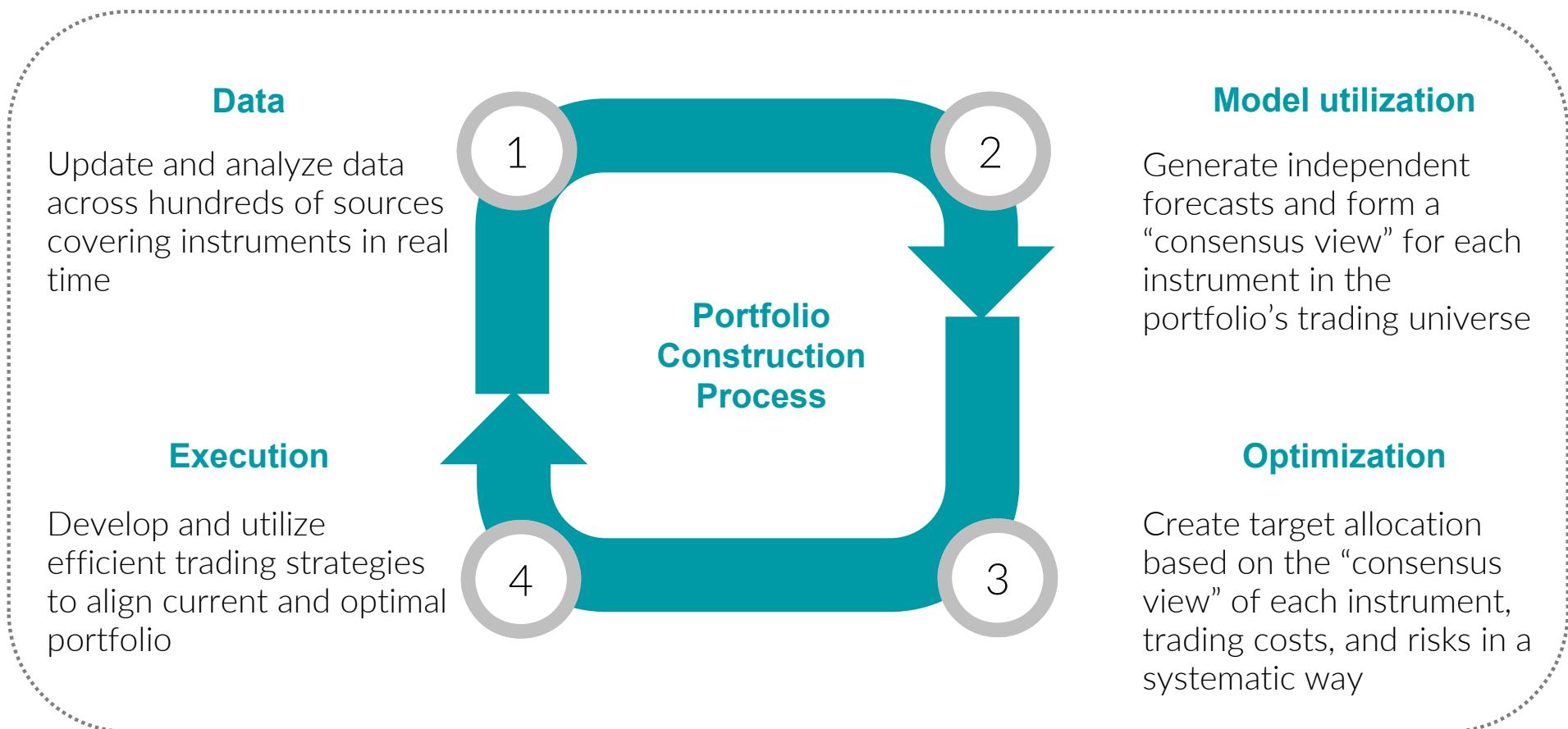
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# Portfolio Construction Process



Portfolio construction is a systematic process that translates information into an “optimal” portfolio in a consistent, repeatable, and scalable way



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# Risk Premia Correlations (August 2015 – March 2021)

	Two Sigma Risk Premia Strategy	SG Multi Alternative Risk Premia Index	HFRX Global Hedge Fund Index	MSCI World TR	Barclays US Agg	Traditional 60/40
Two Sigma Risk Premia Strategy	1.00					
SG Multi Alternative Risk Premia Index	0.52	1.00				
HFRX Global Hedge Fund Index	0.26	0.39	1.00			
MSCI World TR	0.22	0.31	0.72	1.00		
Barclays US Agg	0.12	0.04	-0.09	-0.19	1.00	
Traditional 60/40	0.24	0.32	0.72	0.99	-0.04	1.00

Correlations are computed using daily (net) returns for the life of the Two Sigma Risk Premia strategy (August 3, 2015 – March 31, 2021), except with respect to the SG Multi Alternative Risk Premia Index, which is computed using daily returns since that index's inception in January 2016. The "Traditional 60/40" Index utilizes the daily weighted means of the MSCI World TR Index (60%) and the Barclays US Agg Index (40%). Please see page 3 for important disclosure and disclaimer information relating to the use of these indices, which are provided for illustrative and informational purposes only, as well as for further information concerning the indices used.

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# Risk Premia Performance

## Key Performance Statistics

August 2015 – March 2021 (est.)

### Risk Premia Cayman<sup>1</sup>

### Risk Premia Enhanced Cayman<sup>2</sup>

	2015 Aug - Dec	2016	2017	2018	2019	2020	YTD 2021 March (est.)	Annualized Since Inception August 2015 – March 2021 (est.)	2015 Aug - Dec	2016	2017	2018	2019	2020	YTD 2021 March (est.)	Annualized Since Inception August 2015 – March 2021 (est.)
<b>Net Return</b>	+3.28%	+8.14%	+3.01%	+4.91%	-0.67%	-7.61%	-1.43%	+1.56%	+4.79%	+12.22%	+4.02%	+6.48%	-2.23%	-11.74%	-2.16%	+1.69%
<b>Volatility</b> <small>Annualized Standard Deviation of Monthly Returns</small>								5.21%								7.86%
<b>Sharpe Ratio</b>								0.14								0.13

## Overview<sup>3</sup>

Launch date:

August 1, 2015

Expected Volatility:

Approximately 6.5% annualized (“standard” volatility)  
Approximately 10% annualized (“enhanced” volatility)

Liquidity:

Monthly, with 30 days’ notice

Product Group AuM:<sup>4</sup>

\$3,485 million (as of April 1, 2021)

Leverage Adjusted Product Group AuM:<sup>4</sup>

\$4,886 million (as of April 1, 2021)

1. All return statistics reflect the performance of Two Sigma Risk Premia Cayman Fund, Ltd. (“Risk Premia Cayman”) for the periods referenced and are net of a 1.3% management fee, 0% incentive allocation and all other fund expenses, and reflect the reinvestment of income.

2. All return statistics reflect the performance of Two Sigma Risk Premia Enhanced Cayman Fund, Ltd. (“Risk Premia Enhanced Cayman”) for the periods referenced and are net of a 1.95% management fee, 0% incentive allocation and all other fund expenses, and reflect the reinvestment of income.

3. “Typical” statistics are approximations based on historical data. Such information is not intended to suggest that the investment product always has (or will continue to) perform in such a way.

4. This figure is presented as of April 1, 2021. Product Group AUM is the aggregate AUM of the feeder funds that are invested in Two Sigma Risk Premia Master Fund, LLC (the “Risk Premia Master Fund”). Leverage Adjusted Product Group AUM is the Product Group AUM adjusted to account for the different leverage levels employed by the feeder funds that are invested in the Risk Premia Master Fund.

Additional Performance Notes: Each investor’s rate of return may vary from the performance shown due to, among other things, the timing of capital transactions, if any. In each case, performance statistics are computed using monthly returns.

Refer to Risk Premia Cayman and Risk Premia Enhanced Cayman’s offering materials for a complete description of investment terms and details. Performance statistics are estimated for the most recent month included herein. [Please note that Two Sigma Risk Premia Master Fund, LLC (the “Master Fund”) currently allocates approximately 70% of its capital to Two Sigma Equity Risk Premia Portfolio, LLC (“ERPTV”) and approximately 30% of its capital to Two Sigma Macro Risk Premia Portfolio, LLC (“MRPTV”), although these percentage allocations are subject to change in the Two Sigma’s discretion.]

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**Two Sigma Advisers, LP**

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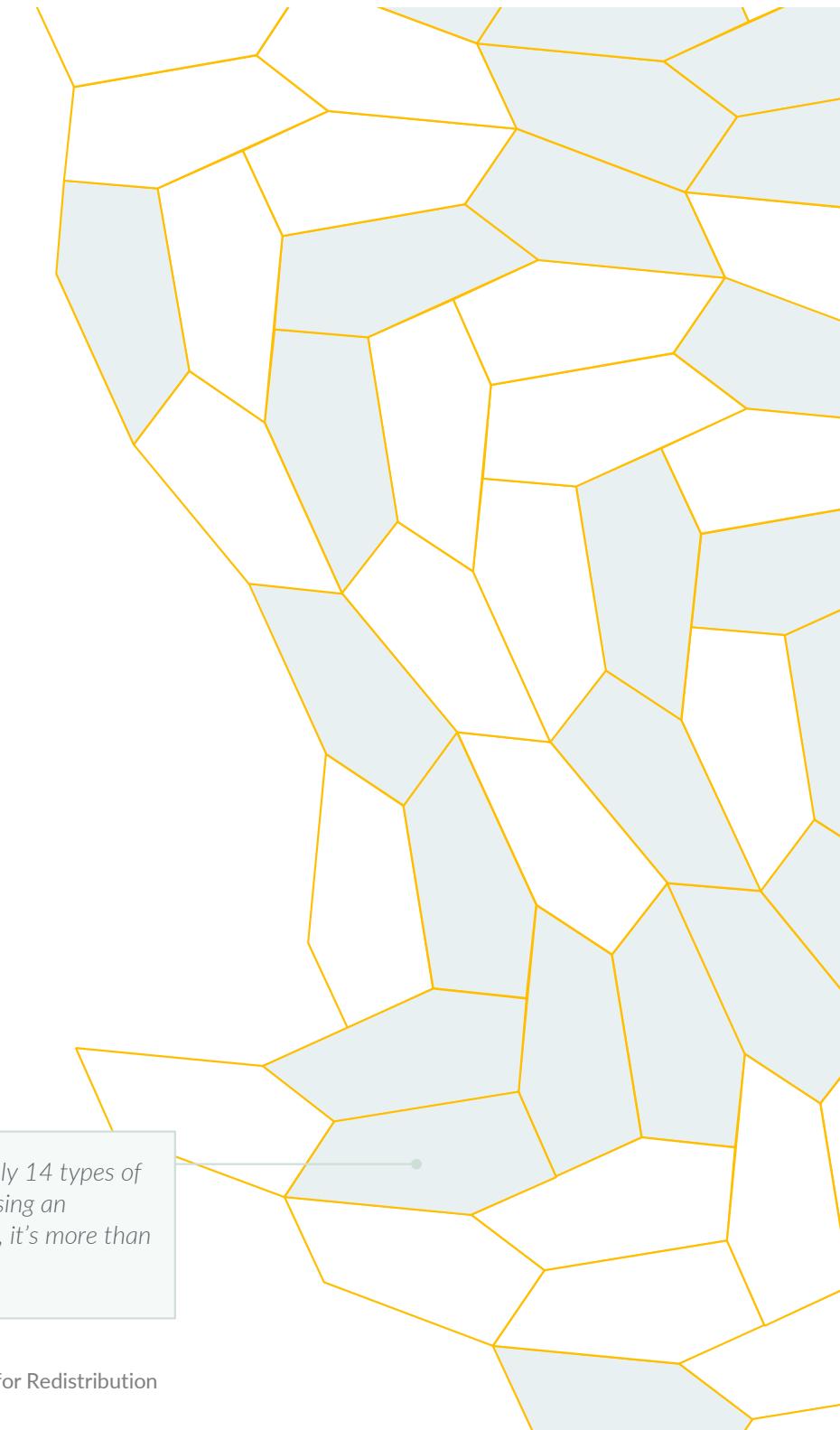
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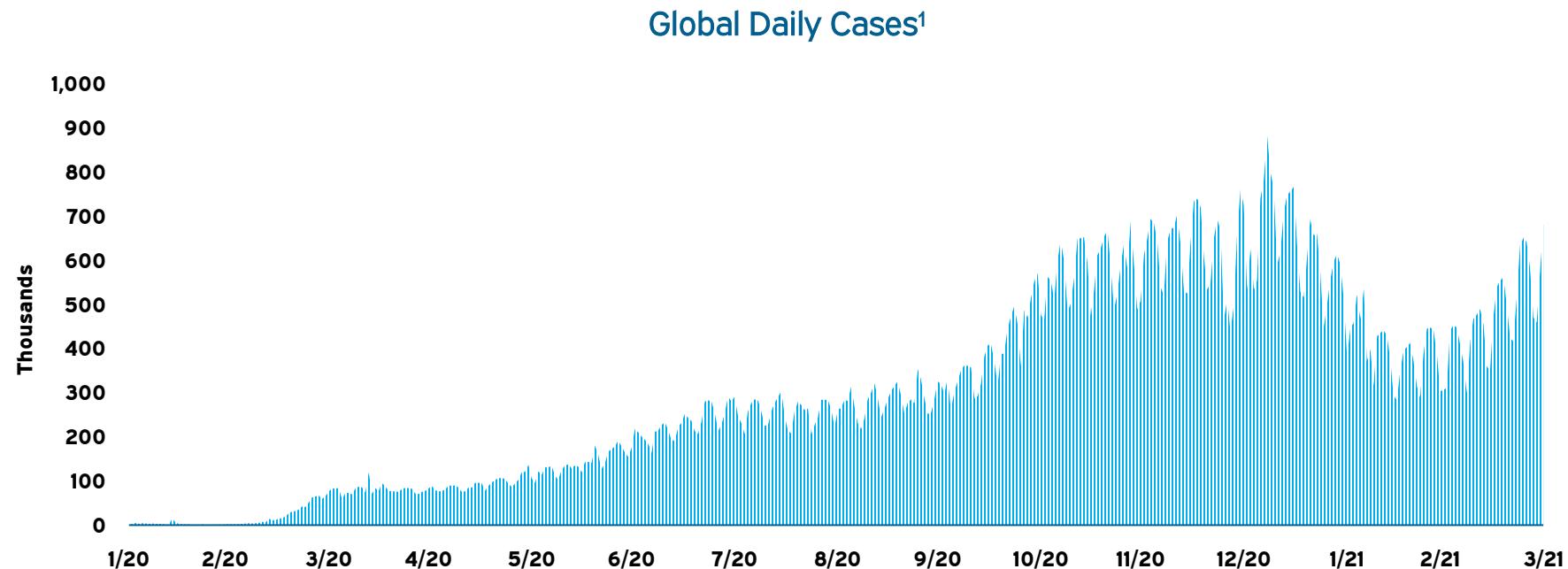
*i* How many different kinds of convex pentagons exist that can tile a plane? For decades, only 14 types of these elusive, "tessellating" pentagons were known. But in 2015, a team of mathematicians using an algorithm and a cluster of computers found a 15th type—the one shown in this pattern. To us, it's more than just an elegant shape. It's a symbol of discovery.



