AGENDA

Date: June 4, 2021

The regular meeting of the Dallas Police and Fire Pension System Board of Trustees will be held at **8:30 a.m. on Thursday, June 10, 2021, via telephone conference for audio at 214-271-5080 access code 588694 or Toll-Free (US & CAN): 1-800-201-5203 and Zoom meeting for visual** https://us02web.zoom.us/j/84567159132?pwd=bndIdEJ0RFpTQWVaeE14KzlxY3RzZz09 **Passcode: 018445.** Items of the following agenda will be presented to the Board:

A. MOMENT OF SILENCE

B. CONSENT AGENDA

1. Approval of Minutes

a. Required Public meeting #1 of May 13, 2021
b. Regular meeting of May 13, 2021

2. **Approval of Refunds of Contributions for the Month of May 2021**

3. **Approval of Activity in the Deferred Retirement Option Plan (DROP) for June 2021**

4. **Approval of Estate Settlements**

5. **Approval of Service Retirements**

6. **Approval of Alternate Payee Benefits**

7. **Approval of Earnings Test**

C. DISCUSSION AND POSSIBLE ACTION REGARDING ITEMS FOR INDIVIDUAL CONSIDERATION

1. **Portfolio Update**

2. **Asset Allocation**

3. **January 1, 2021 Actuarial Valuation Assumptions**

4. **First Quarter 2021 Investment Performance Analysis and Fourth Quarter 2020 Private Markets & Real Assets Review**

   Portions of the discussion under this topic may be closed to the public under the terms of Section 551.072 of the Texas Government Code.

5. **Chairman's Discussion Item**

   Trustee Resignation

6. **Board Chairman, Vice Chairman and Deputy Vice Chairman Election**

7. **Legislative Update**

8. **Monthly Contribution Report**

9. **Board approval of Trustee education and travel**

   a. Future Education and Business-related Travel
   b. Future Investment-related Travel

10. **Board Members' reports on meetings, seminars and/or conferences attended**

11. Financial Audit Status

12. Legal issues - In accordance with Section 551.071 of the Texas Government Code, the Board will meet in executive session to seek and receive the advice of its attorneys about pending or contemplated litigation or any other legal matter in which the duty of the attorneys to DPFP and the Board under the Texas Disciplinary Rules of Professional Conduct clearly conflicts with Texas Open Meeting laws.

D. BRIEFING ITEMS

1. Public Comment

2. Executive Director's report

a. Associations' newsletters
- NCPERS Monitor (June 2021)
- NCPERS PERSist (Spring 2021)

b. Open Records

c. Office Update and Reopening Status

d. CIO Recruitment

The term "possible action" in the wording of any Agenda item contained herein serves as notice that the Board may, as permitted by the Texas Government Code, Section 551, in its discretion, dispose of any item by any action in the following non-exclusive list: approval, disapproval, deferral, table, take no action, and receive and file. At the discretion of the Board, items on this agenda may be considered at times other than in the order indicated in this agenda.

At any point during the consideration of the above items, the Board may go into Closed Executive Session as per Texas Government Code, Section 551.071 for consultation with attorneys, Section 551.072 for real estate matters, Section 551.074 for personnel matters, and Section 551.078 for review of medical records.

DALLAS POLICE & FIRE PENSION SYSTEM

MOMENT OF SILENCE

In memory of our Members and Pensioners who recently passed away

NAME	ACTIVE/ RETIRED	DEPARTMENT	DATE OF DEATH
David P. Ledbetter	Retired	Fire	May 5, 2021
Ronald C. Nelson	Retired	Police	May 20, 2021
Johnny C. Reid	Retired	Police	May 31, 2021
Marcus Evans	Active	Fire	Jun. 1, 2021

Regular Board Meeting –Thursday, June 10, 2021

Dallas Police and Fire Pension System
Thursday, May 13, 2021
8:30 a.m.
Via telephone conference

Required Public meeting, William F. Quinn, Chairman, presiding:

ROLL CALL

Board Members

Present at 8:30 a.m.	William F. Quinn, Nicholas A. Merrick, Michael Brown, Robert B. French, Gilbert A. Garcia, Kenneth Haben, Tina Hernandez Patterson, Steve Idoux, Mark Malveaux, Allen R. Vaught
Absent:	Armando Garza
Staff	Kelly Gottschalk, Josh Mond, Brenda Barnes, Ryan Wagner, Greg Irlbeck, Michael Yan, John Holt, Cynthia Thomas, Milissa Romero
Others	Leandro Festino, Sidney Kawanguzi

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The first of two annual public meetings of the Dallas Police and Fire Pension System Board of Trustees as required by Section 3.01 (j-9) of Article 6243a-1 of Vernon's Revised Civil Statutes.

The meeting was called to order at 8:30 a.m.

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1. Report on the health and performance of the Pension System

a. Quarterly Financial Reports
b. Monthly Contribution Report

The Chief Financial Officer presented the first quarter 2021 financial statements. The Executive Director reviewed the Monthly Contribution Report and reported on the health and performance of DPFP as required by Section 3.01 (j-9) of Article 6243a-1 of Vernon's Revised Civil Statutes.

No motion was made.

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2. Public Comment

The Chairman extended an opportunity for public comment. No one requested to speak to the Board.

Required Public Meeting
Thursday, May 13, 2021

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Ms. Gottschalk stated that there was no further business to come before the Board. On a motion by Mr. Quinn and a second by Mr. Garcia, the meeting was adjourned at 8:48 a.m.

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William F. Quinn
Chairman

ATTEST:

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Kelly Gottschalk
Secretary

Dallas Police and Fire Pension System
Thursday, May 13, 2021
8:30 a.m.
Via telephone conference

Regular meeting, William F. Quinn, Chairman, presiding:

ROLL CALL

Board Members

Present at 8:30 a.m.	William F. Quinn, Nicholas A. Merrick, Michael Brown, Robert B. French, Gilbert A. Garcia, Kenneth Haben, Tina Hernandez Patterson, Steve Idoux, Mark Malveaux, Allen R. Vaught
Present at 8:48 a.m.	Armando Garza
Absent:	None
Staff	Kelly Gottschalk, Josh Mond, Brenda Barnes, Ryan Wagner, Greg Irlbeck, Michael Yan, John Holt, Cynthia Thomas, Milissa Romero
Others	Leandro Festino, Aaron Lally, Sidney Kawanguzi, Stuart Pattillo, Carl Evans, III, Dan Serna, Skeet Ponder

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The meeting was called to order at 8:30 a.m.

