

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

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.*

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

WEDNESDAY, JULY 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/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/j/82880493983>
- 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 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 AUDIT COMMITTEE MEETING
JULY 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

--- ORDER OF BUSINESS ---

- 1. Subject: Oakland Police and Fire Retirement System (“PFRS”) Audit Committee Meeting Minutes**
From: Staff of the PFRS Board

Recommendation: APPROVE the June 30, 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 May 31, 2021
- 3. REVIEW OF PENDING AUDIT COMMITTEE MEETING AGENDA ITEMS**
- 4. OPEN FORUM**
- 5. FUTURE SCHEDULING**
- 6. ADJOURNMENT**

AN AUDIT/OPERATIONS COMMITTEE REGULAR MEETING of the Oakland Police and Fire Retirement System (“PFRS”) was held on Wednesday, June 30, 2021 via Zoom Webinar.

- Committee Members Present:
- John C. Speakman Chairperson
 - Kevin R. Traylor Member
 - R. Steven Wilkinson Member
- Additional Attendees:
- David Jones PFRS Secretary & Plan Administrator
 - Téir Jenkins PFRS Staff Member
 - Maxine Visaya PFRS Staff Member
 - Jennifer Logue PFRS Legal Counsel
 - Annie Louie Macias Gini & O’Connell, LLP (MGO)

The meeting was called to order at 9:08 a.m. PST

1. **PFRS Audit Committee Meeting Minutes** – Member Traylor made a motion to approve the May 26, 2021 Audit Committee minutes, second by Member Wilkinson. Motion passed.

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

2. **Scope of Services and Initiation of the Financial Audit of the PFRS Fund for the Fiscal Year Ending June 30, 2021** – Annie Louie of Macias Gini & O’Connell, LLP presented an informational report regarding on the scope of services and initiation of the Financial Audit of the PFRS fund for the Fiscal Year ending June 30, 2021. It was noted that there are no significant changes to the scope of services or timeline and a possible hybrid of on-site and remote approach will be utilized to conduct the audit.

MOTION: Member Traylor made a motion to accept the informational report regarding the scope of services and initiation of the Financial Audit of the PFRS fund for the Fiscal Year ending June 30, 2021 and forward to the Full Board for approval, second by Member Wilkinson. Motion passed.

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

3. **Administrative Expenses Report** – Staff Member Jenkins presented an informational report on PFRS’s administrative expenditures as of April 30, 2021. PFRS has an approved budget of approximately \$3.5 million and have expensed just over \$2 million fiscal year-to-date. Membership consisted of 732 retired members, which included 441 Police Members and 291 Fire Members.

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

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

4. **PFRS Member Verification** – Staff Member Jenkins provided an informational report regarding the scope and status of the annual PFRS Member Verification Project. Chairperson Speakman provided an update on the notification of dues paying members of Local 55 and Member Nichelini provided an update on notification to ROPOA Members.

MOTION: Member Wilkinson made a motion to accept the informational report regarding the annual PFRS Member Verification project 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)

5. **Review of Pending Audit Committee Meeting Agenda Items** – Plan Administrator Jones reported on the two (2) pending items on the Audit Committee Agenda. Item 1) 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 and normal operations resume this item will move forward; Item 2) Monitoring & Updates regarding upcoming City Council Agendas with scheduled discussions of the 2026 Actuarial Funding Date is ongoing and there are no updates to report at this time, but will convey any updates as we are informed.
6. **Open Forum** – No Report
7. **Future Scheduling** – The next regular Audit/Operations Committee meeting is tentatively scheduled for July 28, 2021.
8. **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 9:26 a.m. PST

JOHN C. SPEAKMAN, COMMITTEE CHAIRPERSON

DATE

Table 1

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Administrative Budget Spent to Date (Preliminary)

As of May 31, 2021

	Approved Budget		May 2021		FYTD		Remaining		Percent Remaining	
Internal Administrative Costs										
PFRS Staff Salaries	\$	1,200,000	\$	81,087	\$	977,503	\$	222,497		18.5%
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		765		13,040		26,960		67.4%
Internal Service Fees (ISF)		88,000		-		74,893		13,107		14.9%
Contract Services Contingency		50,000		-		1,200		48,800		97.6%
Internal Administrative Costs Subtotal :	\$	1,505,600	\$	81,851	\$	1,066,747	\$	438,853		29.1%
Actuary and Accounting Services										
Audit	\$	45,000	\$	-	\$	45,000	\$	-		0.0%
Actuary		46,500		-		19,897		26,604		57.2%
Actuary and Accounting Subtotal:	\$	91,500	\$	-	\$	64,897	\$	26,604		29.1%
Legal Services										
City Attorney Salaries	\$	188,000	\$	16,036	\$	167,890	\$	20,110		10.7%
Legal Contingency		150,000		-		-		150,000		100.0%
Legal Services Subtotal:	\$	338,000	\$	16,036	\$	167,890	\$	170,110		50.3%
Investment Services										
Money Manager Fees	\$	1,353,000	\$	31,093	\$	806,038	\$	546,962		40.4%
Custodial Fee		124,000		29,125		87,375		36,625		29.5%
Investment Consultant		100,000		-		75,000		25,000		25.0%
Investment Subtotal:	\$	1,577,000	\$	60,218	\$	968,413	\$	608,587		38.6%
Total Operating Budget	\$	3,512,100	\$	158,105	\$	2,267,946	\$	1,244,154		35.42%

Table 2

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Cash in Treasury (Fund 7100) - Preliminary

As of May 31, 2021

	May 2021
Beginning Cash as of 4/30/2021	\$ 6,249,579
Additions:	
City Pension Contribution - May	\$ 3,637,333
Investment Draw	\$ 1,000,000
Misc. Receipts	1,037
Total Additions:	\$ 4,638,371
Deductions:	
Pension Payment (April Pension Paid on 5/1/2021)	(4,346,605)
Expenditures Paid	(223,379)
Total Deductions	\$ (4,569,985)
 Ending Cash Balance as of 5/31/2021*	 \$ 6,317,964

* On 6/1/2021, May pension payment of appx \$4,328,000 will be made leaving a cash balance of \$1,990,000

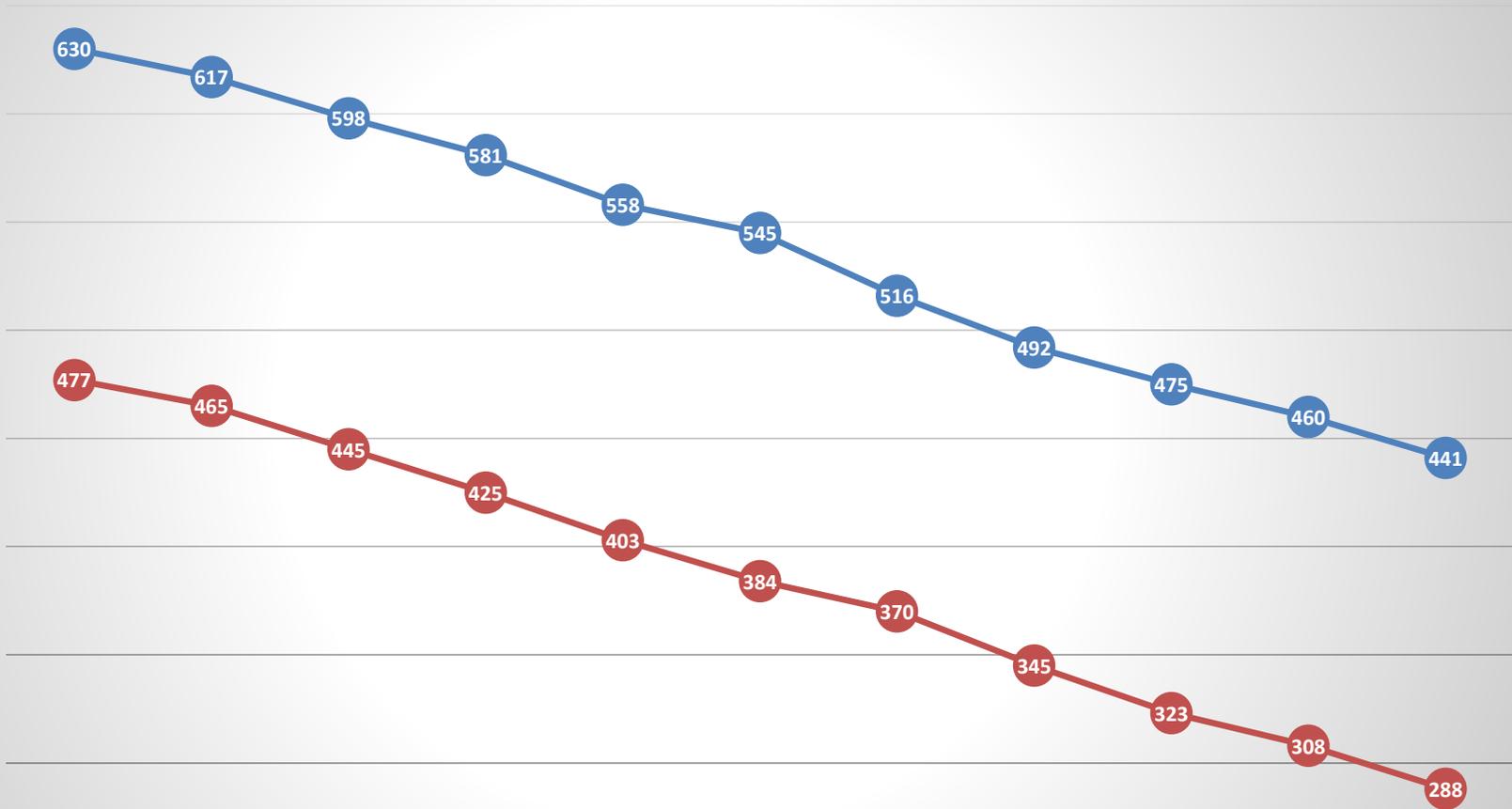
Table 3
CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Census
As of May 31, 2021

COMPOSITION	POLICE	FIRE	TOTAL
Retired Member:			
Retiree	320	184	504
Beneficiary	121	104	225
<i>Total Retired Members</i>	441	288	729
<i>Total Membership:</i>	441	288	729

COMPOSITION	POLICE	FIRE	TOTAL
Retired Member:			
Service Retirement	294	144	438
Disability Retirement	135	131	266
Death Allowance	12	13	25
<i>Total Retired Members:</i>	441	288	729
<i>Total Membership as of May 31, 2021:</i>	441	288	729
<i>Total Membership as of June 30, 2020:</i>	460	308	768
<i>Annual Difference:</i>	-19	-20	-39

Oakland Police and Fire Retirement System Pension Plan Membership Count As of May 31, 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	441
Fire	477	465	445	425	403	384	370	345	323	308	288
Total	1107	1082	1043	1006	961	929	886	837	798	768	729



AGENDA REPORT

TO: Oakland Police and Fire
Retirement System Board (PFRS)

FROM: David Jones
Plan Administrator

SUBJECT: Audit Committee Agenda
Pending List

DATE: July 28, 2021

	SUBJECT	TENTATIVE SCHEDULED MTG DATE	STATUS
1	Staff Review of the 2006 Management Audit	TBD	Pending
2	Monitor & Update PFRS Board of Upcoming City Council Agendas Regarding Discussion of the 2026 Actuarial Funding Date	Ongoing	Ongoing

Respectfully submitted,

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

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**

AGENDA

INVESTMENT COMMITTEE MEMBERS

Jaime T. Godfrey
Chairperson

R. Steve Wilkinson
Member

Robert W. Nichelini
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 Investment Committee does not reach quorum, this meeting is noticed as an informational meeting between staff and the Chair of the Investment Committee.*

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

WEDNESDAY, JULY 28, 2021

10:00 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/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/j/82880493983>
- Webinar ID: 828 8049 3983.
If asked for a participant ID or code, press #.

PUBLIC COMMENTS

There are three ways to submit public comments.

- To send your comment directly to staff BEFORE the meeting starts, please email to 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 INVESTMENT COMMITTEE MEETING
JULY 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](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

--- ORDER OF BUSINESS ---

- 1. Subject: Police and Fire Retirement System (“PFRS”) Investment Committee Meeting Minutes**
From: Staff of the PFRS Board

Recommendation: APPROVE June 30, 2021 Investment Committee Meeting Minutes
- 2. Subject: Custodial Services Update**
From: Northern Trust Company

Recommendation: RECIEVE Informational Report regarding Custodial Services provided by Northern Trust Company
- 3. Subject: Continuation of Custodial Services provided by Northern Trust Company**
From: Meketa Investment Group

Recommendation: DISCUSS and RECOMMEND BOARD APPROVAL of Committee’s recommended course of action regarding the current contract with Northern Trust Company, PFRS Custodial Services Provider
- 4. Subject: Investment Market Overview as of June 30, 2021**
From: Meketa Investment Group

Recommendation: ACCEPT informational report regarding the Global Investment Markets as of June 30, 2021
- 5. Subject: Preliminary Investment Fund Performance Update as of June 30, 2021**
From: Meketa Investment Group

Recommendation: ACCEPT informational report regarding the Preliminary Investment Fund Performance update as of June 30, 2021

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

6. **Subject:** Informational Overview Regarding Inflation
From: Meketa Investment Group
-
- Recommendation:** **ACCEPT** informational overview regarding inflation
7. **Subject:** Asset Allocation Review and Update of the PFRS Fund
From: Meketa Investment Group
-
- Recommendation:** **ACCEPT and DISCUSS** the informational report regarding the asset allocation review of the PFRS Fund and **RECOMMEND BOARD APPROVAL** of Committee's recommended changes to PFRS Investment Portfolio Target Allocation
8. **Schedule of Pending Investment Committee Meeting Agenda Items**
9. **Open Forum**
10. **Future Scheduling**
11. **Adjournment**

AN INVESTMENT AND FINANCIAL MATTERS COMMITTEE REGULAR MEETING of the Oakland Police and Fire Retirement System (“PFRS”) was held Wednesday, June 30, 2021 via Zoom Webinar.

Committee Members:	<ul style="list-style-type: none">▪ Jamie T. Godfrey▪ R. Steven Wilkinson▪ Robert W. Nichelini	Chairperson Member Member (joined meeting at 9:34 a.m.)
Additional Attendees:	<ul style="list-style-type: none">▪ David Jones▪ Jennifer Logue▪ Teir Jenkins▪ Maxine Visaya▪ David Sancewich▪ Sidney Kawanguzi▪ Paola Nealon▪ James Stafford▪ Chip Reed▪ Bill Lynch▪ Adrian Meli▪ Vinh Hinh▪ Jon Moody▪ Paul Foster▪ Brian White▪ Akin Greville▪ Alison Twiss▪ Peter Fisher	PFRS Secretary & Plan Administrator PFRS Legal Counsel PFRS Staff Member PFRS Staff Member Meketa Investment Group Meketa Investment Group Meketa Investment Group Atlanta Capital Management Co., LLC Atlanta Capital Management Co., LLC Eagle Capital Management, LLC Eagle Capital Management, LLC Eagle Capital Management, LLC The London Company The London Company Wellington Management Company, LLP Wellington Management Company, LLP Wellington Management Company, LLP Wellington Management Company, LLP

The meeting was called to order at 9:31 a.m. PST

1. **Approval of Investment Committee Meeting Minutes** Member Wilkinson made a motion to approve the May 26, 2021 Investment Committee Meeting Minutes, as written, second by Chairperson Godfrey. The motion passed.

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

2. **Prospective Defensive Equity Asset Class Investment Manager Presentations** – David Sancewich of Meketa Investment Group provided a brief introduction and recommend hiring one of the four firms being interviewed today to become the new PFRS Defensive Equity Investment Manager within the U.S. Equity Mandate with an approximate value of \$15 million. The following firms provided presentations to discuss the Defensive Equity Investment Strategy:

- Atlanta Capital Management Co., LLC
- Eagle Capital Management, LLC
- The London Company
- Wellington Management Company, LLP

Each firm's presentation included a firm overview, values statement, Diversity & Inclusion Policy and Practices, Environmental, Social, and Governance (ESG) policy and practices, performance, and detailed investment strategies.

MOTION: No action was taken on this item.

3. **Selection of New Defensive Equity Asset Class Investment Manager** – David Sancewich and Paola Nealon of Meketa Investment Group answered questions and provided an informational report of the finalists' summary comparisons, performance comparisons, and fee comparisons.

MOTION: Chairperson Godfrey made a motion to select Wellington Management Company as the new PFRS Defensive Equity Investment Manager with the stipulation we receive confirmation from the firm of US Limited Partnership and receive a reduction of fees considering we currently have an existing relationship and forward to the Full Board for approval, second by Member Nichelini. The motion passed.

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

4. **Investment Market Overview as of May 31, 2021** – In the interest of time, Chairperson Godfrey recommended that this item be heard at the Full Board meeting.

MOTION: Chairperson Godfrey made a motion to move this item to the Full Board, 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 May 31, 2021** – In the interest of time, Chairperson Godfrey recommended that this item be heard at the Full Board meeting.

MOTION: Chairperson Godfrey made a motion to move this item to the Full Board, second by Member Wilkinson. Motion passed.

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

6. **\$13.9 Million Drawdown for Member Allowances Quarter Ending September 30,2021** – In the interest of time, Chairperson Godfrey recommended that this item be heard at the Full Board meeting.

MOTION: Chairperson Godfrey made a motion to move this item to the Full Board, second by Member Wilkinson. Motion passed.

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

7. **Schedule of Pending Investment Committee Meeting Agenda Items** – David Sancewich of Meketa Investment Group presented the 2021 Ongoing Strategic Investment Agenda for discussion and updates to the adjusted timing of upcoming items. No additional changes, additions, or questions were presented in respect to the proposed strategic agenda.

8. **Open Forum** – David Sancewich of Meketa Investment Group provided a team update announcing the departure of Sidney Kawanguzi. Committee Members & Staff congratulated Sidney and expressed appreciation for Sidney’s commitment, hard work, attention to detail, and being extremely responsive to the needs of the PFRS Board, Committee Members, and Staff.
9. **Future Scheduling** – The next Regular Investment Committee Meeting is tentatively scheduled for July 28, 2021.
10. **Adjournment** – Member Nichelini made a motion to adjourn, second by Member Wilkinson. Motion passed.

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

The meeting adjourned at 12:39 p.m. PST

JAMIE T. GODFREY, COMMITTEE CHAIRPERSON

DATE

ASSET SERVICING

Northern Trust Relationship Review

Prepared for: CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM,

July 28, 2021

Claudiu Besoaga
Vice President
Sr. Relationship Manager,



NORTHERN TRUST

NORTHERN TRUST

Founded in Chicago, we have been providing client-centric financial solutions for more than 130 years

FROM 1889...



...TODAY



NORTHERN
TRUST

BRAND STRENGTH BUILT UPON OUR HERITAGE

- Our vision is to be our clients' **most trusted financial partner**, delivering industry-leading capabilities through **exceptional people** and **innovative technology**
- Consistently creating **long-term value**, making a **positive difference** to our shareholders, clients, employees and our global communities

Focused on our
core businesses

A history of
organic growth

Distinctive
financial
strength

Conservative yet
flexible business
model

Record of
managing long-
term profitable
growth

One of the most
highly respected
institutions in the
world

CLIENT-CENTRIC, FOCUSED BUSINESS MODEL

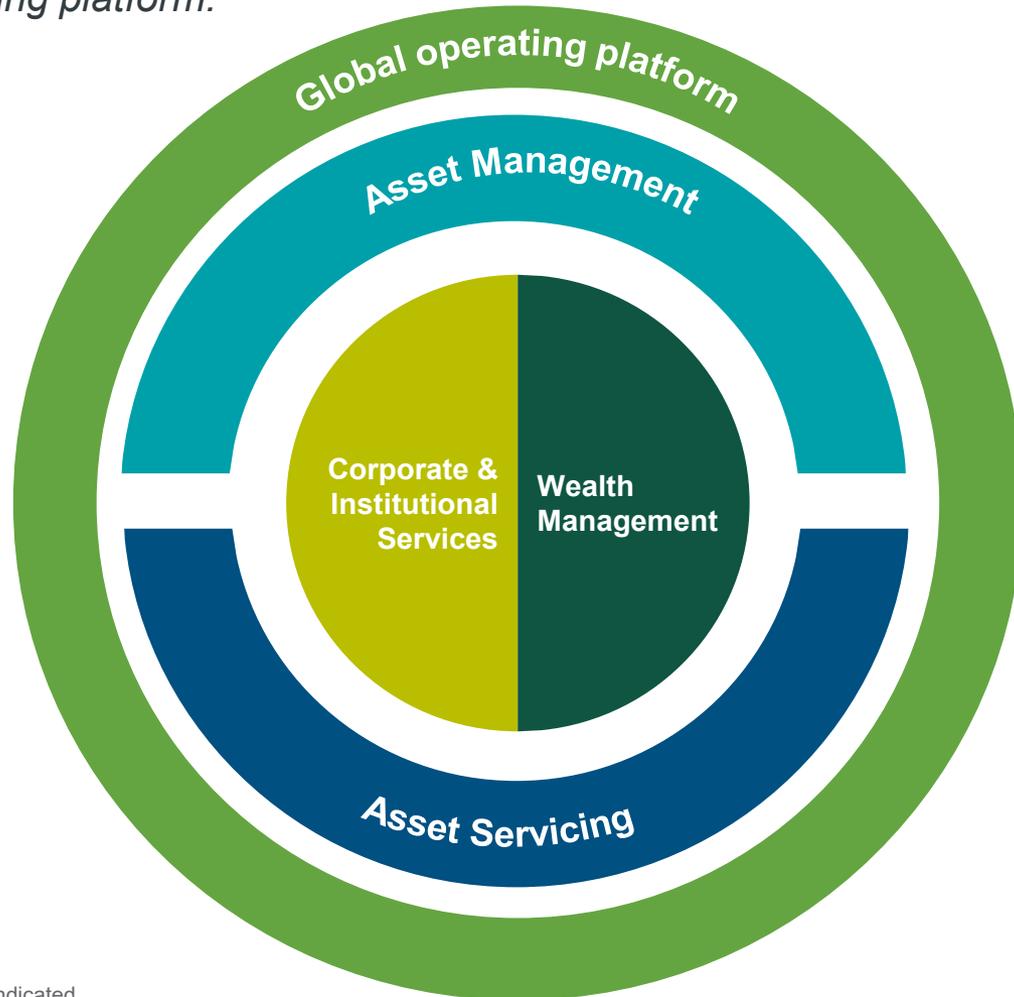
Asset servicing, asset management and banking for personal and institutional clients, supported by our integrated operating platform.

Corporate & Institutional Services

- Insurance companies
- Pensions
- Sovereign entities
- Fund managers
- Foundations and endowments

Wealth Management

- Individuals
- Families
- Family offices
- Foundation
- Endowments
- Privately held businesses



\$11.5 trillion
assets under custody

\$1.4 trillion
assets under management

\$14.8 trillion
assets under custody/administration

Figures as of March 31, 2021 unless otherwise indicated
(*Amounts shown are in U.S. Dollars)
Source: Northern Trust

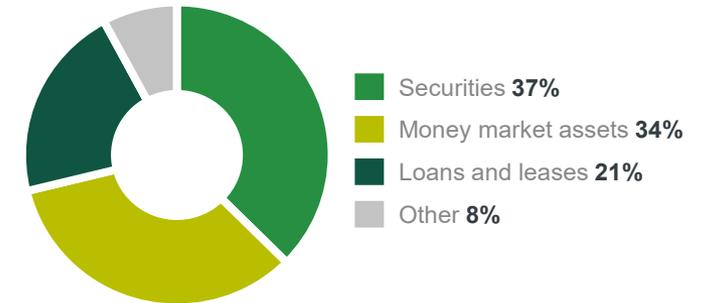
OUTSTANDING FINANCIAL STRENGTH AND STABILITY

Well-positioned for continued investment in our business, across all market cycles

STRONG CAPITAL POSITION

Northern Trust Corporation Capital Ratios	1Q21	Minimum Capital Ratios
Advanced Approach		
Common Equity Tier 1	12.8%	4.5%
Tier 1	14.0%	6.0%
Total	15.2%	8.0%
Tier 1 Leverage	6.9%	4.0%
Supplementary Leverage	8.1%	3.0%
Standardized Approach		
Common Equity Tier 1	12.0%	4.5%
Tier 1	13.0%	6.0%
Total	14.5%	8.0%
Tier 1 Leverage	6.9%	4.0%

HIGH QUALITY BALANCE SHEET



▲ *Balance sheet is highly liquid and low risk*

SUPERIOR CREDIT RATING

	Standard & Poor's	Moody's	Fitch Ratings	DBRS
Northern Trust Corporation				
Short-Term/Commercial Paper	A-1	No Rating*	F1+	R-1 (middle)
Long-Term/Senior Debt	A+	A2	A+	AA (low)
The Northern Trust Company				
Short-Term/Deposits	A-1+	P-1	F1+	R-1 (high)
Long-Term/Deposits	AA-	Aa2	AA	AA

◀ *Standard & Poor's assigned the highest credit ratings of any comparable U.S.-based bank to our Corporation and main bank subsidiary, The Northern Trust Company.*

¹ All figures as of March 31, 2021. Capital ratios are preliminary until regulatory reports have been filed.

* Rating removed as of September 16, 2016, as Northern Trust does not have an active Commercial Paper Program.

REPRESENTATIVE CALIFORNIA CLIENTS



165 California clients.

Profile Name	City	State
Kern County Employees Retirement Association	Bakersfield	CA
Contra Costa County Employees' Retirement Association	Concord	CA
City of Fresno Retirement Systems	Fresno	CA
Fresno County Employees Retirement Assoc.	Fresno	CA
St. Joseph Health System	Irvine	CA
City of Los Angeles Fire and Police	Los Angeles	CA
Los Angeles Water & Power Employees' Retirement	Los Angeles	CA
Los Angeles City Retirement Emp System	Los Angeles	CA
Merced County Employees Retirement Association	Merced	CA
Stanislaus County Employees' Retirement Association	Modesto	CA
Alameda-Contra Costa Transit District	Oakland	CA
San Mateo County Employees Retirement Association	Redwood City	CA
Sacramento Regional Transit District	Sacramento	CA
County of San Diego Department of Treasurer	San Diego	CA
San Diego County Employees' Retirement Association	San Diego	CA
San Francisco Retiree Health Care Trust	San Francisco	CA
California County of Orange	Santa Ana	CA
San Joaquin Employees Retirement Association	Stockton	CA
Motion Pictures Industry Pension & Health	Studio City	CA

CORPORATE & INSTITUTIONAL SERVICES

Custody Services

EXPERTISE IN CLIENT SEGMENT

Public Fund Relationships

- Established in 1987
- 200 clients
 - 30% of top 100 public plans
- \$1.1 Trillion AUC
- 30 new clients from 2017 to date

Client Servicing

- 27 Client Servicing Professionals
 - Average of 18 years of relationship management experience
 - Average of 13 years with Northern Trust
- 15% increase in servicing staff over last 3 years

Commitment to Asset Servicing

- Derived 78% of total revenue from fee-based, non-interest activities related to asset servicing
- Technology:
 - 2018-2020: USD \$3.1 billion
 - 2021-2023: Estimated USD \$3.5 billion

Public Fund Gains & Losses

CLIENTS GAINED

CLIENTS LOST

Year	Number of Clients	Year	Number of Clients
2020–2021 to-date	9	2020	1
2019	6	2019	0
2017 - 2018	15	2017 - 2018	1

Legal

- No litigation on FX practices
- No pay to play actions/investigations
- No DOJ actions

RELATIONSHIP TEAM: ALWAYS FOCUSED ON YOU

CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Senior management oversight

Jeffrey Porta Practice Lead – Public Funds	312-557-0474 JMP6@ntrs.com	Patti Somerville-Koulouris Manager – Public Funds	312-444-2357 PS66@ntrs.com
--	-------------------------------	---	-------------------------------

Relationship management

Claudiu Besoaga Relationship Manager	312-557-4049 CB73@ntrs.com	Gerald Sinish Jr. Back-Up Relationship Manager	312-444-5733 GS60@ntrs.com
--	-------------------------------	--	-------------------------------



Client service team

Don Anderson Securities Lending	312-444-5386 DSA3@ntrs.com	Tamara Doi Beck Asset Management	303-335-1416 TDB7@ntrs.com
---	-------------------------------	--	-------------------------------

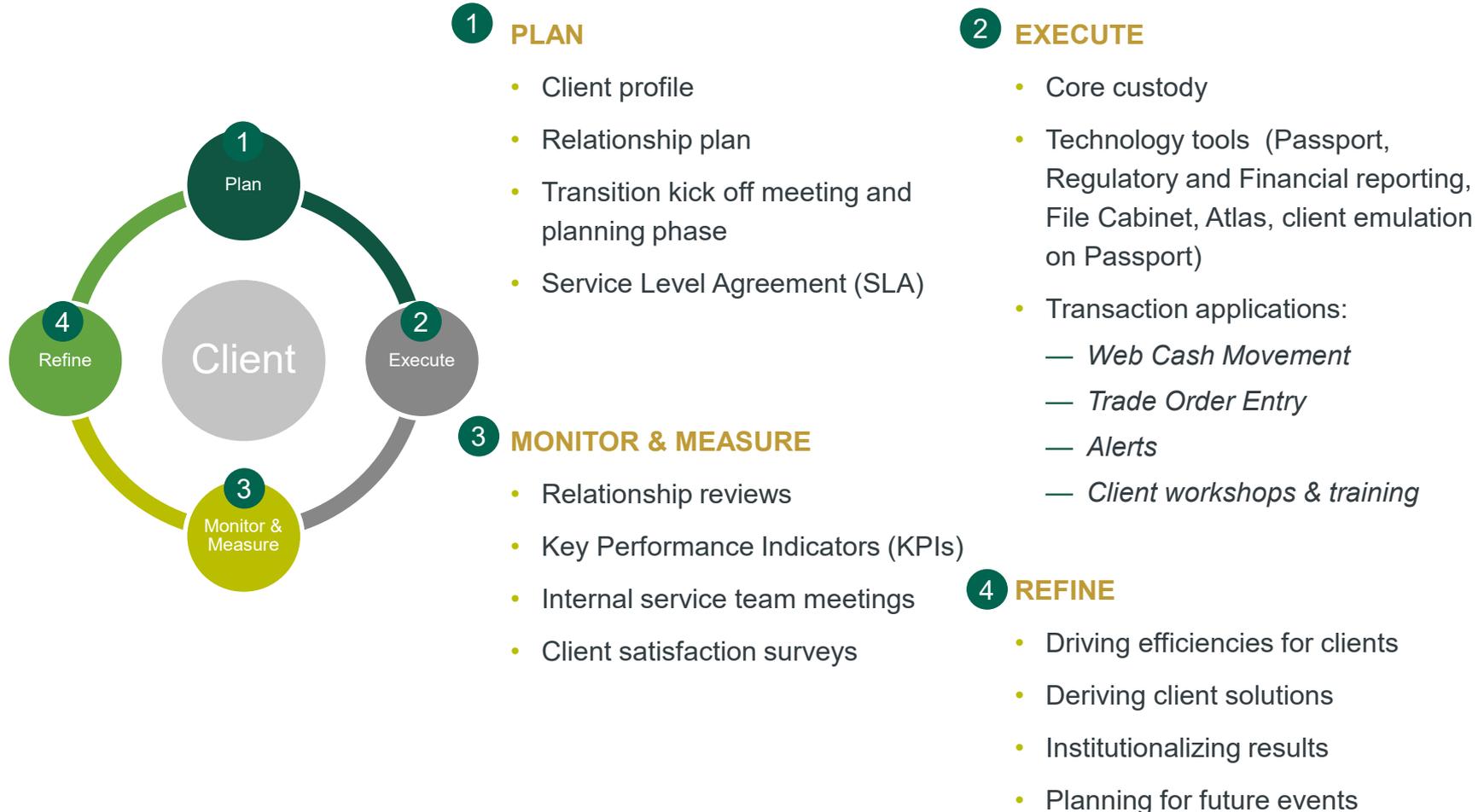
Doug Wells Compliance Monitoring	312-557-2501 DAW2@ntrs.com	Selma Masinovic Account Manager	312-557-0150 SZM63@ntrs.com
--	-------------------------------	---	--------------------------------

Product specialists

Asset pricing and coding	Proxy services	Trade processing	Cash Management
Accounting and regulatory reporting	Investment manager liaison	Income processing	Corporate and class actions
	Tax reclamation	Business continuity and disaster recovery	

SERVICE APPROACH FOR INSTITUTIONAL INVESTORS FOCUSED ON EXECUTION

We apply best practices, operational processes, accounting controls, and a discipline in managing relationships, supported by expert professionals and innovative technology.

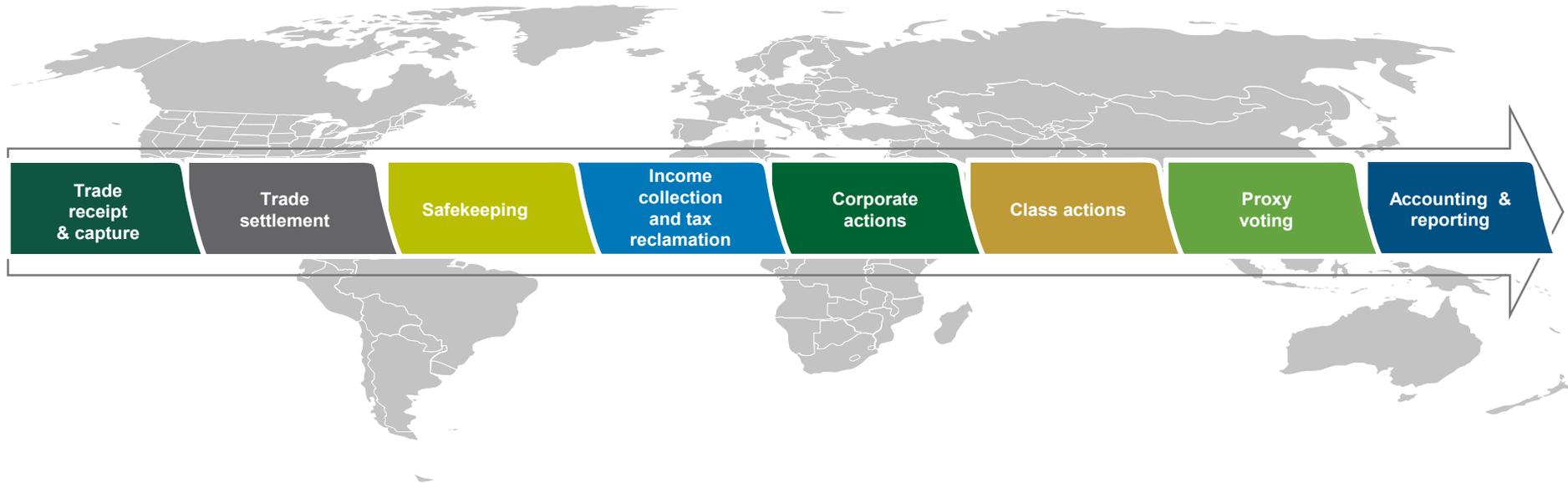


THE COMPLETE SOLUTIONS CONTINUUM

Asset Management	<ul style="list-style-type: none"> • Active management • Alternative Investments • Cash management 	<ul style="list-style-type: none"> • Defined contribution • Equities /fixed income • ESG/SRI 	<ul style="list-style-type: none"> • Factor-based investing • Index management • Outsourced CIO
Asset Servicing	<ul style="list-style-type: none"> • Alternative asset servicing • Collateral management • Derivatives processing 	<ul style="list-style-type: none"> • Fund execution • Entitlement processing • Proxy voting 	<ul style="list-style-type: none"> • Safekeeping • Settlement • Tax reclamation
Capital Markets	<ul style="list-style-type: none"> • Brokerage • Commission management • Foreign exchange 	<ul style="list-style-type: none"> • FX eCommerce/algos • Passive currency overlay • Pooled fund transitions 	<ul style="list-style-type: none"> • Securities lending • Third party lending • Transition management
Data	<ul style="list-style-type: none"> • Compliance monitoring • Data aggregation • Financial accounting 	<ul style="list-style-type: none"> • Investment accounting • Performance analytics • Risk analytics 	<ul style="list-style-type: none"> • Transparency analysis • Unitization/plan allocation • Valuation reporting
Fund	<ul style="list-style-type: none"> • Cross-border pooling • Corporate secretarial • Component outsourcing 	<ul style="list-style-type: none"> • Financial reporting • Fund administration • Operations outsourcing 	<ul style="list-style-type: none"> • Tax transparent pooling • Transfer agency • Trustee/depositary
Liquidity	<ul style="list-style-type: none"> • Banking • Cash funds/management • Credit facilities 	<ul style="list-style-type: none"> • Corporate cash services • Deposit placing • Evergreen deposits 	<ul style="list-style-type: none"> • Peer to peer • Repo, reverse repo • Treasury management
Regulatory	<ul style="list-style-type: none"> • EMIR/Dodd Frank FASB • GASB, GAAP • IFRS, APRA, ASCII 	<ul style="list-style-type: none"> • Regulatory reporting • Regulatory returns • Investment oversight 	<ul style="list-style-type: none"> • SORP, nFTK • Solvency II • Transparency analytics
Retirement	<ul style="list-style-type: none"> • Account control agreement • Benefit payments • Contingent assets 	<ul style="list-style-type: none"> • Defined contribution • De-risking support • Fund rebalancing 	<ul style="list-style-type: none"> • Institutional governance • Reservoir trusts • Trapped surplus vehicles

CUSTODY - A COMPREHENSIVE SERVICE SUITE

Northern Trust delivers process efficiencies, automation, scale and flexibility through our comprehensive asset servicing product offering



KEY METRICS FOR CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Over \$457 Million in Assets Under Custody

17 Custody Accounts

Over 221 statements (monthly and annual)

3,019 SECURITY SALES

2,510 SECURITY PURCHASES

7 - SMA
9 - SLA
1 - CASH

7 Funds
CFs, LPs and MFs

1,072 PRINCIPAL PAYDOWN

17,700 CASH TRANSACTIONS

238 OTHER TRANSACTIONS

Activity from 07/01/2020 to 06/30/2021

\$6,899,723.40 Income Collected

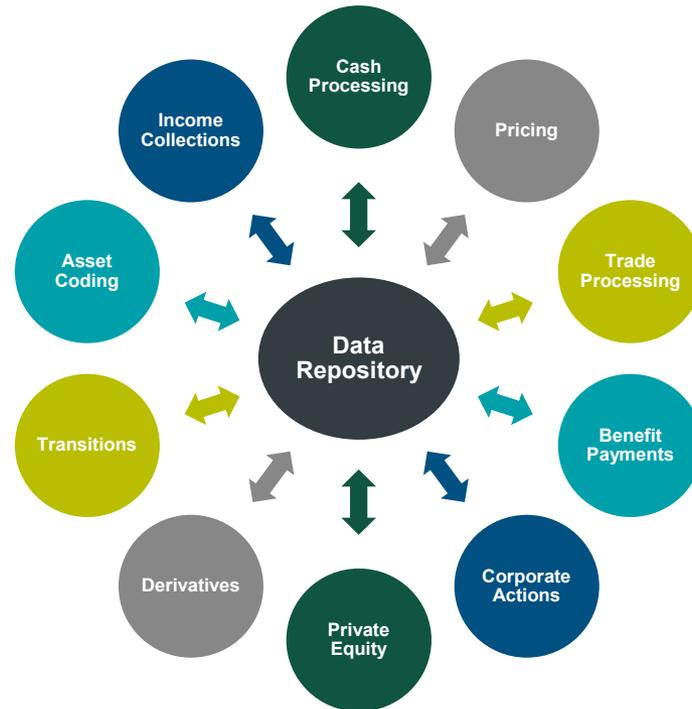
9,084.30 Class Action Proceeds

Filed for 29 Class Actions

CLIENT ACCOUNTING & REPORTING INFORMATION FLOW

Sophisticated Architecture

- Common trade capture for custody and trade services
- Shared utilities benefit all processes and businesses
- An absence of reconciliation by function, platform or geography
- A single data repository

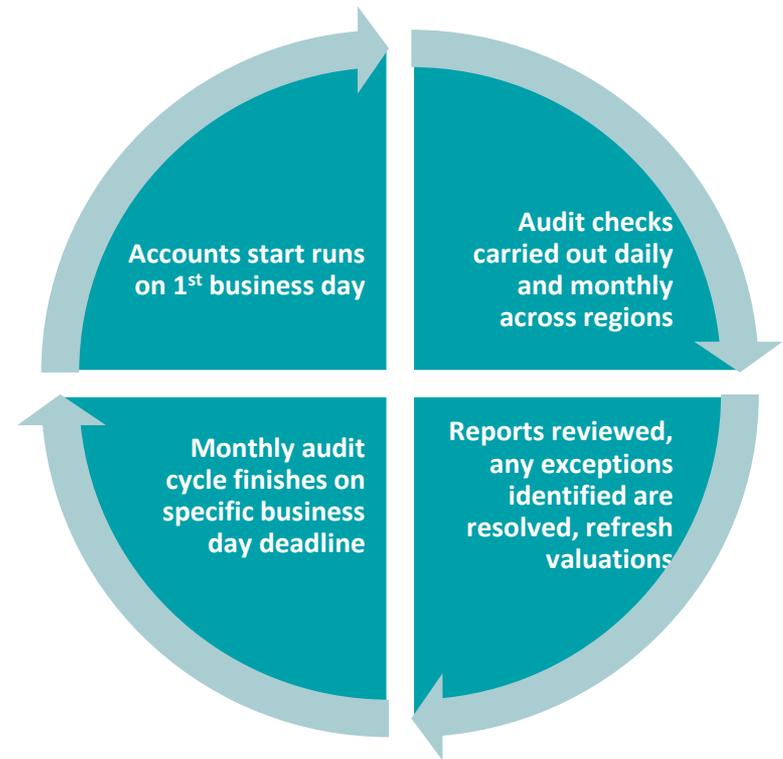
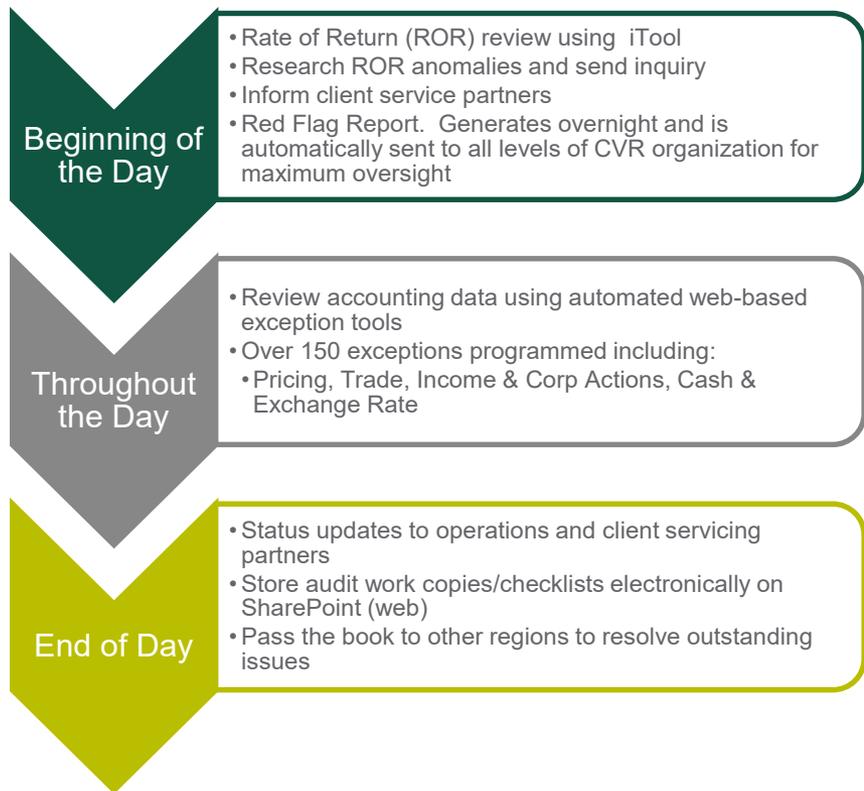


Delivering Exceptional Results

- Faster, more accurate results
- Greater access to our experts
- Ability to focus on more critical/value-added activities
- Greater flexibility on deadlines



DATA REVIEW PROCESS FLOW



Class Action Overview

A DEDICATED TEAM WITH SPECIALIST EXPERTISE

Our dedicated class action group focuses on helping you receive your settlement proceeds for any securities based class actions that has settled in the U.S. or Canadian courts.