# Economic and Market Update

Data as of March 31, 2021



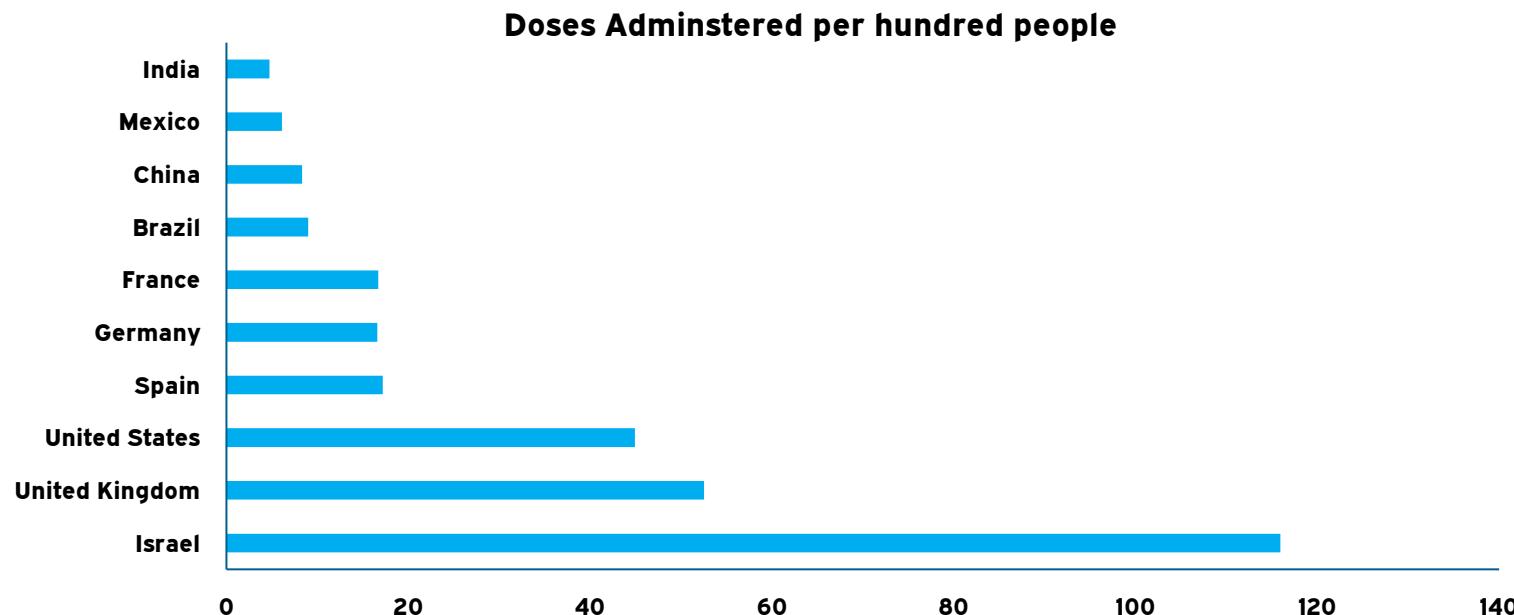


- After peaking in early January at ~858,000, the number of global daily cases steadily declined to ~303,000 at the end of February, before increasing again in March, driven by new variants.
- Looking ahead, the rollout of multiple vaccines continues to gather momentum, with roughly 800 million total doses administered as of mid-April.<sup>2</sup>
- In the US, the Biden administration set a goal of the vaccine being available to the general population by April 19.

<sup>1</sup> Source: Our World in Data. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. <https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/?sref=sA9cMIUe>

### Vaccinations by Country<sup>1</sup>



- Vaccine distribution has ramped up in many countries, including the Pfizer-BioNTech, Moderna, and Johnson & Johnson vaccines in the US. Outside the US, vaccines have also been developed by China, Russia, India, and the UK.
- Some countries have done better with the vaccine rollout, with Israel being at the forefront. The United Kingdom's and the United States' vaccination rates have exceeded many other countries. Early immunization efforts focused on the most vulnerable populations with eligibility expanding recently.

<sup>1</sup> Source: Our World in Data. Data is as of March 31, 2021. Vaccination totals include first and second doses.

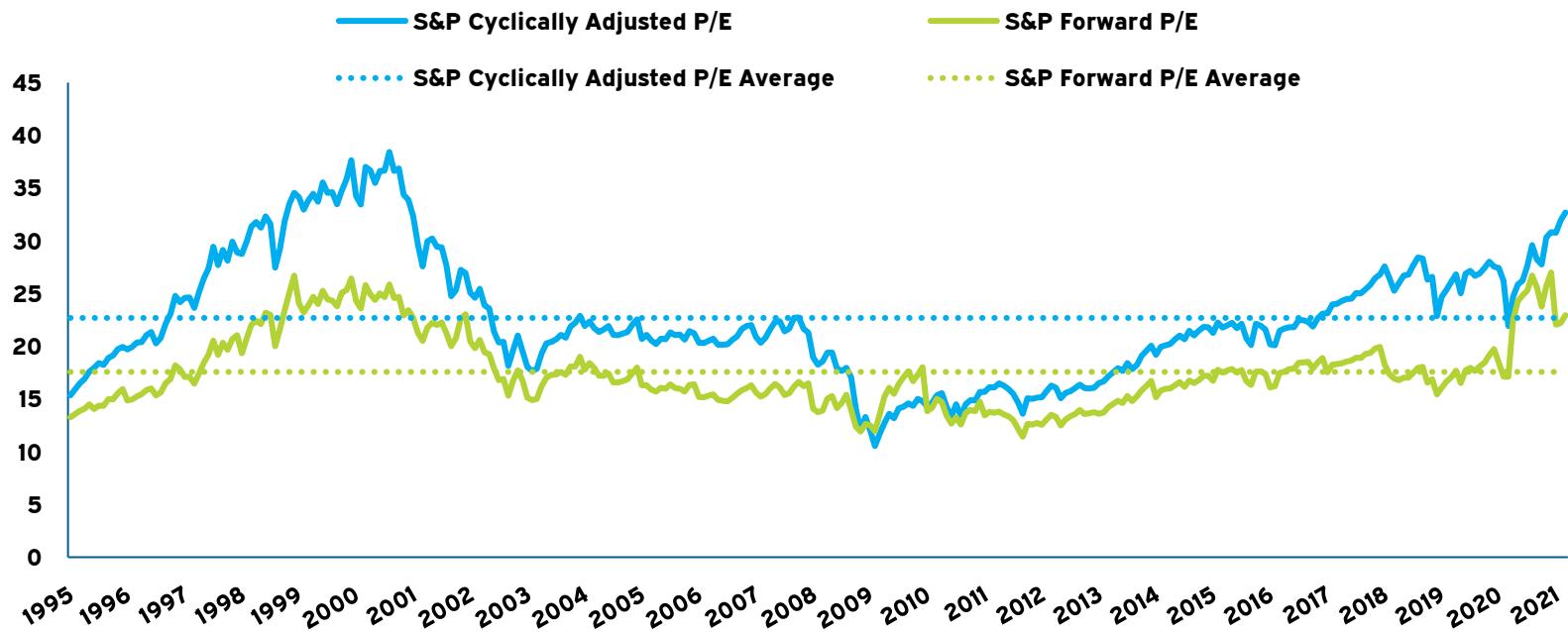
Market Returns<sup>1</sup>

Indices	March (%)	YTD (%)	1 Year (%)	3 Year (%)	5 Year (%)	10 Year (%)
S&P 500	4.4	6.2	56.4	16.8	16.3	13.9
MSCI EAFE	2.3	3.5	44.6	6.0	8.9	5.5
MSCI Emerging Markets	-1.5	2.3	58.4	6.5	12.1	3.7
MSCI China	-6.3	-0.4	43.6	8.2	16.1	7.3
Bloomberg Barclays Aggregate	-1.3	-3.4	0.7	4.7	3.1	3.4
Bloomberg Barclays TIPS	-0.2	-1.5	7.5	5.7	3.9	3.4
Bloomberg Barclays High Yield	0.2	0.9	23.7	6.8	8.1	6.5
10-year US Treasury	-3.1	-7.0	-8.1	4.7	1.7	3.7
30-year US Treasury	-6.1	-15.8	-20.6	5.6	2.7	6.5

- Over the last year, global risk assets produced significant returns, largely driven by record fiscal and monetary policy stimulus and positive developments with the COVID-19 vaccine. One-year returns are also being heavily influenced by the roll-off the significant declines in March 2020.
- In March, rising inflation and US economic growth expectations continued to drive longer-dated Treasury yields higher, leading to negative returns across most maturities.
- Equity markets across developed economies showed a notable level of resilience to the tighter financial conditions. Emerging markets were impacted by rising COVID-19 cases and re-shuttering of some economies, as well as rising inflation risks prompting some central banks to consider tightening measures.

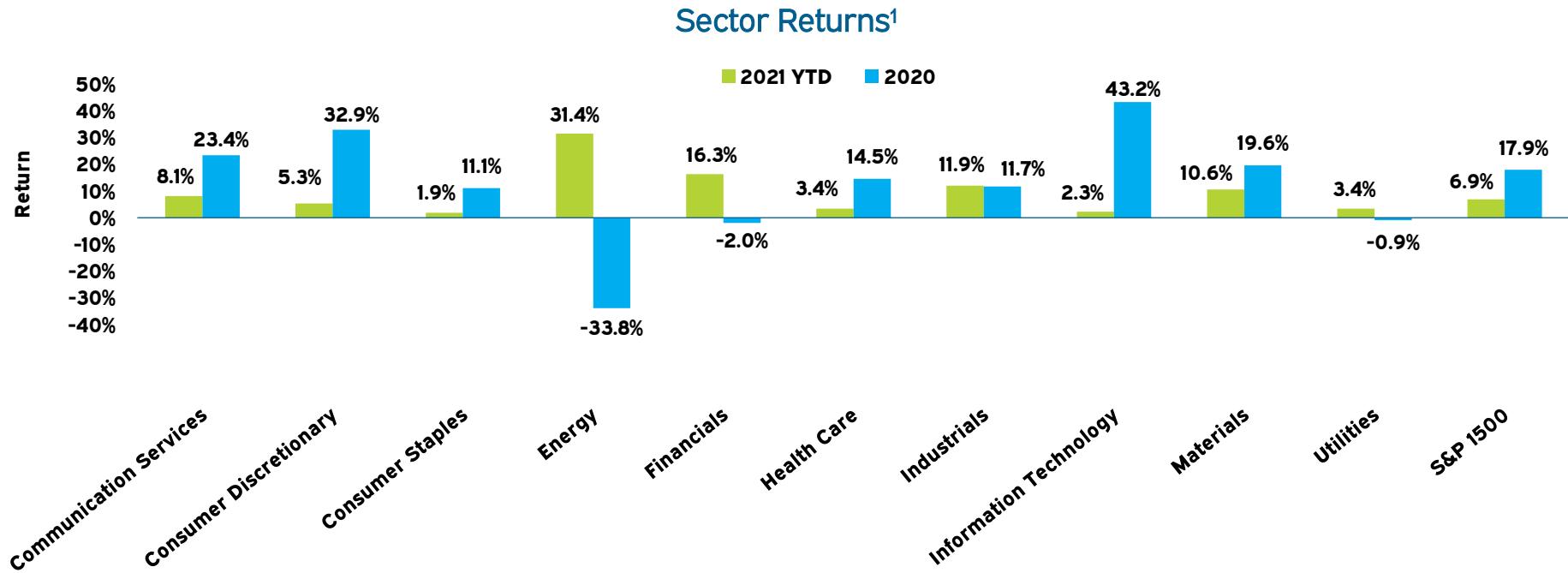
<sup>1</sup> Source: Investment Metrics and Bloomberg. Data is as of March 31, 2021.