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A. MOMENT OF SILENCE

The Board observed a moment of silence in memory of retired police officers Kenneth P. Wolford, James A. Rollins, Donald A. Watts, Samuel G. Breitling, James W. Foster, and active firefighter Reginald Williams, and retired firefighter Michael D. Hyles.

No motion was made.

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B. CONSENT AGENDA

1. Approval of Minutes

a. Regular meeting of April 8, 2021
b. Special meeting of April 20, 2021

Regular Board Meeting
Thursday, May 13, 2021

2. **Approval of Refunds of Contributions for the Month of April 2021**

3. **Approval of Activity in the Deferred Retirement Option Plan (DROP) for May 2021**

4. **Approval of Estate Settlements**

5. **Approval of Survivor Benefits**

6. **Approval of Service Retirements**

7. **Approval of Alternate Payee Benefits**

After discussion, Mr. Vaught made a motion to approve the minutes of the meeting of April 8, 2021. Mr. Quinn seconded the motion, which was unanimously approved by the Board.

After discussion, Mr. Haben made a motion to approve the minutes of the meeting of April 20, 2021. Mr. Vaught seconded the motion, which was unanimously approved by the Board.

After discussion, Mr. Garza made a motion to approve the remaining items on the Consent Agenda, subject to the final approval of the staff. Ms. Hernandez Patterson seconded the motion, which was unanimously approved by the Board.

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C. DISCUSSION AND POSSIBLE ACTION REGARDING ITEMS FOR INDIVIDUAL CONSIDERATION

1. **Quarterly Financial Reports**

   The Chief Financial Officer presented the first quarter 2021 financial statements.

   No motion was made.

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2. **Monthly Contribution Report**

   The Executive Director reviewed the Monthly Contribution Report.

   No motion was made.

Regular Board Meeting
Thursday, May 13, 2021

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3. Chairman's Discussion Items

In-person Board Meetings

The Chairman discussed the Trustees' position on conducting the Board meetings in person and reopening the Board meetings in person starting July 2021.

No motion was made.

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4. Report on Audit Committee

The Audit Committee met with representatives of BDO on April 28, 2021 and reviewed the Audit Plan for the 2020 audit. The Committee Chair commented on the meeting.

No motion was made.

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5. Legislative Update

Staff briefed the Board on pension bills that have been filed which may bear on DPFP.

No motion was made.

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6. Board approval of Trustee education and travel

a. Future Education and Business-related Travel
b. Future Investment-related Travel

The Board and staff discussed future Trustee education. There was no future Trustee business-related travel or investment-related travel scheduled.

No motion was made.

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Regular Board Meeting
Thursday, May 13, 2021

7. Report on Investment Advisory Committee

The Investment Advisory Committee met on April 20, 2021. The Committee Chair and Investment Staff commented on Committee observations and advice.

No motion was made.

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8. Portfolio Update

Investment staff briefed the Board on recent events and current developments with respect to the investment portfolio.

No motion was made.

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9. Asset Allocation

Leandro Festino, Managing Principal and Aaron Lally, Executive Vice President of Meketa Investment Group Meketa and DPFP investment staff discussed the 2021 asset allocation study process, analysis, the recommended long-term asset allocation, and implementation considerations.

No motion was made.

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10. Natural Resources: Hancock Presentation

Stuart Pattillo, Portfolio Manager, Carl Evers, III, Vice President, Water Resources NA, Dan Serna, Associate Director & Senior Agricultural Economist, and Skeet Ponder, Portfolio Analyst Representatives of Hancock Natural Resource Group updated the Board on the status and plans for DPFP's agricultural portfolio, as well as provided a market update on the major crops in the DPFP portfolio.

The Board went into closed executive session at 11:53 a.m.

The meeting was reopened at 12:05 p.m.

No motion was made.

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Regular Board Meeting
Thursday, May 13, 2021

11. Lone Star Investment Advisors and Huff Energy Update

Investment Staff updated the Board on recent performance, operational, and administrative developments with respect to DPFP investments in the Huff Energy fund as well as funds managed by Lone Star Investment Advisors.

The Board went into closed executive session at 10:34 a.m.

The meeting was reopened at 11:26 a.m.

No motion was made.

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Mr. Merrick left the meeting at 11:15 a.m.

Mr. Idoux left the meeting at 11:19 a.m.

Mr. French left the meeting at 11:34 a.m.

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12. Legal issues - In accordance with Section 551.071 of the Texas Government Code, the Board will meet in executive session to seek and receive the advice of its attorneys about pending or contemplated litigation or any other legal matter in which the duty of the attorneys to DPFP and the Board under the Texas Disciplinary Rules of Professional Conduct clearly conflicts with Texas Open Meeting laws.

The Board went into closed executive session at 10:34 a.m.

The meeting was reopened at 11:26 a.m.

No motion was made.

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D. BRIEFING ITEMS

1. Public Comments

Prior to commencing items for Board discussion and deliberation, the Board received public comments during the open forum.

Regular Board Meeting
Thursday, May 13, 2021

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2. Executive Director's report

a. Associations' newsletters
- NCPERS Monitor (May 2021)
- TEXPERS Pension Observer
  - https://anyflip.com/mxfu/sddx/

b. Open Records
c. Office Reopening Status
d. CIO Recruitment
e. GFOA Award

The Executive Director's report was presented.

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Ms. Gottschalk stated that there was no further business to come before the Board. On a motion by Mr. Quinn and a second by Mr. Garza, the meeting was adjourned at 12:05 p.m.

William F. Quinn
Chairman

ATTEST:

Kelly Gottschalk
Secretary

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C1

Topic: **Portfolio Update**

Discussion: Investment Staff will brief the Board on recent events and current developments with respect to the investment portfolio.