As class action lawsuits and settlement funds continue to grow, working with an experienced partner gives you peace of mind that your business interests are being protected.

Comprehensive services for securities litigation that have settled through the U.S. and Canadian courts where claim administration is being handled by U.S. or Canadian claim administrators

Tracking and providing notification of settled lawsuits

Filing claims

Posting disbursements to your portfolios

A team of market specialists oversees the filing and tracking of class action settlement claims

A clear structure providing consistency of approach from beginning to end for audit purposes

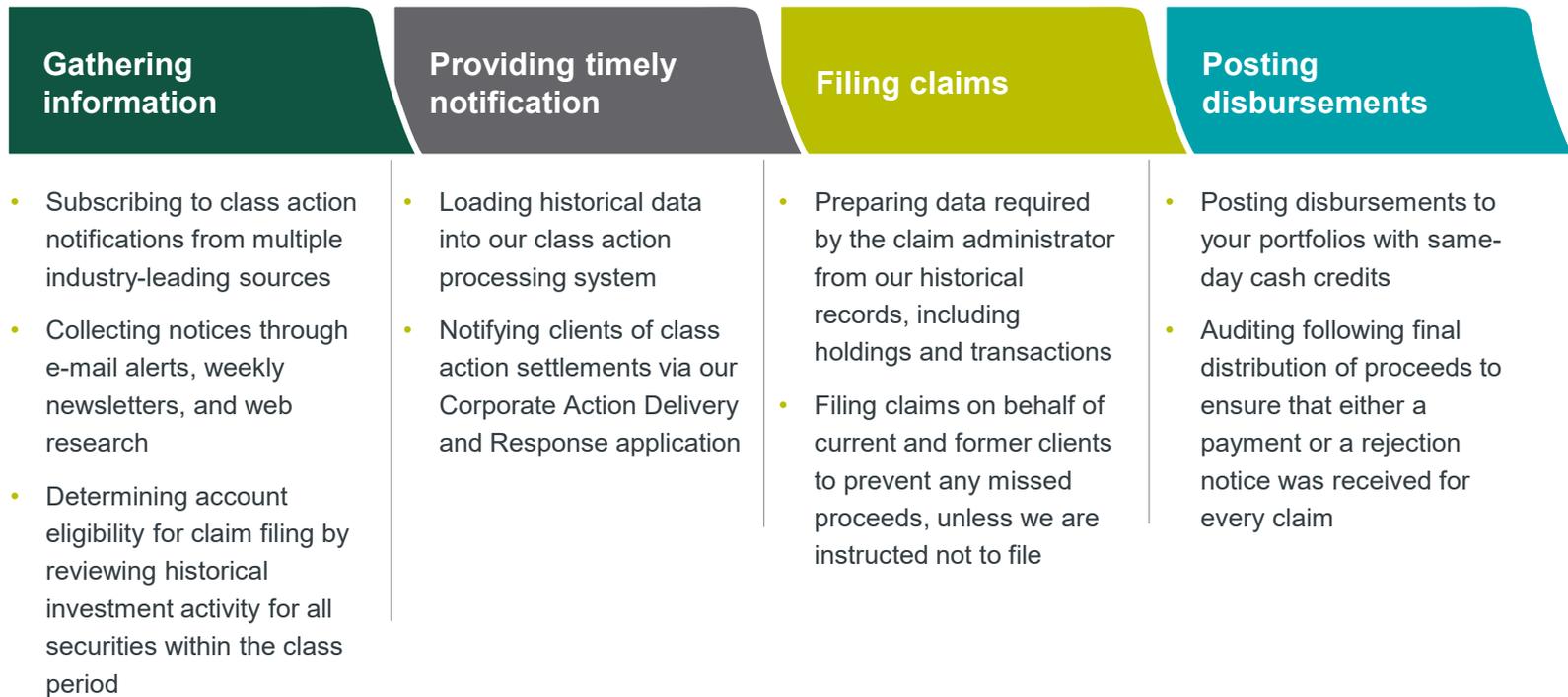
Detailed reporting providing you with information on all class action events that we process delivered via our flexible web portal Northern Trust Passport®

Recent service offerings to cover the rise of class actions outside the U.S. and Canadian courts

CLASS ACTIONS

Our dedicated class action group focuses on helping you receive settlement proceeds for class actions in the U.S., Canada and occasionally the Netherlands.

As class action lawsuits and settlement funds continue to grow, working with an experienced partner gives you peace of mind that your business interests are being protected.



We use multiple industry-leading sources for class action notification to ensure we can quickly identify and notify you of events that impact you. Through our integrated approach, we access and act on information quickly and efficiently on your behalf.

INTERNATIONAL CLASS ACTIONS

Support across multiple markets.



Support international claims filing through two preferred vendors, Broadridge and Institutional Shareholder Services (ISS)

- Covers opt-in jurisdictions such as those in the UK, Germany, Australia (additional markets also covered)
- Clients contract directly with these vendors
- Broadridge or ISS monitor and either prepare filings or file activity on behalf of client for non-US activity custodied at Northern Trust (preparation and filing depends on market)
- Well established data integration with Northern Trust
- Payments can be issued directly to Northern Trust on behalf of the client
- Service covers opt-in legal systems and analysis of the opt-In events provided to client

As at (updated quarterly) Source: Northern Trust

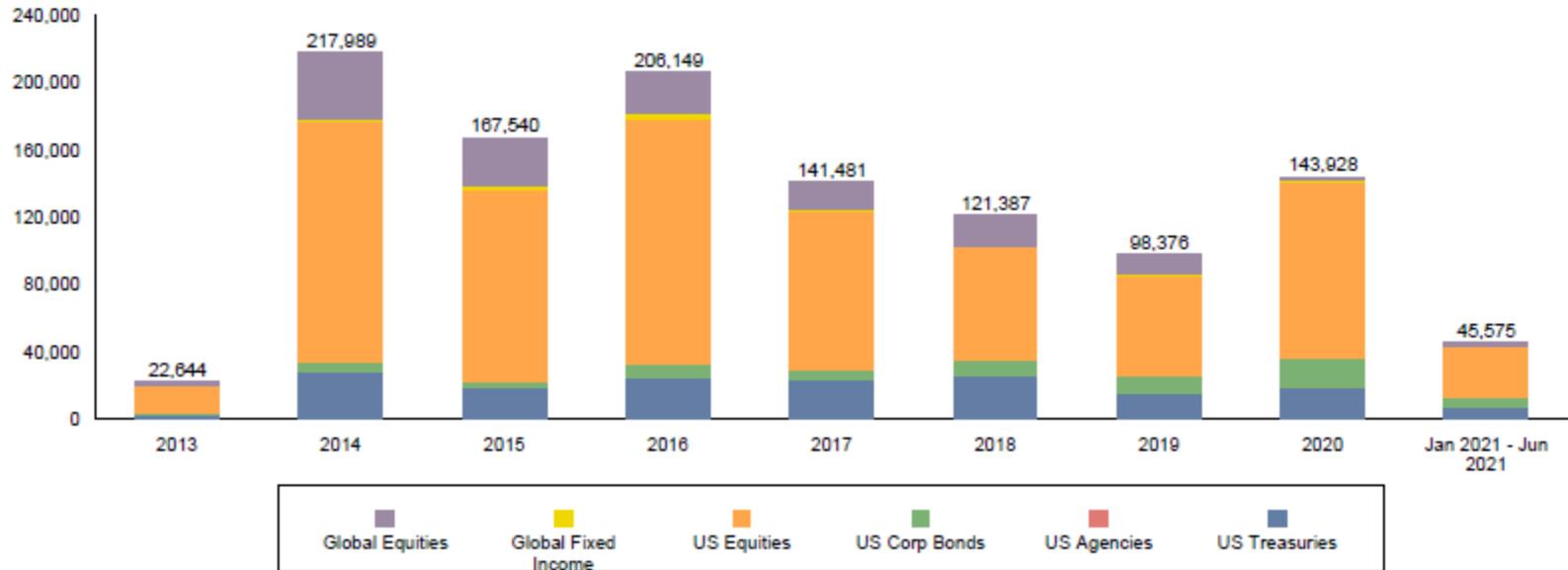
TOTAL NORTHERN TRUST VOLUMES

Year	Events Filed	Events Paid	Total Amount Paid in USD
2008	132	181	\$450,160,604.77
2009	131	283	\$381,734,418.05
2010	169	236	\$297,375,860.59
2011	106	182	\$209,511,012.10
2012	93	190	\$209,885,565.03
2013	107	210	\$124,549,732.15
2014	94	167	\$188,715,911.22
2015	109	125	\$193,368,964.37
2016	130	123	\$109,001,469.32
2017	111	221	\$247,293,494.96
2018	85	178	\$112,920,032.50
2019	103	172	\$290,991,872.62
2020	96	136	\$116,362,371.75

Securities Lending Program

SUMMARY OF LENDING PROGRAM

City of Oakland Police and Fire Retirement System



	2013	2014	2015	2016	2017	2018	2019	2020	2021 YTD	Total
<u>Fee Split*</u>										
70/30										
<u>Cash Collateral Fund</u>										
SL Core STIF										
Gross Revenue	32,314.00	311,156.00	239,042.00	294,233.00	201,908.00	173,261.00	140,446.00	205,554.00	65,076.00	1,662,990.00
Net Revenue	22,644.00	217,989.00	167,540.00	206,149.00	141,481.00	121,387.00	98,376.00	143,928.00	45,575.00	1,165,069.00
Bank Fees	9,670.00	93,167.00	71,502.00	88,084.00	60,427.00	51,874.00	42,070.00	61,626.00	19,501.00	497,921.00

*City of Oakland receiving 70% of the total revenue and Northern Trust receiving 30%

REVENUE BREAKOUT JANUARY 2021 – JUNE 2021

Security Type	Market Value (USD)		% on Loan	Gross Earnings (USD)	On Loan Spread (bp)	Gross BP Return (bp) *	Net Earnings (USD)
	Avg. on Loan	Avg. Available					
US Treasuries	13,190,666	19,013,282	69.4%	9,965	15.0	10.4	6,977
US Agencies	0	641,899	0.0%	0	0.0	0.0	0
US Corp Bonds	7,534,569	32,895,766	22.9%	9,110	24.0	5.5	6,387
US Equities	19,606,128	105,542,971	18.6%	42,657	43.3	8.0	29,870
Global Fixed Income	430,313	1,819,399	23.7%	580	26.8	6.3	407
Global Equities	1,227,415	13,585,022	9.0%	2,763	44.8	4.0	1,936
Total	41,989,091	173,498,339	24.2%	65,076	30.8	7.5	45,575

Account Number	Account Name	Market Value (USD)		% on Loan	Gross Earnings (USD)	On Loan Spread (bp)	Gross BP Return (bp) *	Net Earnings (USD)
		Avg. on Loan	Avg. Available					
2698029	PFRS- VANGUARD FTSE DEV MK ETF	9,918,230	16,812,916	59.0%	12,316	24.7	14.6	8,622
	PFRS03 PFRS - REAM	12,171,972	22,349,411	54.5%	10,736	17.5	9.6	7,519
2686486	*PFRS-RAMIREZ ASSET MANAGEM-SL	8,983,576	32,020,935	28.1%	8,919	19.7	5.5	6,251
2698024	*PFRS - RUSSELL 2000 ETF-SL	289,196	4,145,231	7.0%	6,783	466.5	32.5	4,748
4473903	*PFRS-RICE HALL JAMES-SL	4,854,162	15,723,965	30.9%	6,154	25.2	7.8	4,315
4481520	*PFRS - PARAMETIC RISK PREM-SL	596,439	10,479,209	5.7%	5,784	192.9	11.0	4,049
4486323	*PFRS - LONG DURATION ACCOU-SL	177,512	12,502,564	1.4%	5,104	571.8	8.1	3,573
2698025	*PFRS - EARNEST PARTNERS -SL	3,212,319	43,770,843	7.3%	3,829	23.7	1.7	2,681
4400331	*PFRS - BROWN ADVIS-SL	1,027,031	6,141,257	16.7%	3,292	63.8	10.7	2,306
	PFRS01 PFRS01-PFRS -SGA -SL	758,652	9,552,008	7.9%	2,159	56.6	4.5	1,512
2698022	PFRS-PARAMETRIC (50%) DELTASHI	0	0	0.0%	0	0.0	0.0	0
2698028	PFRS-PARAMETRIC (50%) BXM REP	0	0	0.0%	0	0.0	0.0	0
Total		41,989,091	173,498,339	24.2%	65,076	30.8	7.5	45,575

EXECUTIVE SUMMARY 2021

TOP 10 SECURITIES AND EARNINGS SUMMARY

From 01 Jan 2021 to 30 Jun 2021

Rank	Security ID	Security Name	Net Earnings	Total Spread
1	921943858	VANGUARD FTSE DEVELOPED MARKETS ETF	8,621.80	24.22
2	92206C847	MFC VANGUARD LONG-TERM TREASURY ETF	7,250.47	594.77
3	92206C649	MFC VANGUARD SCOTTSDALE FDS VANGUARD	6,233.59	427.98
4	91282CAE1	UNITED STATES OF AMER TREAS NOTES DTD	1,215.52	18.07
5	91282CBT7	UNITED STATES OF AMER TREAS NOTES DTD	1,145.57	18.59
6	9128282F6	UTD STATES TREAS 1.125% DUE 08-31-2021	867.63	15.02
7	912810SN9	UNITED STATES TREAS BDS 1.25% DUE	726.51	15.67
8	912828ZR4	WI TREASURY SEC .125% DUE 05-31-2022 REG	722.04	14.04
9	53220K504	LIGAND PHARMACEUTICALS INCORPORATED CL B	658.13	74.04
10	48123V102	J2 GLOBAL INC COM	610.32	23.20
Total top 10			28,051.58	39.94
Total Estimated Earnings			45,575.47	30.20
From 01 Jan 2021 To 30 Jun 2021				

The top 10 securities represent 61.55% of the total earnings

TOP 5 BORROWERS

As of 30 Jun 2021

Top 5 Borrowers	Domicile	From 01 Jan 2021 - 30 Jun 2021		30 Jun 2021	
		Net Earnings	% of Net Earnings	As of 30 Jun 2021 Loan Volume	% of Loan Volume
BOFA SECURITIES, INC.	US	17,138.63	37.60 %	22,871,348.34	42.78 %
CITIGROUP GLOBAL MARKETS INC.	US	3,713.10	8.15 %	6,135,668.92	11.48 %
GOLDMAN SACHS & CO. LLC	US	3,604.55	7.91 %	4,326,148.77	8.09 %
SOCIETE GENERALE, NEW YORK BRANCH	US	2,739.78	6.01 %	4,136,685.43	7.74 %
ING FINANCIAL MARKETS LLC	US	1,288.42	2.83 %	3,118,105.53	5.83 %
Total Top 5 Borrowers		28,484.48	62.50 %	40,587,956.99	75.92%
Total All Borrowers	From 01 Jan 2021 to 30 Jun 2021	45,575.47	100 %	53,462,042.83	100%

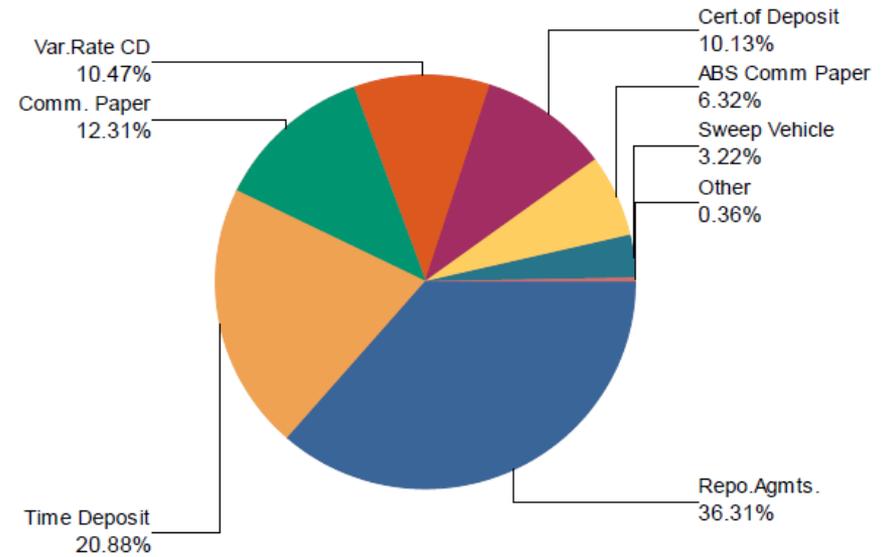
The top 5 borrowers represent 75.92% of the total loan volume

INVESTMENT PROFILE: CORE STIF CASH COLLATERAL FUND

JUNE 30, 2021

Characteristics			
Total Book Value (in USD)	15,238,327,661		
Weighted Average Maturity (Interest Reset Date)	30 Days		
Weighted Average Maturity (Maturity Date)	70 Days		
Average Equivalent Quality Rating			
Total Number of Issues	113		
Quality Distribution		Percentage	
A1+ (SHORT TERM)	77.81%		
A1 (SHORT TERM)	18.6%		
AA- (LONG TERM)	3.22%		
Other	.36%		
Maturity Breakdown Distribution		Interest Reset	Maturity Date
Overnight	66.22%	32.30%	
2 - 15 Days	4.21%	1.57%	
16 - 30 Days	5.67%	5.16%	
31 - 60 Days	5.84%	12.50%	
61 - 97 Days	11.20%	30.97%	
98 - 180 Days	2.45%	7.98%	
181 - 270 Days	1.71%	4.15%	
271 - 366 Days	2.71%	5.01%	
Other	0.00%	0.36%	
Industry/Sector Distribution		Percentage	
Banking Ind.	54.07%		
Broker/Dealer	36.46%		
Finance & Ins	6.81%		
Treasuries	2.30%		
Other	0.36%		

Cash Collateral Asset Class Breakdown



Fund yield as of 6/30/2021 = 22 bps

NOTE: This information was created using the best unaudited data available to us and may not be completely reliable, accurate, or timely. Data is prepared on a settled basis, which may differ from traded basis data on the Cash Collateral Holdings report. "Traded Basis" reflects pending trades.

CORPORATE & INSTITUTIONAL SERVICES

Cybersecurity & Global Technology

NORTHERN TRUST'S APPROACH TO INFORMATION SECURITY

- Strong governance process and culture of risk management
- Layered internal controls and detailed risk management practices
- Business unit compliance with policies, standards and guidelines, and external regulations
- Employees' responsibility for promoting information security to safeguard information
- Comprehensive assessment of 3rd party vendors
- Regular use of third party security teams to assess effectiveness



CYBER THREATS RELATED TO COVID-19

Remote Work

- Attempts to compromise IT infrastructure (e.g. VPN, Citrix, RDP)
- Potentially insecure home computing environment
- Insecure virtual meetings (e.g. Zoom)

Phishing

- Phishing campaigns across all channels (email, SMS, phone calls)
- Used by cyber criminals and nation-state actors
- Themes relate to news covering the pandemic (e.g. economic stimulus)

Scams

- Business Email Compromise (BEC)
- Fraudulent websites (charities, donations, medical supplies)

Disinformation

- Used mostly by nation-state actors
- Aimed to influence spread or spread panic

Cyber Attacks

- Directed at healthcare organizations (e.g. WHO) and hospitals globally
- Increase in ransomware attacks on hospitals

OVERALL CYBER THREAT LANDSCAPE

- New Surveillance Laws

Regulation

- Wide Reaching Impact of New Regulation, e.g. GDPR



Attacks



Evolving Cyber Threat Landscape

People



Technology



- Advanced Persistent Threats
- Nation State Attacks
- Rise in Ransomware
- Undetectable Malware
- Zero Day Exploits
- DDoS Attacks
- Targeting of Critical Infrastructure
- Large Data Breaches

- Social Engineering Attacks (including Persistent Phishing)
- Rise in Insider Threats
- Skills Shortage

- Concentration Risk from a few Dominant Vendors
- Patch Management Problems

- 'Arms-Race' as New Technologies Mature – Artificial Intelligence and Machine Learning
- Increasing Adoption of/Reliance on Cloud

HOW WE PROTECT YOUR DATA – SUMMARY OF PROTECTIONS

Data Protection / Content Security

- Access Management and Certification
- Separation of Duties
- Strict Data Governance on Data In-Use
- End-to-End Encryption (via HTTPS, TLS)
- Encryption on Sensitive Data At-Rest
- Secure online platform for delivery
- Data Loss Prevention (DLP)
- Online Fraud Detection
- VDI, VPN
- Data Exfiltration Controls
- Data Storage Control
- Third Party Risk Management
- Secure Application Development Life

Employees / Culture

- Strong Corporate Culture with Security and Protection as a top priority
- Information Security Training & Awareness Program
- Awareness on leading industry practices for acceptable information security behaviors
- Phishing Simulation for User Awareness

Client Security

- Multifactor Authentication Account Suspension
- Re-authentication
- Client-side Malware Detection
- Restrict Access from Jailbroken and Rooted Devices



Endpoint Security

- Malware Protection
- File & Removable Media Protection
- Application Control (inventory, white/black listing, patch management)
- URL/Website Filtering & Blocking



Network Security

- Security Hardening
- Enterprise-wide Vulnerability and Patch Management
- Intrusion Detection & Prevention
- Malware Prevention & Management
- Vulnerability / Penetration Assessment
- Denial of Service & Botnet Protection
- Privileged Access Management

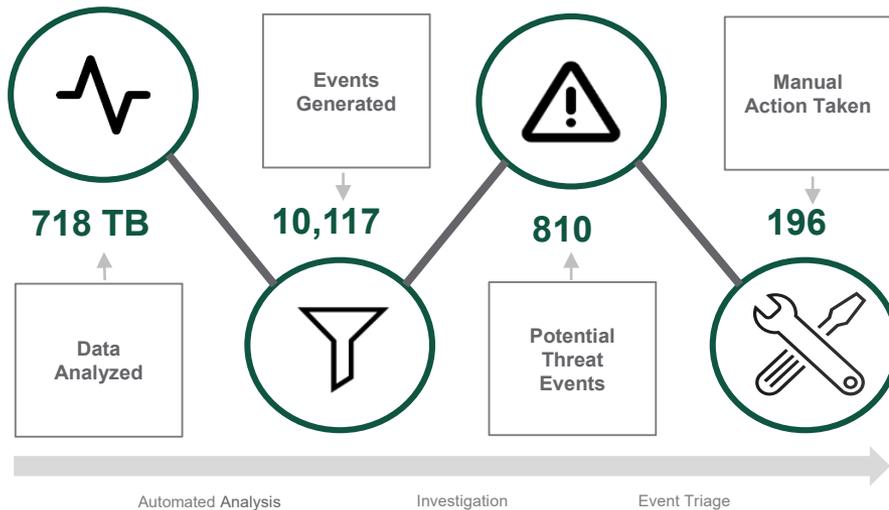


Monitoring & Response Management

- End to End Visibility for Threat Management
- 24x7x365 security monitoring incident response
- Cyber Threat Fusion Program – Enterprise wide incident management
- Cyber Simulations & Resiliency Exercises



CYBER THREAT METRICS – Q1 2021



Cyber Threat Commentary:

- During Q1 2021, Northern Trust’s security systems analyzed approx. 718 Terabytes (718,000 Gigabytes) of data from over 100 separate sources.
- 10,117 events were generated by Northern Trust’s SIEM system and reviewed by our Security team.
- 810 events were classified as potential threats. Most of these events are associated with potentially malicious emails.
- 196 events involved analyst activity in the protection of NT’s systems, e.g., to block malicious email domains.

THE WORLD IN 2021...

By 2020 projections indicate that the amount of digital information in existence will have grown from 3.2 zettabytes today to 40 zettabytes – an increase of 1,150%



25B

SMART DEVICES



\$40B

ANNUAL FINTECH
INVESTMENT



10M

SEMI AND FULL-
AUTONOMOUS
VEHICLES



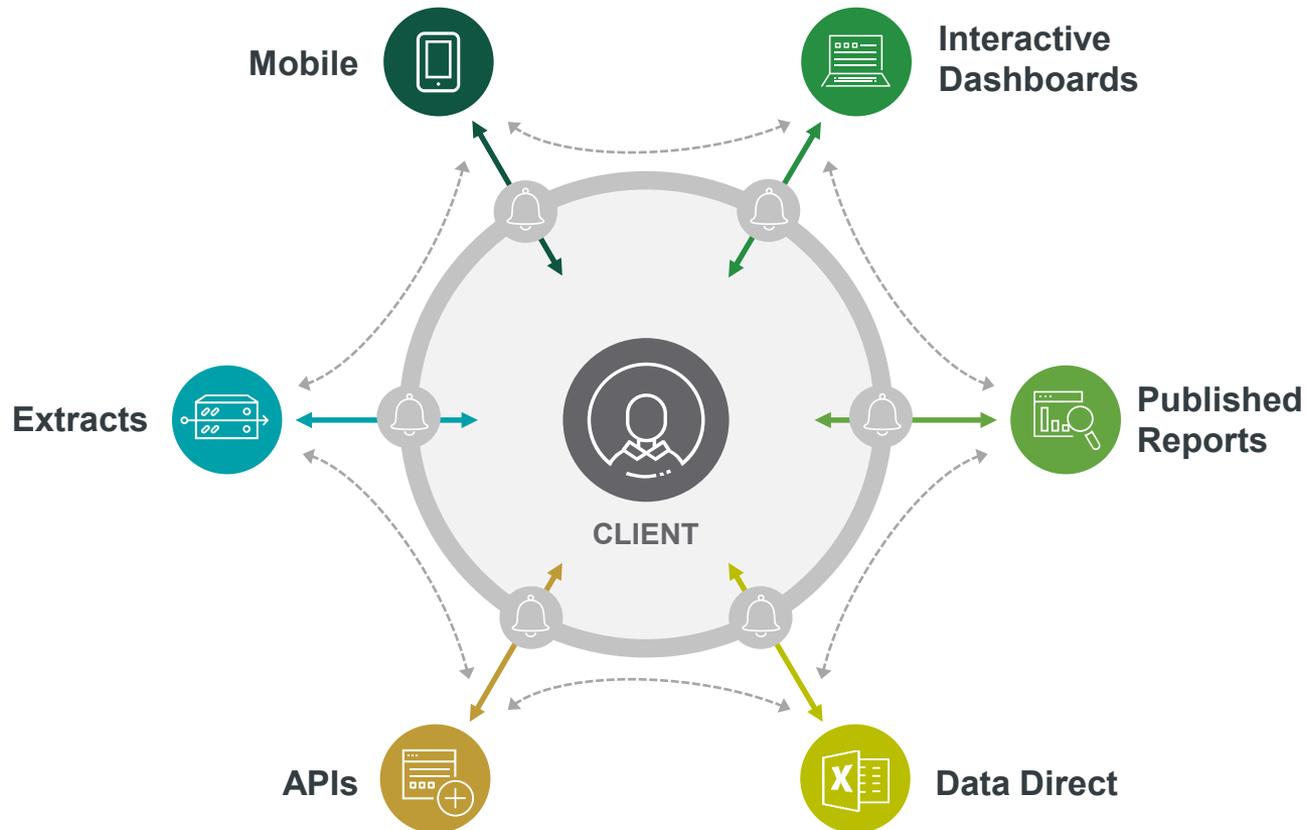
60%

OF DIGITAL
BUSINESSES WILL
SUFFER MAJOR
BREACH

Sources: Gartner, Statista, Business Insider

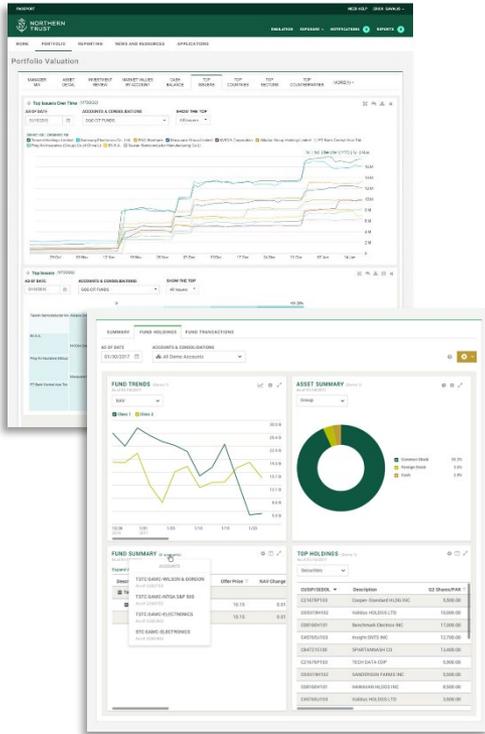
OMNI-CHANNEL DATA ACCESS

Providing a seamless digital experience, regardless of channel or device



DATA ACCESS – NORTHERN TRUST PASSPORT®

A one stop shop for input, information and interrogation across your investment portfolio



Transaction Initiation

- Cash / trade
- Corporate actions
- Capital call
- Foreign exchange
- Benefit payment

Asset Servicing

- Cash
- Trade
- Entitlements
- Tax

Investment Accounting

- Plan / financial accounting
- Insurance accounting
- Statutory reporting
- nFTK, GAAP, APRA etc

Market Information

- Market research
- FX research
- Brokerage research

Fund Administration

- Regional FA reporting
- MIS and dashboards
- Regulatory reporting
- Financial reporting
- Compliance reporting

Transfer Agency

- Investor portal
- Multi-jurisdictional access
- Secure document delivery
- White label client reporting

Middle Office

- Cash laddering
- P&L analysis
- Strategy tagging
- Trade matching

Investment Analytics

- Performance
- Compliance
- Risk analysis

Investment Reporting

- Foreign exchange / overlay
- Securities lending
- Commission management
- Transition management
- Cash / collateral management

Management Reporting

- Management information
- Key performance indicators
- Service level benchmarking
- Regulatory filings

Special Asset Reporting

- Bank loans
- Statutory, tax
- Derivatives, alternatives
- Private equity, real estate

Transparency Reporting

- Transaction cost analysis
- 'Peek through/exposure'
- Transparency analytics

PASSPORT 'TOMORROW' – AI-DRIVEN USER EXPERIENCE

It's all about the data...

Data Quality

- High quality data input once by 'experts' after full validation
- Deploying technology to drive productivity and data quality
 - Utilizing robotics software to revolutionize fund accounting and transfer agency processing
 - Implementing Artificial Intelligence solutions across key operational groups e.g. reconciliations
 - Deployed a process automation solution, Blue Prism, enabling robots to take on repetitive tasks
 - Investing in R&D activities to prove out the potential benefits of emerging technologies e.g. can machine learning detect potential corporate action anomalies

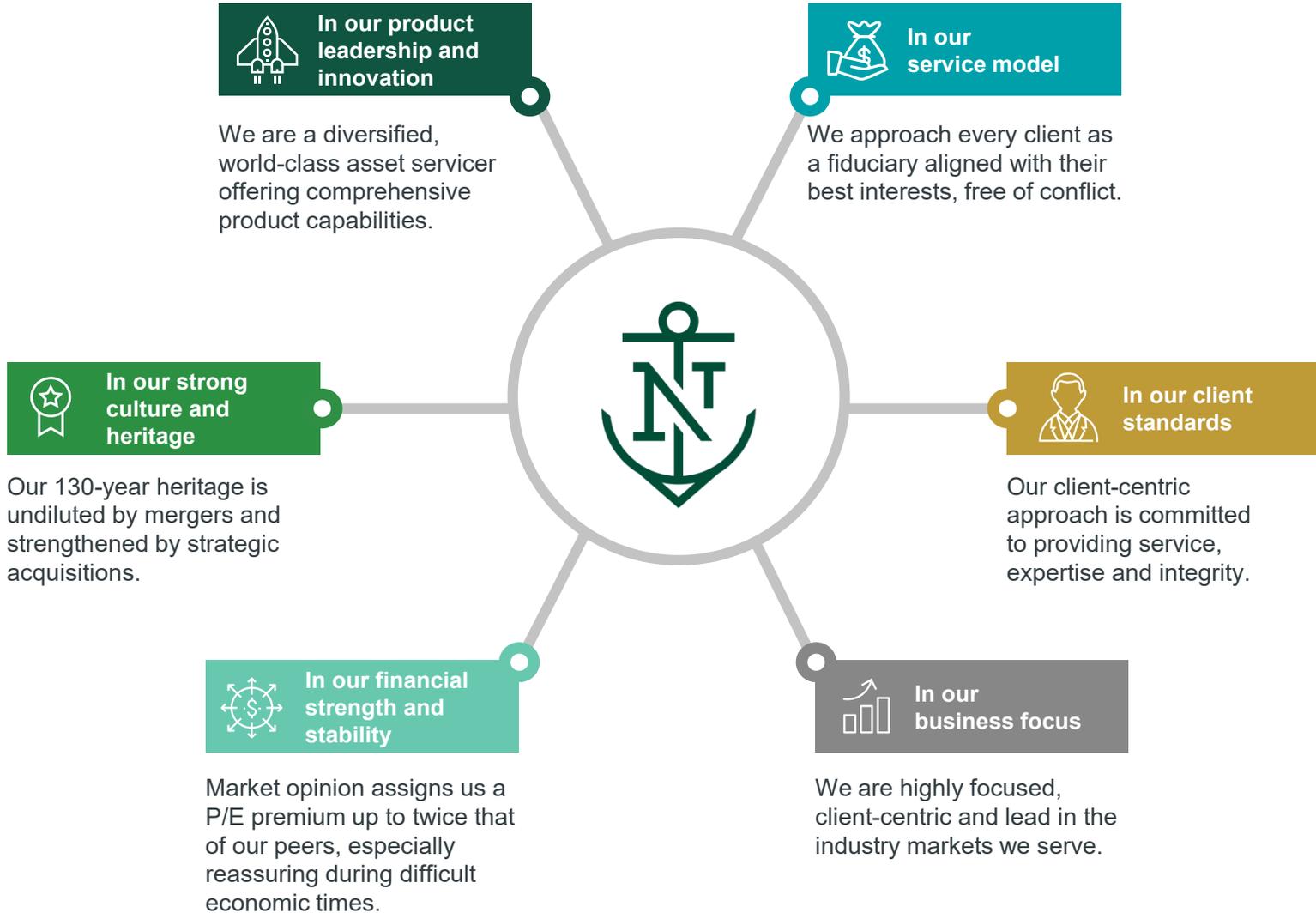
Data Access (via APIs / Portals)

Level 1	Level 2	Level 3
Data based on who you are	Data I have learnt you want based on who you are	Data I think you want based on what I have learnt about you
This is your persona-based experience	This is your refined persona-based experience based on AI	This is your ultimate persona-based experience based on predictive analytics



WHY NORTHERN TRUST?