### S&P Equity Valuations<sup>1</sup>



- With positive developments regarding COVID-19 vaccines, valuations based on backward-looking earnings rose to levels not seen since 2001.
- By contrast, valuations based on forward-looking earnings recently declined due to continued improvements in earnings expectations. Despite the decline in forward P/E ratios, they remain well above long-term averages.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

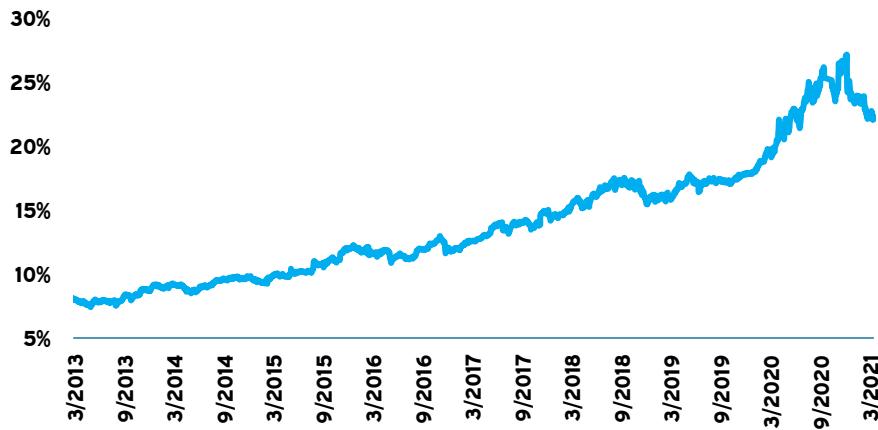


- Cyclical sectors like energy and financials have led the way in 2021, as investors rotate out of the stay-at-home focused companies in the technology sector.
- The recent rotation into value stocks has largely been driven by expectations for the economy to reopen, potentially higher taxes, and rising interest rates. Growth stocks typically produce more of their cash flows further into the future and increased interest rates lead to a larger discounts, reducing present value.
- Energy has been a particular standout this year, supported by record low active rig counts, Saudi Arabia's reductions in output, and expectations of rising demand later in 2021.
- Higher interest rates have benefited lending institutions within the financial sector.

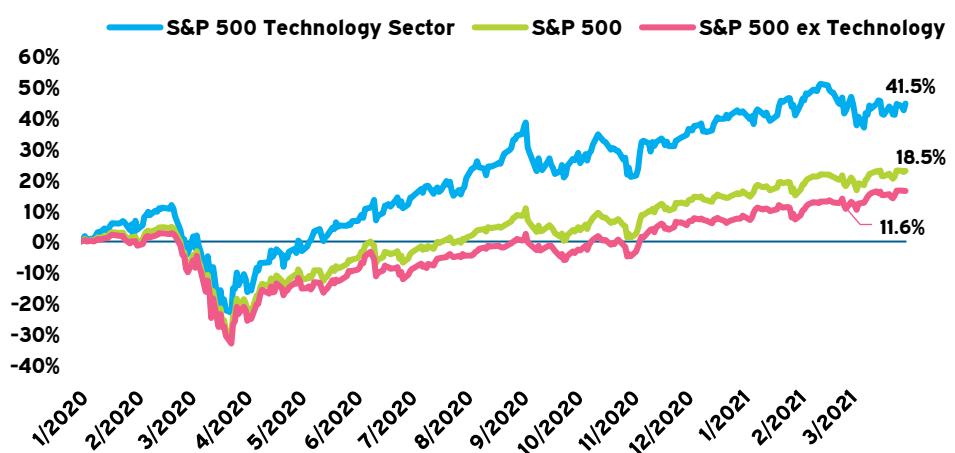
<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021

Growth stocks led the way for most of 2020, but have recently lagged

### FAANG+M Share of S&P 500<sup>1</sup>



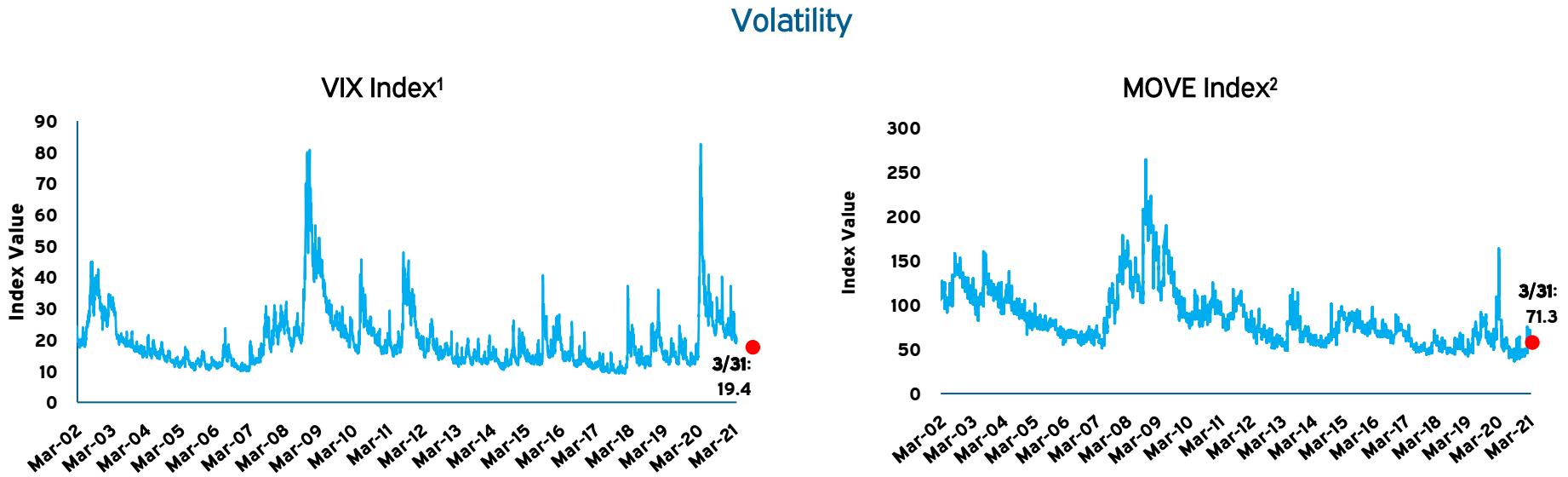
### Returns from Start of 2020 through March 31 2021<sup>2</sup>



- During much of 2020, market gains were driven by a few technology companies that benefited from the stay-at-home environment related to the virus.
- The outsized relative returns of these companies last year caused them to comprise an increasingly large portion of the S&P 500, making their performance going forward impactful to overall market results.
- Recently, their proportion of the index declined as value stocks outpaced growth stocks by over 10% in 2021.

<sup>1</sup> FAANG+M = Facebook, Amazon, Apple, Netflix, Google (Alphabet), and Microsoft. The percentage represents the aggregate market capitalization of the 6 companies compared to the total market capitalization of the S&P 500 as of March 31, 2021.

<sup>2</sup> Each data point represents the price change relative to the 12/31/2019 starting value.



- Equity market volatility, as measured by the VIX, declined over the month to levels last experienced just prior to the spike of market volatility in March 2020.
- Counter to the experience in equity markets, volatility levels within fixed income, as represented by the MOVE index, increased in March due to building expectations for higher growth and inflation. Uncertainty regarding the future path of interest rates could keep fixed income volatility elevated.

<sup>1</sup> Source: Chicago Board of Exchange. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. Data is as of March 31, 2021.

## Key Elements of the Latest Round of US Fiscal Stimulus

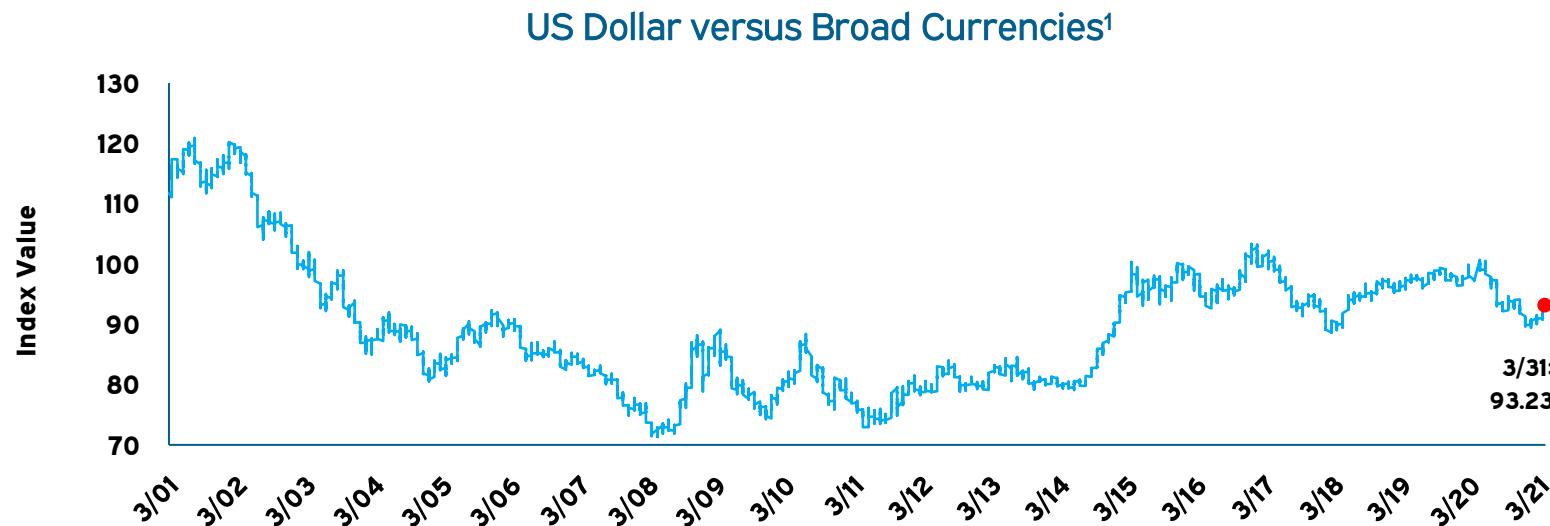
Joint Proposal	
Status	Signed by President Biden on March 11, 2021
Direct Payments	Up to \$1,400 per eligible recipient
Enhanced Unemployment	\$300 per week through September
State & Local Aid	\$360 billion
Vaccines, testing and tracing	\$123 billion
School aid/Education Grants	\$176 billion
Health Insurance Support	\$105 billion
Transportation	\$56 billion
Food / Agriculture aid	\$16 billion
Rental Assistance	\$1 billion
Small Business Assistance	\$59 billion
Total	\$1.9 trillion

- Fiscal stimulus totaling ~\$900 billion, representing the second largest package in history at the time, was finalized in late December 2021.
- President Biden signed an additional \$1.9 trillion stimulus package in March that includes another round of direct payments to individuals, \$300 extra per week in unemployment benefits, and aid to state and local governments.
- Concerns have increased significantly that the historic infusion into the economy could lead to excessive inflation and put pressure on borrowing costs.

### Key Elements of the ~\$2.65 Trillion American Jobs Plan (2021 – 2031)

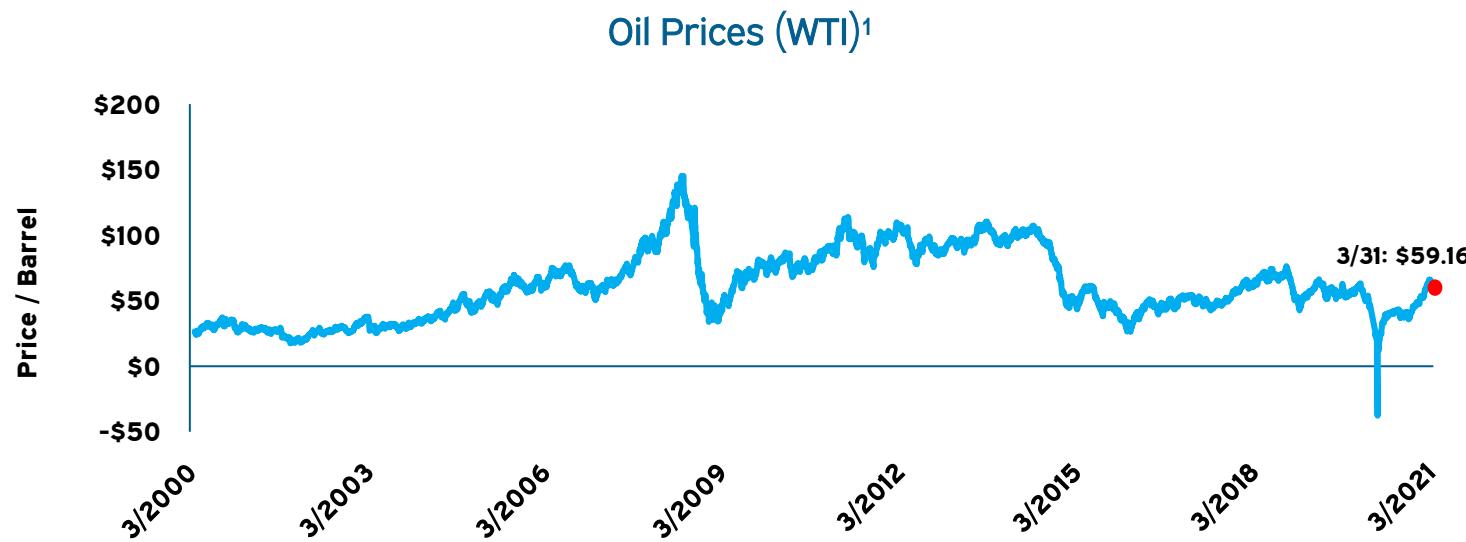
		Key Pillars	Plan Highlights
Key Elements of Proposal \$ Billions			
<b>Transportation Infrastructure</b>	Transportation		<ul style="list-style-type: none"> <li>\$174B to electric vehicles-replacing diesel school buses and transport vehicles</li> <li>\$115B to fix roads and bridges</li> <li>\$165B to the transit system</li> <li>\$80B to Amtrak</li> <li>\$25B to airports</li> <li>\$17B to ports and ferries</li> </ul>
<ul style="list-style-type: none"> <li><b>Broadband, Electrical Grid, and Clean Drinking Water</b></li> <li><b>Caregivers for Elderly &amp; Disabled</b></li> <li><b>Improve Housing Stock, Schools and other Facilities</b></li> <li><b>Clean Energy Tax Credits</b></li> <li><b>Domestic Manufacturing, R&amp;D, and Job Training Initiatives</b></li> </ul>	Quality of life at home: Invest in broadband, the electrical grid, and clean drinking water		<ul style="list-style-type: none"> <li>\$111B on clean water</li> <li>\$100B on broadband networks</li> <li>\$100B on electrical transmission upgrades</li> </ul>
	Improve housing stock, schools, and other facilities		<ul style="list-style-type: none"> <li>\$213B on affordable homes and commercial buildings</li> <li>\$100B on modernizing schools</li> </ul>
	Caregivers for elderly and people with disabilities		<ul style="list-style-type: none"> <li>Improve access to quality, affordable home or community-based care for the elderly</li> <li>Expand the Medicaid program to make more services available</li> <li>It would also boost pay for care workers.</li> </ul>
	Research, development, and manufacturing		<ul style="list-style-type: none"> <li>\$100B for domestic manufacturing and supply chains</li> <li>\$50B to semiconductor manufacturing and research</li> <li>\$100B for worker training and increasing of worker protection</li> </ul>

<sup>1</sup> Dollar amounts are estimates. Source: <https://www.crb.org/blogs/whats-president-bidens-american-jobs-plan>.