Regular Board Meeting – Thursday, June 10, 2021

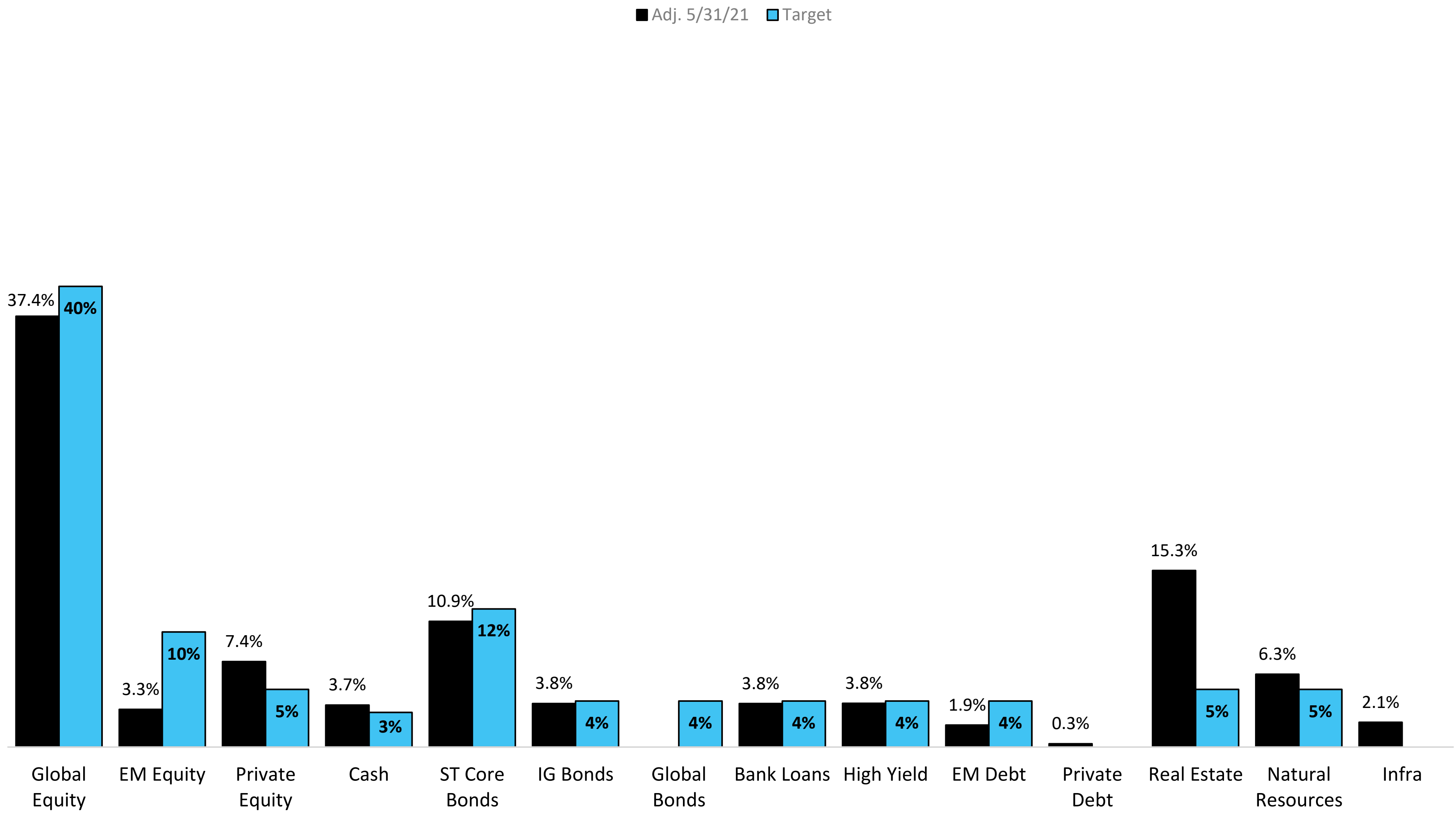
DALLAS POLICE & FIRE PENSION SYSTEM

Portfolio Update

June 10, 2021

Adjusted Asset Allocation – Actual vs Target

In this view staff adjusts reported private market values to roughly estimate the impact of events that have not yet been recognized.



DALLAS POLICE & FIRE PENSION SYSTEM

Adjusted Asset Allocation & Global Equity Detail

In this view staff adjusts reported private market values to roughly estimate the impact of events that have not yet been recognized.