We're unique...



City of Oakland Police & Fire Retirement System (PFRS)

**Domestic
Equities**

Domestic Fixed Income

Global Equity Global Fixed Income

26-86486

Ramirez Asset Management

SM/SL

26-98024

Russell 2000 ETF

SM/SL

26-98025

Earnest Partners

SM/SL

26-98026

Northern Trust

SM/SL

26-98022

Parametric (50%) TIPS

SM/SL

26-98035

DDJ High Yield

CF

PFRS01

17-33541

SGA

SM/SL

PFRS03

17-33544

Ream Global Fixed

SM/SL

26-98028

Parametric (50%) BXM rep

SM/SL

26-98029

Vanguard FTSE Dev Mk ETF

CF

44-00331

Brown Advisory

CF

44-05812

WTC-CIF II CORE BOND

CF

26-98030

Transition

SM

PFRS05

17-74053

MSCI US ETF

SM/ short sale

44-73903

Rice Hall James

SM/SL

44-81520

Parametric Risk Premia

CM/SL

44-86323

Long Duration Account

CM/SL

26-98020

Cash

last updated 7/15/21

General Plan/Trust Information

Client Sponsor Code: OAKLA
Relationship Number: 16360
Fiscal Year-end: 6/30
Monthly Acct Deadline: 10BD
Valuation Frequency: Monthly

Trust EIN: 94-3295644
Checking Acct #: N/A
Plan #: N/A
NAV Type: N/A

Account Code Legend

B = Bonds G = GIC SL = Securities Lending
CF = Commingled Fund LP = Limited Partnership SM = Separately Managed
CM = Client Managed LS = Lifestyle Fund U = Units Held
CS = Company Stock MF = Mutual Fund * = Liquidity Account
E = Equities RE = Real Estate

IMPORTANT INFORMATION

Confidentiality Notice: This communication is confidential, may be privileged, and is meant only for the intended recipient. If you are not the intended recipient, please notify the sender as soon as possible. All materials contained in this presentation, including the description of Northern Trust, its systems, processes and pricing methodology, are proprietary information of Northern Trust. In consideration of acceptance of these materials, the recipient agrees that it will keep all such materials strictly confidential and that it will not, without the prior written consent of Northern Trust, distribute such materials or any part thereof to any person outside the recipient's organization or to any individual within the recipient's organization who is not directly involved in reviewing this presentation, unless required to do so by applicable law. If the recipient is a consultant acting on behalf of a third-party client, the recipient may share such materials with its client if it includes a copy of these restrictions with such materials. In such event, the client agrees to comply with these restrictions in consideration of its accepting such materials.

© 2021 Northern Trust Corporation. Head Office: 50 South La Salle Street, Chicago, Illinois 60603 U.S.A. Incorporated with limited liability in the U.S. Products and services provided by subsidiaries of Northern Trust Corporation may vary in different markets and are offered in accordance with local regulation. This material is directed to professional clients only and is not intended for retail clients. For Asia-Pacific markets, it is directed to expert, institutional, professional and wholesale clients or investors only and should not be relied upon by retail clients or investors. For legal and regulatory information about our offices and legal entities, visit northerntrust.com/disclosures. The following information is provided to comply with local disclosure requirements: The Northern Trust Company, London Branch; Northern Trust Global Investments Limited; Northern Trust Securities LLP. Northern Trust Global Services SE, 10 rue du Château d'Eau, L-3364 Leudelange, Grand-Duché de Luxembourg, RCS B232281; Northern Trust Global Services SE UK Branch, 50 Bank Street, London E14 5 NT; Northern Trust Global Services SE Sweden Bankfilial, Ingmar Bergmans gata 4, 1st Floor, 114 34 Stockholm, Sweden; Northern Trust Global Services SE Netherlands Branch, Viñoly 7th floor, Claude Debussylaan 18 A, 1082 MD Amsterdam; Northern Trust Global Services SE Abu Dhabi Branch, registration Number 000000519 licenced by ADGM under FSRA # 160018. The Northern Trust Company Saudi Arabia, PO Box 7508, Level 20, Kingdom Tower, Al Urubah Road, Olaya District, Riyadh, Kingdom of Saudi Arabia 11214-9597, a Saudi Joint Stock Company – Capital 52 million SAR. Regulated and Authorised by the Capital Market Authority License # 12163-26 CR 1010366439. Northern Trust (Guernsey) Limited (2651)/Northern Trust Fiduciary Services (Guernsey) Limited (29806)/Northern Trust International Fund Administration Services (Guernsey) Limited (15532) Registered Office: Trafalgar Court, Les Banques, St Peter Port, Guernsey GY1 3DA. Northern Trust International Fund Administration Services (Ireland) Limited (160579) / Northern Trust Fiduciary Services (Ireland) Limited (161386), Registered Office: Georges Court, 54-62 Townsend Street, Dublin 2, D02 R156, Ireland.



NORTHERN
TRUST

MEMORANDUM

TO: Oakland Police and Fire Retirement System (PFRS)
FROM: Meketa Investment Group
CC: Teir Jenkins, David Jones - PFRS
DATE: July 28, 2021
RE: Northern Trust Custodial Contract Renewal

Summary and Recommendation

Meketa and PFRS staff recommends that OPFRS renew its contract for an additional 5-years with Northern Trust before the current contract date of expiration. OPFRS contracts reserve the right for the Board to terminate the agreement, with or without cause, at any time upon 30 calendar days' prior written notice. In making this recommendation, PFRS staff and Meketa considered organizational / personnel issues, fee proposal, client service and the ability to meet PFRS cash flow needs. Since the last contract renewal, Northern Trust has met or exceeded the criteria above, therefore Meketa and PFRS staff believes that there are no issues that should prevent a contract extension for this custodial provider.

Effective October 1, 2021, Northern Trust has proposed the following fees for a new 5-year contract:

- New contract with a custody flat fee increase of \$8,000.00 (6.8%). The annual flat fee would be \$124,500.00 for the next 5 years.

DS, PN, pq



NORTHERN TRUST

The Northern Trust Company
50 South LaSalle Street
Chicago, IL 60603
(312) 630-6000

July 19, 2021

VIA E-mail to: DfJones@oaklandca.gov

Cc: TJenkins@oaklandca.gov

Board of Trustees
c/o John C. Speakman, Chairman
150 Frank H. Ogawa Plaza
Oakland, CA 94612

Re: City of Oakland Police and Fire Retirement System – New Custody Fee Schedule Proposal

Dear Board of Trustees:

As you know, Northern Trust has served as custodian for City of Oakland Police and Fire Retirement System (“Pension Plan”) since October 2013.

In October 2018 the custody contract was extended for another 3 years and it is set to expire on September 30, 2021. Since that time, the Pension Plan has been charged a flat fee of \$116,500.00 per year.

The Global Custody charges include the following:

- Safekeeping of the assets
- Settlement of direct trades
- Paydown transactions
- Short settlements
- Future / Options Transactions settlement
- Collection of Income
- Tax Reclamation and relief at source services
- Corporate actions processing
- Class Action processing
- Proxy voting
- Daily and intraday information delivery via web portal, Passport
- Consolidated monthly investment accounting and portfolio valuations delivered via Passport
- GASB reporting
- Compliance Monitoring Services – Cole level and Set up
- Foreign exchange.

Besides these services, the Pension Plan subscribes to other value-added services:

- Securities Lending
- Investment Management
- Transition Management

Comparing the value of your portfolio from 2018 to 2021, we see an increase with over 85 mil in assets under custody.

Effective October 1, 2021, we propose the below custody fee increase.

We have the following proposal to the Board:

- 1) **3-year new contract** with a custody flat fee increase of \$10,000.00 (8.6%). The annual flat fee would be \$126,500.00 for the next 3 years.
- 2) **5-year new contract** with a custody flat fee increase of \$8,000.00 (6.8%). The annual flat fee would be \$124,500.00 for the next 5 years.

This new fee schedule will be guaranteed for 3 years or 5 years (depending on the option selected) and assumes, that there are no substantive changes in the structure or composition of the assets, or major alterations in your reporting requirements. Any changes deemed by Northern as “substantive” shall be discussed between Northern and the Pension Plan, and any change to the fee structure that may result from these substantive changes shall be agreed upon by both parties in writing. Should the Pension Plan utilize other products or services with Northern Trust in the future, we would be happy to re-evaluate the fee schedule at that time.

If the terms of the new custody fee schedule are acceptable to you, please let us know, and we will prepare the necessary documents for signature.

Northern Trust values and appreciates your business. Our intention is to ensure the fund is confident of our desire to continue our custody partnership for many more years to come.

Sincerely,

A handwritten signature in black ink, appearing to read "Claudi Besoaga". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Claudiu Besoaga
Vice President – Public Funds

Economic and Market Update

Data as of June 30, 2021

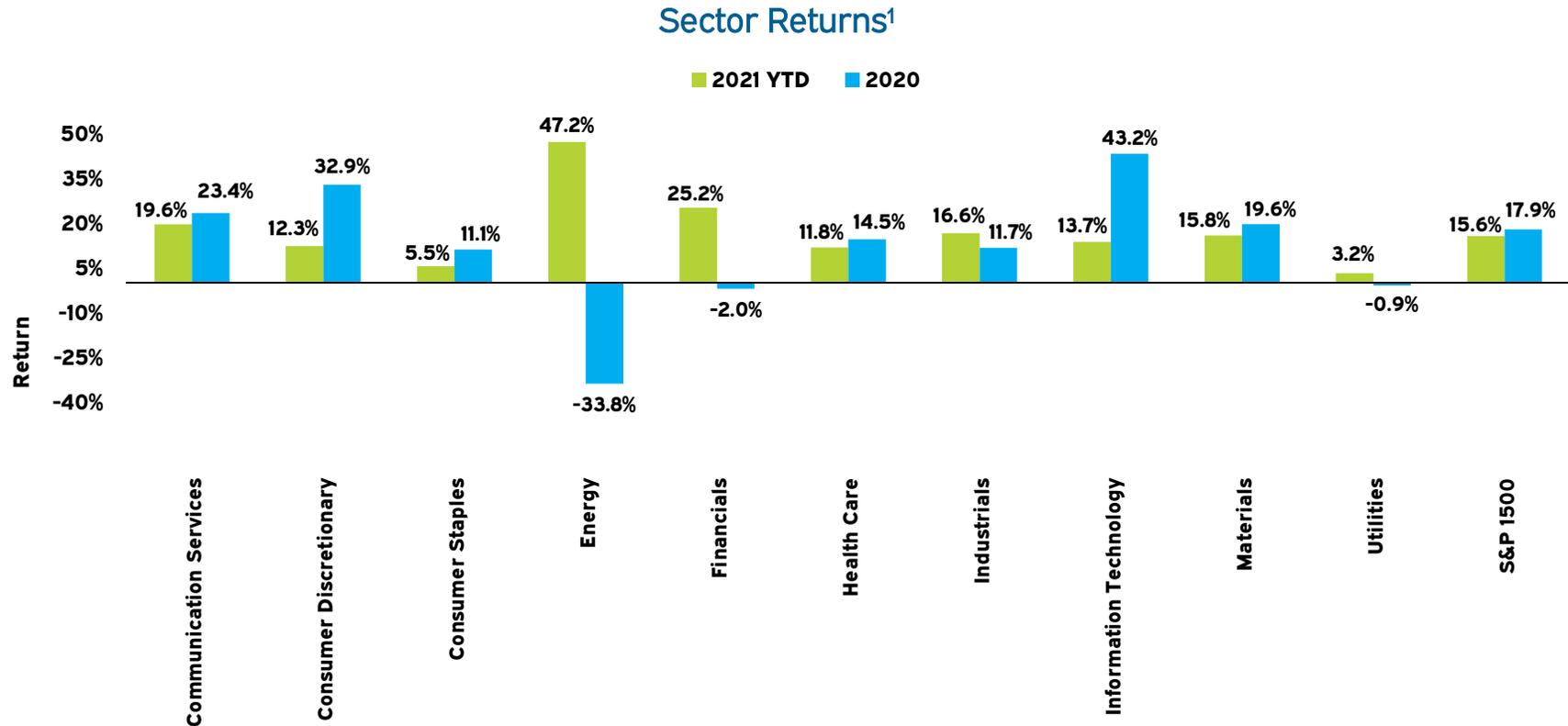


Market Returns¹

Indices	June	YTD	1 Year	3 Year	5 Year	10 Year
S&P 500	2.3%	15.3%	40.8%	18.7%	17.7%	14.8%
MSCI EAFE	-1.1%	8.8%	32.4%	8.3%	10.3%	5.9%
MSCI Emerging Markets	0.2%	7.5%	40.9%	11.3%	13.0%	4.3%
MSCI China	0.1%	1.8%	27.4%	10.4%	16.6%	7.7%
Bloomberg Barclays Aggregate	0.7%	-1.6%	-0.3%	5.3%	3.0%	3.4%
Bloomberg Barclays TIPS	0.6%	1.7%	6.5%	6.5%	4.2%	3.4%
Bloomberg Barclays High Yield	1.3%	3.6%	15.4%	7.5%	7.5%	6.7%
10-year US Treasury	1.3%	-4.2%	-7.1%	5.9%	1.8%	3.7%
30-year US Treasury	4.3%	-13.0%	-13.8%	8.2%	2.9%	7.0%

- So far this year, global risk assets continue to appreciate, leading to significant gains over the trailing year. This has largely been driven by record fiscal and monetary policy stimulus and positive developments with the COVID-19 vaccine.
- In June, Treasuries continued to recover, particularly longer dated issues, as inflation concerns declined.
- Equity markets had mixed results in June with the US leading the way. A stronger US dollar and continued vaccine rollout struggles weighed on international equity markets.

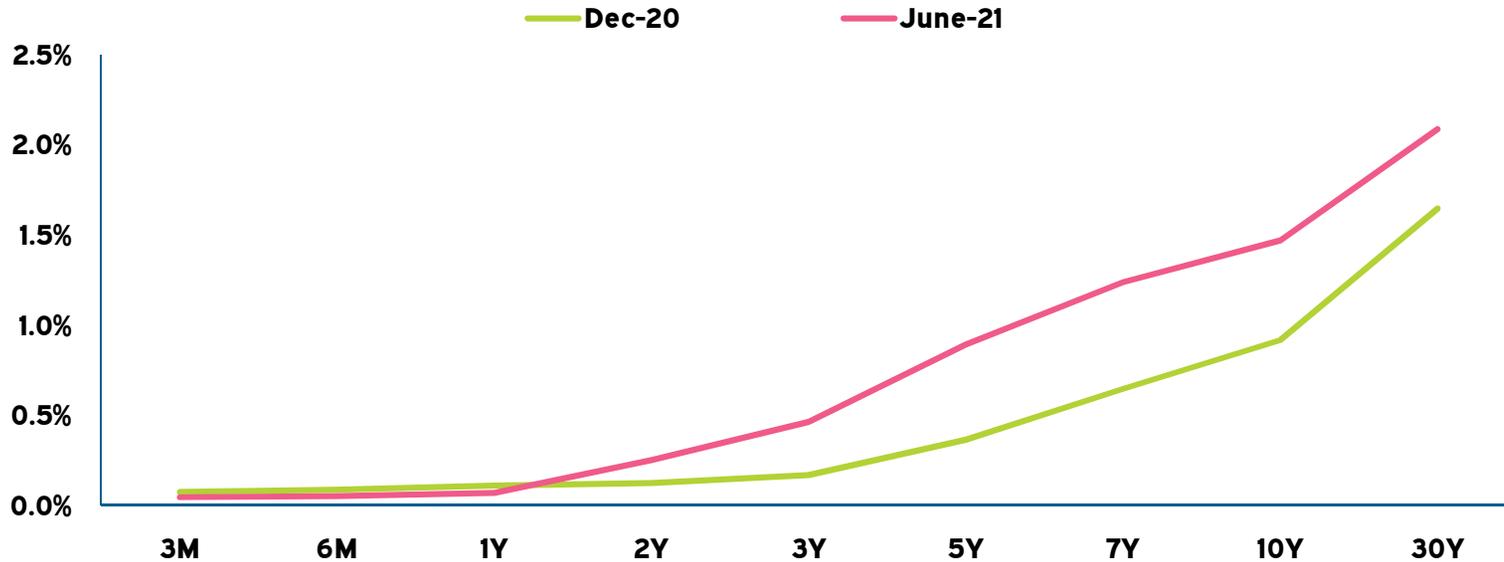
¹ Source: Investment Metrics and Bloomberg. Data is as of June 30, 2021.



- Despite growth's recovery in June, cyclical sectors like energy and financials continue to lead the way in 2021, as some investors rotate out of stay-at-home focused companies in the technology sector as the economy reopens.

¹ Source: Bloomberg. Data is as of June 30, 2021.

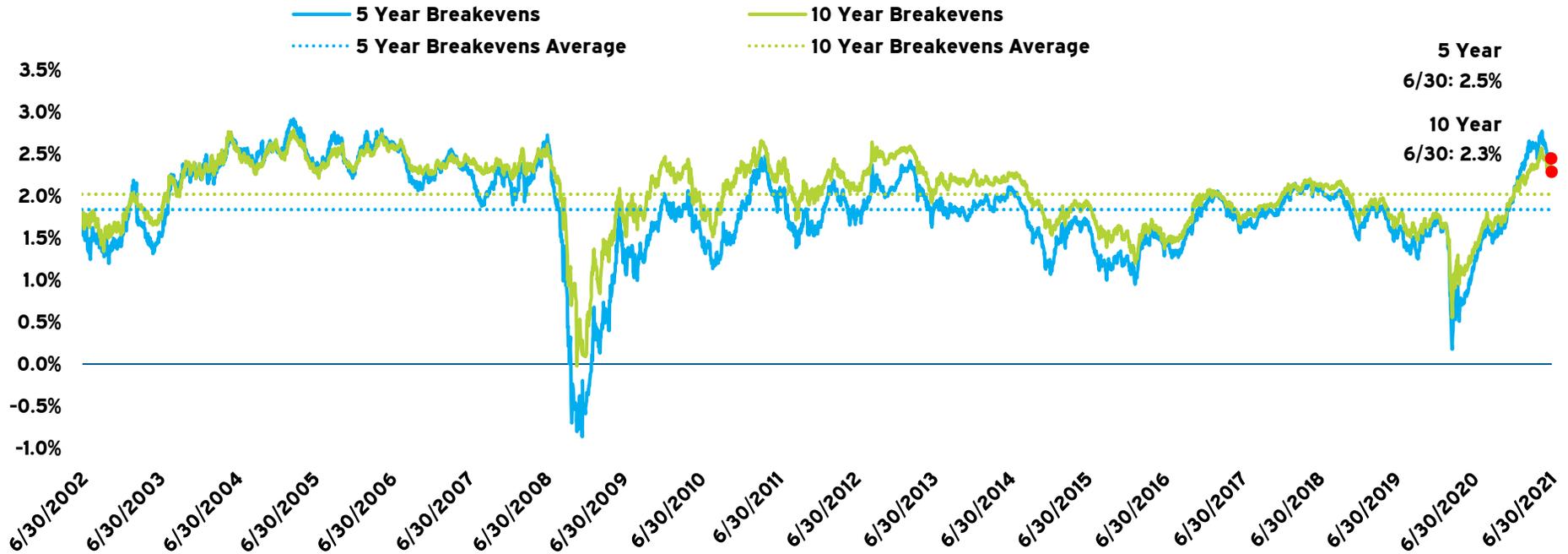
US Yield Curve Steepens¹



- Overall for 2021, the yield curve steepened on inflation fears related to gradual signs of economic improvement given the vaccine rollout.
- Shorter-dated rates have been largely unmoved given Fed policy, while longer-dated rates recently declined from their peak as investors consider whether inflationary pressures have topped.
- Looking ahead, the yield curve could resume its steepening if growth and inflation pressures build beyond current expectations. Alternatively, if the economy weakens, or if economic progress is simply accelerated versus the prior expectations, the flattening trend could continue.

¹ Source: Bloomberg. Data is as of June 30, 2021.

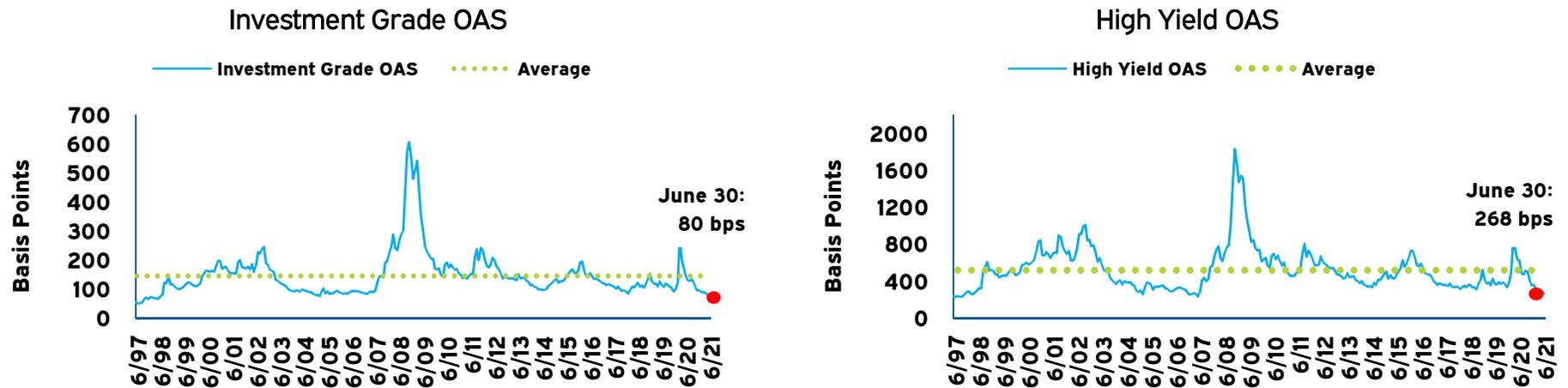
Breakeven Inflation¹



- In 2021, inflation expectations remain well above long-term averages, with the vaccine roll-out, high raw material prices, and expected additional fiscal stimulus as key drivers.
- Recently though, inflation expectations declined from their highs as base effects wane, growth forecasts moderate, and cost pressures slow.
- 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.

¹ Source: Bloomberg. Data is as of June 30, 2021.

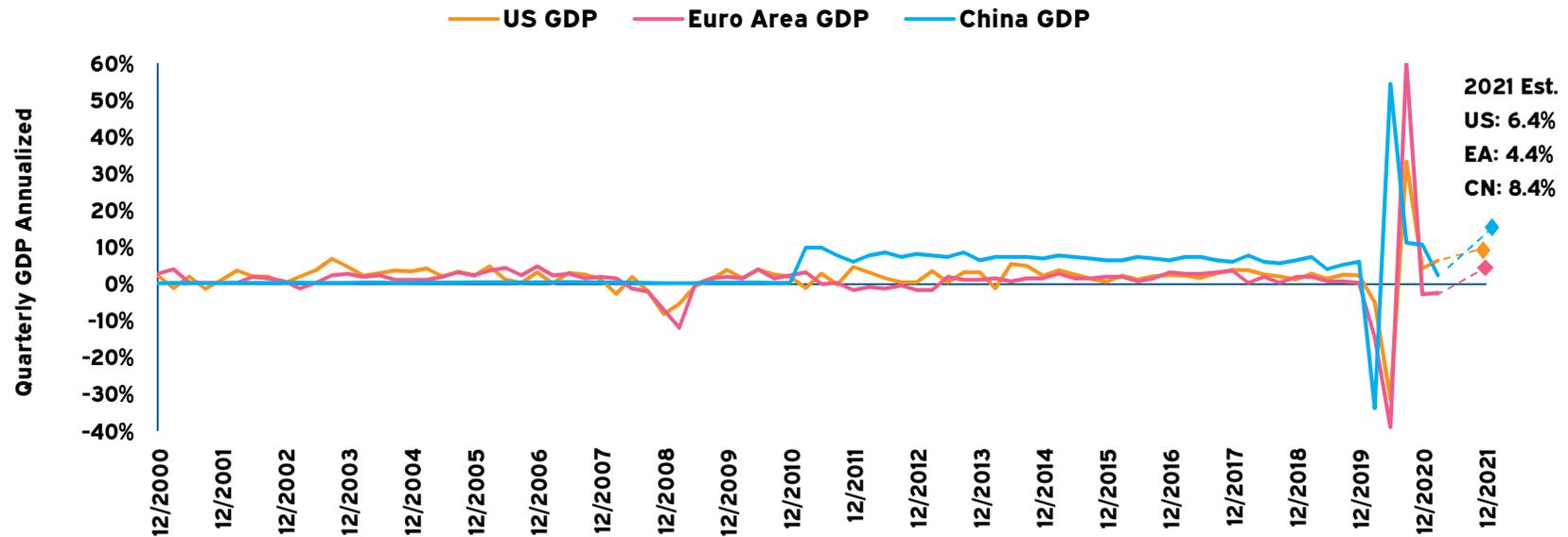
Credit Spreads (High Yield & Investment Grade)¹



- Credit spreads (the spread above a comparable maturity Treasury) for investment-grade and high yield corporate debt continued to compress in June.
- Policy support and the search for yield in a low, and in some cases negative, rate environment have been key drivers in the decline in US credit spreads to below long-term averages, particularly for high yield.

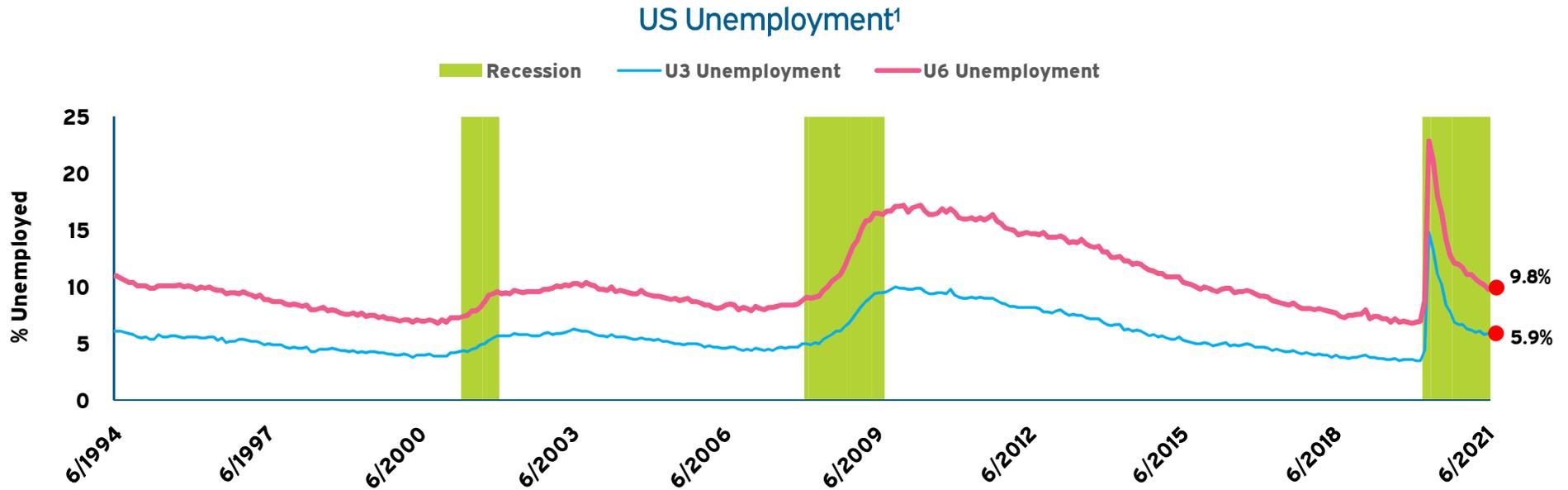
¹ Source: Barclays Live. Data represents OAS and is as of June 30, 2021.

GDP Data Shows Projected Improvements in 2021¹



- Major economies experienced historic declines in growth during the second quarter of 2020, followed by record increases in the third quarter driven by pent-up demand from the lockdown measures earlier in the year.
- Looking forward, strong growth is expected in 2021 particularly for China, projected to grow at an impressive 8.4%, due in part to their ability to quickly control the virus and reopen their economy.
- The US is expected to grow faster than the euro area this year, with some growth pulled forward due to the success in distributing the vaccine.

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



- The unemployment rate (U3) rose slightly in June from 5.8% to 5.9% and remains well above pre-pandemic levels, but far below the pandemic peak.
- The broader measure of unemployment (U6) that includes discouraged and underemployed workers continues to decline, but remains much higher at 9.8%.
- Pandemic related concerns, childcare issues, and a mismatch of skills and available jobs have all contributed to slack in the labor market.

¹ Source: Bloomberg. Data is as of June 30, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

Disclaimers

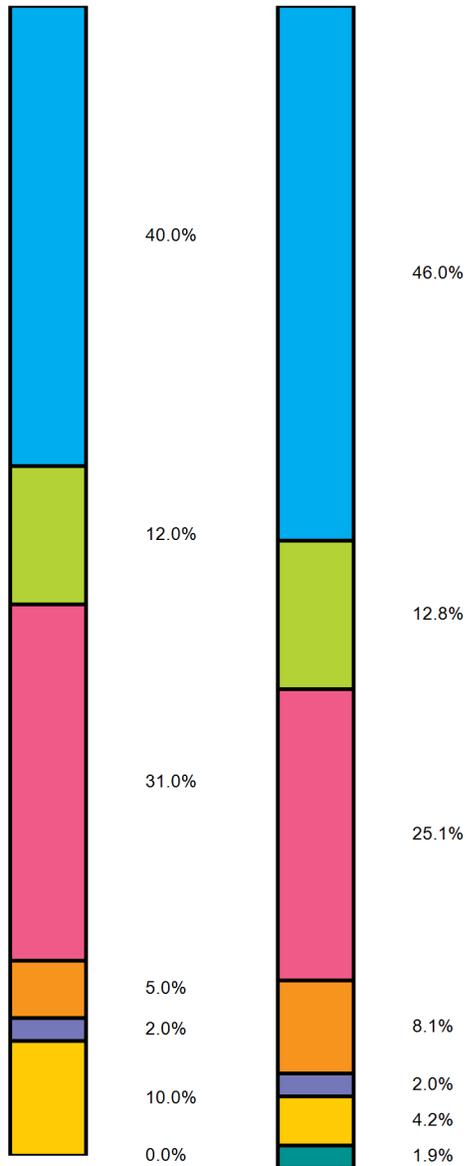
These materials are intended solely for the recipient and may contain information that is not suitable for all investors. This presentation is provided by Meketa Investment Group (“Meketa”) for informational purposes only and no statement is to be construed as a solicitation or offer to buy or sell a security, or the rendering of personalized investment advice. There is no agreement or understanding that Meketa will provide individual advice to any advisory client in receipt of this document. There can be no assurance the views and opinions expressed herein will come to pass. Any data and/or graphics presented herein is obtained from what are considered reliable sources; however, its delivery does not warrant that the information contained is correct. Any reference to a market index is included for illustrative purposes only, as an index is not a security in which an investment can be made and are provided for informational purposes only. For additional information about Meketa, please consult the Firm’s Form ADV disclosure documents, the most recent versions of which are available on the SEC’s Investment Adviser Public Disclosure website (www.adviserinfo.sec.gov) and may otherwise be made available upon written request.

Oakland Police and Fire Retirement System

July 28, 2021

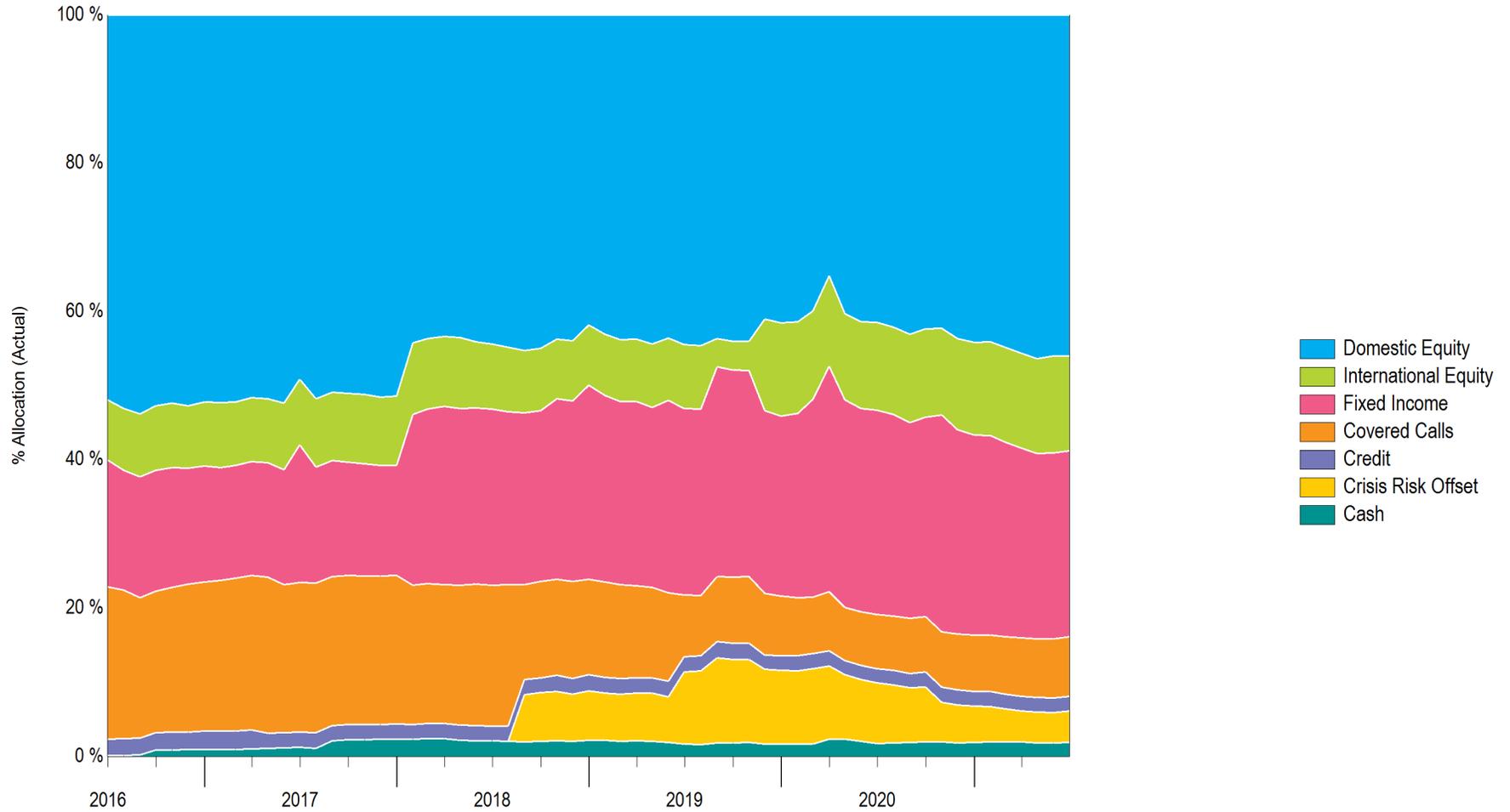
June Flash Report

OPFRS Total Plan As of June 30, 2021



Allocation vs. Targets and Policy						
	Current Balance	Current Allocation	Policy	Difference	Within IPS Range?	
Domestic Equity	\$213,198,037	46.0%	40.0%	6.0%	Yes	
International Equity	\$59,292,971	12.8%	12.0%	0.8%	Yes	
Fixed Income	\$116,313,531	25.1%	31.0%	-5.9%	Yes	
Covered Calls	\$37,328,619	8.1%	5.0%	3.1%	Yes	
Credit	\$9,177,102	2.0%	2.0%	0.0%	Yes	
Crisis Risk Offset	\$19,507,725	4.2%	10.0%	-5.8%	No	
Cash	\$8,822,344	1.9%	0.0%	1.9%	Yes	
Total	\$463,640,329	100.0%	100.0%			

Asset Allocation History
5 Years Ending June 30, 2021



Asset Class Performance Summary											
	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
OPFRS Total Plan	463,640,329	100.0	1.2	5.1	8.1	24.2	10.5	11.5	8.7	7.1	Dec-88
<i>OPFRS Policy Benchmark</i>			<i>1.4</i>	<i>5.3</i>	<i>7.2</i>	<i>22.2</i>	<i>10.5</i>	<i>10.9</i>	<i>8.4</i>	<i>8.5</i>	<i>Dec-88</i>
Domestic Equity	213,198,037	46.0	1.5	6.6	14.3	42.6	16.6	17.2	14.2	9.6	Jun-97
<i>Russell 3000 (Blend)</i>			<i>2.5</i>	<i>8.2</i>	<i>15.1</i>	<i>44.2</i>	<i>18.7</i>	<i>17.9</i>	<i>14.7</i>	<i>9.8</i>	<i>Jun-97</i>
International Equity	59,292,971	12.8	-1.0	5.1	9.4	32.1	9.2	11.8	6.4	6.0	Jan-98
<i>MSCI ACWI ex US (Blend)</i>			<i>-0.5</i>	<i>5.8</i>	<i>9.6</i>	<i>36.4</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>6.2</i>	<i>Jan-98</i>
Fixed Income	116,313,531	25.1	0.9	2.5	-0.6	2.7	5.9	4.1	4.1	5.5	Dec-93
<i>Blmbg BC Universal (Blend)</i>			<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.3</i>	<i>Dec-93</i>
Credit	9,177,102	2.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>BBgBarc US High Yield TR</i>			<i>1.3</i>	<i>2.7</i>	<i>3.6</i>	<i>15.4</i>	<i>7.4</i>	<i>7.5</i>	<i>6.7</i>	<i>6.4</i>	<i>Feb-15</i>
Covered Calls	37,328,619	8.1	2.1	6.6	13.2	33.8	13.4	12.6	--	10.5	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>			<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Crisis Risk Offset	19,507,725	4.2	4.0	5.9	-8.5	-11.6	-9.6	--	--	-9.9	Aug-18
<i>SG Multi Alternative Risk Premia Index</i>			<i>0.4</i>	<i>2.7</i>	<i>6.5</i>	<i>3.7</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-2.7</i>	<i>Aug-18</i>
Cash	8,822,344	1.9	0.0	0.0	0.0	0.1	1.6	1.4	0.7	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>			<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</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.