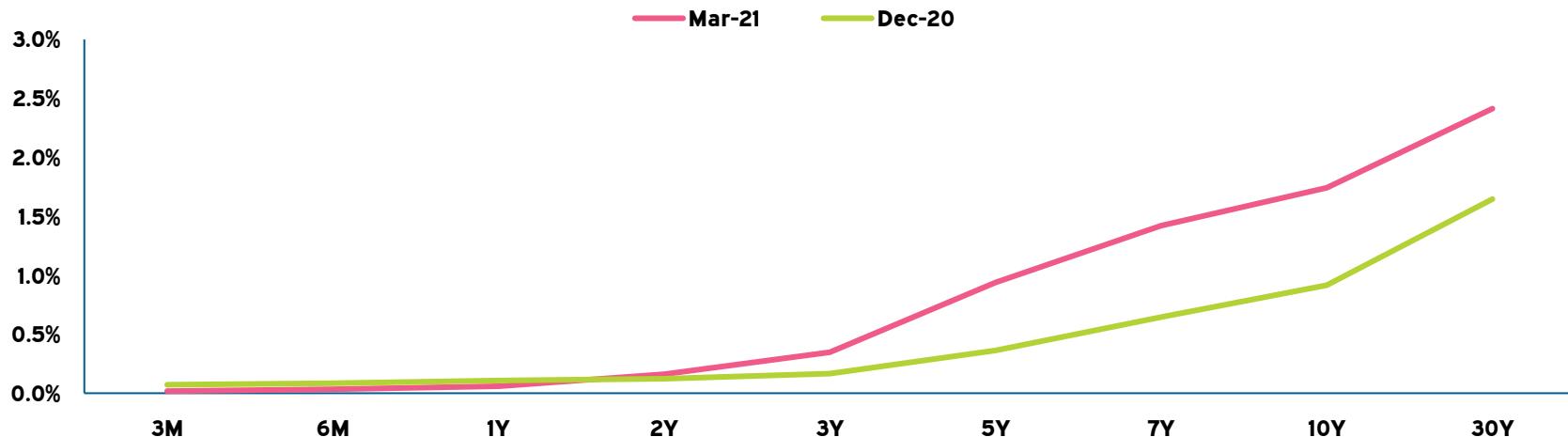
- The US dollar has benefited from higher US growth estimates and rising interest rates. Growth and interest rate differentials have put pressure on emerging market asset prices.
- A stronger US dollar may deepen the US trade deficit and offer a competitive advantage to exporters in Asia and Europe.
- Going forward, the dollar's safe-haven quality and the higher interest rates in the US could continue to provide support.

<sup>1</sup> Source: Bloomberg. Represents the DXY Index. Data is as of March 31, 2021.



- Global oil prices rallied from April 2020 lows, and have recovered to pre-crisis levels.
- In 2020 the collapse in global oil demand led to the shuttering of active drilling in North America and international markets and production capacity has been slow to come back online.
- In a surprise decision, OPEC+ recently announced they would not be increasing production despite signs that the global economy could absorb the additional supply.
- Low production capacity and tight supply may help balance oil markets and drawdown reserves offering support for oil prices as global demand recovers.
- Once reserves are used, and if production remains tight, oil prices could continue to rise, contributing to inflationary pressures, and weighing on the global economic recovery.

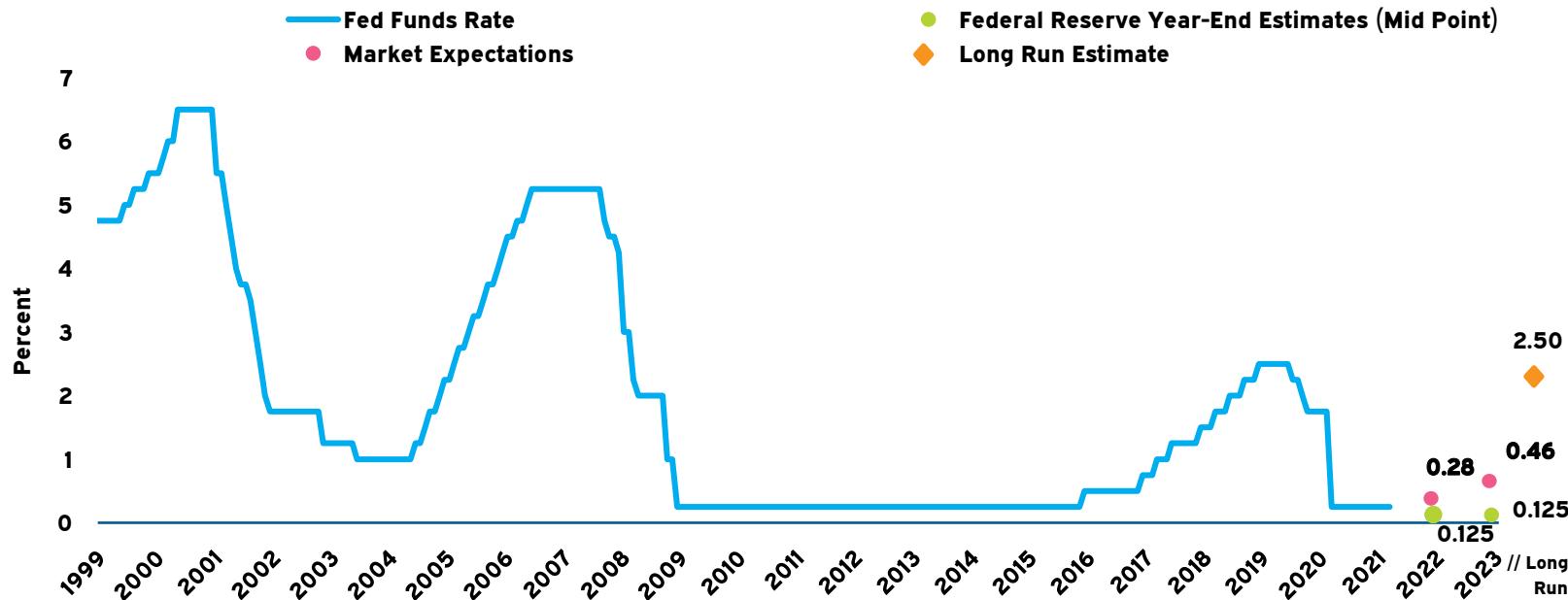
<sup>1</sup> Source: Bloomberg. Represents WTI first available futures contract. Data is as of March 31, 2021.

US Yield Curve Steepens<sup>1</sup>

- The US Treasury yield curve declined materially during 2020, driven by safe-haven demand, Federal Reserve policies (policy rate cuts and the quantitative easing program), and weak US economic fundamentals.
- Thus far in 2021, the curve has steepened on inflation fears related to gradual signs of economic improvement, vaccine developments, and expectations for increased Treasury issuance to support fiscal policy measures.
- Higher yields relative to other countries, and the Fed potentially extending the duration of QE purchases to mitigate tightening financial conditions, could counterbalance steepening trends, but the risk remains that the yield curve could continue to steepen if growth and inflationary pressures build.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

### Dot Plot Continues to Indicate Rate Hikes are Some Time Away<sup>1</sup>



- The FOMC continues to indicate they do not anticipate increasing policy rates for the next few years, as delivered through the FOMC's meeting statements and the supporting Summary of Economic Projections report (aka the "Dot Plot").
- Policy expectations as measured by current asset prices, including fed funds futures, are suggesting more aggressive policy actions, with 1-2 policy rate increases by the end of 2023.

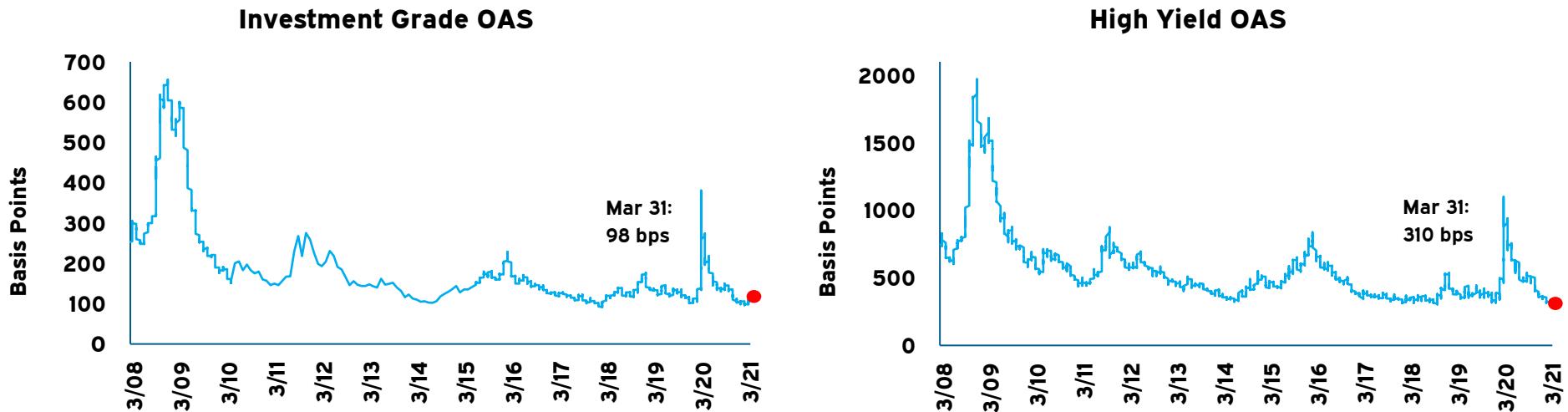
<sup>1</sup> Source: Bloomberg. Data is as of the March 17, 2021 FOMC meeting. Market Expectations reflect Fed Fund Futures



- Inflation breakeven rates declined sharply in early 2020, due to a combination of lower growth and inflation expectations, as well as liquidity dynamics in TIPS during the height of market volatility. Breakeven rates increased as deflationary concerns moderated.
- Inflation expectations have risen abruptly in recent months to slightly above long-term averages, with the vaccine roll-out and expected additional fiscal stimulus as key drivers.
- Looking forward, the track of economic growth and the inflationary effects of the unprecedented US fiscal response will be key issues. Additionally, changes to Fed policy focused on an average inflation target may play a role in the inflation market dynamics going forward.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021.

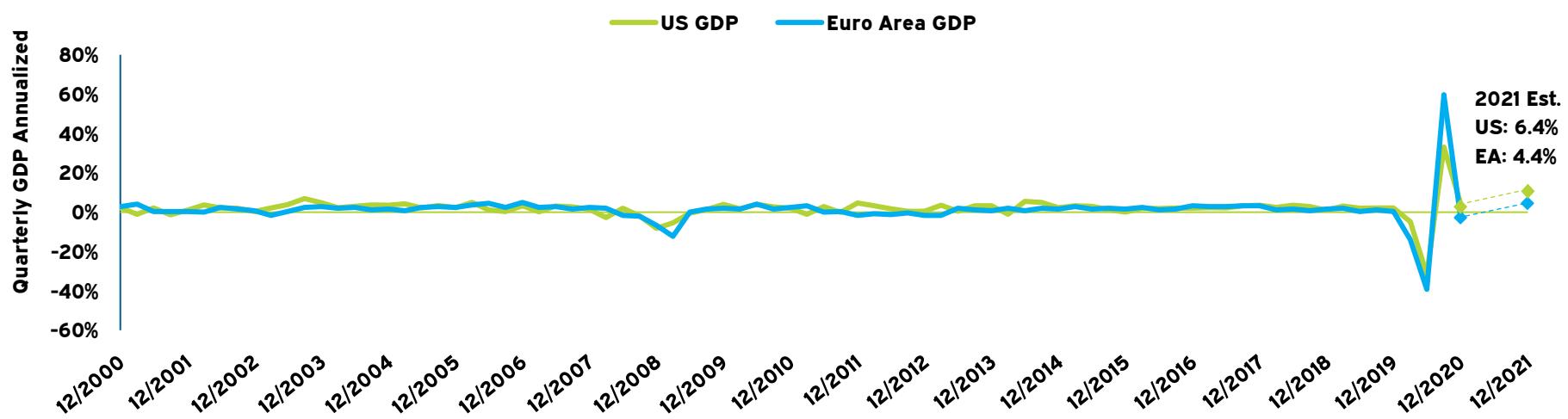
### Credit Spreads (High Yield & Investment Grade)<sup>1</sup>



- Credit spreads (the spread above a comparable maturity Treasury) for investment grade and high yield corporate debt widened sharply at the start of the pandemic as investors sought safety.
- Policy support, the search for yield in the low rate environment, and recent increases in Treasury rates have led to a decline in credit spreads to below long-term averages, particularly for high yield.

<sup>1</sup> Source: Bloomberg. High Yield represents US Corporate High Yield average OAS. Investment grade represents liquid investment grade corporate average OAS. Data is as of March 31, 2021.