DPFP Asset Allocation Using Stressed Private Market Values	5/31/2021 NAV	Adjustments $ mil.	Adjustments % of NAV	Adj. NAV 5/31/2021 $ mil.	Adj. NAV 5/31/2021 %	Target $ mil.	Target %	Variance $ mil.	Variance %
Equity	**1,006**	**-48**	**-4.8%**	**958**	**48.1%**	**1,096**	**55.0%**	**-138**	**-6.9%**
Global Equity	745	0	0.0%	745	37.4%	797	40.0%	-52	-2.6%
Boston Partners	*147*	*0*	*0.0%*	*147*	*7.4%*	*139*	*7.0%*	*7*	*0.4%*
Manulife	*143*	*0*	*0.0%*	*143*	*7.2%*	*139*	*7.0%*	*4*	*0.2%*
Invesco (OFI)	*131*	*0*	*0.0%*	*131*	*6.6%*	*139*	*7.0%*	*-8*	*-0.4%*
Walter Scott	*138*	*0*	*0.0%*	*138*	*6.9%*	*139*	*7.0%*	*-1*	*-0.1%*
Northern Trust ACWI IMI Index	*186*	*0*	*0.0%*	*186*	*9.3%*	*120*	*6.0%*	*66*	*3.3%*
Future US Small Cap Mandate	*0*	*0*	*0.0%*	*0*	*0.0%*	*60*	*3.0%*	*-60*	*-3.0%*
Future International Small Cap Mandate	*0*	*0*	*0.0%*	*0*	*0.0%*	*60*	*3.0%*	*-60*	*-3.0%*
Russell Transition	*0*	*0*	*0.0%*	*0*	*0.0%*	*0*	*0.0%*	*0*	*0.0%*
Emerging Markets Equity	65	0	0.0%	65	3.3%	199	10.0%	-134	-6.7%
Private Equity*	196	-48	-24.5%	148	7.4%	100	5.0%	48	2.4%
Fixed Income	**560**	**0**	**0.0%**	**560**	**28.1%**	**697**	**35.0%**	**-137**	**-6.9%**
Cash	73	0	0.0%	73	3.7%	60	3.0%	13	0.7%
ST Investment Grade Bonds	218	0	0.0%	218	10.9%	239	12.0%	-21	-1.1%
Investment Grade Bonds	75	0	0.0%	75	3.8%	80	4.0%	-4	-0.2%
Global Bonds	0	0	0.0%	0	0.0%	80	4.0%	-80	-4.0%
Bank Loans	75	0	0.0%	75	3.8%	80	4.0%	-5	-0.2%
High Yield Bonds	76	0	0.0%	76	3.8%	80	4.0%	-4	-0.2%
Emerging Markets Debt	38	0	0.0%	38	1.9%	80	4.0%	-42	-2.1%
Private Debt*	6	0	0.0%	6	0.3%	0	0.0%	6	0.3%
Real Assets*	**474**	**0**	**0.0%**	**474**	**23.8%**	**199**	**10.0%**	**275**	**13.8%**
Real Estate*	305	0	0.0%	305	15.3%	100	5.0%	206	10.3%
Natural Resources*	126	0	0.0%	126	6.3%	100	5.0%	26	1.3%
Infrastructure*	43	0	0.0%	43	2.1%	0	0.0%	43	2.1%
Total	**2,040**	**-48**	**-2.3%**	**1,992**	**100.0%**	**1,992**	**100.0%**	**0**	**0.0%**
Safety Reserve ~$270M=30 mo net CF	290	0	0.0%	290	14.6%	299	15.0%	-8	-0.4%
*Private Mkt. Assets w/NAV Discount	675	-48	-7.1%	627	31.5%	299	15.0%	329	16.5%

Source: Preliminary JP Morgan Custodial Data, Staff Estimates and Calculations

Individual target percentages for Global Equity managers based on Global Equity Structure Review approved by Board.

Numbers may not foot due to rounding

Investment Activity

- Liquidation of private market assets remains the top focus.
  - Received $52 million in distributions year to date.
  - $25+ million from in process sales expected by mid-July.
- Staff continuing evaluation of and engagement with end-of-life private equity funds.
- US Small Cap RFP responses received on May 7th. Plan to bring finalists to IAC in June. Expect to bring IAC selection for Board approval in July.

Investment Initiatives – 2021 Quarterly Plan

Q2 2021

- Long-Term Asset Allocation Approval and Implementation Discussion
- US Small Cap Manager Selection Process

Q3 2021

- Investment Policy Statement Update for Asset Allocation Targets, Ranges and Implementation
- US Small Cap Manager Recommendation to Board
- Launch International Small Cap Search/RFP
- Global Equity Structure Review

Q4 2021

- International Small Cap Manager Recommendation to Board
- Possible EM Equity Structure Review/Manager Search

2021 Board Investment Review Plan*

Staff presentations targeted for 15 minutes, Manager presentations 30 – 60 minutes.

January ✓	• Real Estate Reviews: Vista 7, King's Harbor, & Museum Twr.
February ✓	• Real Estate: Clarion Presentation
March ✓	• Natural Resources: Staff Portfolio Review - Forest Investment Associates and BTG Pactual
April ✓	• Real Estate: AEW Presentation
May ✓	• Natural Resources: Hancock Presentation
July	• Infrastructure: Staff review of AIRRO and JPM Maritime
August	• Staff review of Private Equity and Debt
September	• Staff review of Public Equity managers
October	• Staff review of Fixed Income managers

*Presentation schedule is subject to change.

DISCUSSION SHEET

ITEM #C2

Topic: **Asset Allocation**

Attendees: Leandro Festino, Managing Principal - Meketa Investment Group
Aaron Lally, Executive Vice President - Meketa Investment Group

Discussion: Meketa and DPFP investment staff will provide an Emerging Markets equity educational presentation, discuss asset allocation feedback from the May 2021 Board meeting, present updated asset allocation mixes for consideration, and review implementation considerations.

Staff Recommendation: **Approve** the long-term asset allocation and **direct** staff to bring amendments to the Investment Policy Statement reflecting the updated asset allocation back to the Board for its review and approval.

DALLAS POLICE & FIRE PENSION SYSTEM

Long-Term Asset Allocation & Implementation

June 10, 2021

Asset Allocation May Board Feedback

- Staff and Meketa discussed Asset Allocation considerations, recommended a new long-term Asset Allocation mix and implementation at the May 14th Board meeting.
- The Board found the proposed reduction to the Safety Reserve acceptable. Before considering a long-term Asset Allocation Mix for approval, the Board requested education on Emerging Markets ("EM") Equity and to review additional mixes with closer to a market weight in EM Equity at the June Board meeting.
- Meketa will provide an EM Education presentation, then discuss additional long-term asset allocation mixes for consideration.
- Following the Meketa presentations, Staff will review Asset Allocation implementation considerations with the Board.

2021 Asset Allocation Study Timeline

February

Staff and Meketa start Asset Allocation (AA) discussions based on Meketa 2021Return Study

March

Meketa presents Preliminary AA Review at DPFP Board Meeting

April

AA discussion with IAC. Feedback on 4 possible mixes

May

Recommendation of new AA to DPFP Board for approval

June

EM Education, review additional AA mixes for approval, discus AA implementation

July

Updated Investment Policy Statement (IPS) to incorporate new AA targets and implementation.