Trailing Net Performance												
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
OPFRS Total Plan	463,640,329	100.0	--	1.2	5.1	8.1	24.2	10.5	11.5	8.7	7.1	Dec-88
<i>OPFRS Policy Benchmark</i>				<i>1.4</i>	<i>5.3</i>	<i>7.2</i>	<i>22.2</i>	<i>10.5</i>	<i>10.9</i>	<i>8.4</i>	<i>8.5</i>	<i>Dec-88</i>
Domestic Equity	213,198,037	46.0	46.0	1.5	6.6	14.3	42.6	16.6	17.2	14.2	9.6	Jun-97
<i>Russell 3000 (Blend)</i>				<i>2.5</i>	<i>8.2</i>	<i>15.1</i>	<i>44.2</i>	<i>18.7</i>	<i>17.9</i>	<i>14.7</i>	<i>9.8</i>	<i>Jun-97</i>
Northern Trust Russell 1000	117,334,896	25.3	55.0	2.5	8.5	15.0	43.0	19.1	18.0	14.9	15.6	Jun-10
<i>Russell 1000</i>				<i>2.5</i>	<i>8.5</i>	<i>15.0</i>	<i>43.1</i>	<i>19.2</i>	<i>18.0</i>	<i>14.9</i>	<i>15.6</i>	<i>Jun-10</i>
EARNEST Partners	46,751,372	10.1	21.9	-0.2	4.1	14.1	46.3	19.1	19.3	14.8	11.5	Apr-06
<i>Russell MidCap</i>				<i>1.5</i>	<i>7.5</i>	<i>16.2</i>	<i>49.8</i>	<i>16.4</i>	<i>15.6</i>	<i>13.2</i>	<i>10.2</i>	<i>Apr-06</i>
Brown Fundamental Small Cap Value	11,084,914	2.4	5.2	-2.6	3.3	--	--	--	--	--	3.3	Apr-21
<i>Russell 2000 Value</i>				<i>-0.6</i>	<i>4.6</i>	<i>26.7</i>	<i>73.3</i>	<i>10.3</i>	<i>13.6</i>	<i>10.8</i>	<i>4.6</i>	<i>Apr-21</i>
Rice Hall James	17,077,517	3.7	8.0	1.9	5.1	13.8	45.6	11.4	--	--	15.5	Jul-17
<i>Russell 2000 Growth</i>				<i>4.7</i>	<i>3.9</i>	<i>9.0</i>	<i>51.4</i>	<i>15.9</i>	<i>18.8</i>	<i>13.5</i>	<i>17.4</i>	<i>Jul-17</i>
iShares Edge MSCI Min Vol ETF	20,949,332	4.5	9.8	1.7	6.7	9.2	23.4	--	--	--	30.3	Apr-20
<i>MSCI USA Minimum Volatility GR USD</i>				<i>1.8</i>	<i>6.8</i>	<i>9.3</i>	<i>23.6</i>	<i>13.9</i>	<i>12.1</i>	<i>13.4</i>	<i>30.5</i>	<i>Apr-20</i>
International Equity	59,292,971	12.8	12.8	-1.0	5.1	9.4	32.1	9.2	11.8	6.4	6.0	Jan-98
<i>MSCI ACWI ex US (Blend)</i>				<i>-0.5</i>	<i>5.8</i>	<i>9.6</i>	<i>36.4</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>6.2</i>	<i>Jan-98</i>
Vanguard Developed Markets ETF	17,252,245	3.7	29.1	-1.7	4.9	9.1	32.8	--	--	--	16.3	Sep-19
<i>FTSE Developed All Cap Ex US TR USD</i>				<i>-1.2</i>	<i>5.8</i>	<i>10.2</i>	<i>36.8</i>	<i>9.3</i>	<i>10.8</i>	<i>4.6</i>	<i>18.2</i>	<i>Sep-19</i>
SGA ACWI ex-U.S. Equity	41,485,309	8.9	70.0	-1.0	4.7	9.0	31.6	--	--	--	11.0	Dec-19
<i>MSCI ACWI ex USA Gross</i>				<i>-0.6</i>	<i>5.6</i>	<i>9.4</i>	<i>36.3</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>16.3</i>	<i>Dec-19</i>

Throughout the report performance for new funds will be shown after one full month of investment.

International equity performance inclusive of residual cash in Hansberger transition.

OPFRS Total Plan As of June 30, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Fixed Income	116,313,531	25.1	25.1	0.9	2.5	-0.6	2.7	5.9	4.1	4.1	5.5	Dec-93
<i>Blmbg BC Universal (Blend)</i>				<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.3</i>	<i>Dec-93</i>
Ramirez	79,233,829	17.1	68.1	1.0	2.6	-0.1	3.1	5.9	--	--	4.7	Jan-17
<i>BBgBarc US Aggregate TR</i>				<i>0.7</i>	<i>1.8</i>	<i>-1.6</i>	<i>-0.3</i>	<i>5.3</i>	<i>3.0</i>	<i>3.4</i>	<i>4.0</i>	<i>Jan-17</i>
Wellington Core Bond	7,639,617	1.6	6.6	0.9	1.9	--	--	--	--	--	1.9	Apr-21
<i>BBgBarc US Aggregate TR</i>				<i>0.7</i>	<i>1.8</i>	<i>-1.6</i>	<i>-0.3</i>	<i>5.3</i>	<i>3.0</i>	<i>3.4</i>	<i>1.8</i>	<i>Apr-21</i>
Reams	29,440,041	6.3	25.3	0.7	2.1	-1.6	2.1	9.3	5.6	5.2	6.0	Feb-98
<i>Blmbg BC Universal (Blend)</i>				<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.0</i>	<i>Feb-98</i>
Credit	9,177,102	2.0	2.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>BBgBarc US High Yield TR</i>				<i>1.3</i>	<i>2.7</i>	<i>3.6</i>	<i>15.4</i>	<i>7.4</i>	<i>7.5</i>	<i>6.7</i>	<i>6.4</i>	<i>Feb-15</i>
DDJ Capital	9,177,102	2.0	100.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>ICE BofA High Yield Master TR</i>				<i>1.4</i>	<i>2.8</i>	<i>3.7</i>	<i>15.6</i>	<i>7.2</i>	<i>7.3</i>	<i>6.5</i>	<i>6.2</i>	<i>Feb-15</i>
Covered Calls	37,328,619	8.1	8.1	2.1	6.6	13.2	33.8	13.4	12.6	--	10.5	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Parametric BXM	16,398,176	3.5	43.9	1.8	5.1	10.8	27.3	9.5	9.5	--	8.2	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Parametric DeltaShift	20,930,443	4.5	56.1	2.4	7.9	15.2	39.3	17.0	15.6	--	13.0	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Crisis Risk Offset	19,507,725	4.2	4.2	4.0	5.9	-8.5	-11.6	-9.6	--	--	-9.9	Aug-18
<i>SG Multi Alternative Risk Premia Index</i>				<i>0.4</i>	<i>2.7</i>	<i>6.5</i>	<i>3.7</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-2.7</i>	<i>Aug-18</i>
Vanguard Long-Term Treasury ETF	19,507,725	4.2	100.0	4.0	5.9	-8.5	-10.8	--	--	--	5.6	Jul-19
<i>BBgBarc US Govt Long TR</i>				<i>3.6</i>	<i>6.4</i>	<i>-7.8</i>	<i>-10.4</i>	<i>8.0</i>	<i>3.2</i>	<i>6.6</i>	<i>5.9</i>	<i>Jul-19</i>
Cash	8,822,344	1.9	1.9	0.0	0.0	0.0	0.1	1.6	1.4	0.7	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>				<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>
Cash	2,245,344	0.5	25.5	0.0	0.0	0.1	0.5	1.8	1.5	0.8	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>				<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>
Cash - Treasury	6,577,000	1.4	74.5									

Values for DDJ Capital are based on manager estimate for the month of June.

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

Cash Flow Summary
Month to Date

	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value
Brown Fundamental Small Cap Value	\$11,387,286	\$0	-\$302,372	\$11,084,914
Cash	\$2,009,237	\$5,649	\$230,458	\$2,245,344
Cash - Treasury	\$6,343,000	\$234,000	\$0	\$6,577,000
DDJ Capital	\$9,027,908	\$0	\$149,194	\$9,177,102
EARNEST Partners	\$46,829,268	\$0	-\$77,896	\$46,751,372
Hansberger Transition	\$438,979	\$0	\$116,438	\$555,417
iShares Edge MSCI Min Vol ETF	\$20,656,195	\$0	\$293,137	\$20,949,332
Northern Trust Russell 1000	\$115,477,890	-\$1,000,000	\$2,857,006	\$117,334,896
Parametric BXM	\$16,109,137	\$0	\$289,039	\$16,398,176
Parametric DeltaShift	\$20,436,025	\$0	\$494,418	\$20,930,443
Ramirez	\$78,452,542	\$0	\$781,287	\$79,233,829
Reams	\$29,240,343	\$0	\$199,698	\$29,440,041
Reams Low Duration	\$44	\$0	\$0	\$44
Rice Hall James	\$16,767,198	\$0	\$310,319	\$17,077,517
Securities Lending Northern Trust	\$0	-\$5,649	\$5,649	\$0
SGA ACWI ex-U.S. Equity	\$41,911,239	\$0	-\$425,930	\$41,485,309
Vanguard Developed Markets ETF	\$17,553,623	\$0	-\$301,379	\$17,252,245
Vanguard Long-Term Treasury ETF	\$18,758,112	\$0	\$749,613	\$19,507,725
Vanguard Russell 2000 Value ETF	\$6	\$0	\$0	\$6
Wellington Core Bond	\$7,571,693	\$0	\$67,924	\$7,639,617
Total	\$458,969,726	-\$766,000	\$5,436,603	\$463,640,329

Benchmark History

As of June 30, 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 BXM / 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 BXM
10/1/2015	4/30/2016	43% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 15% CBOE BXM / 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 BXM / 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.

The Inflation Variable: Evaluating Potential Outcomes

WORKING PAPER

JULY 2021

This research note is a response to the many client questions we have received about rising inflation and its potential impact on portfolio performance. It follows our recent note, *Inflation: Is It Coming and Should We Care?*¹, which explored the history of inflation in the US, why the inflation situation may be changing, and what impact inflation may have on asset prices.

Asset owners are well aware that inflation has an impact on performance. However, the extent of the impact and even the direction depend on several factors. Accordingly, Meketa developed a quantitative tool to assist decision-makers in their consideration of the potential impacts of a range of inflationary scenarios upon investment portfolios. This note explores the most influential variables – from the source of inflation, whether it was anticipated, and the length of the inflationary period, among other factors – and outlines how these considerations can be expected to affect performance across asset classes.

CONTRIBUTORS

Alison Adams, PhD
Frank Benham, CFA, CAIA
Margret Duvall
Allan Emkin
Gloria Hazard
Leo Hsia
Gordon Latter, FSA, FCIA
Stella Mach
Mary Mustard, CFA
Orray Taft, CAIA, FRM
Rafi Zaman, CFA

¹ <https://meketa.com/leadership/inflation-is-it-coming-and-should-we-care/>

Current drivers of inflation

The COVID-19 pandemic disrupted both the demand and supply side of the global economy, causing short-term inflationary pressures. On the demand side, extraordinary fiscal and monetary stimulus have combined with pent-up savings to elevate consumer spending. The magnitude of these actions is difficult to overstate. US debt-to-GDP rose steadily between 2010 and 2020, with typical quarterly growth ranging from -1% to +3%. However, in 2020-Q3 it rose 28%, nearly five times the previous high mark (2008-Q4) of 5.9%.

Monetary policy tells a similar story of swift and aggressive intervention. The expansion of the Federal Reserve's balance sheet was both quicker and larger following March 2020 than the similar "Quantitative Easing" of 2008. The range of action to support financial assets also spanned a broader range as the Federal Open Market Committee instructed its trading desk to purchase not only US Treasuries but corporate debt as well.

Further on the demand-side, the pandemic induced major reductions in consumer activity: in each of the 12 months between April 2020 and April 2021, the personal savings rate was over 10%, with a peak of 33.7% in April 2020. In the 85 months

preceding the pandemic, the savings rate never eclipsed 10%. While not all the foregone consumption will necessarily be made up for as economies re-open, the force of consumers resuming economic activity after a year of subdued spending is surely inflationary.

The pandemic has similarly disrupted supply chains as manufacturers face unanticipated challenges to resume normal activities. Supply chains for semi-conductors, oil, and lumber are among the most impacted. The semi-conductor shortage began in the used automobile market as suppliers of used cars slashed chip orders, correctly anticipating a halt in transportation activity, while technology producers increased purchases as lockdown measures ushered in a year of virtual living. Now, as countries and economies re-open, car manufacturers cannot get the chips they need to meet demand. The lumber industry braced for a slump in the housing market that never came. Sawmills slowed production, but housing market demand remained strong, perhaps as many elected to relocate from cities to suburban locales in the face of global lockdowns and the drop in interest rates made financing a mortgage attractive. At its recent peak, lumber futures hit a record high of \$1,615, a staggering 7x multiple of its April 2020 lows.

The availability of human capital has also become a supply side issue as low-wage employers report widespread difficulty hiring workers even while unemployment rates remain well above their pre-pandemic levels. Reasons for this include: shifts in employer preferences induced by the pandemic, unsatisfactory wages, and bolstered unemployment benefits. A University of Chicago study found that 42% of those on benefits receive more than they did in their previous jobs. Basic economic analysis suggests that to overcome the gap between labor demand and supply, the price of labor (wages) must rise, or the price at which labor is willingly supplied must fall. The former would occur if employers increase wages, which would be inflationary for the economy. The latter might happen if unemployment benefits return to lower levels, forcing a return to the workforce at current wage offerings; this would be disinflationary.

The case for short-term inflation

Despite the inflationary forces on both the supply and demand sides, there is little reason to believe these factors will cause high long-term inflation. We expect pent-up demand, monetary intervention, fiscal stimulus, and supply chain disruptions to subside in the near-term and relieve the current inflationary pressures. After these economic shocks subside, the long-term disinflationary trends of the US's aging population, disruptive technology, and low borrowing costs will still be in place.² Fixed-income markets seem to reflect this view as well, as the 30-year Treasury rate is virtually unchanged from its pre-pandemic level of around 2%. For reference, 10-year breakeven³ rates remain at a modest 2.25%, on par with its pre-pandemic range.

² The literature on the relationship between the average age of a country's citizens and inflation implies a negative correlation, with Japan being the most notable example.

³ Breakeven inflation expectation rates, as measured by the difference in yields between a nominal Treasury and a Treasury Inflation Protection Security (TIPS) across the same maturity points, are a typical method by which market participants assess inflation expectations.

Globally, the US's high year-over-year inflation (5.0%) seems to be the exception rather than the rule. Inflation rates in other major economies are mostly lower: Eurozone (2%), Australia (1.1%), China (1.3%), Canada (3.4%), UK (1.5%), and Japan (-0.4%). To the extent that the relatively high inflation in the US is driven by relatively strong US fiscal and monetary stimulus, we equivalently expect US inflation to come in line with that of comparable peer nations as fiscal and monetary interventions subside. The wildcard situation for more persistent inflation is the uncertainty around continued stimulus. Specifically, 1) will additional spending be forthcoming from Congress, and if so, how large and for how long will it be, and 2) what actions might the Fed take to reverse its stimulative course, and when?

Inflation scenario analysis: three inflationary regimes

Although we expect the current inflationary forces to be transitory, we believe that accurately forecasting future events is extremely difficult as current trends may quickly change and new, unforeseen variables may arise.

To this end, we developed a quantitative tool that analyzes asset class performance under various inflation scenarios. This Inflation Scenario Analysis tool allows investors to “experience” an array of potential outcomes to better inform portfolio construction decisions. Further, it enables us to help our clients better understand the risk that inflation poses to their portfolios and to help them structure their portfolios to mitigate this risk.

The core of this model considers the long-held investment theory that equity assets are negatively correlated with expected and unexpected inflation. On the other hand, tangible assets such as commodities and gold have historically performed well in periods of rising inflation and may offset inflation's drag on a portfolio's performance. Our Inflation Scenario Analysis tool examines these theories under a range of inflationary regimes while examining the relationship between assets and inflation⁴ and controlling for the economic environment.

⁴ Please see Appendix B: Model Methodology for an explanation of non-linear asset inflation relationships.

The Scenario Analysis tool estimates average, annualized returns for a broad array of asset classes under different kinds of inflationary scenarios. Please refer to Appendix A and Appendix B for a detailed explanation on the regression models and expected returns calculation.

Scenario 1: Inflation Above Expectation

The Inflation Above Expectation scenario estimates average, annualized asset returns when realized inflation is above expected inflation (i.e., when there is “surprise” inflation).

Table 1 shows that at low levels, surprise inflation has a small, negative impact on equity assets and long-term bonds (less than 220 bp decline), and the negative returns

grow as surprise inflation increases - reinforcing the belief that equity assets and long-term bonds perform poorly in inflationary periods, particularly when inflation is much higher than expected. TIPS provide only a modest hedge as their returns are slightly negative. Commodities and gold provide the best hedge at varying surprise inflation levels but even these represent only modest gains, illustrating how damaging unexpected inflation can be to even a well-diversified portfolio of assets.

Asset Class	Inflation Slightly Higher than Expected	Inflation Moderately Higher than Expected	Inflation Meaningfully Higher than Expected
US Equity	-1.0	-4.2	-12.8
Global Equity	-0.7	-3.6	-12.3
Long-term Government Bonds	-2.2	-5.8	-11.4
TIPS	-0.5	-1.4	-3.7
Short-term TIPS	0.1	0.0	-0.4
Commodities	1.7	3.1	1.2
Gold	0.9	1.9	2.6

TABLE 1
Inflation Above Expectation Scenario: Average, Annualized Asset Returns

Note: Please see Appendix B: Model Methodology for detailed descriptions of each inflation scenario.

Scenario 2: Inflation in a High/Low Growth Environment

The Inflation and High Growth Environment scenario estimates average, annualized asset returns when realized inflation varies in an environment with high economic growth.

As expected, equities experience the highest returns in each of the high growth scenarios. However, equity returns decline modestly as inflation increases (Table 2). Gold seems to perform poorly in high growth environments generally, while the returns of TIPS are relatively flat. On the other hand, commodities' returns increase as inflation grows, suggesting they are a good inflation hedge during periods of strong economic growth.

Asset Class	High Growth and Low Inflation	High Growth and Moderate Inflation	High Growth and High Inflation
US Equity	18.6	16.9	14.3
Global Equity	27.7	23.1	18.2
Long-term Government Bonds	3.3	-0.4	-2.5
TIPS	0.9	0.5	1.1
Short-term TIPS	-0.3	-0.2	0.1
Commodities	6.1	10.6	12.1
Gold	-10.2	-8.5	-4.0

TABLE 2
Inflation and High Growth Environment Scenario: Average, Annualized Asset Returns

Scenario 3: Inflation and Low Growth Environment

The Inflation and Low Growth Environment scenario estimates average, annualized asset returns when realized inflation varies in an environment with low economic growth.

Equities and long-term government bonds perform poorly in low growth economic environments, and their performance worsens as inflation increases. Commodities are the best hedge in low growth and moderate-to-high inflation periods – the expected return for commodities is positive in all scenarios and returns increase with higher inflation. Gold provides a small hedge only when inflation is high, while TIPS are not a great hedge during periods of low growth.

Asset Class	Low Growth and Low Inflation	Low Growth and Moderate Inflation	Low Growth and High Inflation
US Equity	-9.3	-10.6	-12.6
Global Equity	-12.1	-15.4	-18.9
Long-term Government Bonds	-4.4	-7.9	-9.8
TIPS	-1.6	-2.0	-1.4
Short-term TIPS	-0.6	-0.5	-0.2
Commodities	2.2	6.5	8.0
Gold	-4.2	-2.4	2.4

TABLE 3
Inflation and Low Growth Environment Scenario: Average, Annualized Asset Returns

Scenario 4: Moderate Inflation Period

Meketa also analyzed the effect of the length of the inflation period on asset returns under “moderate” inflation and “extreme” inflation.

The Moderate Inflation Period scenario estimates expected asset returns for short, medium and long-term periods when the realized inflation level is moderate.

Equities have slightly negative expected returns in moderate inflation periods, and the returns grow more negative with longer inflation periods (Table 4). Commodities are a very strong hedge for short- to long-term inflation periods, while gold is the second-best hedge and experiences its highest returns in long-term inflation periods.

Asset Class	Very Brief, Moderate Inflation Spike	Brief, Moderate Inflation Spike	Extended, Moderate Inflation Spike
US Equity	-15	-3.1	-9.9
Global Equity	-3.3	-5.0	-11.9
Long-term Government Bonds	-6.1	-6.3	-5.8
TIPS	-0.1	0.0	0.7
Short-term TIPS	0.4	0.4	0.2
Commodities	14.8	15.5	14.6
Gold	5.2	8.6	23.6

TABLE 4
Moderate Inflation Period Scenario: Average, Annualized Asset Returns

Scenario 5: Extreme Inflation Period

The Extreme Inflation Period scenario estimates expected asset returns for short, medium and long-term periods when the realized inflation level is very high, similar to levels experienced in 1971-1972.

Table 5 shows that the patterns observed in the Moderate Inflation Period scenario continue for the Extreme Inflation Period case. For example, at extreme levels of inflation, gold is a very strong inflation hedge in all scenarios and performs best in long-term inflation periods. Commodities are also a very strong hedge, but their returns decline modestly as the length of the inflation period grows. Equities perform very poorly during these periods.

Asset Class	Very Brief, Extreme Inflation Spike	Brief, Extreme Inflation Spike	Extended, Extreme Inflation Spike
US Equity	-11.4	-14.2	-18.7
Global Equity	-13.5	-16.2	-20.5
Long-term Government Bonds	-6.0	-5.5	-4.3
TIPS	0.8	1.1	1.6
Short-term TIPS	0.2	0.2	0.0
Commodities	15.3	14.0	11.4
Gold	27.4	34.6	47.2

TABLE 5
Extreme Inflation Period
Scenario: Average,
Annualized Asset Returns

Conclusion

The current drivers of inflation are real and warrant careful consideration. However, we believe that they are likely to remain short-term. Pent-up demand and supply chain issues are direct consequences of the now-receding pandemic, particularly in the US. Monetary and fiscal stimulus are direct policy responses.

As pandemic-related risks continue to decline and economies re-open, it stands to reason that these short-term drivers of inflation will similarly subside. The core structural dis-inflationary realities of global demographics (e.g., an aging US population) and low borrowing costs should continue to dominate the long-term inflation view, which we hold as low to moderate.

Although rising prices will likely subside in the near-term, there is still considerable uncertainty about the outcome. Moreover, inflation still has a sizeable impact on asset prices, and the impact varies based on the type of inflationary environment. Understanding inflation's effect on different asset classes can help investors develop a portfolio that is well-positioned to hedge against inflation risk.

Appendix A: Model approach and limitations

The Inflation Scenario Analysis tool is based on a multivariate regression model that estimates the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated returns are then calculated as the expected value of asset class returns, conditional on the inflation scenario.

The reasons for this model approach are detailed below.

Control for the economic environment. Meketa wanted to control for the economic environment when looking at an asset's inflation hedging ability. Economic theory holds that inflation and growth are tightly related – low levels of inflation tend to spur economic activity, but when economic activity heats up too quickly, inflation grows. A regression model allowed us to estimate how much an asset's performance is due to the economic environment compared to its actual inflation-hedging ability.

Avoid mis-specification. An asset class' inflation hedging ability is typically measured through the correlation of asset performance and inflation levels in historical periods. However, the real relationship between inflation and many asset classes is likely non-linear. Hence, inferring the relationship of inflation and asset returns with linear correlations could mis-specify their real relationship.

Small sample size. Meketa was limited to using regression models to identify the relationship between inflation and asset performance due to the small sample size. Non-parametric models require large sample sizes to perform well, but our sample size was 576 months.

Easy interpretation. The estimated coefficients in a regression model are easy to interpret and validate with theory. Linear regression coefficients are interpreted as elasticities – the effect of Y given one unit increase in X holding all else constant.

As with all regression models, the results of our multivariate regressions depend on the following assumptions to be true:

- The linear functional form represents the true data-generating process.
- The covariance between the error term and independent variables are 0.
- The error term is normally distributed around 0 and has a finite variance.
- The residuals are homoscedastic and are not correlated.

The assumptions need to hold true for our estimators to be unbiased. In addition, by using a model with historical data, Meketa assumes that future asset behavior is similar to past asset behavior.

Appendix B: Model Methodology

Inflation above expectation

The model examines the effect of surprise inflation on asset returns, controlling for the economic environment and realized inflation:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{Unemployment} + \beta_2 \text{Unemployment}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2 + \beta_5 \text{Surprise Inflation} + \beta_6 \text{Surprise Inflation}^2$$

where Asset Returns is the monthly asset class return from 1973 to 2020, unemployment is the 3-month rolling average unemployment rate, inflation is the monthly change in CPI from the 3-month rolling average CPI, and surprise inflation is the difference between this month and last month's inflation rate. Unemployment and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database. The independent variables Unemployment^2 , Inflation^2 and $\text{Surprise Inflation}^2$ capture the non-linear effects of realized inflation, surprise inflation, and the economic environment on asset returns. For example, the relationship between Long-term Government Bonds and realized inflation may be an upside-down U shape in periods of high economic growth – Long-term Government Bond returns are positive when monthly inflation is low at .2%, but returns turn negative when monthly inflation reaches higher levels, such as 0.5%.

The estimate is the annualized return of:

$$\beta_5 * E[\text{Surprise Inflation} | \text{Scenario}] + \beta_6 * E[\text{Surprise Inflation}^2 | \text{Scenario}]$$

where the scenarios are low (.05%, 25th percentile), medium (.15%, median), and high (.3%, 75th percentile) surprise inflation.

Inflation and high/low growth

The model examines the combined effect of inflation and GDP Growth on asset returns:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{GDP Growth} + \beta_2 \text{GDP Growth}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2$$

where Asset Returns is the monthly asset return from 1973 to 2020, GDP Growth is the percent change in GDP from the previous quarter, and inflation is the monthly change in CPI from the 3-month rolling average CPI. GDP Growth and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database. Since GDP data is only quarterly, the regression was run on quarterly asset return, GDP and inflation observations.

The estimate is the annualized return of:

$$\beta_1 * E[\text{GDP Growth} | \text{Scenario}] + \beta_2 * E[\text{GDP Growth}^2 | \text{Scenario}] + \beta_3 * E[\text{Inflation} | \text{Scenario}] + \beta_4 * E[\text{Inflation}^2 | \text{Scenario}]$$

where the GDP Growth scenarios are high growth rate of 1% (75th percentile) and low growth rate of .3% (25th percentile). The inflation scenarios are low (.07%, 25th percentile), medium (.25%, median), and high (.5%, 75th percentile) realized inflation.

Inflation duration

The model examines the effect of inflation duration on asset return, controlling for the economic environment:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{Unemployment} + \beta_2 \text{Unemployment}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2$$

where Asset Returns is the monthly asset return from 1973 to 2020, unemployment is the 3-month rolling average unemployment rate, and inflation is the monthly change in CPI from the 3-month rolling average CPI. Unemployment and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database.

The estimate is the annualized return of:

$$\beta_3 * E[\text{Inflation} | \text{Scenario}] + \beta_4 * E[\text{Inflation}^2 | \text{Scenario}]$$

where the scenarios are short (1-2 months), medium (4-8 months) or long-term (12+ months) inflation duration.

Appendix C: Benchmarking

The following table lists the benchmarks used for each asset class.

Asset Class	Benchmark
US Equity	Russell 3000
Global Equity	MSCI ACWI
Long-term Government Bonds	Bloomberg Barclays US Treasury: Long Index
TIPS	Bloomberg Barclays Global Inflation-Linked: US Tips
Short-term TIPS	Bloomberg Barclays US Treasury Tips 1-5 Years Index
Commodities	Bloomberg Commodity Index
Gold	LBMA Gold Price PM USD

TABLE 6
Asset Class Benchmarks

References

1. "Federal Debt: Total Public Debt as Percent of Gross Domestic Product." FRED, 2 June 2021, fred.stlouisfed.org/series/GFDEGDQ188S.
2. Board of Governors of the Federal Reserve System. (n.d.). https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm.
3. Personal Saving Rate. (2021, May 28). Retrieved from <https://fred.stlouisfed.org/series/PSAVERT>.
4. "LBS." Nasdaq, www.nasdaq.com/market-activity/commodities/lbs.
5. Ganong, P. (2021). Spending and Job Search Impacts of Expanded Unemployment Benefits: Evidence from Administrative Micro Data. Becker Friedman Institute. Retrieved June 23, 2021, from https://bfi.uchicago.edu/wp-content/uploads/2021/02/BFI_WP_2021-19.pdf.
6. "10-Year Breakeven Inflation Rate." FRED, 22 June 2021, fred.stlouisfed.org/series/T10YIE.
7. "30-Year Treasury Constant Maturity Rate." FRED, 22 June 2021, fred.stlouisfed.org/series/DGS30.
8. Bloomberg Terminal.

Disclaimers

This document is for general information and educational purposes only, and must not be considered investment advice or a recommendation that the reader is to engage in, or refrain from taking, a particular investment-related course of action. Any such advice or recommendation must be tailored to your situation and objectives. You should consult all available information, investment, legal, tax and accounting professionals, before making or executing any investment strategy. You must exercise your own independent judgment when making any investment decision.

All information contained in this document is provided "as is," without any representations or warranties of any kind. We disclaim all express and implied warranties including those with respect to accuracy, completeness, timeliness, or fitness for a particular purpose. We assume no responsibility for any losses, whether direct, indirect, special or consequential, which arise out of the use of this presentation.

All investments involve risk. There can be no guarantee that the strategies, tactics, and methods discussed in this document will be successful.

Data contained in this document may be obtained from a variety of sources and may be subject to change. We disclaim any and all liability for such data, including without limitation, any express or implied representations or warranties for information or errors contained in, or omissions from, the information. We shall not be liable for any loss or liability suffered by you resulting from the provision to you of such data or your use or reliance in any way thereon.

Nothing in this document should be interpreted to state or imply that past results are an indication of future performance. Investing involves substantial risk. It is highly unlikely that the past will repeat itself. Selecting an advisor, fund, or strategy based solely on past returns is a poor investment strategy. Past performance does not guarantee future results.

MEMORANDUM

TO: Oakland Police and Fire Retirement System (PFRS)
FROM: Meketa Investment Group ("Meketa")
CC: David Sancewich; Paola Nealon - Meketa
Teir Jenkins - PFRS
DATE: July 28, 2021
RE: 2021 Expected Return Memo

The general theme of the 2021 Meketa Capital Market Assumptions are lower future expected returns. This is a theme which is consistent across the board in the industry and largely driven by the significant changes in interest rates during 2020. Lower interest rates result in lower expected returns for most yield oriented asset classes as starting yield is often a fairly reasonable predictor of future returns for many fixed income related classes. Other approaches which focus on building forecasts from a more bottom-up or fundamental view point for equities and other economic growth risk linked classes are often (or at least in some part) influenced by valuation levels. With a strong year across the board for equity markets, valuations increased across many measures.

As such, expected returns are lower for anyone relying solely on a valuation approach as well. It's important to remember that our capital market assumptions and those of other practitioners and peers have a significant range of error in terms of potential future outcomes. For example, the higher the expected standard deviation, the higher the range of possible outcomes is expected to be for any asset class or portfolio. It is also important to note that the long-term expected portfolio compound return assumes net-of-fee returns, with no attempt to seek added value via active management.

It is important to note that our capital market assumptions are over a 20-year time horizon which is different from the time horizon used by PFRS's actuary, Chieron which projects out over 30-years. Further summary comments of our 2021 capital market assumptions and the detailed projections by asset class are shown on the following page.

- In 2021 our cash return expectations declined materially from 2020 from 2.4% to 1.1% pushing the real return expectation even further into negative territory.
 - Short-term rates declined significantly, with 3 month treasury yields starting at 1.55% and dropping to 0% on March 25th and 26th 2020, before remained low the rest of the year and ending at 0.09%.
- Fixed income yields across the maturity and quality spectrum fell significantly during 2020 reducing return expectations for Fixed Income, High Yield, and Long Duration (a part of Crisis Risk Offset).
- With the exception of Public Equities, no class in the PFRS portfolio is forecasted to achieve a compound return above 7.00% over the next 20 years.
 - Public Equity contains U.S. Equity and International Equity. The next highest returning sub-asset class is Covered Calls at ~4.7%.
- Over the next 20-years the PFRS Long-term policy portfolio is projected to produce a return of 5.63%.

Current Long-Term Policy

Investment Class	2021 20-Year Assumptions		
	Target * %	Exp. Comp. Return**	Expected Std. Dev.
US Equity	40%	6.80	18.00
International Equity	12%	7.10	19.00
Covered Calls	5%	4.70	13.00
Fixed Income	21%	1.80	4.00
Credit	2%	4.20	11.00
Crisis Risk Offset	20%	4.05	8.90
Cash	---	1.10	1.00
Total	100%	5.63	10.21

Current Interim Policy

Investment Class	2021 20-Year Assumptions		
	Target * %	Exp. Comp. Return**	Expected Std. Dev.
US Equity	40%	6.80	18.00
International Equity	12%	7.10	19.00
Covered Calls	5%	4.70	13.00
Fixed Income	31%	1.80	4.00
Credit	2%	4.20	11.00
Crisis Risk Offset	10%	4.05	8.90
Cash	---	1.10	1.00
Total	100%	5.37	10.24

DS, PN, pq

MEMORANDUM

TO: Oakland Police and Fire Retirement System (OPFRS)
FROM: David Sancewich, Paola Nealon, Sidney Kawanguzi, Meketa Investment Group
DATE: July 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
August 2021	<ul style="list-style-type: none">Quarterly Performance Report (2Q 2021)Manager Update: Rice Hall & JamesEducational Item: Cryptocurrency
September 2021	<ul style="list-style-type: none">Cash Flow Report (4Q 2021)Educational Item: SPAC'sThermal Coal List Update: 2021Manager Update: Northern Trust R1000
October 2021	<ul style="list-style-type: none">Flash Performance (3Q2021)Manager Update: SGAManager Update: RamirezContract Renewal: Ramirez
November 2021	<ul style="list-style-type: none">Quarterly Performance Report (3Q 2021)Educational Item: Developments in ESGManager Update (and contract renewal)- Parametric
December 2021	<ul style="list-style-type: none">Cash Flow Report (1Q 2022)Flash performance- NovemberManager Update: DDJ

Bold are priority strategic items.

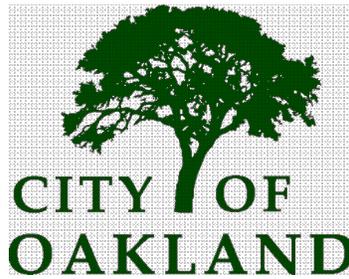


This agenda includes only major strategic items. Meketa also expects to work with the Staff and Board to complete more routine tasks and projects, as expected.

DS/PN/SK/pq

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

AGENDA

RETIREMENT BOARD MEMBERS

Walter L. Johnson, Sr.
President

Jaime T. Godfrey
Vice President

Robert W. Nichelini
Member

Kevin R. Traylor
Member

John C. Speakman
Member

R. Steven Wilkinson
Member

Erin Roseman
Member

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

WEDNESDAY, JULY 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/j/82880493983>
- 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 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**.
- 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>.

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

- 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.

--- ORDER OF BUSINESS ---

- A. Subject: Police and Fire Retirement System (“PFRS”) Board Regular Meeting Minutes**
From: Staff of the PFRS Board

Recommendation: **APPROVE** June 30, 2021 PFRS Board Meeting Minutes
- B. AUDIT & OPERATIONS COMMITTEE AGENDA – JULY 28, 2021**
- B1. Subject: Administrative Expenses Report**
From: Staff of the PFRS Board

Recommendation: **ACCEPT** an informational report regarding PFRS administrative expenses as of May 31, 2021
- C. INVESTMENT & FINANCIAL MATTERS COMMITTEE AGENDA – JULY 28, 2021**
- C1. Subject: Custodial Services Update**
From: Northern Trust Company

Recommendation: **ACCEPT** Informational Report regarding Custodial Services provided by Northern Trust Company
- C2. Subject: Continuation of Custodial Services provided by Northern Trust Company**
From: Meketa Investment Group

Recommendation: **DISCUSS** and **APPROVE** Committee’s recommended course of action regarding the current contract with Northern Trust Company, PFRS Custodial Services Provider
- C3. Subject: Investment Market Overview as of June 30, 2021**
From: Meketa Investment Group

Recommendation: **ACCEPT** informational report regarding the Global Investment Markets as of June 30, 2021

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

- C4. **Subject:** Preliminary Investment Fund Performance Update as of June 30, 2021
From: Meketa Investment Group
Recommendation: **ACCEPT** informational report regarding the Preliminary Investment Fund Performance update as of June 30, 2021
- C5. **Subject:** Informational Overview Regarding Inflation
From: Meketa Investment Group
Recommendation: **ACCEPT** informational overview regarding inflation
- C6. **Subject:** Asset Allocation Review and Update of the PFRS Fund
From: Meketa Investment Group
Recommendation: **ACCEPT and DISCUSS** the informational report regarding the asset allocation review of the PFRS Fund and **APPROVE** Committee's recommended changes to PFRS Investment Portfolio Target Allocation
- D. **Subject:** Resolution No. 8021 – Resolution ratifying the June 30, 2021 motion of the Oakland Police and Fire Retirement System Board to hire Wellington Management Company to serve as the new PFRS Defensive Equity Investment Manager for the Oakland Police and Fire Retirement System with the management fee rate not to exceed 55 basis points (55 bps or 0.55 percent) of the portfolio's annual asset value plus additional operating expenses and authorizing the President of the Police and Fire Retirement System Board to execute a professional service agreement with Wellington Management Company
From: Staff of the PFRS Board
Recommendation: **APPROVE** Resolution No. 8021 – Resolution ratifying the June 30, 2021 motion of the Oakland Police and Fire Retirement System Board to hire Wellington Management Company to serve as the new PFRS Defensive Equity Investment Manager for the Oakland Police and Fire Retirement System with the management fee rate not to exceed 55 basis points (55 bps or 0.55 percent) of the portfolio's annual asset value plus additional operating expenses and authorizing the President of the Police and Fire Retirement System Board to execute a professional service agreement with Wellington Management Company

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

E. Subject: Member Resolutions No. 8022– 8023
From: Staff of the PFRS Board

Recommendation: APPROVE Member Resolutions No. 8022 – 8023

E1. Resolution No. 8022 | Resolution fixing the monthly allowance of surviving spouse of the following retired member of the Oakland Police and Fire Retirement System in the amount indicated:

<u>Deceased Member</u>	<u>Surviving Spouse</u>	<u>Monthly Allowance</u>
▪ John F. Beauchamp	Lynn Beauchamp	\$ 4,051.03

E2. Resolution No. 8023 | 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 Oakland Police and Fire Retirement System:

- Henry J. Tarabochia
- Robert E. Thorsen

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

A REGULAR BOARD MEETING of the Oakland Police and Fire Retirement System (“PFRS”) was held on Wednesday, June 30, 2021 via Zoom Webinar.