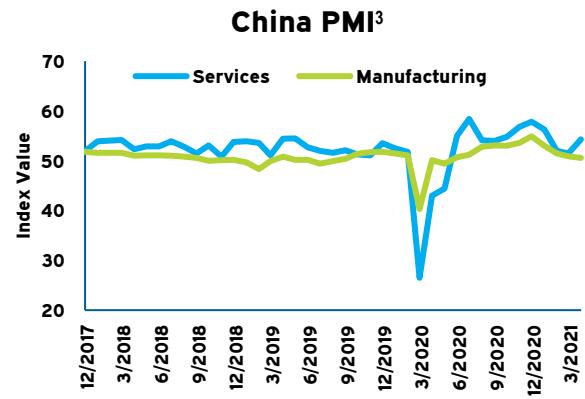
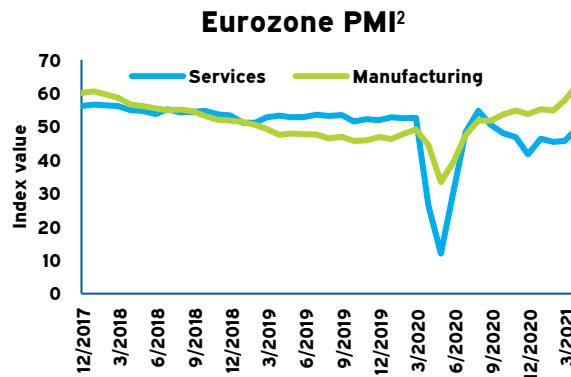
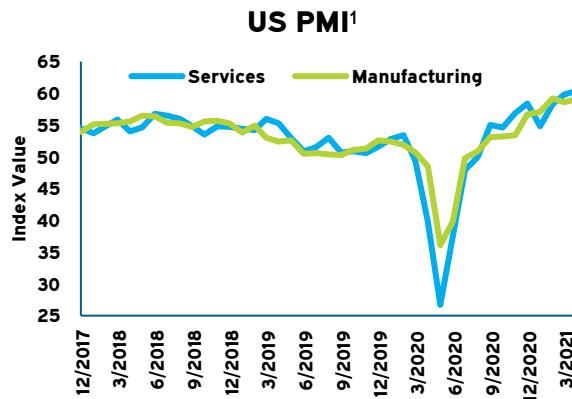
### GDP Data Shows Projected Improvements in 2021<sup>1</sup>



- The global economy faced major recessionary pressures last year, but significant optimism remains for improvements in 2021 as economies are gradually reopening. The IMF is forecasting US 2021 growth at 6.4% and 2022 growth at 3.5%. The IMF has projected 4.4% euro area growth for 2021 and 3.8% in 2022.
- Historic declines in US and European growth during the second quarter were followed by record increases in the third quarter of 2020, due to pent-up demand from the lockdown measures earlier in the year.
- Fourth quarter 2020 US GDP growth was 4.1% (QoQ annualized). Full year US GDP growth declined 2.4%, better than the IMF's forecasted decline of 3.4%.
- In the euro area, increased virus cases and a return to restrictions weighed on fourth quarter growth (-2.8% QoQ annualized). For the year, the euro area economy declined 4.9%, worse than the US, but also ahead of forecasts of a 7.2% decline.

<sup>1</sup> Source: Bloomberg, and IMF; Euro Area figures annualized by Meketa. Projections via April 2021 IMF World Economic Outlook and represent annual numbers.

### Global PMIs



- Purchasing Managers Indices (PMI), based on surveys of private sector companies, initially collapsed across the world to record lows, as closed economies depressed output, new orders, production, and employment.
- Readings below 50 represent contractions across underlying components and are a leading indicator of economic activity, including the future paths of GDP, employment, and industrial production.
- After a period of underperformance, US services and manufacturing are accelerating. In Europe, manufacturing continues to improve, led by Germany, with services lagging given on-going restrictions. After a notable return to full economic activity in the second half of 2020, the Chinese economy has stabilized in positive territory.

<sup>1</sup> Source: Bloomberg. US Markit Services and Manufacturing PMI. Data is as of March 2021.

<sup>2</sup> Source: Bloomberg. Eurozone Markit Services and Manufacturing PMI. Data is as of March 2021.

<sup>3</sup> Source: Bloomberg. Caixin Services and Manufacturing PMI. Data is as of March 2021.

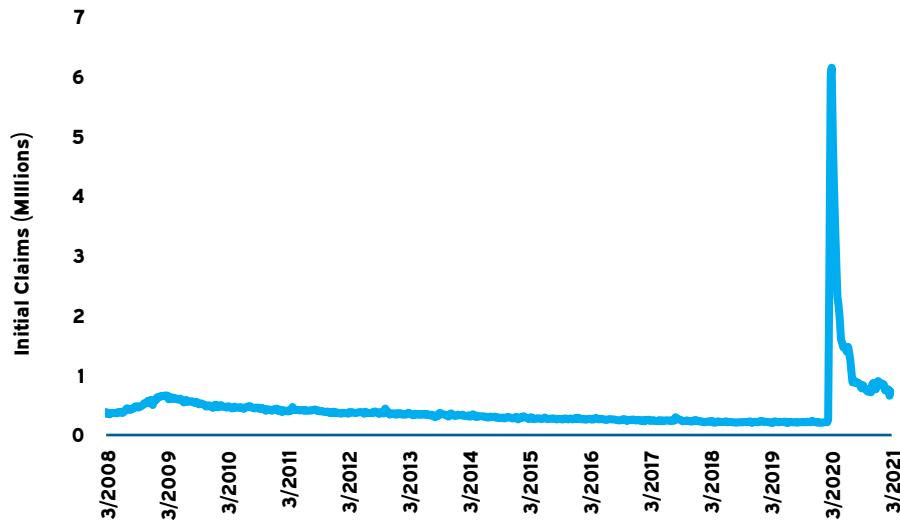


- In March, the unemployment rate (U3) continued its steep decline from the April 2020 peak of 14.7%, falling to 6.0%.
- The broader measure of unemployment (U6) that includes discouraged and underemployed workers is much higher at 10.7%, showing further evidence of the slack in the labor market.
- Despite recent improvements, unemployment levels remain above pre-virus readings and are likely higher than reported, as the total labor force participation rate remains below pre-COVID levels.
- A counterforce to the recent inflation concerns remains the slack in the labor market and corresponding weak wage pressures.

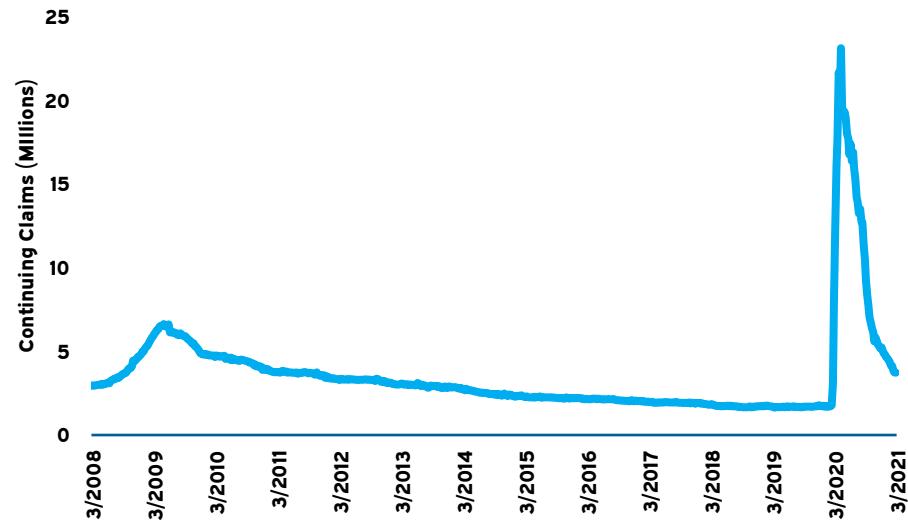
<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

### US Jobless Claims

US Initial Jobless Claims<sup>1</sup>



Continuing Claims<sup>2</sup>

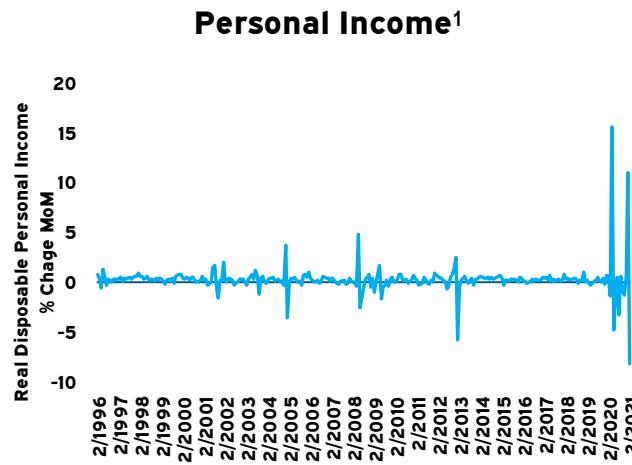
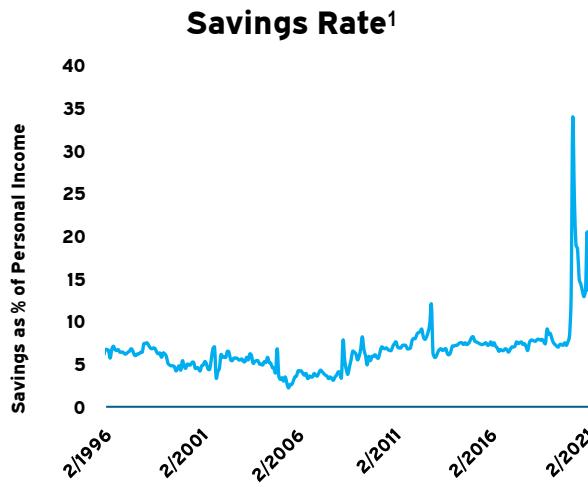


- Since the start of the crisis, ~78 million people filed for initial unemployment. This level is approaching four times the 22 million jobs added since the GFC, highlighting the unprecedented impact of the virus.
- Despite the stabilization in initial jobless claims to below one million per week, levels remain near the worst reading during the Global Financial Crisis.
- Continuing jobless claims (i.e., those currently receiving benefits) have also declined from record levels but remain elevated at 3.7 million.

<sup>1</sup> Source: Bloomberg. First reading of seasonally adjusted initial jobless claims. Data is as of March 26, 2021.

<sup>2</sup> Source: Bloomberg. US Continuing Jobless Claims SA. Data is as of March 26, 2021.

### Savings, Wages and Spending

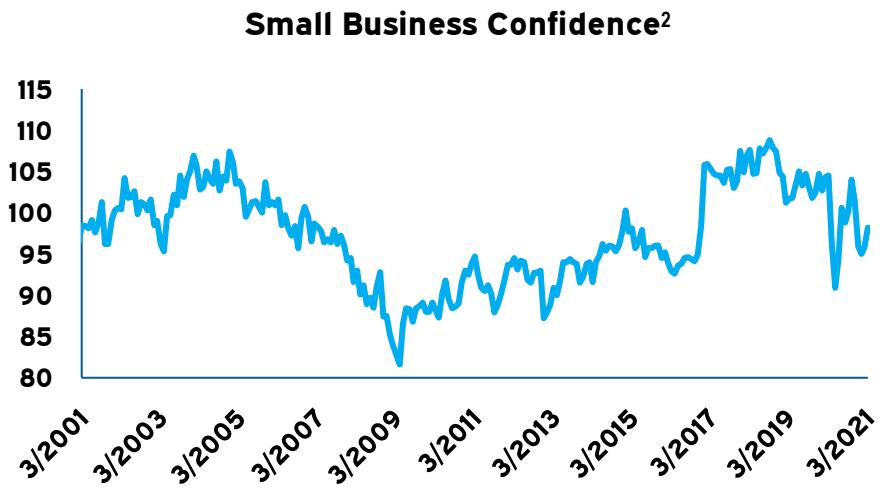
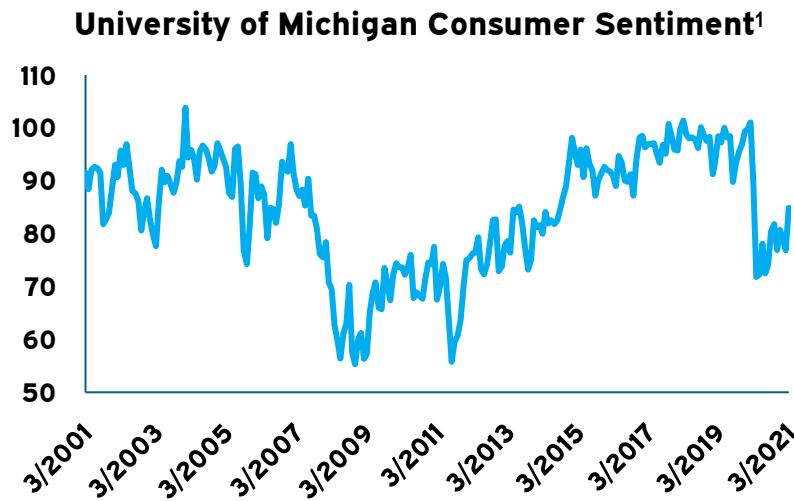


- Fiscal programs including stimulus checks, enhanced unemployment benefits, and loans to small businesses through the Paycheck Protection Program (PPP) have largely supported income levels through the shutdown.
- While estimates of personal income have been extremely volatile since 2020, wage growth has remained relatively stable.
- Despite the income support, the savings rate increased due to the decline in consumer spending, driven by the initial lock-down of the economy, and by uncertainties about the future of the job market and stimulus programs.
- More recently, the savings rate declined from its peak as spending increased with the economy slowly reopening. Going forward, questions remain about how consumers will use the recently approved stimulus programs with concerns over the potential inflationary impacts.

<sup>1</sup> Source: Bloomberg. Latest data is as of February 2021.

<sup>2</sup> Source: Bloomberg. Represents Atlanta FED wage growth tracker. Latest data is as of March 2021.