Emerging Markets Equity Education

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Dallas Police and Fire Pension System

Emerging Markets Equity Education

Long-Term Case for Emerging Markets

- Growth (GDP)
- Growth (middle class)
- Technological advancement (faster and starting from lower base)
- Productivity rates
- Better demographics (younger)
- Lower equity valuations

Risks and Considerations

- Sector and Country Concentration
- Volatility
- Cyclicality
- Currency Effect
- Event and Political Risks
- Impact from Covid – 19
- Likely greater climate change impact

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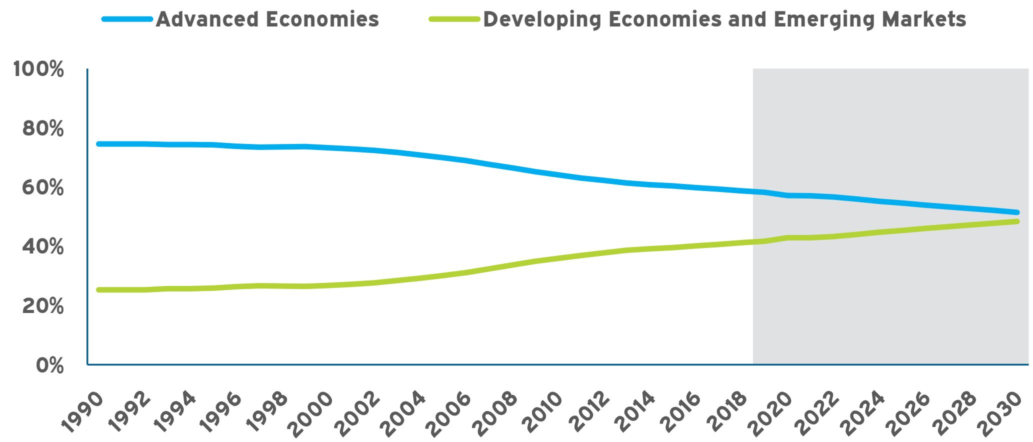
Emerging Markets Equity Education

The Case for Growth

- Emerging markets continue to grow faster than the rest of the world.
  - The pace may be slowing down, but relative growth is the story.

Share of Real World GDP[1]



- There is still room to benefit from urbanization, growth of the middle class, technological leaps, etc.
  - Many economists believe that these factors generally lead to greater productivity, and hence economic growth.[2]

[1] Source: Oxford Economics as of May 2020. Projections start on 2019

[2] Chen, Zhang, Liu, & Zhang , "The Global Pattern of Urbanization and Economic Growth: Evidence from the Last Three Decades", August 2014. Brueckner, Markus; Dabla-Norris, Era; Gradstein, Mark; Lederman, Daniel. "The Rise of the Middle Class and Economic Growth in ASEAN". Policy Research Working Paper; No. 8068. World Bank 2017.

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Emerging Markets Equity Education

The Case for Growth: Better Outlook than Developed Markets

- Economists project higher growth for emerging markets.

Emerging Markets

Country	Projected Real GDP Growth[1]
Brazil	2.3%
China	5.2%
India	7.2%
South Korea	2.5%
Russia	2.0%
South Africa	2.4%
Average:	*3.6%*

Developed Markets

Country	Projected Real GDP Growth
Australia	3.2%
France	2.3%
Germany	1.5%
Japan	1.3%
United Kingdom	2.3%
United States	2.5%
Average:	*2.2%*

[1] Source Oxford Economics as of May 2020. Figures represent 10-year annualized averages from 2021 through 2030.

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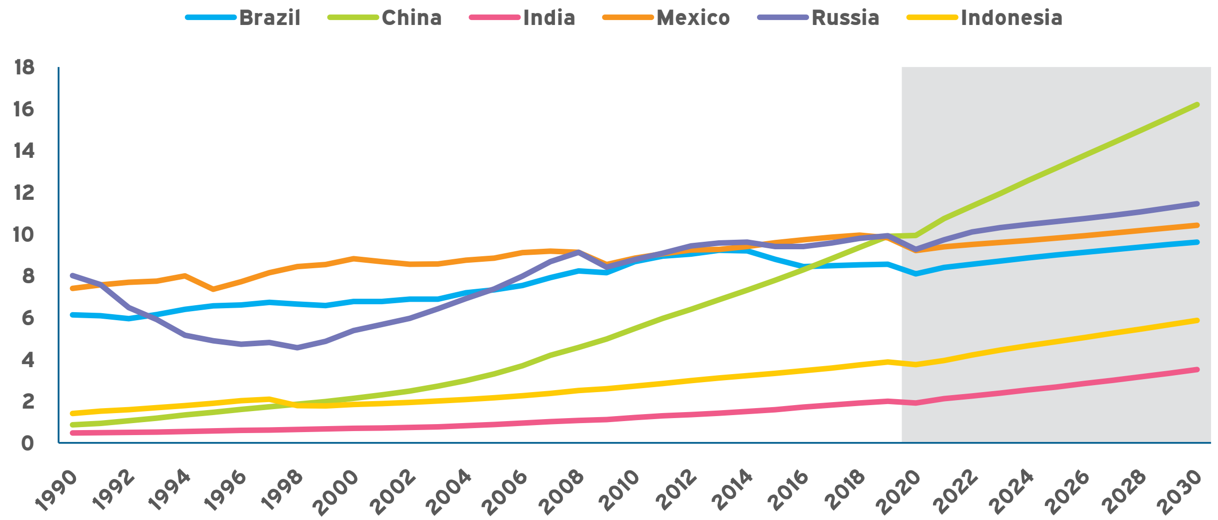
Emerging Markets Equity Education

Growth of the Middle Class

- As a country becomes richer, its people are able to spend on more than meeting the most basic needs.
  - Many emerging market countries have grown wealthier over the past two decades, but they have a long way to go before catching up with developed markets[1].

Real GDP per capita (current US$ Thousands)[2]



[1] For comparison, US Real GDP per Capita was $60,851 in 2019, according to Oxford Economics.