- | | | |
|-----------------------|-----------------------|-------------------------------------|
| Board Members: | ▪ Walter L. Johnson | President |
| | ▪ Jaime T. Godfrey | Vice President |
| | ▪ Robert W. Nichelini | Member |
| | ▪ Erin Roseman | 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 |
| | ▪ Sidney Kawanguzi | Meketa Investment Group |

The meeting was called to order at 12:54 p.m. PST

- A. PFRS Board Meeting Minutes** – Vice President Godfrey made a motion to approve the May 26, 2021 Special Board Meeting Minutes, second by Member Traylor. The motion passed.

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

B. AUDIT AND OPERATIONS COMMITTEE AGENDA – MAY 26, 2021

- B1. Scope of Services and Initiation of the Financial Audit of the PFRS Fund for the Fiscal Year Ending June 30, 2021** – Member Speakman provided a summary of the informational report presented by Macias Gini & O’Connell.

MOTION: Member Speakman made a motion to accept the informational report presented by Macias Gini & O’Connell and approve the Scope of Services and initiation of the Financial Audit of the PFRS Fund, second by Member Traylor. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

- B2. Administrative Expenses Report** – Staff Member Jenkins presented an informational report on PFRS’s administrative expenditures as of April 30, 2021. PFRS has an approved budget of approximately \$3.5 million and have expensed approximately \$2.1 million fiscal year-to-date. Membership consisted of 731 retired members, which included 441 Police Members and 291 Fire Members.

MOTION: Member Speakman made a motion to accept the administrative expenses report as of April 30, 2021, second by Member Traylor. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

- B3. PFRS Member Verification** – Member Speakman provided a brief summary regarding the annual PFRS Member Verification project. Member Traylor suggested including a self-addressed stamped return envelope to encourage timely responses. Staff Member Jenkins discussed the challenges considering the scope of the project, as additional information has been requested of the members leaving the postage requirement unpredictable.

MOTION: Member Speakman made a motion to accept the informational report regarding the Annual PFRS Member Verification project, second by Vice President Godfrey. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

C. INVESTMENT & FINANCIAL MATTERS COMMITTEE AGENDA – MAY 26, 2021

- C1. Selection of New Defensive Equity Asset Class Investment Manager** – Vice President Godfrey provided a brief summary of the presentations from the following prospective Investment Managers for the Defensive Equity Investment Strategy: 1) Atlanta Capital Management Co., LLC; 2) Eagle Capital Management, LLC; 3) The London Company; and 4) Wellington Management Company, LLP. David Sancewich of Meketa Investment Group provided an update regarding the stipulations posed at the Investment Committee Meeting. Wellington Management Company confirmed the L.P. Fund is U.S. based out of Delaware and all L.P. investors are treated the same and there is no room for negotiation of fees.

MOTION: Vice President Godfrey made a motion to hire Wellington Management Company as the new PFRS Defensive Equity Investment Manager, second by Member Nichelini. Motion Passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

- C2. Investment Market Overview as of May 31, 2021** – David Sancewich of Meketa Investment Group provided a brief report regarding the Investment Market Overview as of May 31, 2021. D. Sancewich highlighted concerns regarding the level of inflation across the economy and noted the upcoming Asset Allocation Review and thus strategizing how to hedge the portfolio against inflation.

MOTION: Vice President Godfrey made a motion to accept the informational report regarding the Investment Market Overview as of May 31, 2021 provided by Meketa Investment Group, second by Member Speakman. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

C3. **Preliminary Investment Fund Performance Update as of May 31, 2021** – David Sancewich of Meketa Investment Group provided a summary of the Preliminary Investment Fund Performance Update as of May 31, 2021.

C4. **MOTION:** Vice President Godfrey made a motion to accept the informational report from Meketa regarding the Preliminary Investment Fund Performance Update as of May 31, 2021, second by Member Wilkinson. Motion Passed.

(PRESIDENT JOHNSON DROPPED OF MOMENTARILY DUE TO TECHNICAL DIFFICULTIES AND WAS UNABLE TO VOTE ON ITEM C4.)

[JOHNSON – ABSENT / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 6 / NOES: 0 / ABSENT: 1)

C5. **\$13.9 Million Drawdown for Member Allowances Quarter Ending September 30,2021** – Vice President Godfrey made a motion to approve the recommendation by Meketa regarding the \$13.9 million drawdown for Member Allowances.

MOTION: Vice President Godfrey made a motion to approve the recommendation by Meketa regarding the \$13.9 Million Drawdown for Member Allowances Quarter Ending September 30,2021 with a \$10.9 million contribution from the City of Oakland and \$3.0 million contribution from the PFRS Investment Fund, second by Member Speakman. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

D. **Resolution No. 8018 – Resolution ratifying the May 26, 2021 motion of the Oakland Police and Fire Retirement System Board to hire Versor Investments, LLC to serve as the Systematic Trend Following Asset Class Investment Manager for the Oakland Police and Fire Retirement System at a management fee rate not to exceed 90 basis points (90 BPS or 0.90 percent) of the portfolio’s annual asset value and authorizing the President of the Police and Fire Retirement System Board to execute a professional services agreement with Versor Investments, LLC** – Resolution No. 8018 – Resolution ratifying the May 26, 2021 motion of the Oakland Police and Fire Retirement System Board to hire Versor Investments, LLC to serve as the Systematic Trend Following Asset Class Investment Manager for the Oakland Police and Fire Retirement System at a management fee rate not to exceed 90 basis points (90 BPS or 0.90 percent) of the portfolio’s annual asset value and authorizing the President of the Police and Fire Retirement System Board to execute a professional services agreement with Versor Investments, LLC

MOTION: Vice President Godfrey made a motion to approve Resolution No. 8018, second by Member Speakman. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

- E. Update Regarding Post-Pandemic Brown Act Requirements for Board and Committee Meetings (VERBAL REPORT)** – PFRS Legal Counsel Logue provided an update regarding Government Agencies ability to hold public meetings in a virtual format. The Governor’s Office announced, in early June, the Executive Order which allows public meetings to be held in a virtual format will remain in effect for a while and sufficient notice will be provided to Government Agencies to allow for preparation for a return to in-person public meetings. There are proposals to make the allowance for virtual public meetings to remain permanent, however no information is currently available as to the status of these proposals. The PFRS Board may continue to meet virtually and notice will be provided as to any change to this allowance. This item will remain on the Full Board Pending Items List so updates can be provided accordingly.

MOTION: Vice President Godfrey made a motion to accept the update from Legal Counsel Logue regarding the ability for Government Agencies to hold public meetings virtually, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – Y / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

F. Member Resolutions No. 8019 – 8020

- F1. Resolution No. 8019** – Resolution Fixing the Monthly Allowances of Surviving Spouse of the following Retired Member of the Police and Fire Retirement System in the amount indicated:

<u>Deceased Member</u>	<u>Surviving Spouse</u>	<u>Monthly Allowance</u>
Victor L. Grant	Margaret M. Grant	\$ 2,670.19

MOTION: Member Nichelini made a motion to approve Resolution No. 8019, second by Vice President Godfrey. Motion passed.

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

- F2. Resolution No. 8020** – Resolution Approving Death Benefit Payment and Directing Warrants Thereunder in the Total Sum of \$1,000.00 Payable to the Beneficiaries of the following Deceased Members of the Police and Fire Retirement System:

- Lawrence Pinto
- Robert Kenney

MOTION: Member Nichelini made a motion to approve Resolution No. 8020, second by Vice President Godfrey. Motion passed.

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

- G. Pending Items** – No New Report – Pending Item Discussed as Agenda Item E

- H. New Business** – No Report

- I. **Open Forum** – David Sancewich of Meketa Investment Group provided a team update announcing the departure of Sidney Kawanguzi and Meketa will keep the Board apprised of any updates concerning the vacancy. Committee Members & Staff congratulated Sidney and expressed appreciation for Sidney’s commitment, hard work, attention to detail, and being extremely responsive to the needs of the PFRS Board, Committee Members, and Staff.
- J. **Future Scheduling** – The next Regular Board Meeting is scheduled for Wednesday, July 28, 2021.
- K. **Adjournment** – Member Traylor made a motion to adjourn, second by Member Nichelini. Motion passed.

[JOHNSON – Y / GODFREY – Y / NICHELINI – Y / ROSEMAN – EXCUSED / SPEAKMAN – Y / TRAYLOR – Y / WILKINSON – Y]
(AYES: 7 / NOES: 0 / EXCUSED: 0)

The meeting adjourned at 1:22 p.m. PST

DAVID F. JONES, SECRETARY

DATE

Table 1

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Administrative Budget Spent to Date (Preliminary)

As of May 31, 2021

	Approved Budget					
	May 2021	FYTD	Remaining	Percent Remaining		
Internal Administrative Costs						
PFRS Staff Salaries	\$ 1,200,000	\$ 81,087	\$ 977,503	\$ 222,497	18.5%	
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	765	13,040	26,960	67.4%	
Internal Service Fees (ISF)	88,000	-	74,893	13,107	14.9%	
Contract Services Contingency	50,000	-	1,200	48,800	97.6%	
Internal Administrative Costs Subtotal :	\$ 1,505,600	\$ 81,851	\$ 1,066,747	\$ 438,853	29.1%	
Actuary and Accounting Services						
Audit	\$ 45,000	\$ -	\$ 45,000	\$ -	0.0%	
Actuary	46,500	-	19,897	26,604	57.2%	
Actuary and Accounting Subtotal:	\$ 91,500	\$ -	\$ 64,897	\$ 26,604	29.1%	
Legal Services						
City Attorney Salaries	\$ 188,000	\$ 16,036	\$ 167,890	\$ 20,110	10.7%	
Legal Contingency	150,000	-	-	150,000	100.0%	
Legal Services Subtotal:	\$ 338,000	\$ 16,036	\$ 167,890	\$ 170,110	50.3%	
Investment Services						
Money Manager Fees	\$ 1,353,000	\$ 31,093	\$ 806,038	\$ 546,962	40.4%	
Custodial Fee	124,000	29,125	87,375	36,625	29.5%	
Investment Consultant	100,000	-	75,000	25,000	25.0%	
Investment Subtotal:	\$ 1,577,000	\$ 60,218	\$ 968,413	\$ 608,587	38.6%	
Total Operating Budget	\$ 3,512,100	\$ 158,105	\$ 2,267,946	\$ 1,244,154	35.42%	

Table 2

OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Cash in Treasury (Fund 7100) - Preliminary

As of May 31, 2021

	May 2021
Beginning Cash as of 4/30/2021	\$ 6,249,579
Additions:	
City Pension Contribution - May	\$ 3,637,333
Investment Draw	\$ 1,000,000
Misc. Receipts	1,037
Total Additions:	\$ 4,638,371
Deductions:	
Pension Payment (April Pension Paid on 5/1/2021)	(4,346,605)
Expenditures Paid	(223,379)
Total Deductions	\$ (4,569,985)
 Ending Cash Balance as of 5/31/2021*	 \$ 6,317,964

* On 6/1/2021, May pension payment of appx \$4,328,000 will be made leaving a cash balance of \$1,990,000

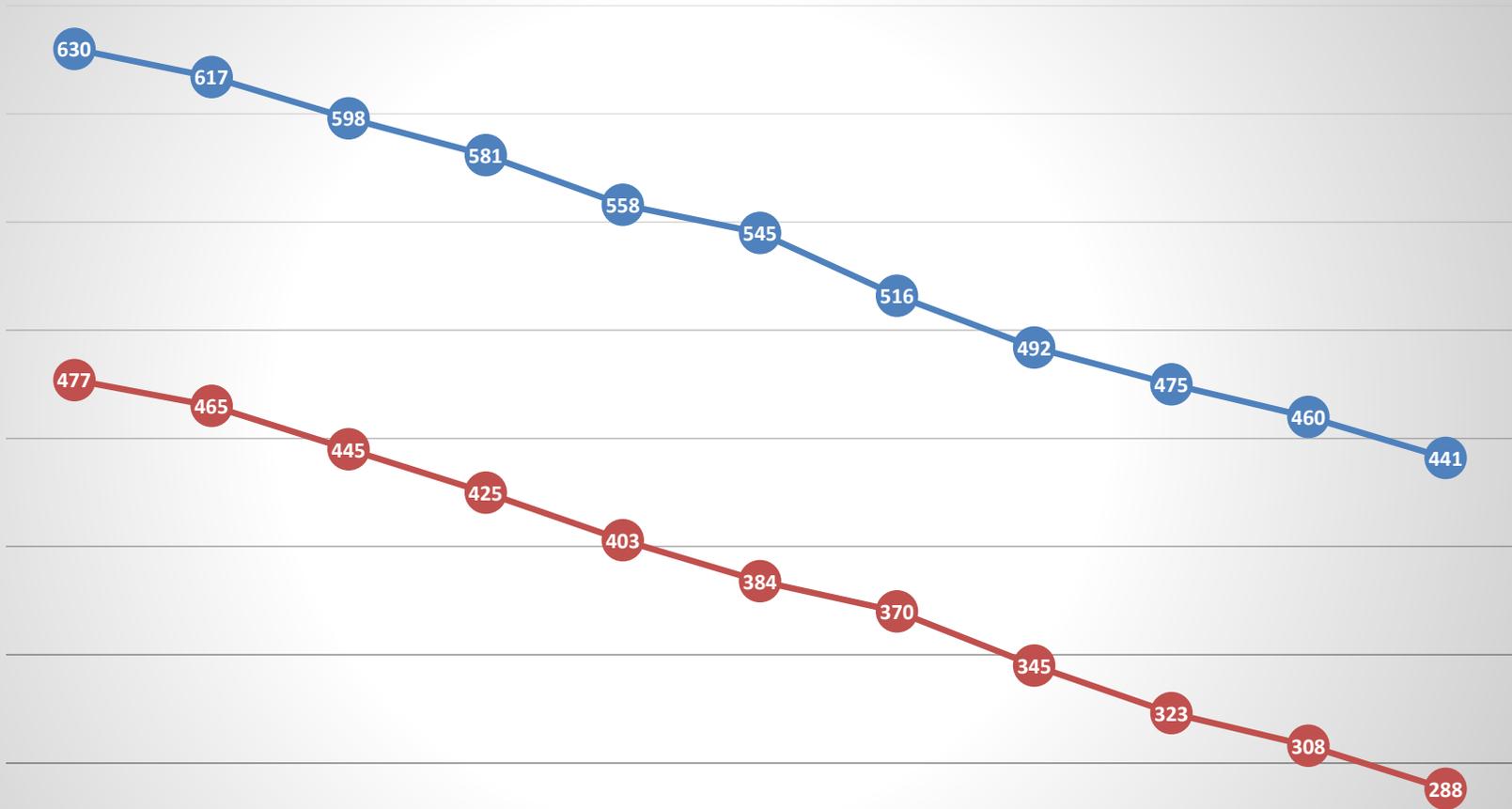
Table 3
CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Census
As of May 31, 2021

COMPOSITION	POLICE	FIRE	TOTAL
Retired Member:			
Retiree	320	184	504
Beneficiary	121	104	225
<i>Total Retired Members</i>	441	288	729
<i>Total Membership:</i>	441	288	729

COMPOSITION	POLICE	FIRE	TOTAL
Retired Member:			
Service Retirement	294	144	438
Disability Retirement	135	131	266
Death Allowance	12	13	25
<i>Total Retired Members:</i>	441	288	729
<i>Total Membership as of May 31, 2021:</i>	441	288	729
<i>Total Membership as of June 30, 2020:</i>	460	308	768
<i>Annual Difference:</i>	-19	-20	-39

Oakland Police and Fire Retirement System Pension Plan Membership Count As of May 31, 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	441
Fire	477	465	445	425	403	384	370	345	323	308	288
Total	1107	1082	1043	1006	961	929	886	837	798	768	729

ASSET SERVICING

Northern Trust Relationship Review

Prepared for: CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM,

July 28, 2021

Claudiu Besoaga
Vice President
Sr. Relationship Manager,



NORTHERN TRUST

NORTHERN TRUST

Founded in Chicago, we have been providing client-centric financial solutions for more than 130 years

FROM 1889...



...TODAY



NORTHERN
TRUST

BRAND STRENGTH BUILT UPON OUR HERITAGE

- Our vision is to be our clients' **most trusted financial partner**, delivering industry-leading capabilities through **exceptional people** and **innovative technology**
- Consistently creating **long-term value**, making a **positive difference** to our shareholders, clients, employees and our global communities

Focused on our
core businesses

A history of
organic growth

Distinctive
financial
strength

Conservative yet
flexible business
model

Record of
managing long-
term profitable
growth

One of the most
highly respected
institutions in the
world

CLIENT-CENTRIC, FOCUSED BUSINESS MODEL

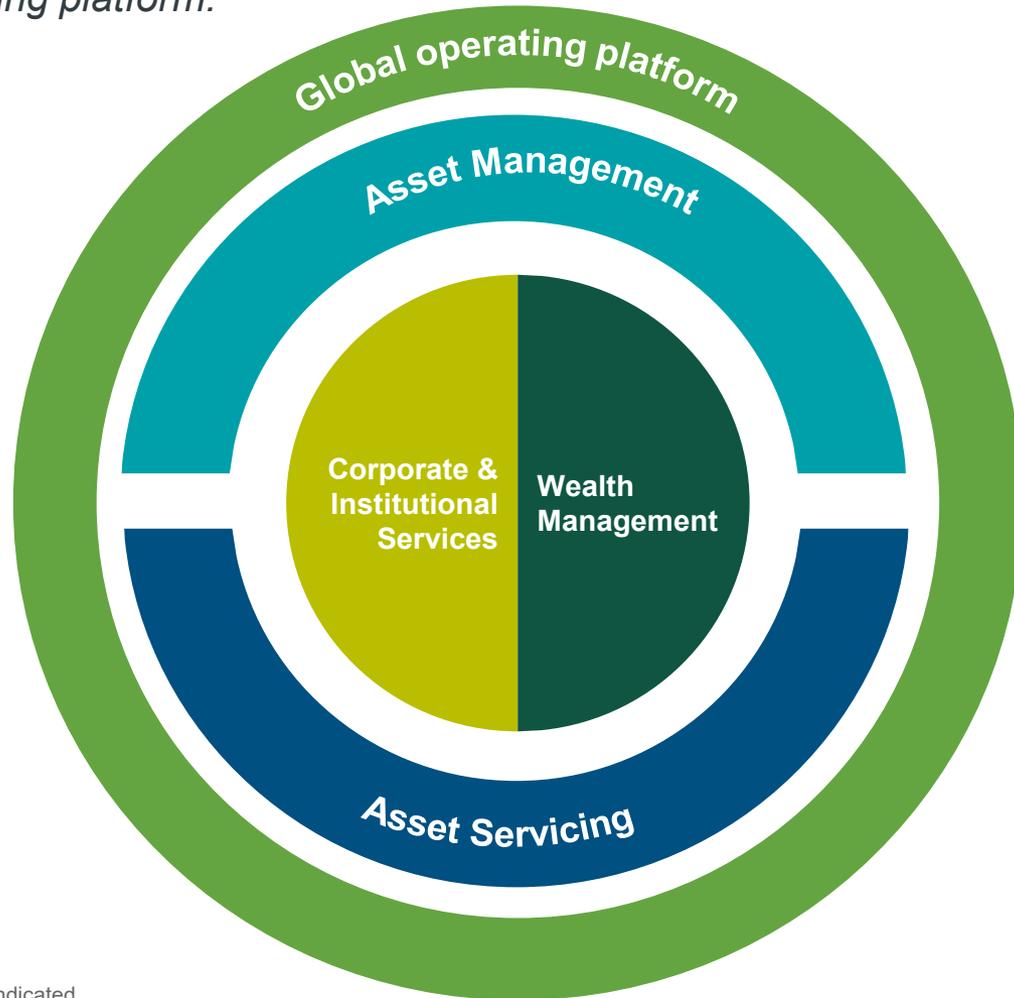
Asset servicing, asset management and banking for personal and institutional clients, supported by our integrated operating platform.

Corporate & Institutional Services

- Insurance companies
- Pensions
- Sovereign entities
- Fund managers
- Foundations and endowments

Wealth Management

- Individuals
- Families
- Family offices
- Foundation
- Endowments
- Privately held businesses



\$11.5 trillion
assets under custody

\$1.4 trillion
assets under management

\$14.8 trillion
assets under custody/administration

Figures as of March 31, 2021 unless otherwise indicated
(*Amounts shown are in U.S. Dollars)
Source: Northern Trust

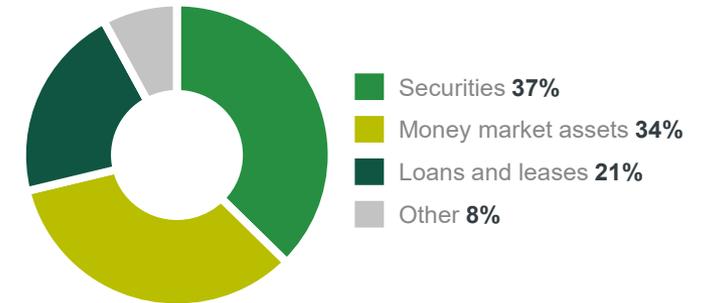
OUTSTANDING FINANCIAL STRENGTH AND STABILITY

Well-positioned for continued investment in our business, across all market cycles

STRONG CAPITAL POSITION

Northern Trust Corporation Capital Ratios	1Q21	Minimum Capital Ratios
Advanced Approach		
Common Equity Tier 1	12.8%	4.5%
Tier 1	14.0%	6.0%
Total	15.2%	8.0%
Tier 1 Leverage	6.9%	4.0%
Supplementary Leverage	8.1%	3.0%
Standardized Approach		
Common Equity Tier 1	12.0%	4.5%
Tier 1	13.0%	6.0%
Total	14.5%	8.0%
Tier 1 Leverage	6.9%	4.0%

HIGH QUALITY BALANCE SHEET



▲ *Balance sheet is highly liquid and low risk*

SUPERIOR CREDIT RATING

	Standard & Poor's	Moody's	Fitch Ratings	DBRS
Northern Trust Corporation				
Short-Term/Commercial Paper	A-1	No Rating*	F1+	R-1 (middle)
Long-Term/Senior Debt	A+	A2	A+	AA (low)
The Northern Trust Company				
Short-Term/Deposits	A-1+	P-1	F1+	R-1 (high)
Long-Term/Deposits	AA-	Aa2	AA	AA

◀ *Standard & Poor's assigned the highest credit ratings of any comparable U.S.-based bank to our Corporation and main bank subsidiary, The Northern Trust Company.*

¹ All figures as of March 31, 2021. Capital ratios are preliminary until regulatory reports have been filed.

* Rating removed as of September 16, 2016, as Northern Trust does not have an active Commercial Paper Program.

REPRESENTATIVE CALIFORNIA CLIENTS



165 California clients.

Profile Name	City	State
Kern County Employees Retirement Association	Bakersfield	CA
Contra Costa County Employees' Retirement Association	Concord	CA
City of Fresno Retirement Systems	Fresno	CA
Fresno County Employees Retirement Assoc.	Fresno	CA
St. Joseph Health System	Irvine	CA
City of Los Angeles Fire and Police	Los Angeles	CA
Los Angeles Water & Power Employees' Retirement	Los Angeles	CA
Los Angeles City Retirement Emp System	Los Angeles	CA
Merced County Employees Retirement Association	Merced	CA
Stanislaus County Employees' Retirement Association	Modesto	CA
Alameda-Contra Costa Transit District	Oakland	CA
San Mateo County Employees Retirement Association	Redwood City	CA
Sacramento Regional Transit District	Sacramento	CA
County of San Diego Department of Treasurer	San Diego	CA
San Diego County Employees' Retirement Association	San Diego	CA
San Francisco Retiree Health Care Trust	San Francisco	CA
California County of Orange	Santa Ana	CA
San Joaquin Employees Retirement Association	Stockton	CA
Motion Pictures Industry Pension & Health	Studio City	CA

CORPORATE & INSTITUTIONAL SERVICES

Custody Services

EXPERTISE IN CLIENT SEGMENT

Public Fund Relationships

- Established in 1987
- 200 clients
 - 30% of top 100 public plans
- \$1.1 Trillion AUC
- 30 new clients from 2017 to date

Client Servicing

- 27 Client Servicing Professionals
 - Average of 18 years of relationship management experience
 - Average of 13 years with Northern Trust
- 15% increase in servicing staff over last 3 years

Commitment to Asset Servicing

- Derived 78% of total revenue from fee-based, non-interest activities related to asset servicing
- Technology:
 - 2018-2020: USD \$3.1 billion
 - 2021-2023: Estimated USD \$3.5 billion

Public Fund Gains & Losses

CLIENTS GAINED

CLIENTS LOST

Year	Number of Clients	Year	Number of Clients
2020–2021 to-date	9	2020	1
2019	6	2019	0
2017 - 2018	15	2017 - 2018	1

Legal

- No litigation on FX practices
- No pay to play actions/investigations
- No DOJ actions

RELATIONSHIP TEAM: ALWAYS FOCUSED ON YOU

CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Senior management oversight

Jeffrey Porta Practice Lead – Public Funds	312-557-0474 JMP6@ntrs.com	Patti Somerville-Koulouris Manager – Public Funds	312-444-2357 PS66@ntrs.com
--	-------------------------------	---	-------------------------------

Relationship management

Claudiu Besoaga Relationship Manager	312-557-4049 CB73@ntrs.com	Gerald Sinish Jr. Back-Up Relationship Manager	312-444-5733 GS60@ntrs.com
--	-------------------------------	--	-------------------------------



Client service team

Don Anderson Securities Lending	312-444-5386 DSA3@ntrs.com	Tamara Doi Beck Asset Management	303-335-1416 TDB7@ntrs.com
---	-------------------------------	--	-------------------------------

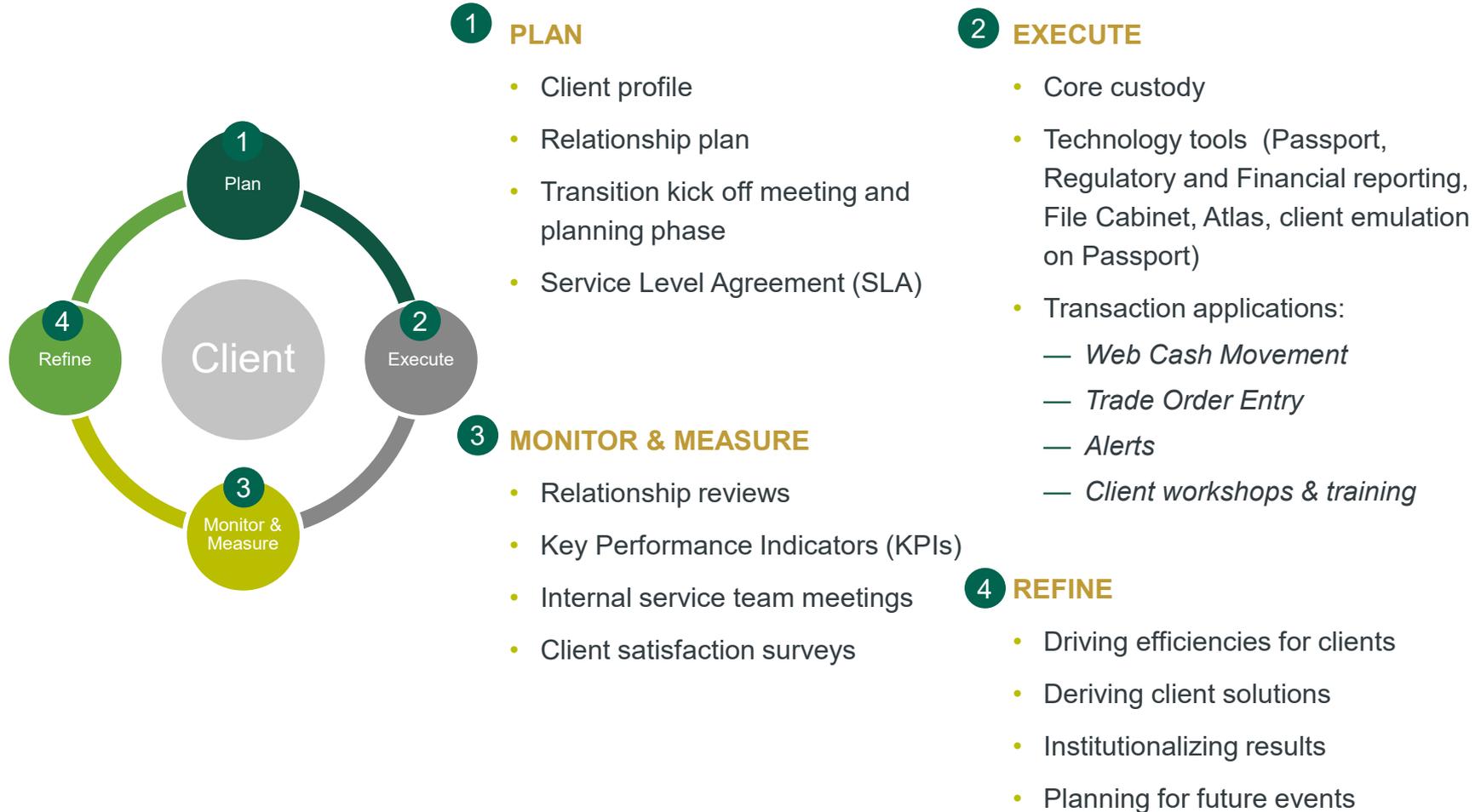
Doug Wells Compliance Monitoring	312-557-2501 DAW2@ntrs.com	Selma Masinovic Account Manager	312-557-0150 SZM63@ntrs.com
--	-------------------------------	---	--------------------------------

Product specialists

Asset pricing and coding	Proxy services	Trade processing	Cash Management
Accounting and regulatory reporting	Investment manager liaison	Income processing	Corporate and class actions
	Tax reclamation	Business continuity and disaster recovery	

SERVICE APPROACH FOR INSTITUTIONAL INVESTORS FOCUSED ON EXECUTION

We apply best practices, operational processes, accounting controls, and a discipline in managing relationships, supported by expert professionals and innovative technology.

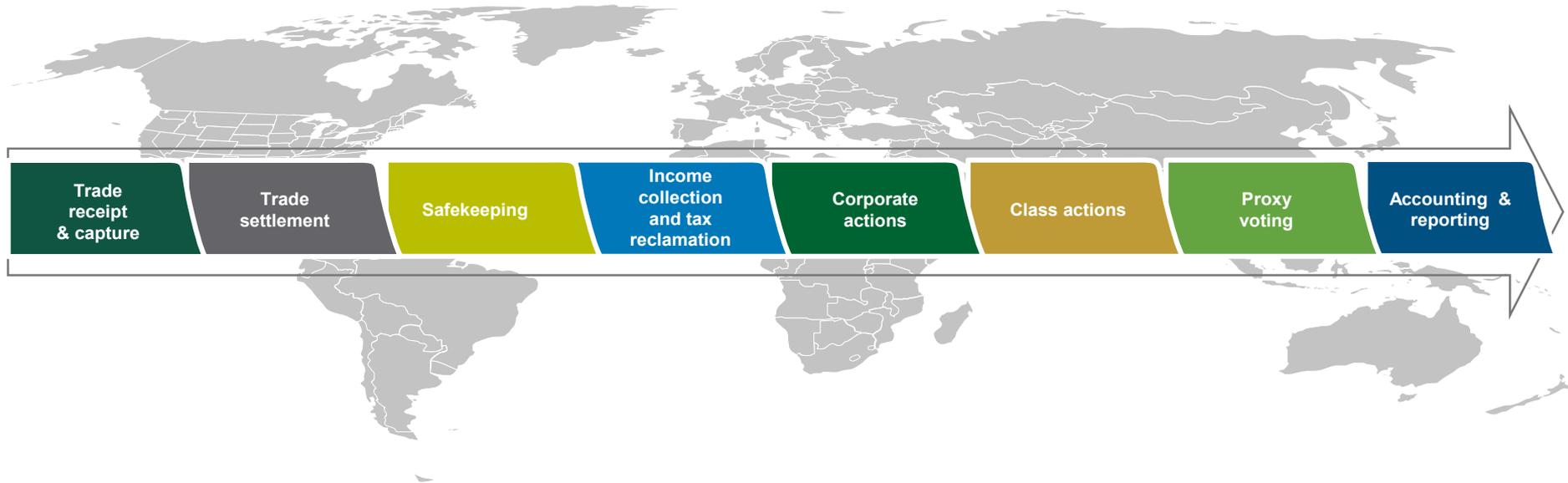


THE COMPLETE SOLUTIONS CONTINUUM

Asset Management	<ul style="list-style-type: none"> • Active management • Alternative Investments • Cash management 	<ul style="list-style-type: none"> • Defined contribution • Equities /fixed income • ESG/SRI 	<ul style="list-style-type: none"> • Factor-based investing • Index management • Outsourced CIO
Asset Servicing	<ul style="list-style-type: none"> • Alternative asset servicing • Collateral management • Derivatives processing 	<ul style="list-style-type: none"> • Fund execution • Entitlement processing • Proxy voting 	<ul style="list-style-type: none"> • Safekeeping • Settlement • Tax reclamation
Capital Markets	<ul style="list-style-type: none"> • Brokerage • Commission management • Foreign exchange 	<ul style="list-style-type: none"> • FX eCommerce/algos • Passive currency overlay • Pooled fund transitions 	<ul style="list-style-type: none"> • Securities lending • Third party lending • Transition management
Data	<ul style="list-style-type: none"> • Compliance monitoring • Data aggregation • Financial accounting 	<ul style="list-style-type: none"> • Investment accounting • Performance analytics • Risk analytics 	<ul style="list-style-type: none"> • Transparency analysis • Unitization/plan allocation • Valuation reporting
Fund	<ul style="list-style-type: none"> • Cross-border pooling • Corporate secretarial • Component outsourcing 	<ul style="list-style-type: none"> • Financial reporting • Fund administration • Operations outsourcing 	<ul style="list-style-type: none"> • Tax transparent pooling • Transfer agency • Trustee/depositary
Liquidity	<ul style="list-style-type: none"> • Banking • Cash funds/management • Credit facilities 	<ul style="list-style-type: none"> • Corporate cash services • Deposit placing • Evergreen deposits 	<ul style="list-style-type: none"> • Peer to peer • Repo, reverse repo • Treasury management
Regulatory	<ul style="list-style-type: none"> • EMIR/Dodd Frank FASB • GASB, GAAP • IFRS, APRA, ASCII 	<ul style="list-style-type: none"> • Regulatory reporting • Regulatory returns • Investment oversight 	<ul style="list-style-type: none"> • SORP, nFTK • Solvency II • Transparency analytics
Retirement	<ul style="list-style-type: none"> • Account control agreement • Benefit payments • Contingent assets 	<ul style="list-style-type: none"> • Defined contribution • De-risking support • Fund rebalancing 	<ul style="list-style-type: none"> • Institutional governance • Reservoir trusts • Trapped surplus vehicles

CUSTODY - A COMPREHENSIVE SERVICE SUITE

Northern Trust delivers process efficiencies, automation, scale and flexibility through our comprehensive asset servicing product offering



KEY METRICS FOR CITY OF OAKLAND POLICE AND FIRE RETIREMENT SYSTEM

Over \$457 Million in Assets Under Custody

17 Custody Accounts

Over 221 statements (monthly and annual)

3,019 SECURITY SALES

2,510 SECURITY PURCHASES

7 - SMA
9 - SLA
1 - CASH

7 Funds
CFs, LPs and MFs

1,072 PRINCIPAL PAYDOWN

17,700 CASH TRANSACTIONS

238 OTHER TRANSACTIONS

Activity from 07/01/2020 to 06/30/2021

\$6,899,723.40 Income Collected

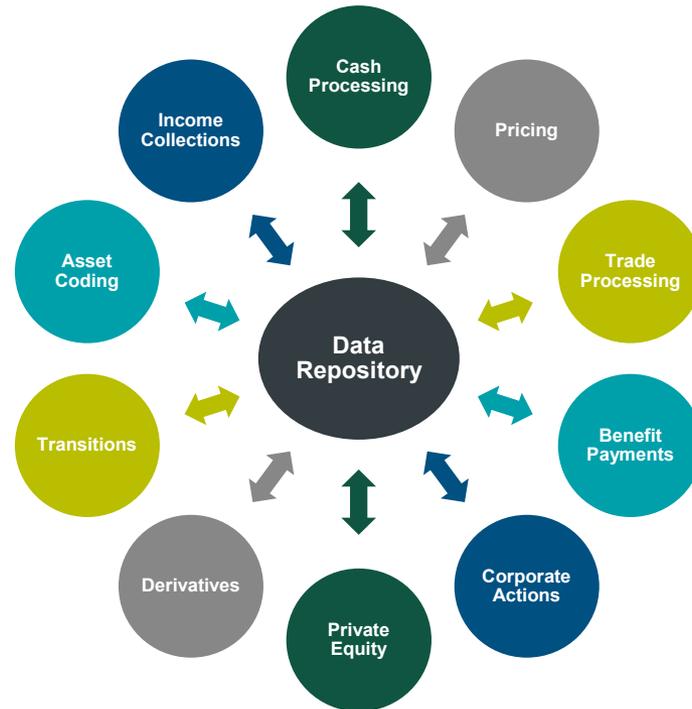
9,084.30 Class Action Proceeds

Filed for 29 Class Actions

CLIENT ACCOUNTING & REPORTING INFORMATION FLOW

Sophisticated Architecture

- Common trade capture for custody and trade services
- Shared utilities benefit all processes and businesses
- An absence of reconciliation by function, platform or geography
- A single data repository



Transaction Processing and Audit at Local Operations level

Delivering Exceptional Results

- Faster, more accurate results
- Greater access to our experts
- Ability to focus on more critical/value-added activities
- Greater flexibility on deadlines

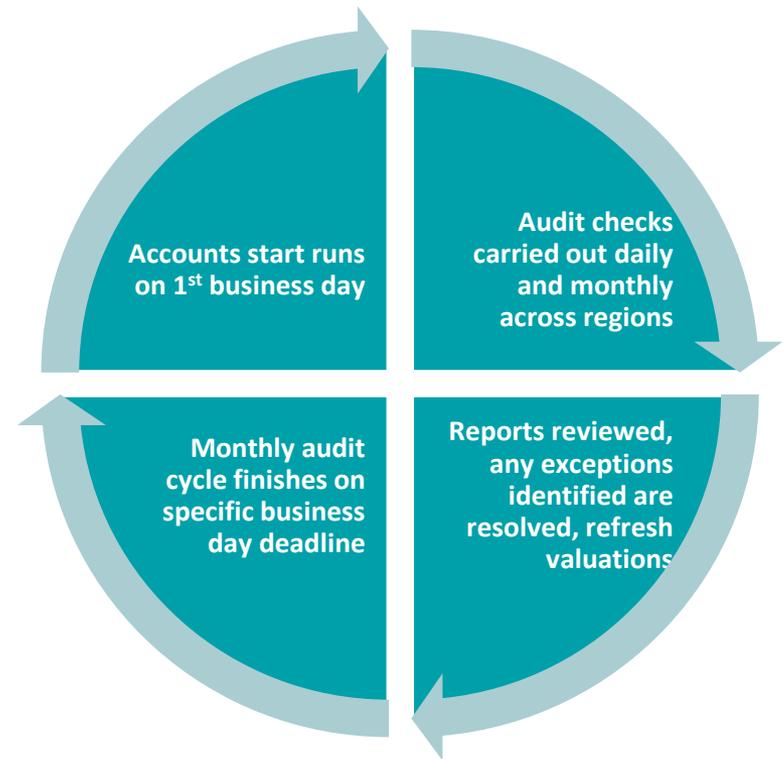
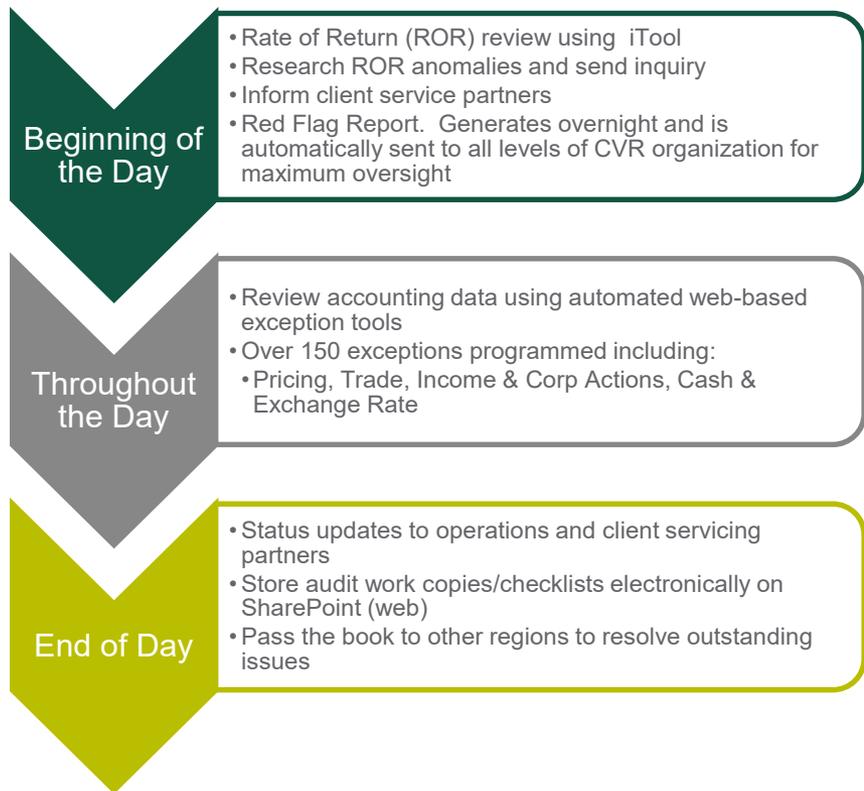


Client Valuation Reporting

Final Audit in Accounting

Final Output/Report Delivery

DATA REVIEW PROCESS FLOW



Class Action Overview

A DEDICATED TEAM WITH SPECIALIST EXPERTISE

Our dedicated class action group focuses on helping you receive your settlement proceeds for any securities based class actions that has settled in the U.S. or Canadian courts.