### Sentiment Indicators

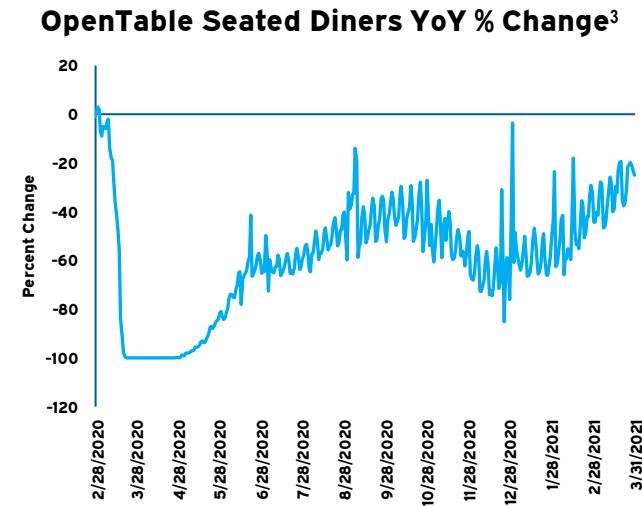
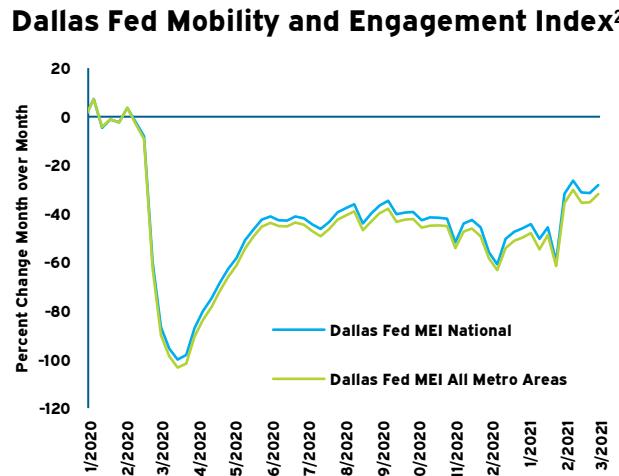
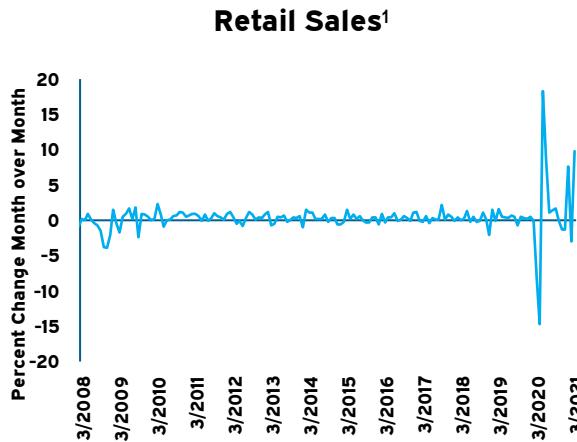


- The attitudes of businesses and consumers are useful indicators of future economic activity.
- Consumer spending comprises close to 70% of US GDP, making the attitudes of consumers an important driver of economic growth. Additionally, small businesses generate around half of US GDP, making sentiment in that segment important.
- Sentiment indicators showed improvements as the economy re-opened, particularly for small businesses. Increasing cases, including from new variants, and the initial slow vaccine rollout have recently weighed on short-term sentiment. This trend could change based on improvements in vaccine distribution and the recent fiscal stimulus.

<sup>1</sup> Source: Bloomberg. University of Michigan Consumer Sentiment Index. Data is as of March 31, 2021.

<sup>2</sup> Source: Bloomberg. NFIB Small Business Optimism Index. Data is as of March 31, 2021.

### US Consumers are beginning to venture out again



- There have been improvements in high frequency data, but overall levels remain well below historical averages, and have slowed in some instances given the recent spike in cases.
- Generally, people have become more active as restrictions eased and stores reopened. Retail sales recovered from a record decline with five consecutive months of growth, and notably beat estimates for March as consumers spent recently received stimulus checks.
- Restaurants saw initial improvements before declining with the fall spike in cases and rising again after the holidays. In-store dining has been cited as a key contributor to increases in infections.

<sup>1</sup> Source: Bloomberg. Data is as of March 31, 2021 and represents the US Retail Sales SA MoM%.

<sup>2</sup> Source: Bloomberg. Data is as of March 26, 2021 and represents the deviation from normal mobility behaviors induced by COVID-19 (formerly the "Social Distancing Index"). The index represents a weighted average of various lengths of time that a mobile device, like a cell phone, leaves its "home" or place of residence, and/or how long a device stays at home. A decline in this index represents a mobile device at home for a longer period than average.

<sup>3</sup> Source: Bloomberg. This data shows year-over-year seated diners at restaurants on the OpenTable network across all channels: online reservations, phone reservations, and walk-ins. Only states or cities with 50+ restaurants in the sample are included. All such restaurants on the OpenTable network in either period are included. Data is as of March 31, 2021. Index start date 2/19/20.



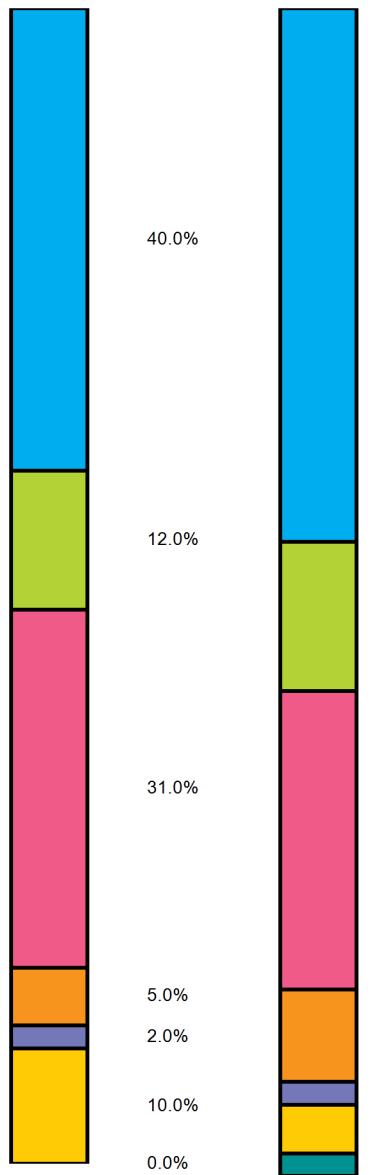
INVESTMENT GROUP

## Oakland Police and Fire Retirement System

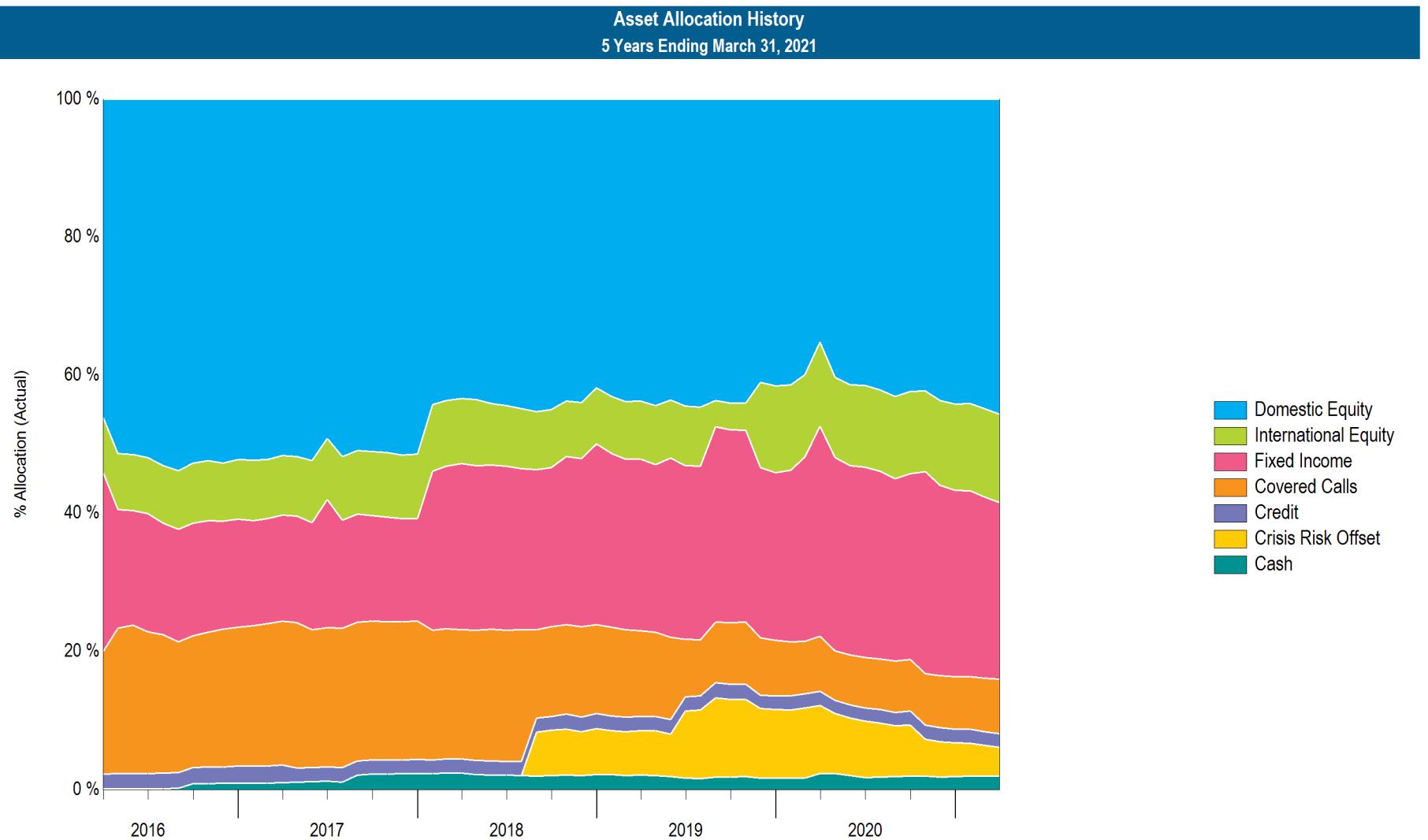
April 28, 2021

March Flash Report

### OPFRS Total Plan As of March 31, 2021



Allocation vs. Targets and Policy						
	Current Balance	Current Allocation	Policy	Difference	Within IPS Range?	
Domestic Equity	\$202,337,790	45.6%	40.0%	5.6%	Yes	
International Equity	\$56,681,628	12.8%	12.0%	0.8%	Yes	
Fixed Income	\$113,419,761	25.6%	31.0%	-5.4%	Yes	
Covered Calls	\$35,002,226	7.9%	5.0%	2.9%	Yes	
Credit	\$8,901,168	2.0%	2.0%	0.0%	Yes	
Crisis Risk Offset	\$18,417,784	4.2%	10.0%	-5.8%	No	
Cash	\$8,540,995	1.9%	0.0%	1.9%	Yes	
<b>Total</b>	<b>\$443,301,351</b>	<b>100.0%</b>	<b>100.0%</b>			



Asset Class Performance Summary												
	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date	
<b>OPFRS Total Plan</b>	<b>443,301,351</b>	<b>100.0</b>	<b>1.8</b>	<b>2.8</b>	<b>18.1</b>	<b>33.6</b>	<b>9.3</b>	<b>10.9</b>	<b>8.2</b>	<b>7.0</b>	<b>Dec-88</b>	
<i>OPFRS Policy Benchmark</i>			<i>1.4</i>	<i>1.8</i>	<i>16.0</i>	<i>30.0</i>	<i>9.4</i>	<i>10.3</i>	<i>7.9</i>	<i>8.4</i>	<i>Dec-88</i>	
<b>Domestic Equity</b>	<b>202,337,790</b>	<b>45.6</b>	<b>3.9</b>	<b>7.3</b>	<b>33.7</b>	<b>63.1</b>	<b>15.5</b>	<b>16.3</b>	<b>13.5</b>	<b>9.4</b>	<b>Jun-97</b>	
<i>Russell 3000 (Blend)</i>			<i>3.6</i>	<i>6.3</i>	<i>33.2</i>	<i>62.5</i>	<i>17.1</i>	<i>16.6</i>	<i>13.8</i>	<i>9.6</i>	<i>Jun-97</i>	
<b>International Equity</b>	<b>56,681,628</b>	<b>12.8</b>	<b>2.0</b>	<b>4.1</b>	<b>25.7</b>	<b>43.0</b>	<b>6.5</b>	<b>10.5</b>	<b>5.9</b>	<b>5.8</b>	<b>Jan-98</b>	
<i>MSCI ACWI ex US (Blend)</i>			<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>	<i>6.0</i>	<i>Jan-98</i>	
<b>Fixed Income</b>	<b>113,419,761</b>	<b>25.6</b>	<b>-1.2</b>	<b>-2.9</b>	<b>0.2</b>	<b>6.1</b>	<b>5.0</b>	<b>4.2</b>	<b>4.1</b>	<b>5.4</b>	<b>Dec-93</b>	
<i>Blmbg BC Universal (Blend)</i>			<i>-1.2</i>	<i>-3.1</i>	<i>-0.8</i>	<i>3.0</i>	<i>4.9</i>	<i>3.6</i>	<i>3.8</i>	<i>5.3</i>	<i>Dec-93</i>	
<b>Credit</b>	<b>8,901,168</b>	<b>2.0</b>	<b>0.9</b>	<b>3.5</b>	<b>19.7</b>	<b>32.7</b>	<b>4.9</b>	<b>8.6</b>	--	<b>6.4</b>	<b>Feb-15</b>	
<i>BBgBarc US High Yield TR</i>			<i>0.1</i>	<i>0.8</i>	<i>12.3</i>	<i>23.7</i>	<i>6.8</i>	<i>8.1</i>	<i>6.5</i>	<i>6.2</i>	<i>Feb-15</i>	
<b>Covered Calls</b>	<b>35,002,226</b>	<b>7.9</b>	<b>4.0</b>	<b>6.2</b>	<b>25.4</b>	<b>45.4</b>	<b>12.3</b>	<b>11.9</b>	--	<b>9.9</b>	<b>Apr-14</b>	
<i>CBOE S&amp;P 500 BuyWrite USD</i>			<i>1.4</i>	<i>2.6</i>	<i>17.5</i>	<i>28.3</i>	<i>4.0</i>	<i>6.2</i>	<i>6.3</i>	<i>5.5</i>	<i>Apr-14</i>	
<b>Crisis Risk Offset</b>	<b>18,417,784</b>	<b>4.2</b>	<b>-5.0</b>	<b>-13.6</b>	<b>-16.6</b>	<b>-18.7</b>	<b>-11.4</b>	--	--	<b>-12.7</b>	<b>Aug-18</b>	
<i>SG Multi Alternative Risk Premia Index</i>			<i>3.6</i>	<i>3.7</i>	<i>1.0</i>	<i>-3.3</i>	--	--	--	<i>-3.9</i>	<i>Aug-18</i>	
<b>Cash</b>	<b>8,540,995</b>	<b>1.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>1.7</b>	<b>1.4</b>	<b>0.7</b>	<b>0.7</b>	<b>Mar-11</b>	
<i>FTSE T-Bill 3 Months TR</i>			<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>0.2</i>	<i>1.5</i>	<i>1.2</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>	

Cash balances held in ETF accounts at the Custodian are reflected in the Cash account market value.