[2] Source: Oxford Economics as of May 2020. Projections start in 2020

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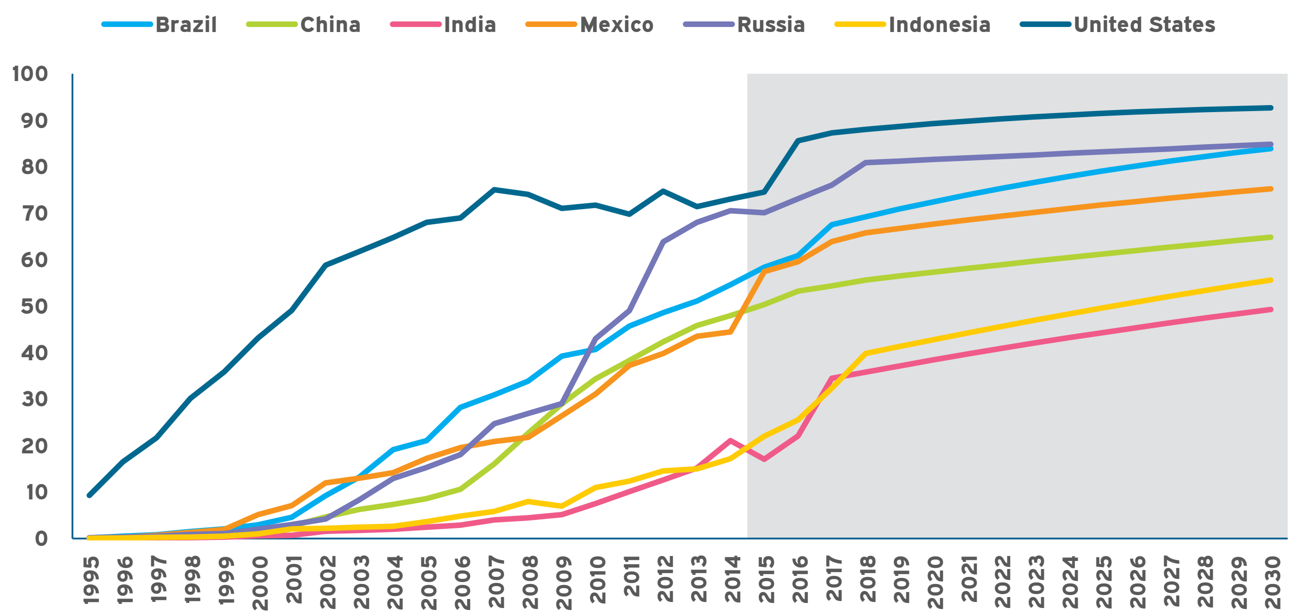
Emerging Markets Equity Education

Technological Advancement

- Data such as the percentage of the population who have internet access is one metric of technological progress (and potential) in a country.

Internet Users (per 100 people)[1]



[1] Source: Oxford Economics as of May, 2020. Projections start in 2015.

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Emerging Markets Equity Education

Productivity

- Productivity has been increasing at a faster rate in emerging economies.
  - "Productivity isn't everything, but in the long run it is almost everything."[1]

Emerging Markets

Country	Productivity Growth[2]
Brazil	2.6%
Indonesia	5.3%
India	5.7%
Mexico	2.3%
Russia	2.6%
South Africa	3.1%
Average:	*3.6%*

Developed Markets

Country	Productivity Growth
Australia	3.1%
France	1.2%
Germany	1.9%
Japan	1.2%
United Kingdom	1.5%
United States	1.9%
Average:	*1.8%*

[1] Krugman, Paul. "The Age of Diminishing Expectations", 1994.

[2] Source: FRED. Productivity is defined as Real GDP/ Average Annual Hours Worked for People in that country. Data is form 2005 through 2017, except for India, where data ended in 2015. Data was not available for China.

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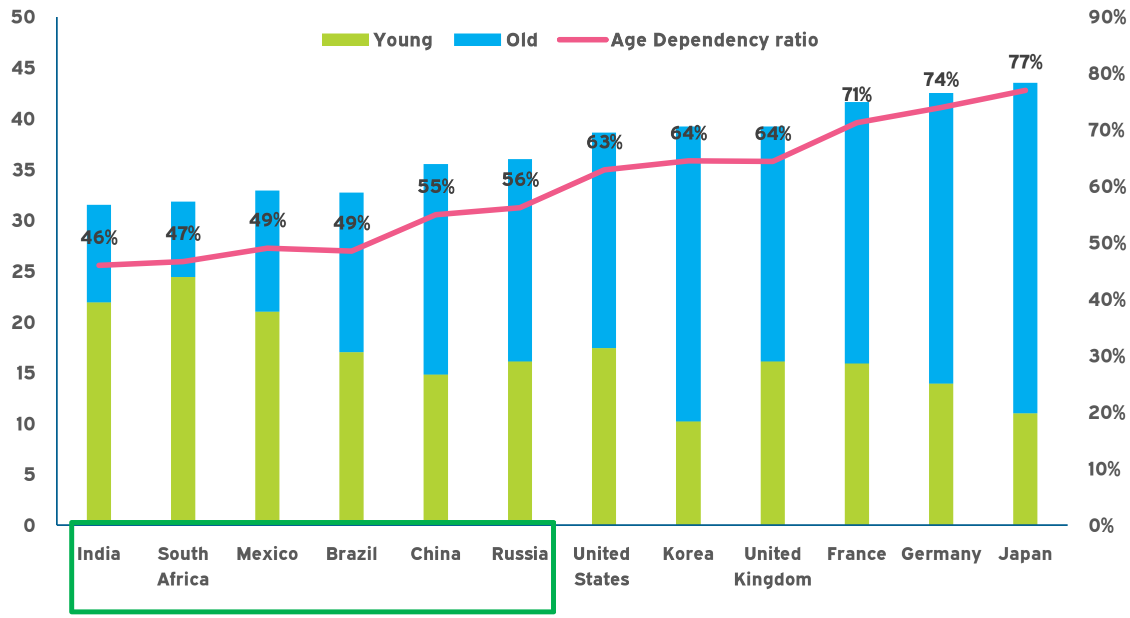
Dallas Police and Fire Pension System

Emerging Markets Equity Education

Better Demographics

- Demographics favor emerging economies.
  - A higher proportion of working age population has led to higher productivity growth historically.[1]
  - Hence, a lower proportion of those "dependent" on the working age population is better.