As class action lawsuits and settlement funds continue to grow, working with an experienced partner gives you peace of mind that your business interests are being protected.

Comprehensive services for securities litigation that have settled through the U.S. and Canadian courts where claim administration is being handled by U.S. or Canadian claim administrators

Tracking and providing notification of settled lawsuits

Filing claims

Posting disbursements to your portfolios

A team of market specialists oversees the filing and tracking of class action settlement claims

A clear structure providing consistency of approach from beginning to end for audit purposes

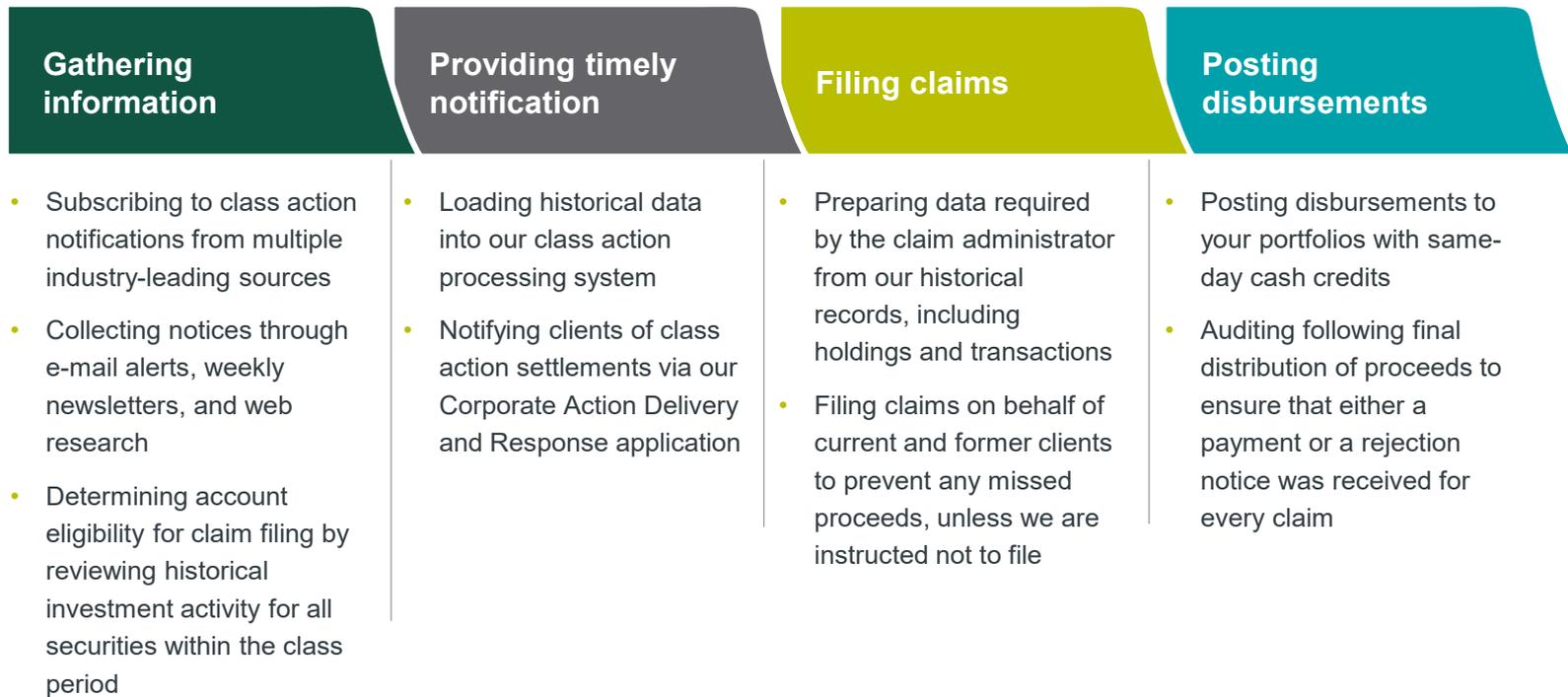
Detailed reporting providing you with information on all class action events that we process delivered via our flexible web portal Northern Trust Passport®

Recent service offerings to cover the rise of class actions outside the U.S. and Canadian courts

CLASS ACTIONS

Our dedicated class action group focuses on helping you receive settlement proceeds for class actions in the U.S., Canada and occasionally the Netherlands.

As class action lawsuits and settlement funds continue to grow, working with an experienced partner gives you peace of mind that your business interests are being protected.



We use multiple industry-leading sources for class action notification to ensure we can quickly identify and notify you of events that impact you. Through our integrated approach, we access and act on information quickly and efficiently on your behalf.

INTERNATIONAL CLASS ACTIONS

Support across multiple markets.



Support international claims filing through two preferred vendors, Broadridge and Institutional Shareholder Services (ISS)

- Covers opt-in jurisdictions such as those in the UK, Germany, Australia (additional markets also covered)
- Clients contract directly with these vendors
- Broadridge or ISS monitor and either prepare filings or file activity on behalf of client for non-US activity custodied at Northern Trust (preparation and filing depends on market)
- Well established data integration with Northern Trust
- Payments can be issued directly to Northern Trust on behalf of the client
- Service covers opt-in legal systems and analysis of the opt-In events provided to client

As at (updated quarterly) Source: Northern Trust

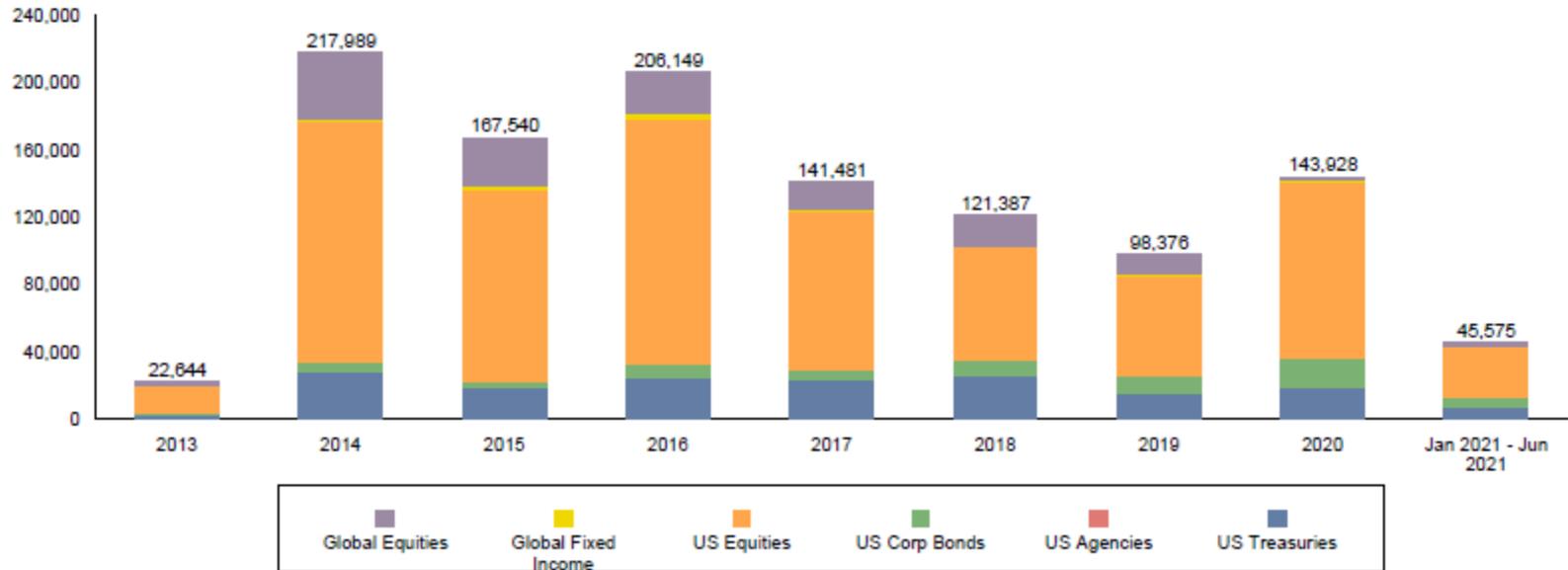
TOTAL NORTHERN TRUST VOLUMES

Year	Events Filed	Events Paid	Total Amount Paid in USD
2008	132	181	\$450,160,604.77
2009	131	283	\$381,734,418.05
2010	169	236	\$297,375,860.59
2011	106	182	\$209,511,012.10
2012	93	190	\$209,885,565.03
2013	107	210	\$124,549,732.15
2014	94	167	\$188,715,911.22
2015	109	125	\$193,368,964.37
2016	130	123	\$109,001,469.32
2017	111	221	\$247,293,494.96
2018	85	178	\$112,920,032.50
2019	103	172	\$290,991,872.62
2020	96	136	\$116,362,371.75

Securities Lending Program

SUMMARY OF LENDING PROGRAM

City of Oakland Police and Fire Retirement System



	2013	2014	2015	2016	2017	2018	2019	2020	2021 YTD	Total
Fee Split*										
70/30										
Gross Revenue	32,314.00	311,156.00	239,042.00	294,233.00	201,908.00	173,261.00	140,446.00	205,554.00	65,076.00	1,662,990.00
Net Revenue	22,644.00	217,989.00	167,540.00	206,149.00	141,481.00	121,387.00	98,376.00	143,928.00	45,575.00	1,165,069.00
Bank Fees	9,670.00	93,167.00	71,502.00	88,084.00	60,427.00	51,874.00	42,070.00	61,626.00	19,501.00	497,921.00

Cash Collateral Fund

SL Core STIF

*City of Oakland receiving 70% of the total revenue and Northern Trust receiving 30%

REVENUE BREAKOUT JANUARY 2021 – JUNE 2021

Security Type	Market Value (USD)		% on Loan	Gross Earnings (USD)	On Loan Spread (bp)	Gross BP Return (bp) *	Net Earnings (USD)
	Avg. on Loan	Avg. Available					
US Treasuries	13,190,666	19,013,282	69.4%	9,965	15.0	10.4	6,977
US Agencies	0	641,899	0.0%	0	0.0	0.0	0
US Corp Bonds	7,534,569	32,895,766	22.9%	9,110	24.0	5.5	6,387
US Equities	19,606,128	105,542,971	18.6%	42,657	43.3	8.0	29,870
Global Fixed Income	430,313	1,819,399	23.7%	580	26.8	6.3	407
Global Equities	1,227,415	13,585,022	9.0%	2,763	44.8	4.0	1,936
Total	41,989,091	173,498,339	24.2%	65,076	30.8	7.5	45,575

Account Number	Account Name	Market Value (USD)		% on Loan	Gross Earnings (USD)	On Loan Spread (bp)	Gross BP Return (bp) *	Net Earnings (USD)
		Avg. on Loan	Avg. Available					
2698029	PFRS- VANGUARD FTSE DEV MK ETF	9,918,230	16,812,916	59.0%	12,316	24.7	14.6	8,622
	PFRS03 PFRS - REAM	12,171,972	22,349,411	54.5%	10,736	17.5	9.6	7,519
2686486	*PFRS-RAMIREZ ASSET MANAGEM-SL	8,983,576	32,020,935	28.1%	8,919	19.7	5.5	6,251
2698024	*PFRS - RUSSELL 2000 ETF-SL	289,196	4,145,231	7.0%	6,783	466.5	32.5	4,748
4473903	*PFRS-RICE HALL JAMES-SL	4,854,162	15,723,965	30.9%	6,154	25.2	7.8	4,315
4481520	*PFRS - PARAMETIC RISK PREM-SL	596,439	10,479,209	5.7%	5,784	192.9	11.0	4,049
4486323	*PFRS - LONG DURATION ACCOU-SL	177,512	12,502,564	1.4%	5,104	571.8	8.1	3,573
2698025	*PFRS - EARNEST PARTNERS -SL	3,212,319	43,770,843	7.3%	3,829	23.7	1.7	2,681
4400331	*PFRS - BROWN ADVIS-SL	1,027,031	6,141,257	16.7%	3,292	63.8	10.7	2,306
	PFRS01 PFRS01-PFRS -SGA -SL	758,652	9,552,008	7.9%	2,159	56.6	4.5	1,512
2698022	PFRS-PARAMETRIC (50%) DELTASHI	0	0	0.0%	0	0.0	0.0	0
2698028	PFRS-PARAMETRIC (50%) BXM REP	0	0	0.0%	0	0.0	0.0	0
Total		41,989,091	173,498,339	24.2%	65,076	30.8	7.5	45,575

EXECUTIVE SUMMARY 2021

TOP 10 SECURITIES AND EARNINGS SUMMARY

From 01 Jan 2021 to 30 Jun 2021

Rank	Security ID	Security Name	Net Earnings	Total Spread
1	921943858	VANGUARD FTSE DEVELOPED MARKETS ETF	8,621.80	24.22
2	92206C847	MFC VANGUARD LONG-TERM TREASURY ETF	7,250.47	594.77
3	92206C649	MFC VANGUARD SCOTTSDALE FDS VANGUARD	6,233.59	427.98
4	91282CAE1	UNITED STATES OF AMER TREAS NOTES DTD	1,215.52	18.07
5	91282CBT7	UNITED STATES OF AMER TREAS NOTES DTD	1,145.57	18.59
6	9128282F6	UTD STATES TREAS 1.125% DUE 08-31-2021	867.63	15.02
7	912810SN9	UNITED STATES TREAS BDS 1.25% DUE	726.51	15.67
8	912828ZR4	WI TREASURY SEC .125% DUE 05-31-2022 REG	722.04	14.04
9	53220K504	LIGAND PHARMACEUTICALS INCORPORATED CL B	658.13	74.04
10	48123V102	J2 GLOBAL INC COM	610.32	23.20
Total top 10			28,051.58	39.94
Total Estimated Earnings			45,575.47	30.20
From 01 Jan 2021 To 30 Jun 2021				

The top 10 securities represent 61.55% of the total earnings

TOP 5 BORROWERS

As of 30 Jun 2021

Top 5 Borrowers	Domicile	From 01 Jan 2021 - 30 Jun 2021		30 Jun 2021	
		Net Earnings	% of Net Earnings	As of 30 Jun 2021 Loan Volume	% of Loan Volume
BOFA SECURITIES, INC.	US	17,138.63	37.60 %	22,871,348.34	42.78 %
CITIGROUP GLOBAL MARKETS INC.	US	3,713.10	8.15 %	6,135,668.92	11.48 %
GOLDMAN SACHS & CO. LLC	US	3,604.55	7.91 %	4,326,148.77	8.09 %
SOCIETE GENERALE, NEW YORK BRANCH	US	2,739.78	6.01 %	4,136,685.43	7.74 %
ING FINANCIAL MARKETS LLC	US	1,288.42	2.83 %	3,118,105.53	5.83 %
Total Top 5 Borrowers		28,484.48	62.50 %	40,587,956.99	75.92%
Total All Borrowers	From 01 Jan 2021 to 30 Jun 2021	45,575.47	100 %	53,462,042.83	100%

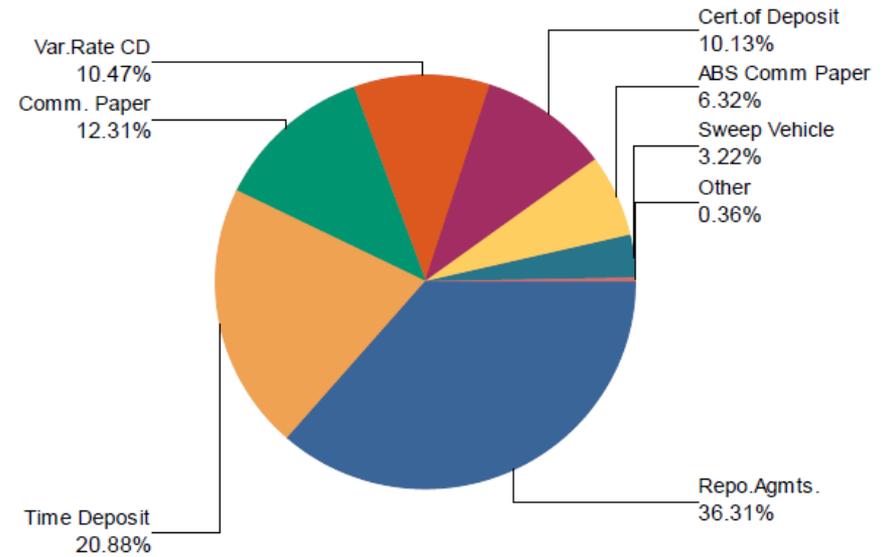
The top 5 borrowers represent 75.92% of the total loan volume

INVESTMENT PROFILE: CORE STIF CASH COLLATERAL FUND

JUNE 30, 2021

Characteristics			
Total Book Value (in USD)	15,238,327,661		
Weighted Average Maturity (Interest Reset Date)	30 Days		
Weighted Average Maturity (Maturity Date)	70 Days		
Average Equivalent Quality Rating			
Total Number of Issues	113		
Quality Distribution		Percentage	
A1+ (SHORT TERM)	77.81%		
A1 (SHORT TERM)	18.6%		
AA- (LONG TERM)	3.22%		
Other	.36%		
Maturity Breakdown Distribution		Interest Reset	Maturity Date
Overnight	66.22%	32.30%	
2 - 15 Days	4.21%	1.57%	
16 - 30 Days	5.67%	5.16%	
31 - 60 Days	5.84%	12.50%	
61 - 97 Days	11.20%	30.97%	
98 - 180 Days	2.45%	7.98%	
181 - 270 Days	1.71%	4.15%	
271 - 366 Days	2.71%	5.01%	
Other	0.00%	0.36%	
Industry/Sector Distribution		Percentage	
Banking Ind.	54.07%		
Broker/Dealer	36.46%		
Finance & Ins	6.81%		
Treasuries	2.30%		
Other	0.36%		

Cash Collateral Asset Class Breakdown



Fund yield as of 6/30/2021 = 22 bps

NOTE: This information was created using the best unaudited data available to us and may not be completely reliable, accurate, or timely. Data is prepared on a settled basis, which may differ from traded basis data on the Cash Collateral Holdings report. "Traded Basis" reflects pending trades.

CORPORATE & INSTITUTIONAL SERVICES

Cybersecurity & Global Technology

NORTHERN TRUST'S APPROACH TO INFORMATION SECURITY

- Strong governance process and culture of risk management
- Layered internal controls and detailed risk management practices
- Business unit compliance with policies, standards and guidelines, and external regulations
- Employees' responsibility for promoting information security to safeguard information
- Comprehensive assessment of 3rd party vendors
- Regular use of third party security teams to assess effectiveness



CYBER THREATS RELATED TO COVID-19

Remote Work

- Attempts to compromise IT infrastructure (e.g. VPN, Citrix, RDP)
- Potentially insecure home computing environment
- Insecure virtual meetings (e.g. Zoom)

Phishing

- Phishing campaigns across all channels (email, SMS, phone calls)
- Used by cyber criminals and nation-state actors
- Themes relate to news covering the pandemic (e.g. economic stimulus)

Scams

- Business Email Compromise (BEC)
- Fraudulent websites (charities, donations, medical supplies)

Disinformation

- Used mostly by nation-state actors
- Aimed to influence spread or spread panic

Cyber Attacks

- Directed at healthcare organizations (e.g. WHO) and hospitals globally
- Increase in ransomware attacks on hospitals

OVERALL CYBER THREAT LANDSCAPE

- New Surveillance Laws

Regulation

- Wide Reaching Impact of New Regulation, e.g. GDPR



Attacks



Evolving Cyber Threat Landscape

People



Technology

- Social Engineering Attacks (including Persistent Phishing)
- Rise in Insider Threats
- Skills Shortage

- Concentration Risk from a few Dominant Vendors
- Patch Management Problems

- 'Arms-Race' as New Technologies Mature – Artificial Intelligence and Machine Learning
- Increasing Adoption of/Reliance on Cloud

HOW WE PROTECT YOUR DATA – SUMMARY OF PROTECTIONS

Data Protection / Content Security

- Access Management and Certification
- Separation of Duties
- Strict Data Governance on Data In-Use
- End-to-End Encryption (via HTTPS, TLS)
- Encryption on Sensitive Data At-Rest
- Secure online platform for delivery
- Data Loss Prevention (DLP)
- Online Fraud Detection
- VDI, VPN
- Data Exfiltration Controls
- Data Storage Control
- Third Party Risk Management
- Secure Application Development Life

Employees / Culture

- Strong Corporate Culture with Security and Protection as a top priority
- Information Security Training & Awareness Program
- Awareness on leading industry practices for acceptable information security behaviors
- Phishing Simulation for User Awareness

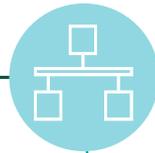
Client Security

- Multifactor Authentication Account Suspension
- Re-authentication
- Client-side Malware Detection
- Restrict Access from Jailbroken and Rooted Devices



Endpoint Security

- Malware Protection
- File & Removable Media Protection
- Application Control (inventory, white/black listing, patch management)
- URL/Website Filtering & Blocking



Network Security

- Security Hardening
- Enterprise-wide Vulnerability and Patch Management
- Intrusion Detection & Prevention
- Malware Prevention & Management
- Vulnerability / Penetration Assessment
- Denial of Service & Botnet Protection
- Privileged Access Management

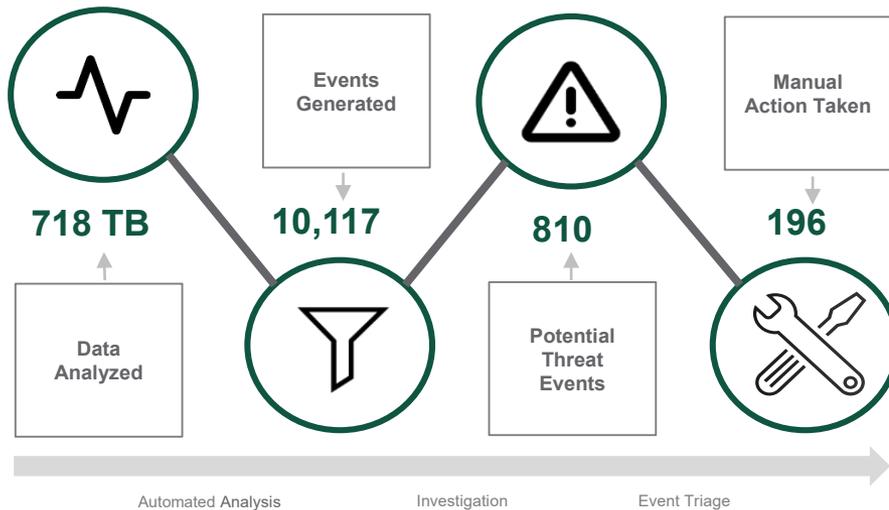


Monitoring & Response Management

- End to End Visibility for Threat Management
- 24x7x365 security monitoring incident response
- Cyber Threat Fusion Program – Enterprise wide incident management
- Cyber Simulations & Resiliency Exercises



CYBER THREAT METRICS – Q1 2021



Cyber Threat Commentary:

- During Q1 2021, Northern Trust’s security systems analyzed approx. 718 Terabytes (718,000 Gigabytes) of data from over 100 separate sources.
- 10,117 events were generated by Northern Trust’s SIEM system and reviewed by our Security team.
- 810 events were classified as potential threats. Most of these events are associated with potentially malicious emails.
- 196 events involved analyst activity in the protection of NT’s systems, e.g., to block malicious email domains.

THE WORLD IN 2021...

By 2020 projections indicate that the amount of digital information in existence will have grown from 3.2 zettabytes today to 40 zettabytes – an increase of 1,150%



25B

SMART DEVICES



\$40B

ANNUAL FINTECH
INVESTMENT



10M

SEMI AND FULL-
AUTONOMOUS
VEHICLES



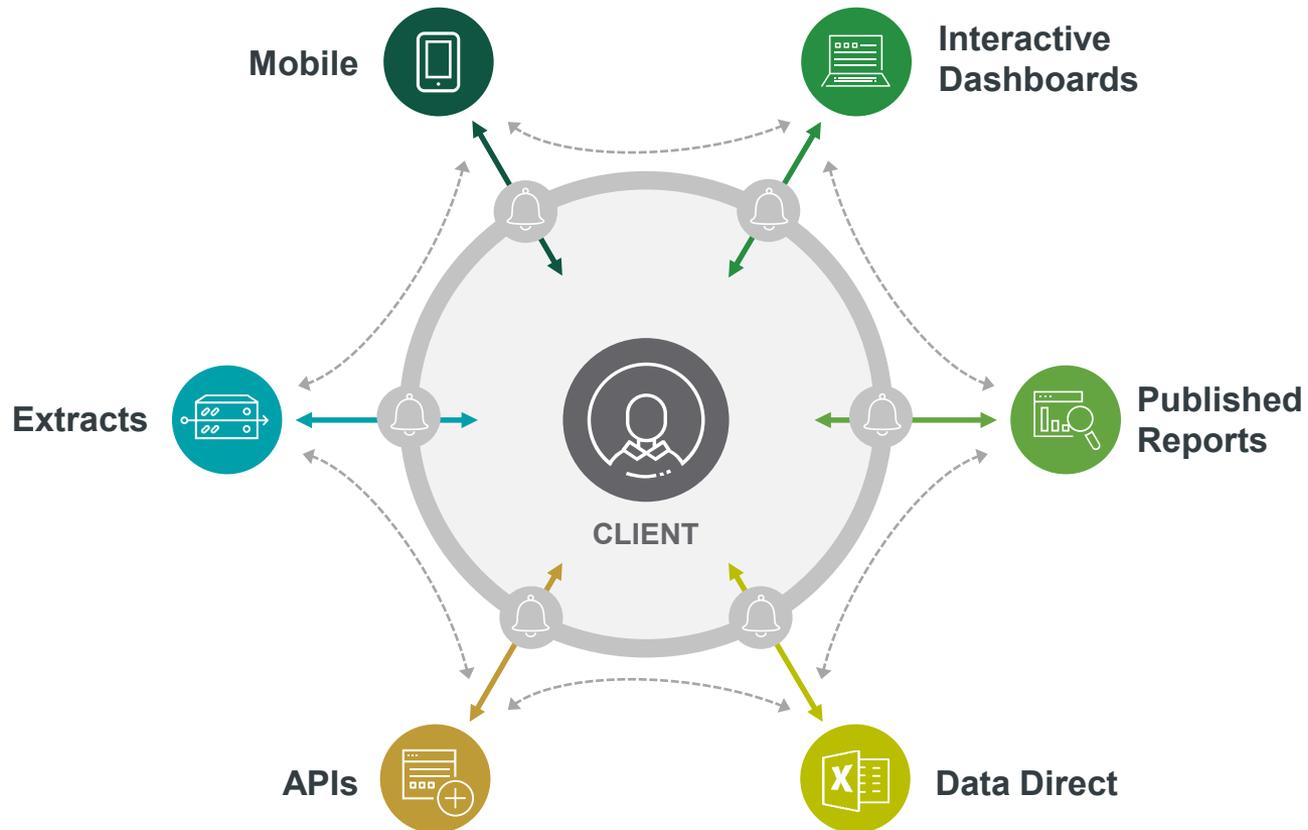
60%

OF DIGITAL
BUSINESSES WILL
SUFFER MAJOR
BREACH

Sources: Gartner, Statista, Business Insider

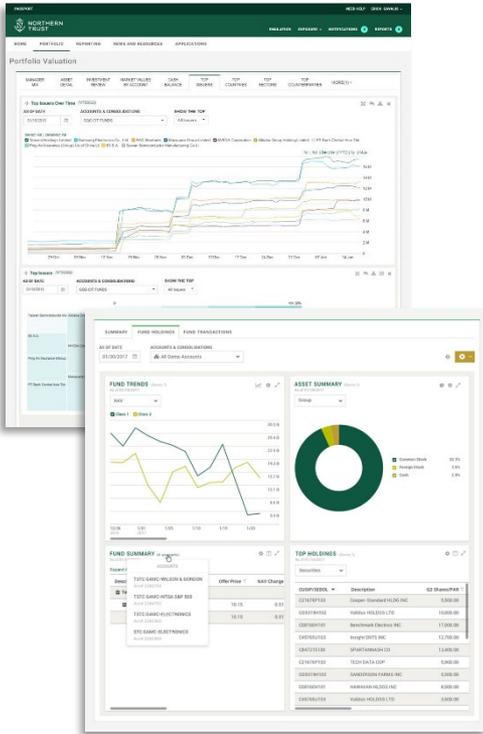
OMNI-CHANNEL DATA ACCESS

Providing a seamless digital experience, regardless of channel or device



DATA ACCESS – NORTHERN TRUST PASSPORT®

A one stop shop for input, information and interrogation across your investment portfolio



Transaction Initiation

- Cash / trade
- Corporate actions
- Capital call
- Foreign exchange
- Benefit payment

Asset Servicing

- Cash
- Trade
- Entitlements
- Tax

Investment Accounting

- Plan / financial accounting
- Insurance accounting
- Statutory reporting
- nFTK, GAAP, APRA etc

Market Information

- Market research
- FX research
- Brokerage research

Fund Administration

- Regional FA reporting
- MIS and dashboards
- Regulatory reporting
- Financial reporting
- Compliance reporting

Transfer Agency

- Investor portal
- Multi-jurisdictional access
- Secure document delivery
- White label client reporting

Middle Office

- Cash laddering
- P&L analysis
- Strategy tagging
- Trade matching

Investment Analytics

- Performance
- Compliance
- Risk analysis

Investment Reporting

- Foreign exchange / overlay
- Securities lending
- Commission management
- Transition management
- Cash / collateral management

Management Reporting

- Management information
- Key performance indicators
- Service level benchmarking
- Regulatory filings

Special Asset Reporting

- Bank loans
- Statutory, tax
- Derivatives, alternatives
- Private equity, real estate

Transparency Reporting

- Transaction cost analysis
- 'Peek through/exposure'
- Transparency analytics

PASSPORT 'TOMORROW' – AI-DRIVEN USER EXPERIENCE

It's all about the data...

Data Quality

- High quality data input once by 'experts' after full validation
- Deploying technology to drive productivity and data quality
 - Utilizing robotics software to revolutionize fund accounting and transfer agency processing
 - Implementing Artificial Intelligence solutions across key operational groups e.g. reconciliations
 - Deployed a process automation solution, Blue Prism, enabling robots to take on repetitive tasks
 - Investing in R&D activities to prove out the potential benefits of emerging technologies e.g. can machine learning detect potential corporate action anomalies

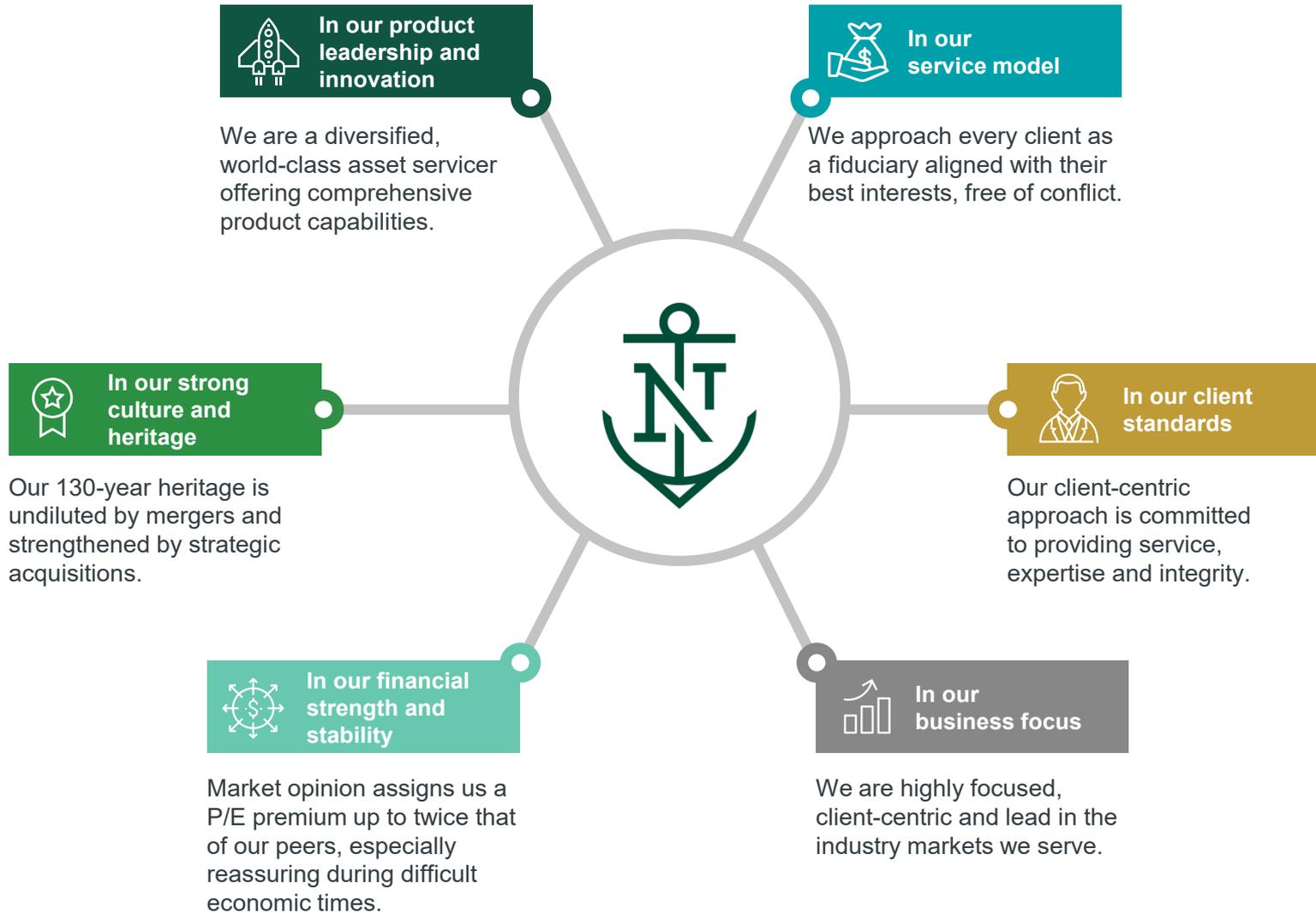
Data Access (via APIs / Portals)

Level 1	Level 2	Level 3
Data based on who you are	Data I have learnt you want based on who you are	Data I think you want based on what I have learnt about you
This is your persona-based experience	This is your refined persona-based experience based on AI	This is your ultimate persona-based experience based on predictive analytics



WHY NORTHERN TRUST?

We're unique...



City of Oakland Police & Fire Retirement System (PFRS)

**Domestic
Equities**

Domestic Fixed Income

Global Equity Global Fixed Income

26-86486

Ramirez Asset
Management

SM/SL

26-98024

Russell 2000
ETF

SM/SL

26-98025

Earnest Partners

SM/SL

26-98026

Northern Trust

SM/SL

26-98022

Parametric
(50%) TIPS

SM/SL

26-98035

DDJ High Yield

CF

PFRS01

17-33541

SGA

SM/SL

PFRS03

17-33544

Ream Global
Fixed

SM/SL

26-98028

Parametric
(50%) BXM rep

SM/SL

26-98029

Vanguard FTSE
Dev Mk ETF

CF

44-00331

Brown Advisory

CF

44-05812

WTC-CIF II
CORE BOND

CF

26-98030

Transition

SM

PFRS05

17-74053

MSCI US ETF

SM/ short sale

44-73903

Rice Hall
James

SM/SL

44-81520

Parametric Risk
Premia

CM/SL

44-86323

Long Duration
Account

CM/SL

26-98020

Cash

last updated 7/15/21

General Plan/Trust Information

Client Sponsor Code: OAKLA
Relationship Number: 16360
Fiscal Year-end: 6/30
Monthly Acct Deadline: 10BD
Valuation Frequency: Monthly

Trust EIN: 94-3295644
Checking Acct #: N/A
Plan #: N/A
NAV Type: N/A

Account Code Legend

B = Bonds
CF = Commingled Fund
CM = Client Managed
CS = Company Stock
E = Equities
G = GIC
LP = Limited Partnership
LS = Lifestyle Fund
MF = Mutual Fund
RE = Real Estate
SL = Securities Lending
SM = Separately Managed
U = Units Held
* = Liquidity Account

IMPORTANT INFORMATION

Confidentiality Notice: This communication is confidential, may be privileged, and is meant only for the intended recipient. If you are not the intended recipient, please notify the sender as soon as possible. All materials contained in this presentation, including the description of Northern Trust, its systems, processes and pricing methodology, are proprietary information of Northern Trust. In consideration of acceptance of these materials, the recipient agrees that it will keep all such materials strictly confidential and that it will not, without the prior written consent of Northern Trust, distribute such materials or any part thereof to any person outside the recipient's organization or to any individual within the recipient's organization who is not directly involved in reviewing this presentation, unless required to do so by applicable law. If the recipient is a consultant acting on behalf of a third-party client, the recipient may share such materials with its client if it includes a copy of these restrictions with such materials. In such event, the client agrees to comply with these restrictions in consideration of its accepting such materials.