**OPFRS Total Plan As of March 31, 2021**

	Trailing Net Performance												S.I. (%)	S.I. Date
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)				
<b>OPFRS Total Plan</b>	<b>443,301,351</b>	<b>100.0</b>	--	<b>1.8</b>	<b>2.8</b>	<b>18.1</b>	<b>33.6</b>	<b>9.3</b>	<b>10.9</b>	<b>8.2</b>			<b>7.0</b>	<b>Dec-88</b>
<i>OPFRS Policy Benchmark</i>				<i>1.4</i>	<i>1.8</i>	<i>16.0</i>	<i>30.0</i>	<i>9.4</i>	<i>10.3</i>	<i>7.9</i>			<i>8.4</i>	<i>Dec-88</i>
<b>Domestic Equity</b>	<b>202,337,790</b>	<b>45.6</b>	<b>45.6</b>	<b>3.9</b>	<b>7.3</b>	<b>33.7</b>	<b>63.1</b>	<b>15.5</b>	<b>16.3</b>	<b>13.5</b>			<b>9.4</b>	<b>Jun-97</b>
<i>Russell 3000 (Blend)</i>				<i>3.6</i>	<i>6.3</i>	<i>33.2</i>	<i>62.5</i>	<i>17.1</i>	<i>16.6</i>	<i>13.8</i>			<i>9.6</i>	<i>Jun-97</i>
Northern Trust Russell 1000	111,018,819	25.0	54.9	3.8	5.9	31.8	60.5	17.3	16.6	13.9			15.1	Jun-10
<i>Russell 1000</i>				<i>3.8</i>	<i>5.9</i>	<i>31.8</i>	<i>60.6</i>	<i>17.3</i>	<i>16.7</i>	<i>14.0</i>			<i>15.1</i>	<i>Jun-10</i>
EARNEST Partners	44,905,705	10.1	22.2	4.9	9.6	40.5	74.0	18.4	19.3	14.3			11.4	Apr-06
<i>Russell MidCap</i>				<i>2.7</i>	<i>8.1</i>	<i>39.3</i>	<i>73.6</i>	<i>14.7</i>	<i>14.7</i>	<i>12.5</i>			<i>9.8</i>	<i>Apr-06</i>
Vanguard Russell 2000 Value	10,466,133	2.4	5.2	5.5	21.0	64.1	95.0	--	--	--			20.4	Aug-19
<i>Russell 2000 Value</i>				<i>5.2</i>	<i>21.2</i>	<i>65.7</i>	<i>97.1</i>	<i>11.6</i>	<i>13.6</i>	<i>10.1</i>			<i>20.5</i>	<i>Aug-19</i>
Rice Hall James	16,255,728	3.7	8.0	-0.9	8.3	38.6	90.4	11.9	--	--			15.1	Jul-17
<i>Russell 2000 Growth</i>				<i>-3.1</i>	<i>4.9</i>	<i>45.7</i>	<i>90.2</i>	<i>17.2</i>	<i>18.6</i>	<i>13.0</i>			<i>17.4</i>	<i>Jul-17</i>
iShares Edge MSCI Min Vol	19,691,405	4.4	9.7	5.6	2.3	15.7	30.5	--	--	--			30.5	Apr-20
<i>MSCI USA Minimum Volatility GR USD</i>				<i>5.5</i>	<i>2.3</i>	<i>15.7</i>	<i>30.6</i>	<i>12.4</i>	<i>11.9</i>	<i>13.1</i>			<i>30.6</i>	<i>Apr-20</i>
<b>International Equity</b>	<b>56,681,628</b>	<b>12.8</b>	<b>12.8</b>	<b>2.0</b>	<b>4.1</b>	<b>25.7</b>	<b>43.0</b>	<b>6.5</b>	<b>10.5</b>	<b>5.9</b>			<b>5.8</b>	<b>Jan-98</b>
<i>MSCI ACWI ex US (Blend)</i>				<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>			<i>6.0</i>	<i>Jan-98</i>
Vanguard Developed Markets ETF	16,445,220	3.7	29.0	2.3	4.0	26.6	47.5	--	--	--			15.6	Sep-19
<i>FTSE Developed All Cap Ex US TR USD</i>				<i>2.5</i>	<i>4.1</i>	<i>29.3</i>	<i>50.6</i>	<i>6.9</i>	<i>9.1</i>	<i>4.0</i>			<i>17.2</i>	<i>Sep-19</i>
SGA ACWI ex-U.S. Equity	39,826,795	9.0	70.3	1.7	4.1	25.7	42.3	--	--	--			9.4	Dec-19
<i>MSCI ACWI ex USA Gross</i>				<i>1.3</i>	<i>3.6</i>	<i>29.0</i>	<i>50.0</i>	<i>7.0</i>	<i>10.3</i>	<i>5.4</i>			<i>14.8</i>	<i>Dec-19</i>

International equity performance inclusive of residual cash in Fisher and Hansberger transition accounts.

### OPFRS Total Plan As of March 31, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
<b>Fixed Income</b>	<b>113,419,761</b>	<b>25.6</b>	<b>25.6</b>	<b>-1.2</b>	<b>-2.9</b>	<b>0.2</b>	<b>6.1</b>	<b>5.0</b>	<b>4.2</b>	<b>4.1</b>	<b>5.4</b>	<b>Dec-93</b>
Blmbg BC Universal (Blend)				-1.2	-3.1	-0.8	3.0	4.9	3.6	3.8	5.3	Dec-93
Ramirez	77,199,344	17.4	68.1	-1.2	-2.6	0.5	6.3	4.9	--	--	4.4	Jan-17
BBgBarc US Aggregate TR				-1.2	-3.4	-2.1	0.7	4.7	3.1	3.4	3.8	Jan-17
Reams	28,845,472	6.5	25.4	-1.2	-3.6	0.1	9.1	8.7	5.7	5.2	5.9	Feb-98
Blmbg BC Universal (Blend)				-1.2	-3.1	-0.8	3.0	4.9	3.6	3.8	4.9	Feb-98
iShares Core US Aggregate Bond ETF	7,374,902	1.7	6.5	-1.1	-3.4	--	--	--	--	--	-2.4	Nov-20
BBgBarc US Aggregate TR				-1.2	-3.4	-2.1	0.7	4.7	3.1	3.4	-2.3	Nov-20
<b>Credit</b>	<b>8,901,168</b>	<b>2.0</b>	<b>2.0</b>	<b>0.9</b>	<b>3.5</b>	<b>19.7</b>	<b>32.7</b>	<b>4.9</b>	<b>8.6</b>	--	<b>6.4</b>	<b>Feb-15</b>
BBgBarc US High Yield TR				0.1	0.8	12.3	23.7	6.8	8.1	6.5	6.2	Feb-15
DDJ Capital	8,901,168	2.0	100.0	0.9	3.5	19.7	32.7	4.9	8.6	--	6.4	Feb-15
ICE BofA High Yield Master TR				0.2	0.9	12.5	23.3	6.6	8.0	6.3	6.0	Feb-15
<b>Covered Calls</b>	<b>35,002,226</b>	<b>7.9</b>	<b>7.9</b>	<b>4.0</b>	<b>6.2</b>	<b>25.4</b>	<b>45.4</b>	<b>12.3</b>	<b>11.9</b>	--	<b>9.9</b>	<b>Apr-14</b>
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
Parametric BXM	15,599,360	3.5	44.6	3.5	5.4	21.1	35.6	9.0	9.1	--	7.8	Apr-14
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
Parametric DeltaShift	19,402,866	4.4	55.4	4.4	6.8	29.2	54.6	15.5	14.5	--	12.3	Apr-14
CBOE S&P 500 BuyWrite USD				1.4	2.6	17.5	28.3	4.0	6.2	6.3	5.5	Apr-14
<b>Crisis Risk Offset</b>	<b>18,417,784</b>	<b>4.2</b>	<b>4.2</b>	<b>-5.0</b>	<b>-13.6</b>	<b>-16.6</b>	<b>-18.7</b>	<b>-11.4</b>	--	--	<b>-12.7</b>	<b>Aug-18</b>
SG Multi Alternative Risk Premia Index				3.6	3.7	1.0	-3.3	--	--	--	-3.9	Aug-18
Vanguard Long-Term Treasury ETF	18,417,784	4.2	100.0	-5.0	-13.6	-15.8	-16.1	--	--	--	3.0	Jul-19
BBgBarc US Govt Long TR				-5.0	-13.4	-15.8	-15.6	5.8	3.2	6.3	3.0	Jul-19
<b>Cash</b>	<b>8,540,995</b>	<b>1.9</b>	<b>1.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>1.7</b>	<b>1.4</b>	<b>0.7</b>	<b>0.7</b>	<b>Mar-11</b>
FTSE T-Bill 3 Months TR				0.0	0.0	0.1	0.2	1.5	1.2	0.6	0.6	Mar-11
Cash	2,261,995	0.5	26.5	0.0	0.1	0.5	0.6	1.9	1.5	0.8	0.8	Mar-11
FTSE T-Bill 3 Months TR				0.0	0.0	0.1	0.2	1.5	1.2	0.6	0.6	Mar-11
Cash - Treasury	6,279,000	1.4	73.5									

Market value for DDJ Capital is based on manager estimate for the month of March.

Cash balances held in ETF accounts at the Custodian are reflected in the Cash account market value.

	<b>Cash Flow Summary</b>				
	<b>Month to Date</b>				
	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value	
Cash	\$2,112,406	\$149,563	\$26	\$2,261,995	
Cash - Treasury	\$6,357,000	-\$78,000	\$0	\$6,279,000	
DDJ Capital	\$8,821,149	\$0	\$80,019	\$8,901,168	
EARNEST Partners	\$42,793,614	\$0	\$2,112,091	\$44,905,705	
Fisher Transition	\$69,477	\$0	-\$2,271	\$67,206	
Hansberger Transition	\$258,520	\$0	\$83,886	\$342,407	
iShares Core US Aggregate Bond ETF	\$7,481,183	\$0	-\$106,282	\$7,374,902	
iShares Edge MSCI Min Vol	\$18,720,922	\$0	\$970,483	\$19,691,405	
Northern Trust Russell 1000	\$107,960,039	-\$1,000,000	\$4,058,780	\$111,018,819	
Parametric BXM	\$15,074,680	\$0	\$524,681	\$15,599,360	
Parametric DeltaShift	\$18,590,159	\$0	\$812,706	\$19,402,866	
Ramirez	\$78,098,870	\$0	-\$899,526	\$77,199,344	
Reams	\$29,181,745	\$0	-\$336,272	\$28,845,472	
Reams Low Duration	\$44	\$0	\$0	\$44	
Rice Hall James	\$16,404,174	\$0	-\$148,447	\$16,255,728	
Securities Lending Northern Trust	\$0	-\$9,243	\$9,243	\$0	
SGA ACWI ex-U.S. Equity	\$39,142,281	\$0	\$684,514	\$39,826,795	
Vanguard Developed Markets ETF	\$16,076,869	\$0	\$368,352	\$16,445,220	
Vanguard Long-Term Treasury ETF	\$19,396,506	\$0	-\$978,723	\$18,417,784	
Vanguard Russell 2000 Value	\$9,926,350	\$0	\$539,783	\$10,466,133	
<b>Total</b>	<b>\$436,465,988</b>	<b>-\$937,679</b>	<b>\$7,773,042</b>	<b>\$443,301,351</b>	

**OPFRS Total Plan As of March 31, 2021****Benchmark History**  
**As of March 31, 2021**

Total Plan x Securities Lending x Reams LD Exception Comp

1/1/2019	Present	40% Russell 3000 / 12% MSCI ACWI ex USA Gross / 33% BBgBarc US Universal TR / 5% CBOE BX / 6.7% SG Multi Alternative Risk Premia Index / 3.3% BBgBarc US Treasury Long TR
5/1/2016	12/31/2018	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 20% CBOE BX
10/1/2015	4/30/2016	43% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 15% CBOE BX / 10% CPI - All Urban Consumers (unadjusted) +3%
1/1/2014	9/30/2015	48% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 10% CBOE BX / 10% CPI - All Urban Consumers (unadjusted) +3%
3/1/2013	12/31/2013	40% Russell 3000 / 10% MSCI ACWI ex USA Gross / 17% BBgBarc US Universal TR / 33% ICE BofA 3M US Treasury TR USD
8/1/2012	2/28/2013	20% Russell 3000 / 7% MSCI ACWI ex USA Gross / 18% BBgBarc US Universal TR / 55% ICE BofA 3M US Treasury TR USD
10/1/2007	7/31/2012	53% Russell 3000 / 17% MSCI ACWI ex USA Gross / 30% BBgBarc US Universal TR
4/1/2006	9/30/2007	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% BBgBarc US Universal TR
1/1/2005	3/31/2006	35% Russell 3000 / 15% MSCI ACWI ex USA Gross / 50% BBgBarc US Aggregate TR
4/1/1998	12/31/2004	50% BBgBarc US Aggregate TR / 10% Russell 1000 / 20% Russell 1000 Value / 5% Russell MidCap / 15% MSCI EAFE
9/1/1988	3/31/1998	40% S&P 500 / 55% BBgBarc US Aggregate TR / 5% FTSE T-Bill 3 Months TR

WE HAVE PREPARED THIS REPORT (THIS "REPORT") FOR THE SOLE BENEFIT OF THE INTENDED RECIPIENT (THE "RECIPIENT").