Age Dependency Ratio (%) in 2035[2]



[1] Source: Bloom, Canning and Sevilla, "Economic Growth and the Demographic Transition" (2001).

[2] Data Source; United Nation. Age Dependency Ratio is defined by the World Bank as the percentage of old (older than 64) and young (younger than 15) dependents to the working age population (ages 15 to 64).

MEKETA

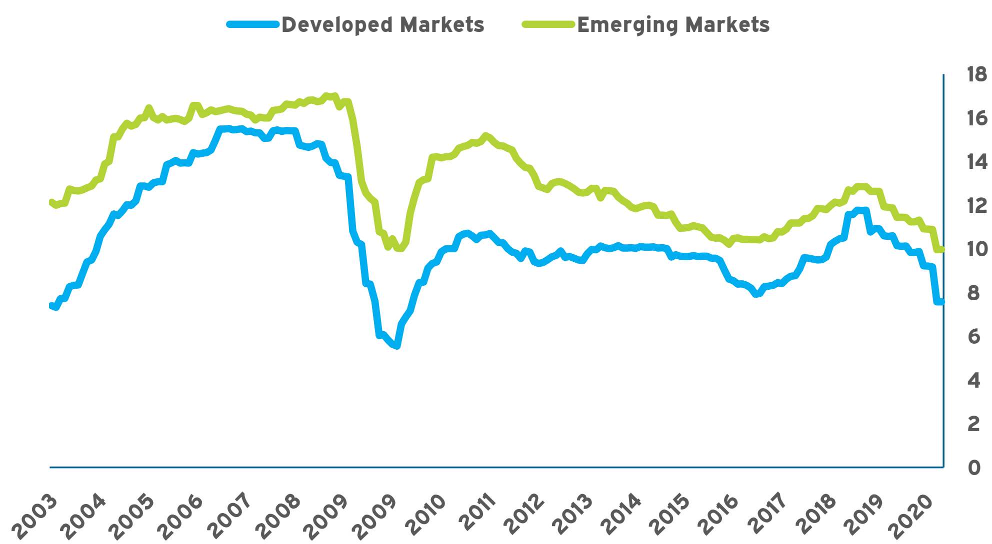
Dallas Police and Fire Pension System

Emerging Markets Equity Education

Does Higher Growth Lead to Higher Returns?

- Higher growth in emerging markets should lead to higher equity market returns.
  - A region's companies should grow at roughly the same rate as its economy, as defined by GDP.
- The development of financial and banking systems, along property rights, is likewise critical.
- Evidence suggests that economic growth has resulted in higher *Return on Equity* for emerging market stocks.

Return on Equity (%)[1]

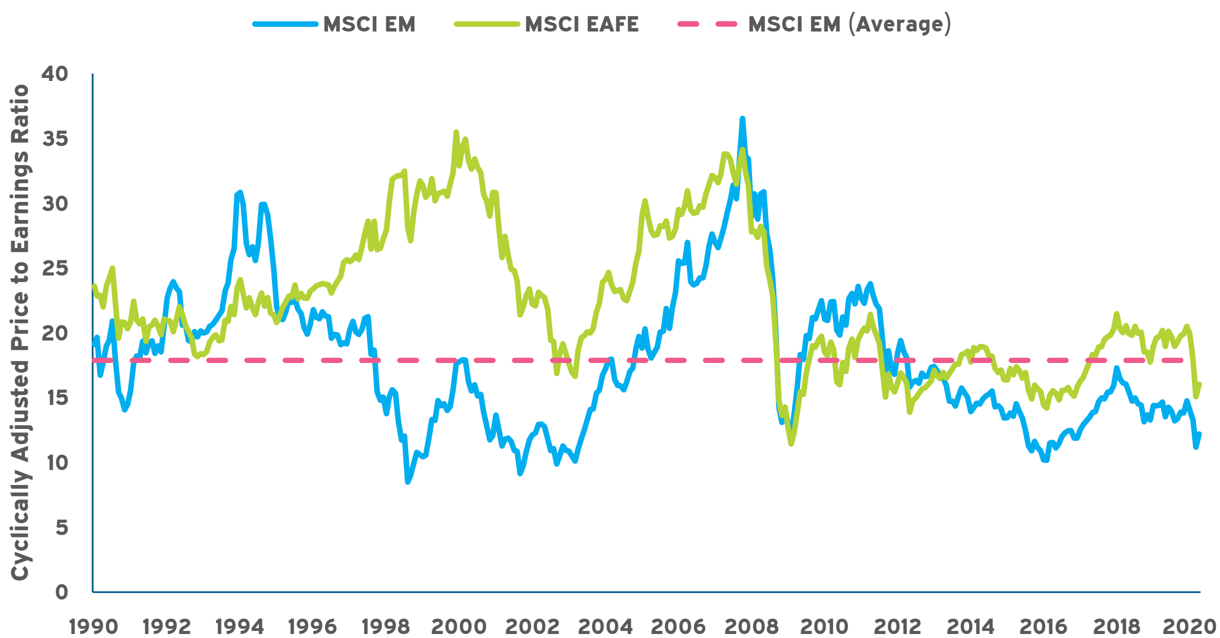


[1] Source: MSCI, Bloomberg.

EM Equity Valuations

- EM equity prices are still cheap relative to both their own history and also relative to international developed markets.

Cyclically Adjusted P/E[1]



[1] Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

MEKETA

Dallas Police and Fire Pension System

Emerging Markets Equity Education

Risks and Considerations

MEKETA

Dallas Police and Fire Pension System

Emerging Markets Equity Education

Emerging Market Equity Risks and Concerns

- The composition of the investable emerging market equity universe has changed significantly over the past ten years.
- Emerging market equities tend to be more volatile than developed markets.
- Like most capital markets, emerging markets tend to exhibit cyclicality as they move in and out of favor.
- EM equity returns have been recently lower in US dollar terms due to a currency headwind.
  - Currency movements can also amplify the level of volatility.
- Within emerging markets, there are unique political and event risks that can lead to higher volatility and potentially lower returns.
- The impact of Covid-19 is global and, as of yet, unknown.
  - The vaccine rollout has been more challenged in emerging market countries.
  - On the other hand, faced with uncertainty, the case for diversification remains.
- The impact of climate change will likely be felt over the next several years, and many emerging economies may be hit hardest, due to physical risks as well as fewer resources to combat it.