© 2021 Northern Trust Corporation. Head Office: 50 South La Salle Street, Chicago, Illinois 60603 U.S.A. Incorporated with limited liability in the U.S. Products and services provided by subsidiaries of Northern Trust Corporation may vary in different markets and are offered in accordance with local regulation. This material is directed to professional clients only and is not intended for retail clients. For Asia-Pacific markets, it is directed to expert, institutional, professional and wholesale clients or investors only and should not be relied upon by retail clients or investors. For legal and regulatory information about our offices and legal entities, visit northerntrust.com/disclosures. The following information is provided to comply with local disclosure requirements: The Northern Trust Company, London Branch; Northern Trust Global Investments Limited; Northern Trust Securities LLP. Northern Trust Global Services SE, 10 rue du Château d'Eau, L-3364 Leudelange, Grand-Duché de Luxembourg, RCS B232281; Northern Trust Global Services SE UK Branch, 50 Bank Street, London E14 5 NT; Northern Trust Global Services SE Sweden Bankfilial, Ingmar Bergmans gata 4, 1st Floor, 114 34 Stockholm, Sweden; Northern Trust Global Services SE Netherlands Branch, Viñoly 7th floor, Claude Debussylaan 18 A, 1082 MD Amsterdam; Northern Trust Global Services SE Abu Dhabi Branch, registration Number 000000519 licenced by ADGM under FSRA # 160018. The Northern Trust Company Saudi Arabia, PO Box 7508, Level 20, Kingdom Tower, Al Urubah Road, Olaya District, Riyadh, Kingdom of Saudi Arabia 11214-9597, a Saudi Joint Stock Company – Capital 52 million SAR. Regulated and Authorised by the Capital Market Authority License # 12163-26 CR 1010366439. Northern Trust (Guernsey) Limited (2651)/Northern Trust Fiduciary Services (Guernsey) Limited (29806)/Northern Trust International Fund Administration Services (Guernsey) Limited (15532) Registered Office: Trafalgar Court, Les Banques, St Peter Port, Guernsey GY1 3DA. Northern Trust International Fund Administration Services (Ireland) Limited (160579) / Northern Trust Fiduciary Services (Ireland) Limited (161386), Registered Office: Georges Court, 54-62 Townsend Street, Dublin 2, D02 R156, Ireland.



NORTHERN
TRUST

MEMORANDUM

TO: Oakland Police and Fire Retirement System (PFRS)
FROM: Meketa Investment Group
CC: Teir Jenkins, David Jones - PFRS
DATE: July 28, 2021
RE: Northern Trust Custodial Contract Renewal

Summary and Recommendation

Meketa and PFRS staff recommends that OPFRS renew its contract for an additional 5-years with Northern Trust before the current contract date of expiration. OPFRS contracts reserve the right for the Board to terminate the agreement, with or without cause, at any time upon 30 calendar days' prior written notice. In making this recommendation, PFRS staff and Meketa considered organizational / personnel issues, fee proposal, client service and the ability to meet PFRS cash flow needs. Since the last contract renewal, Northern Trust has met or exceeded the criteria above, therefore Meketa and PFRS staff believes that there are no issues that should prevent a contract extension for this custodial provider.

Effective October 1, 2021, Northern Trust has proposed the following fees for a new 5-year contract:

- New contract with a custody flat fee increase of \$8,000.00 (6.8%). The annual flat fee would be \$124,500.00 for the next 5 years.

DS, PN, pq



NORTHERN TRUST

The Northern Trust Company
50 South LaSalle Street
Chicago, IL 60603
(312) 630-6000

July 19, 2021

VIA E-mail to: DfJones@oaklandca.gov

Cc: TJenkins@oaklandca.gov

Board of Trustees
c/o John C. Speakman, Chairman
150 Frank H. Ogawa Plaza
Oakland, CA 94612

Re: City of Oakland Police and Fire Retirement System – New Custody Fee Schedule Proposal

Dear Board of Trustees:

As you know, Northern Trust has served as custodian for City of Oakland Police and Fire Retirement System (“Pension Plan”) since October 2013.

In October 2018 the custody contract was extended for another 3 years and it is set to expire on September 30, 2021. Since that time, the Pension Plan has been charged a flat fee of \$116,500.00 per year.

The Global Custody charges include the following:

- Safekeeping of the assets
- Settlement of direct trades
- Paydown transactions
- Short settlements
- Future / Options Transactions settlement
- Collection of Income
- Tax Reclamation and relief at source services
- Corporate actions processing
- Class Action processing
- Proxy voting
- Daily and intraday information delivery via web portal, Passport
- Consolidated monthly investment accounting and portfolio valuations delivered via Passport
- GASB reporting
- Compliance Monitoring Services – Cole level and Set up
- Foreign exchange.

Besides these services, the Pension Plan subscribes to other value-added services:

- Securities Lending
- Investment Management
- Transition Management

Comparing the value of your portfolio from 2018 to 2021, we see an increase with over 85 mil in assets under custody.

Effective October 1, 2021, we propose the below custody fee increase.

We have the following proposal to the Board:

- 1) **3-year new contract** with a custody flat fee increase of \$10,000.00 (8.6%). The annual flat fee would be \$126,500.00 for the next 3 years.
- 2) **5-year new contract** with a custody flat fee increase of \$8,000.00 (6.8%). The annual flat fee would be \$124,500.00 for the next 5 years.

This new fee schedule will be guaranteed for 3 years or 5 years (depending on the option selected) and assumes, that there are no substantive changes in the structure or composition of the assets, or major alterations in your reporting requirements. Any changes deemed by Northern as “substantive” shall be discussed between Northern and the Pension Plan, and any change to the fee structure that may result from these substantive changes shall be agreed upon by both parties in writing. Should the Pension Plan utilize other products or services with Northern Trust in the future, we would be happy to re-evaluate the fee schedule at that time.

If the terms of the new custody fee schedule are acceptable to you, please let us know, and we will prepare the necessary documents for signature.

Northern Trust values and appreciates your business. Our intention is to ensure the fund is confident of our desire to continue our custody partnership for many more years to come.

Sincerely,

A handwritten signature in black ink, appearing to read "Claudi Besoaga". The signature is fluid and cursive, with a long horizontal stroke at the end.

Claudiu Besoaga
Vice President – Public Funds

Economic and Market Update

Data as of June 30, 2021

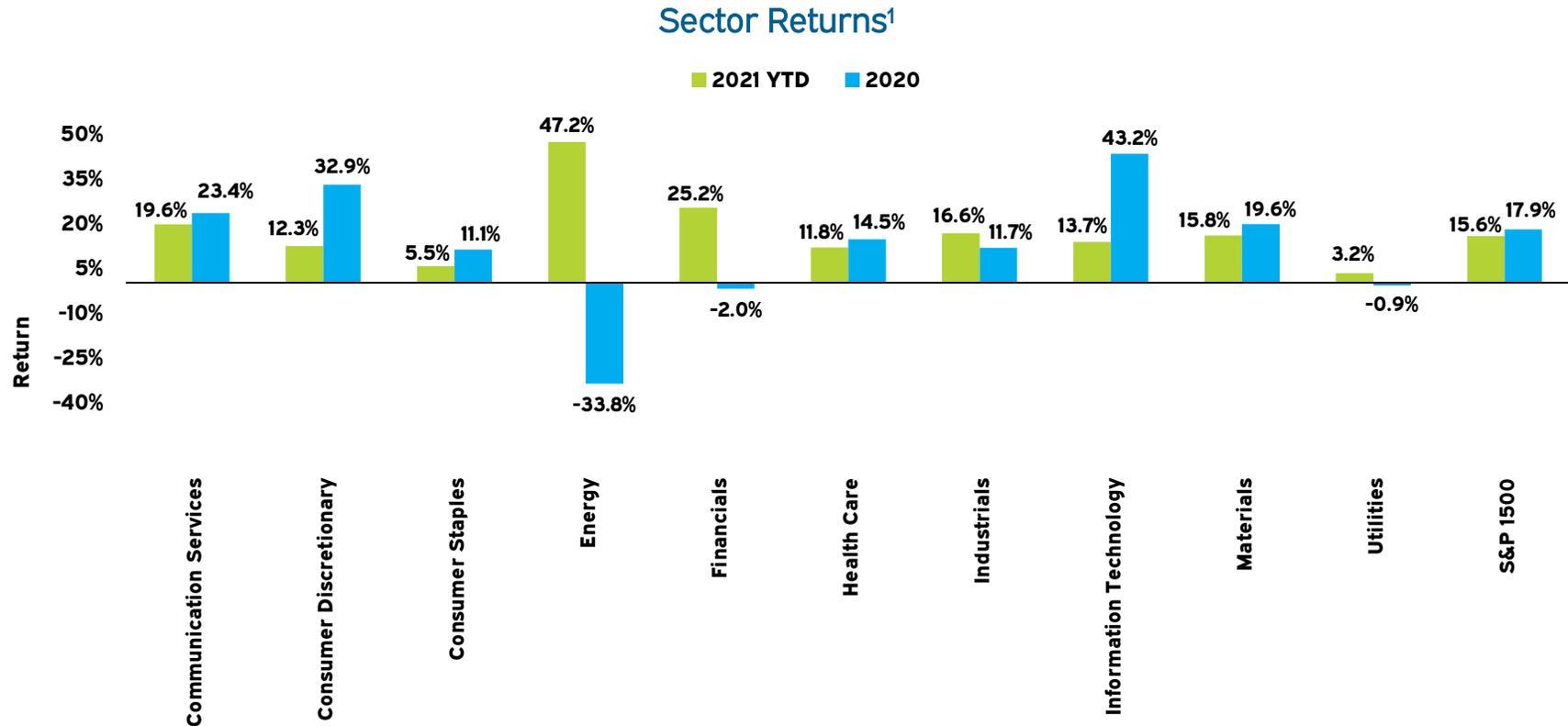


Market Returns¹

Indices	June	YTD	1 Year	3 Year	5 Year	10 Year
S&P 500	2.3%	15.3%	40.8%	18.7%	17.7%	14.8%
MSCI EAFE	-1.1%	8.8%	32.4%	8.3%	10.3%	5.9%
MSCI Emerging Markets	0.2%	7.5%	40.9%	11.3%	13.0%	4.3%
MSCI China	0.1%	1.8%	27.4%	10.4%	16.6%	7.7%
Bloomberg Barclays Aggregate	0.7%	-1.6%	-0.3%	5.3%	3.0%	3.4%
Bloomberg Barclays TIPS	0.6%	1.7%	6.5%	6.5%	4.2%	3.4%
Bloomberg Barclays High Yield	1.3%	3.6%	15.4%	7.5%	7.5%	6.7%
10-year US Treasury	1.3%	-4.2%	-7.1%	5.9%	1.8%	3.7%
30-year US Treasury	4.3%	-13.0%	-13.8%	8.2%	2.9%	7.0%

- So far this year, global risk assets continue to appreciate, leading to significant gains over the trailing year. This has largely been driven by record fiscal and monetary policy stimulus and positive developments with the COVID-19 vaccine.
- In June, Treasuries continued to recover, particularly longer dated issues, as inflation concerns declined.
- Equity markets had mixed results in June with the US leading the way. A stronger US dollar and continued vaccine rollout struggles weighed on international equity markets.

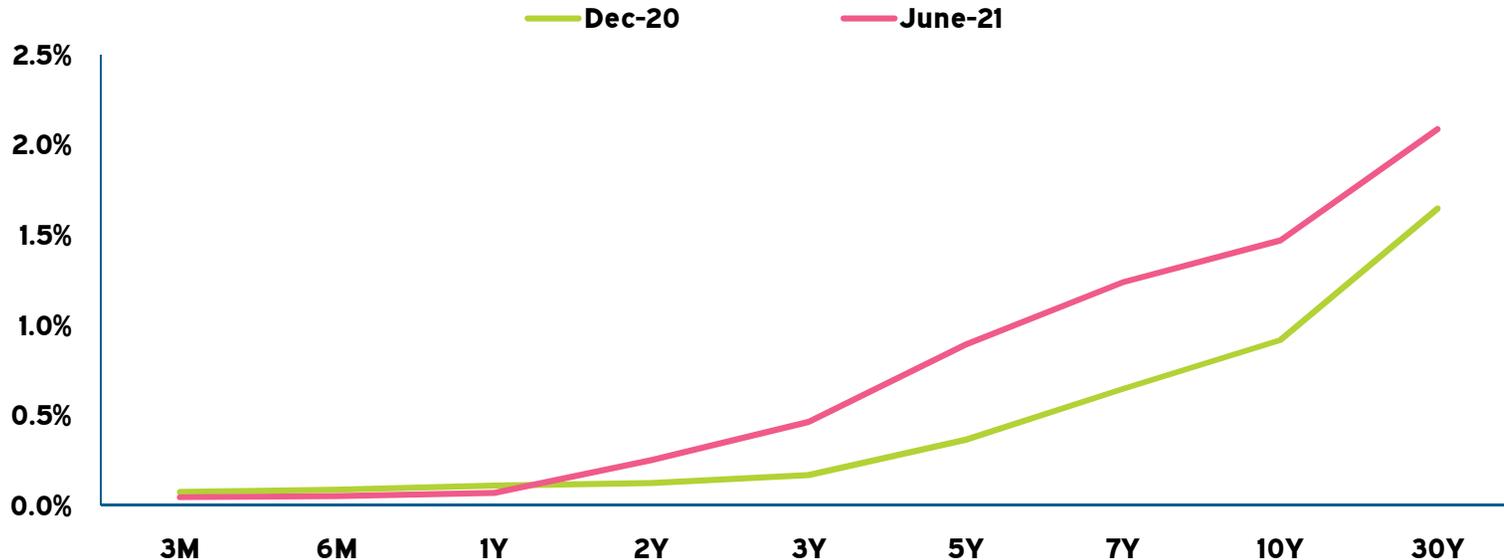
¹ Source: Investment Metrics and Bloomberg. Data is as of June 30, 2021.



- Despite growth's recovery in June, cyclical sectors like energy and financials continue to lead the way in 2021, as some investors rotate out of stay-at-home focused companies in the technology sector as the economy reopens.

¹ Source: Bloomberg. Data is as of June 30, 2021.

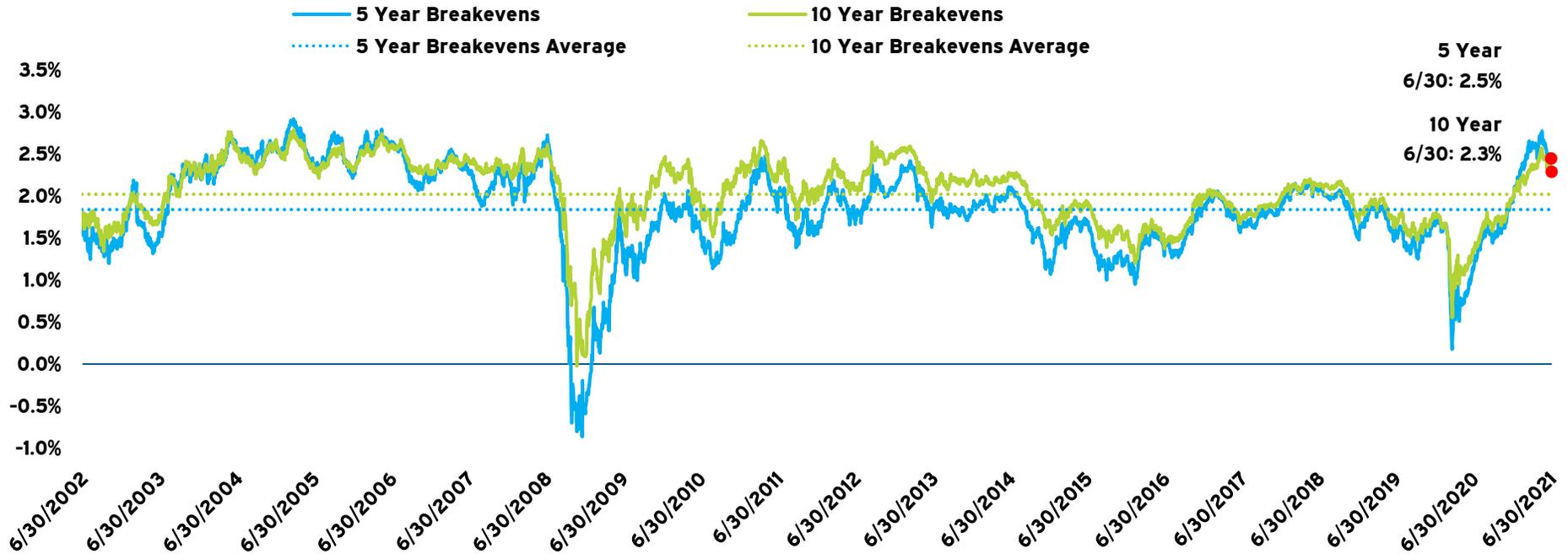
US Yield Curve Steepens¹



- Overall for 2021, the yield curve steepened on inflation fears related to gradual signs of economic improvement given the vaccine rollout.
- Shorter-dated rates have been largely unmoved given Fed policy, while longer-dated rates recently declined from their peak as investors consider whether inflationary pressures have topped.
- Looking ahead, the yield curve could resume its steepening if growth and inflation pressures build beyond current expectations. Alternatively, if the economy weakens, or if economic progress is simply accelerated versus the prior expectations, the flattening trend could continue.

¹ Source: Bloomberg. Data is as of June 30, 2021.

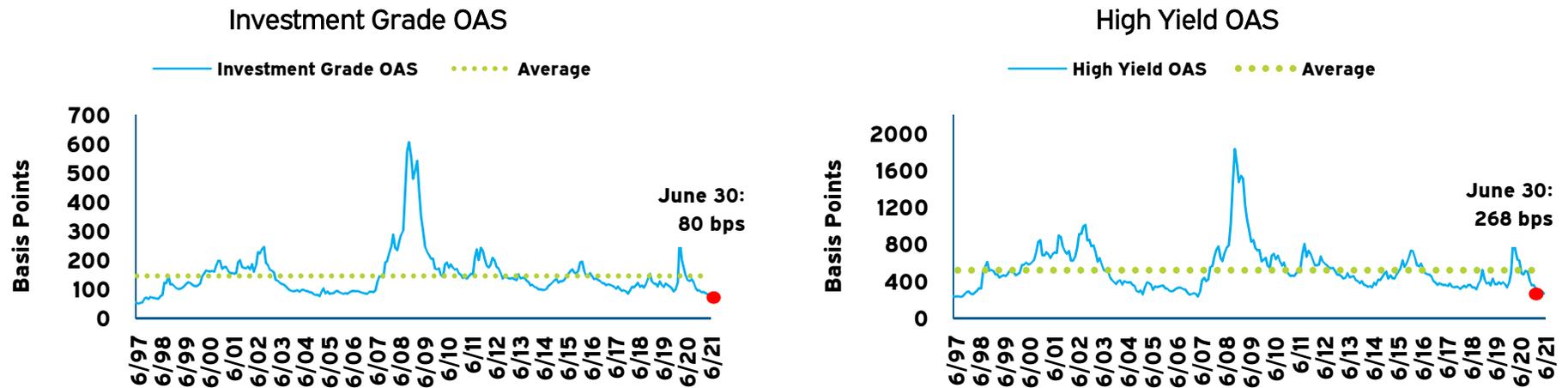
Breakeven Inflation¹



- In 2021, inflation expectations remain well above long-term averages, with the vaccine roll-out, high raw material prices, and expected additional fiscal stimulus as key drivers.
- Recently though, inflation expectations declined from their highs as base effects wane, growth forecasts moderate, and cost pressures slow.
- 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.

¹ Source: Bloomberg. Data is as of June 30, 2021.

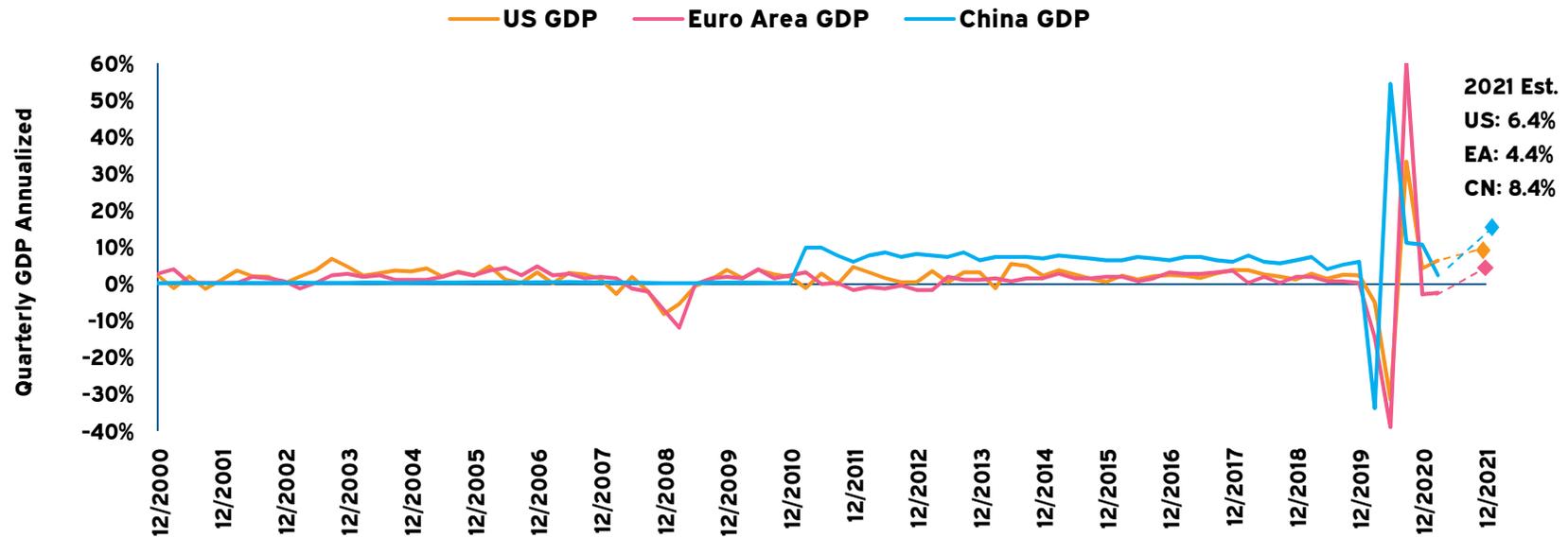
Credit Spreads (High Yield & Investment Grade)¹



- Credit spreads (the spread above a comparable maturity Treasury) for investment-grade and high yield corporate debt continued to compress in June.
- Policy support and the search for yield in a low, and in some cases negative, rate environment have been key drivers in the decline in US credit spreads to below long-term averages, particularly for high yield.

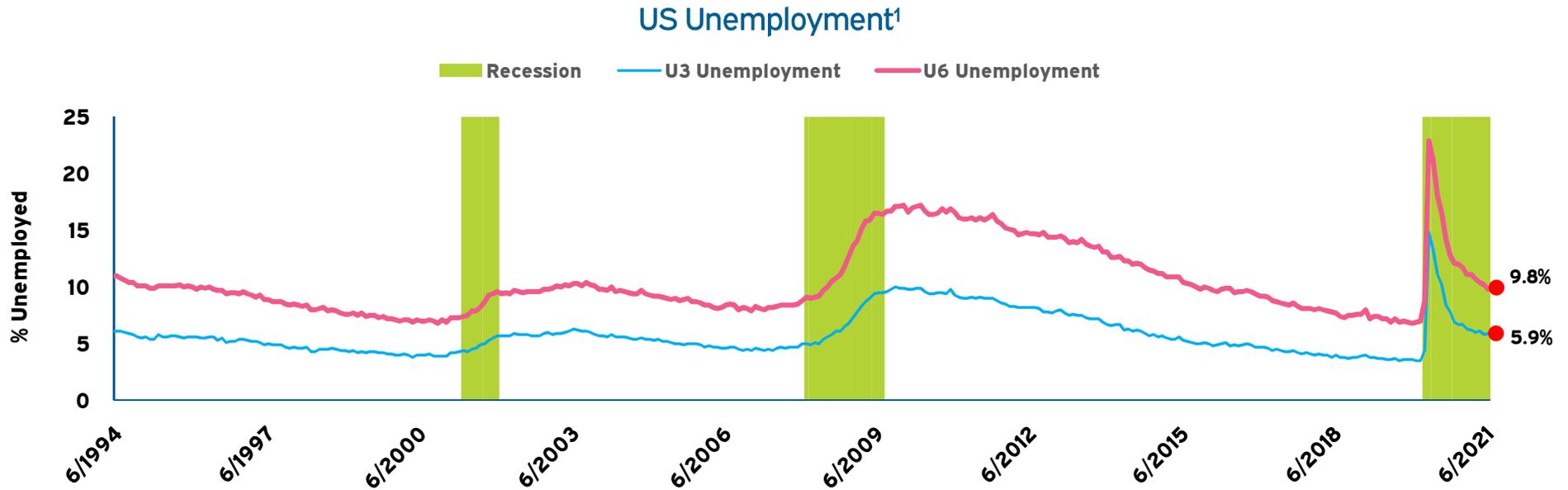
¹ Source: Barclays Live. Data represents OAS and is as of June 30, 2021.

GDP Data Shows Projected Improvements in 2021¹



- Major economies experienced historic declines in growth during the second quarter of 2020, followed by record increases in the third quarter driven by pent-up demand from the lockdown measures earlier in the year.
- Looking forward, strong growth is expected in 2021 particularly for China, projected to grow at an impressive 8.4%, due in part to their ability to quickly control the virus and reopen their economy.
- The US is expected to grow faster than the euro area this year, with some growth pulled forward due to the success in distributing the vaccine.

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



- The unemployment rate (U3) rose slightly in June from 5.8% to 5.9% and remains well above pre-pandemic levels, but far below the pandemic peak.
- The broader measure of unemployment (U6) that includes discouraged and underemployed workers continues to decline, but remains much higher at 9.8%.
- Pandemic related concerns, childcare issues, and a mismatch of skills and available jobs have all contributed to slack in the labor market.

¹ Source: Bloomberg. Data is as of June 30, 2021. Bars represent recessions as observed by the National Bureau of Economic Research.

Disclaimers

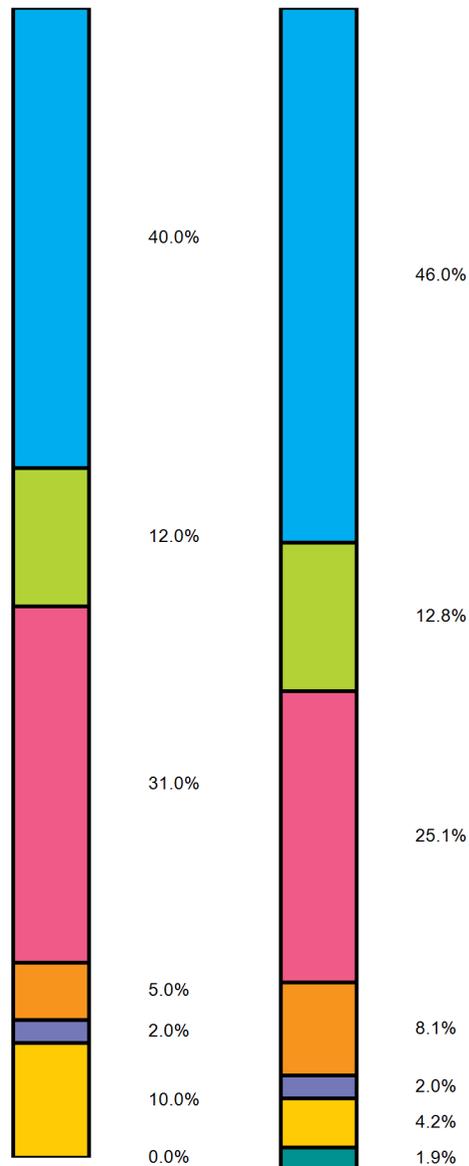
These materials are intended solely for the recipient and may contain information that is not suitable for all investors. This presentation is provided by Meketa Investment Group (“Meketa”) for informational purposes only and no statement is to be construed as a solicitation or offer to buy or sell a security, or the rendering of personalized investment advice. There is no agreement or understanding that Meketa will provide individual advice to any advisory client in receipt of this document. There can be no assurance the views and opinions expressed herein will come to pass. Any data and/or graphics presented herein is obtained from what are considered reliable sources; however, its delivery does not warrant that the information contained is correct. Any reference to a market index is included for illustrative purposes only, as an index is not a security in which an investment can be made and are provided for informational purposes only. For additional information about Meketa, please consult the Firm’s Form ADV disclosure documents, the most recent versions of which are available on the SEC’s Investment Adviser Public Disclosure website (www.adviserinfo.sec.gov) and may otherwise be made available upon written request.

Oakland Police and Fire Retirement System

July 28, 2021

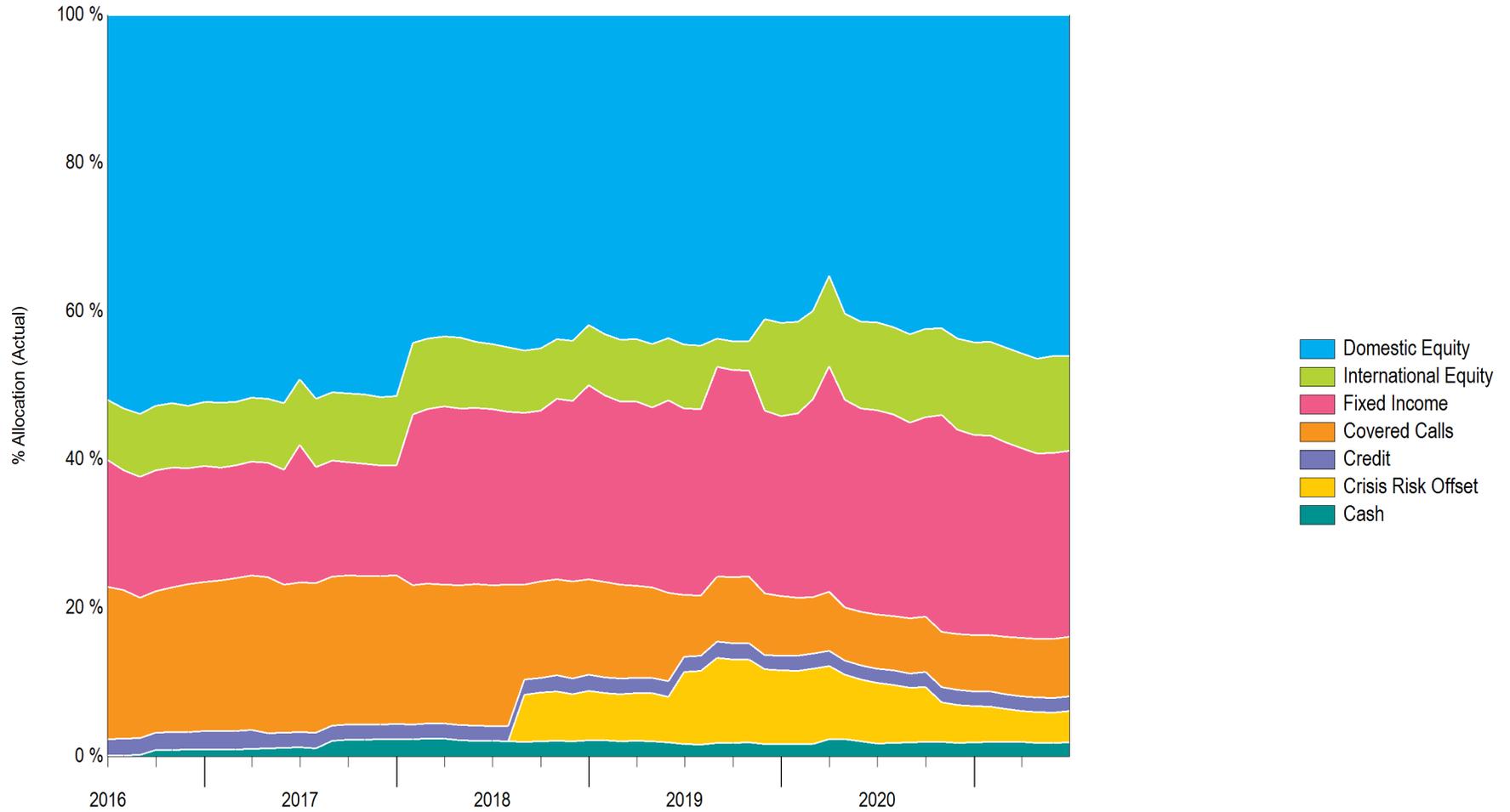
June Flash Report

OPFRS Total Plan As of June 30, 2021



Allocation vs. Targets and Policy						
	Current Balance	Current Allocation	Policy	Difference	Within IPS Range?	
Domestic Equity	\$213,198,037	46.0%	40.0%	6.0%	Yes	
International Equity	\$59,292,971	12.8%	12.0%	0.8%	Yes	
Fixed Income	\$116,313,531	25.1%	31.0%	-5.9%	Yes	
Covered Calls	\$37,328,619	8.1%	5.0%	3.1%	Yes	
Credit	\$9,177,102	2.0%	2.0%	0.0%	Yes	
Crisis Risk Offset	\$19,507,725	4.2%	10.0%	-5.8%	No	
Cash	\$8,822,344	1.9%	0.0%	1.9%	Yes	
Total	\$463,640,329	100.0%	100.0%			

Asset Allocation History
5 Years Ending June 30, 2021



Asset Class Performance Summary											
	Market Value (\$)	% of Portfolio	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
OPFRS Total Plan	463,640,329	100.0	1.2	5.1	8.1	24.2	10.5	11.5	8.7	7.1	Dec-88
<i>OPFRS Policy Benchmark</i>			<i>1.4</i>	<i>5.3</i>	<i>7.2</i>	<i>22.2</i>	<i>10.5</i>	<i>10.9</i>	<i>8.4</i>	<i>8.5</i>	<i>Dec-88</i>
Domestic Equity	213,198,037	46.0	1.5	6.6	14.3	42.6	16.6	17.2	14.2	9.6	Jun-97
<i>Russell 3000 (Blend)</i>			<i>2.5</i>	<i>8.2</i>	<i>15.1</i>	<i>44.2</i>	<i>18.7</i>	<i>17.9</i>	<i>14.7</i>	<i>9.8</i>	<i>Jun-97</i>
International Equity	59,292,971	12.8	-1.0	5.1	9.4	32.1	9.2	11.8	6.4	6.0	Jan-98
<i>MSCI ACWI ex US (Blend)</i>			<i>-0.5</i>	<i>5.8</i>	<i>9.6</i>	<i>36.4</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>6.2</i>	<i>Jan-98</i>
Fixed Income	116,313,531	25.1	0.9	2.5	-0.6	2.7	5.9	4.1	4.1	5.5	Dec-93
<i>Blmbg BC Universal (Blend)</i>			<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.3</i>	<i>Dec-93</i>
Credit	9,177,102	2.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>BBgBarc US High Yield TR</i>			<i>1.3</i>	<i>2.7</i>	<i>3.6</i>	<i>15.4</i>	<i>7.4</i>	<i>7.5</i>	<i>6.7</i>	<i>6.4</i>	<i>Feb-15</i>
Covered Calls	37,328,619	8.1	2.1	6.6	13.2	33.8	13.4	12.6	--	10.5	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>			<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Crisis Risk Offset	19,507,725	4.2	4.0	5.9	-8.5	-11.6	-9.6	--	--	-9.9	Aug-18
<i>SG Multi Alternative Risk Premia Index</i>			<i>0.4</i>	<i>2.7</i>	<i>6.5</i>	<i>3.7</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-2.7</i>	<i>Aug-18</i>
Cash	8,822,344	1.9	0.0	0.0	0.0	0.1	1.6	1.4	0.7	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>			<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</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.

Trailing Net Performance												
	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
OPFRS Total Plan	463,640,329	100.0	--	1.2	5.1	8.1	24.2	10.5	11.5	8.7	7.1	Dec-88
<i>OPFRS Policy Benchmark</i>				<i>1.4</i>	<i>5.3</i>	<i>7.2</i>	<i>22.2</i>	<i>10.5</i>	<i>10.9</i>	<i>8.4</i>	<i>8.5</i>	<i>Dec-88</i>
Domestic Equity	213,198,037	46.0	46.0	1.5	6.6	14.3	42.6	16.6	17.2	14.2	9.6	Jun-97
<i>Russell 3000 (Blend)</i>				<i>2.5</i>	<i>8.2</i>	<i>15.1</i>	<i>44.2</i>	<i>18.7</i>	<i>17.9</i>	<i>14.7</i>	<i>9.8</i>	<i>Jun-97</i>
Northern Trust Russell 1000	117,334,896	25.3	55.0	2.5	8.5	15.0	43.0	19.1	18.0	14.9	15.6	Jun-10
<i>Russell 1000</i>				<i>2.5</i>	<i>8.5</i>	<i>15.0</i>	<i>43.1</i>	<i>19.2</i>	<i>18.0</i>	<i>14.9</i>	<i>15.6</i>	<i>Jun-10</i>
EARNEST Partners	46,751,372	10.1	21.9	-0.2	4.1	14.1	46.3	19.1	19.3	14.8	11.5	Apr-06
<i>Russell MidCap</i>				<i>1.5</i>	<i>7.5</i>	<i>16.2</i>	<i>49.8</i>	<i>16.4</i>	<i>15.6</i>	<i>13.2</i>	<i>10.2</i>	<i>Apr-06</i>
Brown Fundamental Small Cap Value	11,084,914	2.4	5.2	-2.6	3.3	--	--	--	--	--	3.3	Apr-21
<i>Russell 2000 Value</i>				<i>-0.6</i>	<i>4.6</i>	<i>26.7</i>	<i>73.3</i>	<i>10.3</i>	<i>13.6</i>	<i>10.8</i>	<i>4.6</i>	<i>Apr-21</i>
Rice Hall James	17,077,517	3.7	8.0	1.9	5.1	13.8	45.6	11.4	--	--	15.5	Jul-17
<i>Russell 2000 Growth</i>				<i>4.7</i>	<i>3.9</i>	<i>9.0</i>	<i>51.4</i>	<i>15.9</i>	<i>18.8</i>	<i>13.5</i>	<i>17.4</i>	<i>Jul-17</i>
iShares Edge MSCI Min Vol ETF	20,949,332	4.5	9.8	1.7	6.7	9.2	23.4	--	--	--	30.3	Apr-20
<i>MSCI USA Minimum Volatility GR USD</i>				<i>1.8</i>	<i>6.8</i>	<i>9.3</i>	<i>23.6</i>	<i>13.9</i>	<i>12.1</i>	<i>13.4</i>	<i>30.5</i>	<i>Apr-20</i>
International Equity	59,292,971	12.8	12.8	-1.0	5.1	9.4	32.1	9.2	11.8	6.4	6.0	Jan-98
<i>MSCI ACWI ex US (Blend)</i>				<i>-0.5</i>	<i>5.8</i>	<i>9.6</i>	<i>36.4</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>6.2</i>	<i>Jan-98</i>
Vanguard Developed Markets ETF	17,252,245	3.7	29.1	-1.7	4.9	9.1	32.8	--	--	--	16.3	Sep-19
<i>FTSE Developed All Cap Ex US TR USD</i>				<i>-1.2</i>	<i>5.8</i>	<i>10.2</i>	<i>36.8</i>	<i>9.3</i>	<i>10.8</i>	<i>4.6</i>	<i>18.2</i>	<i>Sep-19</i>
SGA ACWI ex-U.S. Equity	41,485,309	8.9	70.0	-1.0	4.7	9.0	31.6	--	--	--	11.0	Dec-19
<i>MSCI ACWI ex USA Gross</i>				<i>-0.6</i>	<i>5.6</i>	<i>9.4</i>	<i>36.3</i>	<i>9.9</i>	<i>11.6</i>	<i>5.9</i>	<i>16.3</i>	<i>Dec-19</i>

Throughout the report performance for new funds will be shown after one full month of investment.