SIGNIFICANT EVENTS MAY OCCUR (OR HAVE OCCURRED) AFTER THE DATE OF THIS REPORT AND THAT IT IS NOT OUR FUNCTION OR RESPONSIBILITY TO UPDATE THIS REPORT. ANY OPINIONS OR RECOMMENDATIONS PRESENTED HEREIN REPRESENT OUR GOOD FAITH VIEWS AS OF THE DATE OF THIS REPORT AND ARE SUBJECT TO CHANGE AT ANY TIME. ALL INVESTMENTS INVOLVE RISK. THERE CAN BE NO GUARANTEE THAT THE STRATEGIES, TACTICS, AND METHODS DISCUSSED HERE WILL BE SUCCESSFUL.

INFORMATION USED TO PREPARE THIS REPORT WAS OBTAINED FROM INVESTMENT MANAGERS, CUSTODIANS, AND OTHER EXTERNAL SOURCES. WHILE WE HAVE EXERCISED REASONABLE CARE IN PREPARING THIS REPORT, WE CANNOT GUARANTEE THE ACCURACY OF ALL SOURCE INFORMATION CONTAINED HEREIN.

CERTAIN INFORMATION CONTAINED IN THIS REPORT MAY CONSTITUTE "FORWARD - LOOKING STATEMENTS," WHICH CAN BE IDENTIFIED BY THE USE OF TERMINOLOGY SUCH AS "MAY," "WILL," "SHOULD," "EXPECT," "AIM", "ANTICIPATE," "TARGET," "PROJECT," "ESTIMATE," "INTEND," "CONTINUE" OR "BELIEVE," OR THE NEGATIVES THEREOF OR OTHER VARIATIONS THEREON OR COMPARABLE TERMINOLOGY. ANY FORWARD-LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION ARE BASED UPON CURRENT ASSUMPTIONS. CHANGES TO ANY ASSUMPTIONS MAY HAVE A MATERIAL IMPACT ON FORWARD - LOOKING STATEMENTS, FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS. ACTUAL RESULTS MAY THEREFORE BE MATERIALLY DIFFERENT FROM ANY FORECASTS, PROJECTIONS, VALUATIONS, OR RESULTS IN THIS PRESENTATION.

PERFORMANCE DATA CONTAINED HEREIN REPRESENT PAST PERFORMANCE. PAST PERFORMANCE IS NO GUARANTEE OF FUTURE RESULTS.

**MEMORANDUM**

**TO:** Oakland Police and Fire Retirement System (OPFRS)  
**FROM:** Meketa Investment Group  
**DATE:** April 28, 2021  
**RE:** Manager Fee Comparison

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**Summary**

Meketa conducted a fee analysis of OPFRS current public market investment managers and reviewed the reasonableness of their management fees. To evaluate each manager's fee, Meketa considered the following:

- (i) fees of managers of similar size managed in the same style and
- (ii) the structure of the account.

**Finding<sup>1</sup>**

Generally, OPFRS public market manager fees are highly competitive for the size and type of each mandate. For OPFRS, 8 of its 14 public fund managers/ strategies rank in median or better (lowest fees), representing approximately 79% of the total assets reviewed as of December 31, 2020. Three of OPFRS fourteen public market managers, Rice Hall James, SGA, and the DDJ High Yield/Bank Loan strategy, currently ranks in the 4th quartile (highest fees). Meketa would note that DDJ was compared to the broad High yield universe. The other two strategies- Covered Calls, both managed by Parametric do not have a broad enough peer universe for fees comparison.

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<sup>1</sup> Values used for Brown Advisory and Wellington are estimates based on the market value of funding sources as of 3/31/2021. Both manager mandates were funded at the beginning of April 2021.



Investment Manager Fees Review						
Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee	Fee Rank	Median Fee
<b>Total Plan</b>		<b>\$443,301,351</b>	<b>\$1,262,332</b>	<b>0.29%</b>		
<b>Domestic Equity</b>		<b>\$202,337,790</b>	<b>\$561,932</b>	<b>0.28%</b>		
Northern Trust Russell 1000	0.02% of Assets	\$11,018,819	\$22,204	0.02%	1	0.06%
	1.00% of First 10.0 Mil, <sup>ii</sup>					
EARNEST Partners	0.75% of Next 15.0 Mil, <sup>ii</sup>	\$44,905,705	\$331,934	0.74%		0.81%
	0.60% Thereafter				25	
Brown Advisory	0.85% of Assets	\$10,466,133	\$88,962	0.85%	34	0.95%
Rice Hall James	1.00% of Assets	\$16,255,728	\$162,557	1.00%	80	0.90%
iShares Edge MSCI Min Vol	0.15% of Assets	\$19,691,405	\$29,537	0.15%	8	0.48%
<b>International Equity</b>		<b>\$56,681,628</b>	<b>\$346,750</b>	<b>0.62%</b>		
Vanguard Developed Markets ETF	0.05% of Assets	\$16,445,220	\$8,223	0.05%	1	0.12%
SGA ACWI ex-U.S. Equity	0.85% of Assets	\$39,826,795	\$338,528	0.85%	79	0.72%
<b>Fixed Income</b>		<b>\$113,419,761</b>	<b>\$215,040</b>	<b>0.19%</b>		
Ramirez	0.20% of Assets	\$77,199,344	\$154,399	0.20%	3	0.30%
Reams	0.20% of Assets	\$28,845,472	\$57,691	0.20%	3	0.30%
Wellington Core Bond <sup>ii</sup>	0.12% of Assets	\$7,374,902	\$8,850	0.12%	3	0.30%
<b>Credit</b>		<b>\$8,901,168</b>	<b>\$57,858</b>	<b>0.65%</b>		
DDJ Capital	0.65% of Assets	\$8,901,168	\$57,858	0.65%	80	0.55%
<b>Covered Calls</b>		<b>\$35,002,226</b>	<b>\$71,544</b>	<b>0.20%</b>		
	0.30% of First 0.0 Mil, <sup>ii</sup>					
Parametric BXM	0.25% of Next 0.0 Mil, <sup>ii</sup>	\$15,599,360	\$27,344	0.18%		
	0.20% of Next 0.0 Mil, <sup>ii</sup>					
	0.18% Thereafter					
	0.39% of First 0.0 Mil, <sup>ii</sup>					
Parametric DeltaShift	0.33% of Next 0.0 Mil, <sup>ii</sup>	\$19,402,866	\$44,200	0.23%		
	0.26% of Next 0.0 Mil, <sup>ii</sup>					
	0.23% Thereafter					
<b>Crisis Risk Offset</b>		<b>\$18,417,784</b>	<b>\$9,209</b>	<b>0.05%</b>		
Vanguard Long-Term Treasury ETF	0.05% of Assets	\$18,417,784	\$9,209	0.05%	1	0.20%
<b>Cash</b>		<b>\$8,540,995</b>	<b>\$0</b>	<b>0.00%</b>		
Cash		\$2,261,995				
Cash - Treasury		\$6,279,000				
<b>Total</b>		<b>\$442,891,738</b>	<b>\$1,262,332</b>	<b>0.29%</b>		

DS/jls

OAKLAND POLICE AND FIRE RETIREMENT BOARD

CITY OF OAKLAND, CALIFORNIA

RESOLUTION NO. 8014

Approved to  
Form  
and Legality



ON MOTION OF MEMBER \_\_\_\_\_ SECONDED BY MEMBER \_\_\_\_\_

**RESOLUTION EXPRESSING APPRECIATION FOR  
MARGARET O'BRIEN'S LOYAL SERVICE, DEDICATION  
AND VALUABLE CONTRIBUTION AS A MEMBER OF  
THE OAKLAND POLICE AND FIRE RETIREMENT  
SYSTEM BOARD OF ADMINISTRATION AND  
CHAIRPERSON OF THE AD HOC COMMITTEE FOR  
THE OAKLAND POLICE AND FIRE RETIREMENT  
SYSTEMS 2026 ACTUARIAL FUNDING DATE**

**WHEREAS**, Margaret O'Brien was appointed to the Board of Administration of the Oakland Police and Fire Retirement System (PFRS) as the Mayoral Representative in accordance with Section 2601 of the Oakland City Charter commencing on August 22, 2020; and

**WHEREAS**, Margaret O'Brien served as Chairperson of the Ad Hoc Committee for the PFRS 2026 Actuarial Funding Date during her entire term and assisted the Board with its policy decisions; and now, therefore, be it

**RESOLVED:** That the Oakland Police and Fire Retirement System Board does hereby express its appreciation for Margaret O'Brien's loyal service, dedication and valuable contribution as a member of the Oakland Police and Fire Retirement System Board and Chairperson of the Ad Hoc Committee for the PFRS 2026 Actuarial Funding Date; and be it

**FURTHER RESOLVED:** That the members of the Oakland Police and Fire Retirement System Board express their sincere best wishes to Margaret O'Brien for a healthy and prosperous future.

IN BOARD MEETING, VIA ZOOM TELE-CONFERENCE APRIL 28, 2021

PASSED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ATTEST: \_\_\_\_\_  
PRESIDENT

ATTEST: \_\_\_\_\_  
SECRETARY



*Oakland Police & Fire  
Retirement System*

Presented to

*Margaret L. O'Brien*



In recognition & appreciation of your  
dedicated service as a member of the  
Oakland Police & Fire Retirement  
System Board

August 22, 2020 – April 16, 2021

**OAKLAND POLICE AND FIRE RETIREMENT BOARD**

CITY OF OAKLAND, CALIFORNIA

**RESOLUTION NO. 8015**

*Approved to  
Form  
and Legality*



ON MOTION OF MEMBER \_\_\_\_\_ SECONDED BY MEMBER \_\_\_\_\_

**RESOLUTION APPROVING DEATH BENEFIT PAYMENTS  
AND DIRECTING WARRANTS THEREUNDER IN THE  
AMOUNT OF \$1,000.00 PAYABLE TO THE BENEFICIARY OF  
DECEASED MEMBER STEVEN H. TODAR.**

**WHEREAS**, due proof having been received of the death of the person named in Column (1) below, retired member of the Oakland Police or Fire Department, under XXVI of the Charter of the City of Oakland; and

**WHEREAS**, the beneficiary to whom the death benefit provided in Charter Section 2612 is payable, is the person whose name is stated in Column (2) opposite the name of the deceased retired member; and

**WHEREAS**, the amount of said death benefit is stated in Column (3) opposite the name of the beneficiary; now, therefore, be it

**RESOLVED:** That the Retirement Board does hereby approve the Death Benefit payment to the person named in Column (2); and be it

**FURTHER RESOLVED:** That the Director of Finance, be and is hereby directed to draw and sign warrants for the amount in Column (3) payable to the person whose name appears in Column (2):

(1)	(2)	(3)
Name of Deceased Member	Name of Beneficiary	Death Benefit Amount
Steven H. Todar	Sandra Privett-Todar	\$1,000.00

IN BOARD MEETING, VIA ZOOM CONFERENCE \_\_\_\_\_ APRIL 28, 2021

PASSED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ATTEST: \_\_\_\_\_  
PRESIDENT

ATTEST: \_\_\_\_\_  
SECRETARY

**OAKLAND POLICE AND FIRE RETIREMENT BOARD**

CITY OF OAKLAND, CALIFORNIA

**RESOLUTION NO. 8016**

*Approved to  
Form  
and Legality*

ON MOTION OF MEMBER \_\_\_\_\_ SECONDED BY MEMBER \_\_\_\_\_

**RESOLUTION FIXING THE MONTHLY ALLOWANCE OF  
SHIRLEY R. WISEMAN, SURVIVING SPOUSE OF ARTIS S.  
WISEMAN; RETIRED MEMBER OF THE POLICE AND FIRE  
RETIREMENT SYSTEM**

**WHEREAS**, the retired member of the Police and Fire Retirement System, whose name appears in Column (1) below, died on the date shown in Column (2) below; and

**WHEREAS**, the surviving spouse, whose name appears in Column (3) below, does not claim that their spouse's death was by reason of an injury received in, or illness caused by or arising out of the performance of duty; and

**WHEREAS**, there is now presented to this Board, the monthly allowance shown in Column (7) below and as calculated by the Actuary in accordance with Article XXVI of the Charter of the City of Oakland; now, therefore, be it

**RESOLVED:** That the Police and Fire Retirement Board does hereby fix the amounts shown in Column (7) as the monthly allowance that said surviving spouse shall receive beginning on the date shown in Column (4):

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Name of Deceased Member	Date of Death	Name of Surviving Spouse	Effective Date of Allowance	Form of Retirement	% of Compensation Attached to Avg. Rank Held	Monthly Allowance
Artis S. Wiseman	01/26/2021	Shirley R. Wiseman	01/27/2021	Dis	0.3333333	\$4,005.33

IN BOARD MEETING, VIA ZOOM CONFERENCE APRIL 28, 2021

PASSED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSTAIN:

ABSENT:

ATTEST: \_\_\_\_\_  
PRESIDENT

ATTEST: \_\_\_\_\_  
SECRETARY