International equity performance inclusive of residual cash in Hansberger transition.

OPFRS Total Plan As of June 30, 2021

	Market Value (\$)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Fixed Income	116,313,531	25.1	25.1	0.9	2.5	-0.6	2.7	5.9	4.1	4.1	5.5	Dec-93
<i>Blmbg BC Universal (Blend)</i>				<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.3</i>	<i>Dec-93</i>
Ramirez	79,233,829	17.1	68.1	1.0	2.6	-0.1	3.1	5.9	--	--	4.7	Jan-17
<i>BBgBarc US Aggregate TR</i>				<i>0.7</i>	<i>1.8</i>	<i>-1.6</i>	<i>-0.3</i>	<i>5.3</i>	<i>3.0</i>	<i>3.4</i>	<i>4.0</i>	<i>Jan-17</i>
Wellington Core Bond	7,639,617	1.6	6.6	0.9	1.9	--	--	--	--	--	1.9	Apr-21
<i>BBgBarc US Aggregate TR</i>				<i>0.7</i>	<i>1.8</i>	<i>-1.6</i>	<i>-0.3</i>	<i>5.3</i>	<i>3.0</i>	<i>3.4</i>	<i>1.8</i>	<i>Apr-21</i>
Reams	29,440,041	6.3	25.3	0.7	2.1	-1.6	2.1	9.3	5.6	5.2	6.0	Feb-98
<i>Blmbg BC Universal (Blend)</i>				<i>0.7</i>	<i>2.0</i>	<i>-1.1</i>	<i>1.1</i>	<i>5.6</i>	<i>3.5</i>	<i>3.7</i>	<i>5.0</i>	<i>Feb-98</i>
Credit	9,177,102	2.0	2.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>BBgBarc US High Yield TR</i>				<i>1.3</i>	<i>2.7</i>	<i>3.6</i>	<i>15.4</i>	<i>7.4</i>	<i>7.5</i>	<i>6.7</i>	<i>6.4</i>	<i>Feb-15</i>
DDJ Capital	9,177,102	2.0	100.0	1.7	3.1	6.8	23.5	6.2	8.5	--	6.7	Feb-15
<i>ICE BofA High Yield Master TR</i>				<i>1.4</i>	<i>2.8</i>	<i>3.7</i>	<i>15.6</i>	<i>7.2</i>	<i>7.3</i>	<i>6.5</i>	<i>6.2</i>	<i>Feb-15</i>
Covered Calls	37,328,619	8.1	8.1	2.1	6.6	13.2	33.8	13.4	12.6	--	10.5	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Parametric BXM	16,398,176	3.5	43.9	1.8	5.1	10.8	27.3	9.5	9.5	--	8.2	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Parametric DeltaShift	20,930,443	4.5	56.1	2.4	7.9	15.2	39.3	17.0	15.6	--	13.0	Apr-14
<i>CBOE S&P 500 BuyWrite USD</i>				<i>2.2</i>	<i>5.1</i>	<i>11.1</i>	<i>27.3</i>	<i>5.6</i>	<i>7.2</i>	<i>7.1</i>	<i>6.5</i>	<i>Apr-14</i>
Crisis Risk Offset	19,507,725	4.2	4.2	4.0	5.9	-8.5	-11.6	-9.6	--	--	-9.9	Aug-18
<i>SG Multi Alternative Risk Premia Index</i>				<i>0.4</i>	<i>2.7</i>	<i>6.5</i>	<i>3.7</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>-2.7</i>	<i>Aug-18</i>
Vanguard Long-Term Treasury ETF	19,507,725	4.2	100.0	4.0	5.9	-8.5	-10.8	--	--	--	5.6	Jul-19
<i>BBgBarc US Govt Long TR</i>				<i>3.6</i>	<i>6.4</i>	<i>-7.8</i>	<i>-10.4</i>	<i>8.0</i>	<i>3.2</i>	<i>6.6</i>	<i>5.9</i>	<i>Jul-19</i>
Cash	8,822,344	1.9	1.9	0.0	0.0	0.0	0.1	1.6	1.4	0.7	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>				<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>
Cash	2,245,344	0.5	25.5	0.0	0.0	0.1	0.5	1.8	1.5	0.8	0.7	Mar-11
<i>FTSE T-Bill 3 Months TR</i>				<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>1.3</i>	<i>1.1</i>	<i>0.6</i>	<i>0.6</i>	<i>Mar-11</i>
Cash - Treasury	6,577,000	1.4	74.5									

Values for DDJ Capital are based on manager estimate for the month of June.

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

Cash Flow Summary
Month to Date

	Beginning Market Value	Net Cash Flow	Net Investment Change	Ending Market Value
Brown Fundamental Small Cap Value	\$11,387,286	\$0	-\$302,372	\$11,084,914
Cash	\$2,009,237	\$5,649	\$230,458	\$2,245,344
Cash - Treasury	\$6,343,000	\$234,000	\$0	\$6,577,000
DDJ Capital	\$9,027,908	\$0	\$149,194	\$9,177,102
EARNEST Partners	\$46,829,268	\$0	-\$77,896	\$46,751,372
Hansberger Transition	\$438,979	\$0	\$116,438	\$555,417
iShares Edge MSCI Min Vol ETF	\$20,656,195	\$0	\$293,137	\$20,949,332
Northern Trust Russell 1000	\$115,477,890	-\$1,000,000	\$2,857,006	\$117,334,896
Parametric BXM	\$16,109,137	\$0	\$289,039	\$16,398,176
Parametric DeltaShift	\$20,436,025	\$0	\$494,418	\$20,930,443
Ramirez	\$78,452,542	\$0	\$781,287	\$79,233,829
Reams	\$29,240,343	\$0	\$199,698	\$29,440,041
Reams Low Duration	\$44	\$0	\$0	\$44
Rice Hall James	\$16,767,198	\$0	\$310,319	\$17,077,517
Securities Lending Northern Trust	\$0	-\$5,649	\$5,649	\$0
SGA ACWI ex-U.S. Equity	\$41,911,239	\$0	-\$425,930	\$41,485,309
Vanguard Developed Markets ETF	\$17,553,623	\$0	-\$301,379	\$17,252,245
Vanguard Long-Term Treasury ETF	\$18,758,112	\$0	\$749,613	\$19,507,725
Vanguard Russell 2000 Value ETF	\$6	\$0	\$0	\$6
Wellington Core Bond	\$7,571,693	\$0	\$67,924	\$7,639,617
Total	\$458,969,726	-\$766,000	\$5,436,603	\$463,640,329

Benchmark History

As of June 30, 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 BXM / 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 BXM
10/1/2015	4/30/2016	43% Russell 3000 / 12% MSCI ACWI ex USA Gross / 20% BBgBarc US Universal TR / 15% CBOE BXM / 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 BXM / 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.

The Inflation Variable: Evaluating Potential Outcomes

WORKING PAPER

JULY 2021

This research note is a response to the many client questions we have received about rising inflation and its potential impact on portfolio performance. It follows our recent note, *Inflation: Is It Coming and Should We Care?*¹, which explored the history of inflation in the US, why the inflation situation may be changing, and what impact inflation may have on asset prices.

Asset owners are well aware that inflation has an impact on performance. However, the extent of the impact and even the direction depend on several factors. Accordingly, Meketa developed a quantitative tool to assist decision-makers in their consideration of the potential impacts of a range of inflationary scenarios upon investment portfolios. This note explores the most influential variables – from the source of inflation, whether it was anticipated, and the length of the inflationary period, among other factors – and outlines how these considerations can be expected to affect performance across asset classes.

CONTRIBUTORS

Alison Adams, PhD
Frank Benham, CFA, CAIA
Margret Duvall
Allan Emkin
Gloria Hazard
Leo Hsia
Gordon Latter, FSA, FCIA
Stella Mach
Mary Mustard, CFA
Orray Taft, CAIA, FRM
Rafi Zaman, CFA

¹ <https://meketa.com/leadership/inflation-is-it-coming-and-should-we-care/>

Current drivers of inflation

The COVID-19 pandemic disrupted both the demand and supply side of the global economy, causing short-term inflationary pressures. On the demand side, extraordinary fiscal and monetary stimulus have combined with pent-up savings to elevate consumer spending. The magnitude of these actions is difficult to overstate. US debt-to-GDP rose steadily between 2010 and 2020, with typical quarterly growth ranging from -1% to +3%. However, in 2020-Q3 it rose 28%, nearly five times the previous high mark (2008-Q4) of 5.9%.

Monetary policy tells a similar story of swift and aggressive intervention. The expansion of the Federal Reserve's balance sheet was both quicker and larger following March 2020 than the similar "Quantitative Easing" of 2008. The range of action to support financial assets also spanned a broader range as the Federal Open Market Committee instructed its trading desk to purchase not only US Treasuries but corporate debt as well.

Further on the demand-side, the pandemic induced major reductions in consumer activity: in each of the 12 months between April 2020 and April 2021, the personal savings rate was over 10%, with a peak of 33.7% in April 2020. In the 85 months

preceding the pandemic, the savings rate never eclipsed 10%. While not all the foregone consumption will necessarily be made up for as economies re-open, the force of consumers resuming economic activity after a year of subdued spending is surely inflationary.

The pandemic has similarly disrupted supply chains as manufacturers face unanticipated challenges to resume normal activities. Supply chains for semi-conductors, oil, and lumber are among the most impacted. The semi-conductor shortage began in the used automobile market as suppliers of used cars slashed chip orders, correctly anticipating a halt in transportation activity, while technology producers increased purchases as lockdown measures ushered in a year of virtual living. Now, as countries and economies re-open, car manufacturers cannot get the chips they need to meet demand. The lumber industry braced for a slump in the housing market that never came. Sawmills slowed production, but housing market demand remained strong, perhaps as many elected to relocate from cities to suburban locales in the face of global lockdowns and the drop in interest rates made financing a mortgage attractive. At its recent peak, lumber futures hit a record high of \$1,615, a staggering 7x multiple of its April 2020 lows.

The availability of human capital has also become a supply side issue as low-wage employers report widespread difficulty hiring workers even while unemployment rates remain well above their pre-pandemic levels. Reasons for this include: shifts in employer preferences induced by the pandemic, unsatisfactory wages, and bolstered unemployment benefits. A University of Chicago study found that 42% of those on benefits receive more than they did in their previous jobs. Basic economic analysis suggests that to overcome the gap between labor demand and supply, the price of labor (wages) must rise, or the price at which labor is willingly supplied must fall. The former would occur if employers increase wages, which would be inflationary for the economy. The latter might happen if unemployment benefits return to lower levels, forcing a return to the workforce at current wage offerings; this would be disinflationary.

The case for short-term inflation

Despite the inflationary forces on both the supply and demand sides, there is little reason to believe these factors will cause high long-term inflation. We expect pent-up demand, monetary intervention, fiscal stimulus, and supply chain disruptions to subside in the near-term and relieve the current inflationary pressures. After these economic shocks subside, the long-term disinflationary trends of the US's aging population, disruptive technology, and low borrowing costs will still be in place.² Fixed-income markets seem to reflect this view as well, as the 30-year Treasury rate is virtually unchanged from its pre-pandemic level of around 2%. For reference, 10-year breakeven³ rates remain at a modest 2.25%, on par with its pre-pandemic range.

² The literature on the relationship between the average age of a country's citizens and inflation implies a negative correlation, with Japan being the most notable example.

³ Breakeven inflation expectation rates, as measured by the difference in yields between a nominal Treasury and a Treasury Inflation Protection Security (TIPS) across the same maturity points, are a typical method by which market participants assess inflation expectations.

Globally, the US's high year-over-year inflation (5.0%) seems to be the exception rather than the rule. Inflation rates in other major economies are mostly lower: Eurozone (2%), Australia (1.1%), China (1.3%), Canada (3.4%), UK (1.5%), and Japan (-0.4%). To the extent that the relatively high inflation in the US is driven by relatively strong US fiscal and monetary stimulus, we equivalently expect US inflation to come in line with that of comparable peer nations as fiscal and monetary interventions subside. The wildcard situation for more persistent inflation is the uncertainty around continued stimulus. Specifically, 1) will additional spending be forthcoming from Congress, and if so, how large and for how long will it be, and 2) what actions might the Fed take to reverse its stimulative course, and when?

Inflation scenario analysis: three inflationary regimes

Although we expect the current inflationary forces to be transitory, we believe that accurately forecasting future events is extremely difficult as current trends may quickly change and new, unforeseen variables may arise.

To this end, we developed a quantitative tool that analyzes asset class performance under various inflation scenarios. This Inflation Scenario Analysis tool allows investors to "experience" an array of potential outcomes to better inform portfolio construction decisions. Further, it enables us to help our clients better understand the risk that inflation poses to their portfolios and to help them structure their portfolios to mitigate this risk.

The core of this model considers the long-held investment theory that equity assets are negatively correlated with expected and unexpected inflation. On the other hand, tangible assets such as commodities and gold have historically performed well in periods of rising inflation and may offset inflation's drag on a portfolio's performance. Our Inflation Scenario Analysis tool examines these theories under a range of inflationary regimes while examining the relationship between assets and inflation⁴ and controlling for the economic environment.

⁴ Please see Appendix B: Model Methodology for an explanation of non-linear asset inflation relationships.

The Scenario Analysis tool estimates average, annualized returns for a broad array of asset classes under different kinds of inflationary scenarios. Please refer to Appendix A and Appendix B for a detailed explanation on the regression models and expected returns calculation.

Scenario 1: Inflation Above Expectation

The Inflation Above Expectation scenario estimates average, annualized asset returns when realized inflation is above expected inflation (i.e., when there is "surprise" inflation).

Table 1 shows that at low levels, surprise inflation has a small, negative impact on equity assets and long-term bonds (less than 220 bp decline), and the negative returns

grow as surprise inflation increases - reinforcing the belief that equity assets and long-term bonds perform poorly in inflationary periods, particularly when inflation is much higher than expected. TIPS provide only a modest hedge as their returns are slightly negative. Commodities and gold provide the best hedge at varying surprise inflation levels but even these represent only modest gains, illustrating how damaging unexpected inflation can be to even a well-diversified portfolio of assets.

Asset Class	Inflation Slightly Higher than Expected	Inflation Moderately Higher than Expected	Inflation Meaningfully Higher than Expected
US Equity	-1.0	-4.2	-12.8
Global Equity	-0.7	-3.6	-12.3
Long-term Government Bonds	-2.2	-5.8	-11.4
TIPS	-0.5	-1.4	-3.7
Short-term TIPS	0.1	0.0	-0.4
Commodities	1.7	3.1	1.2
Gold	0.9	1.9	2.6

TABLE 1
Inflation Above Expectation Scenario: Average, Annualized Asset Returns

Note: Please see Appendix B: Model Methodology for detailed descriptions of each inflation scenario.

Scenario 2: Inflation in a High/Low Growth Environment

The Inflation and High Growth Environment scenario estimates average, annualized asset returns when realized inflation varies in an environment with high economic growth.

As expected, equities experience the highest returns in each of the high growth scenarios. However, equity returns decline modestly as inflation increases (Table 2). Gold seems to perform poorly in high growth environments generally, while the returns of TIPS are relatively flat. On the other hand, commodities' returns increase as inflation grows, suggesting they are a good inflation hedge during periods of strong economic growth.

Asset Class	High Growth and Low Inflation	High Growth and Moderate Inflation	High Growth and High Inflation
US Equity	18.6	16.9	14.3
Global Equity	27.7	23.1	18.2
Long-term Government Bonds	3.3	-0.4	-2.5
TIPS	0.9	0.5	1.1
Short-term TIPS	-0.3	-0.2	0.1
Commodities	6.1	10.6	12.1
Gold	-10.2	-8.5	-4.0

TABLE 2
Inflation and High Growth Environment Scenario: Average, Annualized Asset Returns

Scenario 3: Inflation and Low Growth Environment

The Inflation and Low Growth Environment scenario estimates average, annualized asset returns when realized inflation varies in an environment with low economic growth.

Equities and long-term government bonds perform poorly in low growth economic environments, and their performance worsens as inflation increases. Commodities are the best hedge in low growth and moderate-to-high inflation periods – the expected return for commodities is positive in all scenarios and returns increase with higher inflation. Gold provides a small hedge only when inflation is high, while TIPS are not a great hedge during periods of low growth.

Asset Class	Low Growth and Low Inflation	Low Growth and Moderate Inflation	Low Growth and High Inflation
US Equity	-9.3	-10.6	-12.6
Global Equity	-12.1	-15.4	-18.9
Long-term Government Bonds	-4.4	-7.9	-9.8
TIPS	-1.6	-2.0	-1.4
Short-term TIPS	-0.6	-0.5	-0.2
Commodities	2.2	6.5	8.0
Gold	-4.2	-2.4	2.4

TABLE 3
Inflation and Low Growth Environment Scenario: Average, Annualized Asset Returns

Scenario 4: Moderate Inflation Period

Meketa also analyzed the effect of the length of the inflation period on asset returns under “moderate” inflation and “extreme” inflation.

The Moderate Inflation Period scenario estimates expected asset returns for short, medium and long-term periods when the realized inflation level is moderate.

Equities have slightly negative expected returns in moderate inflation periods, and the returns grow more negative with longer inflation periods (Table 4). Commodities are a very strong hedge for short- to long-term inflation periods, while gold is the second-best hedge and experiences its highest returns in long-term inflation periods.

Asset Class	Very Brief, Moderate Inflation Spike	Brief, Moderate Inflation Spike	Extended, Moderate Inflation Spike
US Equity	-15	-3.1	-9.9
Global Equity	-3.3	-5.0	-11.9
Long-term Government Bonds	-6.1	-6.3	-5.8
TIPS	-0.1	0.0	0.7
Short-term TIPS	0.4	0.4	0.2
Commodities	14.8	15.5	14.6
Gold	5.2	8.6	23.6

TABLE 4
Moderate Inflation Period Scenario: Average, Annualized Asset Returns

Scenario 5: Extreme Inflation Period

The Extreme Inflation Period scenario estimates expected asset returns for short, medium and long-term periods when the realized inflation level is very high, similar to levels experienced in 1971-1972.

Table 5 shows that the patterns observed in the Moderate Inflation Period scenario continue for the Extreme Inflation Period case. For example, at extreme levels of inflation, gold is a very strong inflation hedge in all scenarios and performs best in long-term inflation periods. Commodities are also a very strong hedge, but their returns decline modestly as the length of the inflation period grows. Equities perform very poorly during these periods.

Asset Class	Very Brief, Extreme Inflation Spike	Brief, Extreme Inflation Spike	Extended, Extreme Inflation Spike
US Equity	-11.4	-14.2	-18.7
Global Equity	-13.5	-16.2	-20.5
Long-term Government Bonds	-6.0	-5.5	-4.3
TIPS	0.8	1.1	1.6
Short-term TIPS	0.2	0.2	0.0
Commodities	15.3	14.0	11.4
Gold	27.4	34.6	47.2

TABLE 5
Extreme Inflation Period
Scenario: Average,
Annualized Asset Returns

Conclusion

The current drivers of inflation are real and warrant careful consideration. However, we believe that they are likely to remain short-term. Pent-up demand and supply chain issues are direct consequences of the now-receding pandemic, particularly in the US. Monetary and fiscal stimulus are direct policy responses.

As pandemic-related risks continue to decline and economies re-open, it stands to reason that these short-term drivers of inflation will similarly subside. The core structural dis-inflationary realities of global demographics (e.g., an aging US population) and low borrowing costs should continue to dominate the long-term inflation view, which we hold as low to moderate.

Although rising prices will likely subside in the near-term, there is still considerable uncertainty about the outcome. Moreover, inflation still has a sizeable impact on asset prices, and the impact varies based on the type of inflationary environment. Understanding inflation's effect on different asset classes can help investors develop a portfolio that is well-positioned to hedge against inflation risk.

Appendix A: Model approach and limitations

The Inflation Scenario Analysis tool is based on a multivariate regression model that estimates the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated returns are then calculated as the expected value of asset class returns, conditional on the inflation scenario.

The reasons for this model approach are detailed below.

Control for the economic environment. Meketa wanted to control for the economic environment when looking at an asset's inflation hedging ability. Economic theory holds that inflation and growth are tightly related – low levels of inflation tend to spur economic activity, but when economic activity heats up too quickly, inflation grows. A regression model allowed us to estimate how much an asset's performance is due to the economic environment compared to its actual inflation-hedging ability.

Avoid mis-specification. An asset class' inflation hedging ability is typically measured through the correlation of asset performance and inflation levels in historical periods. However, the real relationship between inflation and many asset classes is likely non-linear. Hence, inferring the relationship of inflation and asset returns with linear correlations could mis-specify their real relationship.

Small sample size. Meketa was limited to using regression models to identify the relationship between inflation and asset performance due to the small sample size. Non-parametric models require large sample sizes to perform well, but our sample size was 576 months.

Easy interpretation. The estimated coefficients in a regression model are easy to interpret and validate with theory. Linear regression coefficients are interpreted as elasticities – the effect of Y given one unit increase in X holding all else constant.

As with all regression models, the results of our multivariate regressions depend on the following assumptions to be true:

- The linear functional form represents the true data-generating process.
- The covariance between the error term and independent variables are 0.
- The error term is normally distributed around 0 and has a finite variance.
- The residuals are homoscedastic and are not correlated.

The assumptions need to hold true for our estimators to be unbiased. In addition, by using a model with historical data, Meketa assumes that future asset behavior is similar to past asset behavior.

Appendix B: Model Methodology

Inflation above expectation

The model examines the effect of surprise inflation on asset returns, controlling for the economic environment and realized inflation:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{Unemployment} + \beta_2 \text{Unemployment}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2 + \beta_5 \text{Surprise Inflation} + \beta_6 \text{Surprise Inflation}^2$$

where Asset Returns is the monthly asset class return from 1973 to 2020, unemployment is the 3-month rolling average unemployment rate, inflation is the monthly change in CPI from the 3-month rolling average CPI, and surprise inflation is the difference between this month and last month's inflation rate. Unemployment and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database. The independent variables Unemployment^2 , Inflation^2 and $\text{Surprise Inflation}^2$ capture the non-linear effects of realized inflation, surprise inflation, and the economic environment on asset returns. For example, the relationship between Long-term Government Bonds and realized inflation may be an upside-down U shape in periods of high economic growth – Long-term Government Bond returns are positive when monthly inflation is low at .2%, but returns turn negative when monthly inflation reaches higher levels, such as 0.5%.

The estimate is the annualized return of:

$$\beta_5 * E[\text{Surprise Inflation} | \text{Scenario}] + \beta_6 * E[\text{Surprise Inflation}^2 | \text{Scenario}]$$

where the scenarios are low (.05%, 25th percentile), medium (.15%, median), and high (.3%, 75th percentile) surprise inflation.

Inflation and high/low growth

The model examines the combined effect of inflation and GDP Growth on asset returns:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{GDP Growth} + \beta_2 \text{GDP Growth}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2$$

where Asset Returns is the monthly asset return from 1973 to 2020, GDP Growth is the percent change in GDP from the previous quarter, and inflation is the monthly change in CPI from the 3-month rolling average CPI. GDP Growth and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database. Since GDP data is only quarterly, the regression was run on quarterly asset return, GDP and inflation observations.

The estimate is the annualized return of:

$$\beta_1 * E[\text{GDP Growth} | \text{Scenario}] + \beta_2 * E[\text{GDP Growth}^2 | \text{Scenario}] + \beta_3 * E[\text{Inflation} | \text{Scenario}] + \beta_4 * E[\text{Inflation}^2 | \text{Scenario}]$$

where the GDP Growth scenarios are high growth rate of 1% (75th percentile) and low growth rate of .3% (25th percentile). The inflation scenarios are low (.07%, 25th percentile), medium (.25%, median), and high (.5%, 75th percentile) realized inflation.

Inflation duration

The model examines the effect of inflation duration on asset return, controlling for the economic environment:

$$\text{Asset Returns} = \beta_0 + \beta_1 \text{Unemployment} + \beta_2 \text{Unemployment}^2 + \beta_3 \text{Inflation} + \beta_4 \text{Inflation}^2$$

where Asset Returns is the monthly asset return from 1973 to 2020, unemployment is the 3-month rolling average unemployment rate, and inflation is the monthly change in CPI from the 3-month rolling average CPI. Unemployment and inflation data are taken from the St. Louis Federal Reserve Bank's FRED database.

The estimate is the annualized return of:

$$\beta_3 * E[\text{Inflation} | \text{Scenario}] + \beta_4 * E[\text{Inflation}^2 | \text{Scenario}]$$

where the scenarios are short (1-2 months), medium (4-8 months) or long-term (12+ months) inflation duration.

Appendix C: Benchmarking

The following table lists the benchmarks used for each asset class.

Asset Class	Benchmark
US Equity	Russell 3000
Global Equity	MSCI ACWI
Long-term Government Bonds	Bloomberg Barclays US Treasury: Long Index
TIPS	Bloomberg Barclays Global Inflation-Linked: US Tips
Short-term TIPS	Bloomberg Barclays US Treasury Tips 1-5 Years Index
Commodities	Bloomberg Commodity Index
Gold	LBMA Gold Price PM USD

TABLE 6
Asset Class Benchmarks

References

1. "Federal Debt: Total Public Debt as Percent of Gross Domestic Product." FRED, 2 June 2021, fred.stlouisfed.org/series/GFDEGDQ188S.
2. Board of Governors of the Federal Reserve System. (n.d.). https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm.
3. Personal Saving Rate. (2021, May 28). Retrieved from <https://fred.stlouisfed.org/series/PSAVERT>.
4. "LBS." Nasdaq, www.nasdaq.com/market-activity/commodities/lbs.
5. Ganong, P. (2021). Spending and Job Search Impacts of Expanded Unemployment Benefits: Evidence from Administrative Micro Data. Becker Friedman Institute. Retrieved June 23, 2021, from https://bfi.uchicago.edu/wp-content/uploads/2021/02/BFI_WP_2021-19.pdf.
6. "10-Year Breakeven Inflation Rate." FRED, 22 June 2021, fred.stlouisfed.org/series/T10YIE.
7. "30-Year Treasury Constant Maturity Rate." FRED, 22 June 2021, fred.stlouisfed.org/series/DGS30.
8. Bloomberg Terminal.

Disclaimers

This document is for general information and educational purposes only, and must not be considered investment advice or a recommendation that the reader is to engage in, or refrain from taking, a particular investment-related course of action. Any such advice or recommendation must be tailored to your situation and objectives. You should consult all available information, investment, legal, tax and accounting professionals, before making or executing any investment strategy. You must exercise your own independent judgment when making any investment decision.

All information contained in this document is provided "as is," without any representations or warranties of any kind. We disclaim all express and implied warranties including those with respect to accuracy, completeness, timeliness, or fitness for a particular purpose. We assume no responsibility for any losses, whether direct, indirect, special or consequential, which arise out of the use of this presentation.

All investments involve risk. There can be no guarantee that the strategies, tactics, and methods discussed in this document will be successful.

Data contained in this document may be obtained from a variety of sources and may be subject to change. We disclaim any and all liability for such data, including without limitation, any express or implied representations or warranties for information or errors contained in, or omissions from, the information. We shall not be liable for any loss or liability suffered by you resulting from the provision to you of such data or your use or reliance in any way thereon.

Nothing in this document should be interpreted to state or imply that past results are an indication of future performance. Investing involves substantial risk. It is highly unlikely that the past will repeat itself. Selecting an advisor, fund, or strategy based solely on past returns is a poor investment strategy. Past performance does not guarantee future results.

MEMORANDUM

TO: Oakland Police and Fire Retirement System (PFRS)
FROM: Meketa Investment Group ("Meketa")
CC: David Sancewich; Paola Nealon - Meketa
Teir Jenkins - PFRS
DATE: July 28, 2021
RE: 2021 Expected Return Memo

The general theme of the 2021 Meketa Capital Market Assumptions are lower future expected returns. This is a theme which is consistent across the board in the industry and largely driven by the significant changes in interest rates during 2020. Lower interest rates result in lower expected returns for most yield oriented asset classes as starting yield is often a fairly reasonable predictor of future returns for many fixed income related classes. Other approaches which focus on building forecasts from a more bottom-up or fundamental view point for equities and other economic growth risk linked classes are often (or at least in some part) influenced by valuation levels. With a strong year across the board for equity markets, valuations increased across many measures.

As such, expected returns are lower for anyone relying solely on a valuation approach as well. It's important to remember that our capital market assumptions and those of other practitioners and peers have a significant range of error in terms of potential future outcomes. For example, the higher the expected standard deviation, the higher the range of possible outcomes is expected to be for any asset class or portfolio. It is also important to note that the long-term expected portfolio compound return assumes net-of-fee returns, with no attempt to seek added value via active management.

It is important to note that our capital market assumptions are over a 20-year time horizon which is different from the time horizon used by PFRS's actuary, Chieron which projects out over 30-years. Further summary comments of our 2021 capital market assumptions and the detailed projections by asset class are shown on the following page.

- In 2021 our cash return expectations declined materially from 2020 from 2.4% to 1.1% pushing the real return expectation even further into negative territory.
 - Short-term rates declined significantly, with 3 month treasury yields starting at 1.55% and dropping to 0% on March 25th and 26th 2020, before remained low the rest of the year and ending at 0.09%.
- Fixed income yields across the maturity and quality spectrum fell significantly during 2020 reducing return expectations for Fixed Income, High Yield, and Long Duration (a part of Crisis Risk Offset).
- With the exception of Public Equities, no class in the PFRS portfolio is forecasted to achieve a compound return above 7.00% over the next 20 years.
 - Public Equity contains U.S. Equity and International Equity. The next highest returning sub-asset class is Covered Calls at ~4.7%.
- Over the next 20-years the PFRS Long-term policy portfolio is projected to produce a return of 5.63%.

Current Long-Term Policy

		2021 20-Year Assumptions	
Investment Class	Target * %	Exp. Comp. Return**	Expected Std. Dev.
US Equity	40%	6.80	18.00
International Equity	12%	7.10	19.00
Covered Calls	5%	4.70	13.00
Fixed Income	21%	1.80	4.00
Credit	2%	4.20	11.00
Crisis Risk Offset	20%	4.05	8.90
Cash	---	1.10	1.00
Total	100%	5.63	10.21

Current Interim Policy

		2021 20-Year Assumptions	
Investment Class	Target * %	Exp. Comp. Return**	Expected Std. Dev.
US Equity	40%	6.80	18.00
International Equity	12%	7.10	19.00
Covered Calls	5%	4.70	13.00
Fixed Income	31%	1.80	4.00
Credit	2%	4.20	11.00
Crisis Risk Offset	10%	4.05	8.90
Cash	---	1.10	1.00
Total	100%	5.37	10.24

DS, PN, pq

OAKLAND POLICE AND FIRE RETIREMENT BOARD
CITY OF OAKLAND, CALIFORNIA
RESOLUTION No. 8021

Approved to Form
and Legality



ON MOTION OF MEMBER _____ SECONDED BY MEMBER _____

RESOLUTION RATIFYING THE JUNE 30, 2021 MOTION OF THE OAKLAND POLICE AND FIRE RETIREMENT SYSTEM BOARD TO HIRE WELLINGTON MANAGEMENT COMPANY TO SERVE AS THE U.S. DEFENSIVE EQUITY INVESTMENT MANAGER FOR THE OAKLAND POLICE AND FIRE RETIREMENT SYSTEM WITH THE MANAGEMENT FEE RATE NOT TO EXCEED 55 BASIS POINTS (55 BPS OR 0.55 PERCENT) OF THE PORTFOLIO'S ANNUAL ASSET VALUE PLUS ADDITIONAL OPERATING EXPENSES AND AUTHORIZING THE PRESIDENT OF THE POLICE AND FIRE RETIREMENT SYSTEM BOARD TO EXECUTE A PROFESSIONAL SERVICE AGREEMENT WITH WELLINGTON MANAGEMENT COMPANY

WHEREAS, Article XVI §17 of the California Constitution, commonly referred to as the Pension Protection Act or Proposition 162, and Article XXVI of the Oakland City Charter (“Charter”) vest the Oakland Police and Fire Retirement System Board (“PFRS Board”) with exclusive control of the administration and investment of the assets of the Police and Fire Retirement Fund (the “Fund”); and

WHEREAS, the PFRS Board manages and administers the Police and Fire Retirement System (“PFRS”), pursuant to the requirements of Article XXVI of the Charter; and

WHEREAS, Charter section 2601(e) gives the Board power to make all necessary rules and regulation for its guidance and exclusive control of the administration and investment of the funds established for the maintenance and operation of the system; and

WHEREAS, Article XXVI of the Charter expressly authorizes the PFRS Board to secure competent investment counsel to provide advice and counsel regarding the investment of the Fund and further provides that discretionary powers granted to such investment counsel will be at the option of the Board; and

WHEREAS, on June 28, 2017, the PFRS Board approved Resolution No. 6976, authorizing a new asset allocation called U.S. Defensive Domestic Equity Asset Class for the PFRS investment portfolio to reduce the risk tolerance of the portfolio; and

WHEREAS, on October 25, 2017, the PFRS Board passed a motion which authorized the PFRS Investment Consultant, Pension Consulting Alliance (“PCA”), to issue a Request for Proposals for a new U.S. Defensive Domestic Equity AssetClass Investment Manager to fill this mandate; and

OAKLAND POLICE AND FIRE RETIREMENT BOARD

CITY OF OAKLAND, CALIFORNIA

RESOLUTION NO. 8021

WHEREAS, on October 31, 2018, the PFRS Board approved Resolution No.7028 authorizing a Professional Service Agreement with SPI Strategies, LLP to act as the new PFRS U.S. Defensive Equity Investment Manager; and

WHEREAS, on February 26, 2020, the PFRS Board passed a motion to terminate the service agreement with SPI Strategies, LLC following internal changes at the firm and PFRS investment assets were moved to an equivalent Exchange Traded Fund; and

WHEREAS, on December 10, 2020, pursuant to direction from the PFRS Board, the PFRS Investment Consultant, Meketa Investment Group (“Meketa”), reviewed the finalists’ responses to the 2018 RFP for the U.S. Defensive Domestic Equity Asset Class Investment Strategy and compiled a list of qualified candidates to recommend for interview; and

WHEREAS, on March 31, 2021, Meketa, recommended that the PFRS Board interview: 1) Atlanta Capital Management Co., LLC; 2) Eagle Capital Management, LLC; 3) The London Company; and 4) Wellington Management Company for the U.S. Defensive Equity Investment Manager position; and

WHEREAS, Meketa did provide its rationale for recommending 1) Atlanta Capital Management Co., LLC; 2) Eagle Capital Management, LLC; 3) The London Company; and 4) Wellington Management Company for consideration as the new U.S. Defensive Equity Investment Manager for the Oakland Police and Fire Retirement System; and

WHEREAS, on June 30, 2021 after interviewing the candidates and discussing the qualifications of each candidate, the PFRS Board passed a motion to hire Wellington Management Company to serve as the U.S. Defensive Equity Investment Manager for the Oakland Police and Fire Retirement System with the management fee rate not to exceed 55 basis points (55 BPS or 0.55 percent) of the portfolio’s annual asset value, which is presently valued at approximately Fifteen Million Dollars (\$15,000,000), plus additional operating expenses; now, therefore, be it

RESOLVED: That the PFRS Board hereby ratifies its June 30, 2021 motion to hire Wellington Management Company to serve as the U.S. Defensive Equity Investment Manager for the Oakland Police and Fire Retirement System with the management fee rate not to exceed 55 basis points (55 BPS or 0.55 percent) of the portfolio’s annual asset value, plus additional operating expenses; and be it

OAKLAND POLICE AND FIRE RETIREMENT BOARD
 CITY OF OAKLAND, CALIFORNIA
RESOLUTION No. 8023

*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 BENEFICIARIES OF DECEASED OAKLAND POLICE AND FIRE RETIREMENT SYSTEM MEMBERS HENRY J. TARABOCHIA AND ROBERT E. THORSEN.

WHEREAS, due proof having been received in accordance with Article XXVI of the Charter of the City of Oakland of the death of the retired members of the Oakland Police or Fire Department identified in Column (1) below; and

WHEREAS, the beneficiaries to whom the death benefit provided in Charter Section 2612 is payable, are the persons whose names are stated in Column (2) opposite the names of the deceased retired members; and

WHEREAS, the amount of said death benefit is stated in Column (3) opposite the names of the beneficiaries; now, therefore, be it

RESOLVED: That the Police and Fire Retirement System Board does hereby approve the Death Benefit payment to the persons 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 persons whose names appear in Column (2):

(1)	(2)	(3)
Name of Deceased Member	Name of Beneficiary	Death Benefit Amount
Henry J. Tarabochia	Estate of Henry J. Tarabochia	\$1,000.00
Robert E. Thorsen	Patricia Thorsen	\$1,000.00

IN BOARD MEETING, VIA ZOOM CONFERENCE _____ JULY 28, 2021

PASSED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ATTEST: _____
 PRESIDENT

ATTEST: _____
 SECRETARY



AGENDA REPORT

TO: Oakland Police and Fire Retirement System Board (PFRS) **FROM:** David Jones
Plan Administrator

SUBJECT: PFRS Board Agenda Pending List **DATE:** July 28, 2021

	SUBJECT	TENTATIVE SCHEDULED MTG DATE	STATUS
1	Informational Report regarding Post-Pandemic Brown Act Requirements for Board and Committee Meetings and Discussion regarding whether PFRS Board and Committees may Continue to Meet Virtually	Ongoing	Ongoing

Respectfully submitted,

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