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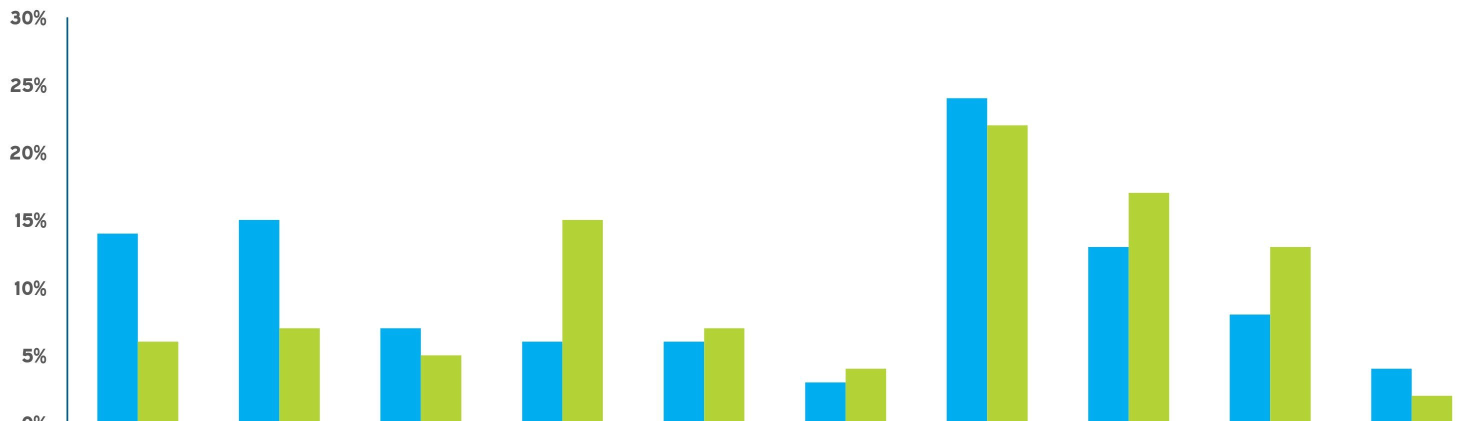
Emerging Markets Equity Education

Changes in Sector Allocations

- EM is not what it used to be.
- Commodities-driven sectors like Energy and Materials have declined over the past ten years, as other sectors such as Consumer Discretionary, and IT have grown.

MSCI Emerging Markets Index Sector Weights[1]



	Energy	Materials	Industrials	Consumer Discretionary	Consumer Staples	Health Care	Financials	Information Technology	Communicati on Services	Utilities
Mar-10	14%	15%	7%	6%	6%	3%	24%	13%	8%	4%
Mar-20	6%	7%	5%	15%	7%	4%	22%	17%	13%	2%

[1] Source: Bloomberg

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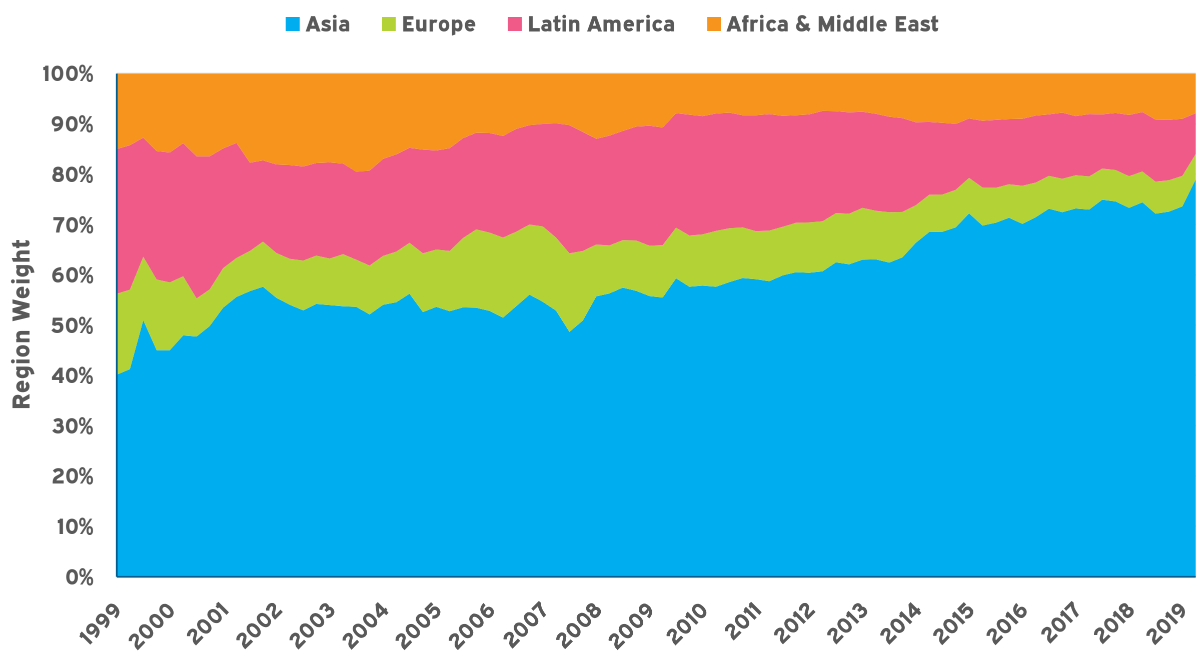
Changes in Geographic Allocations

- Asia clearly dominates the index, doubling its weight from ~40% to ~80% over the last twenty years.
- This is mostly driven by China, whose weight has grown from less than 1% in 1999, to ~40% in 2020.

MSCI Emerging Markets Index Region Weights[1]



[1] Source: Bloomberg.

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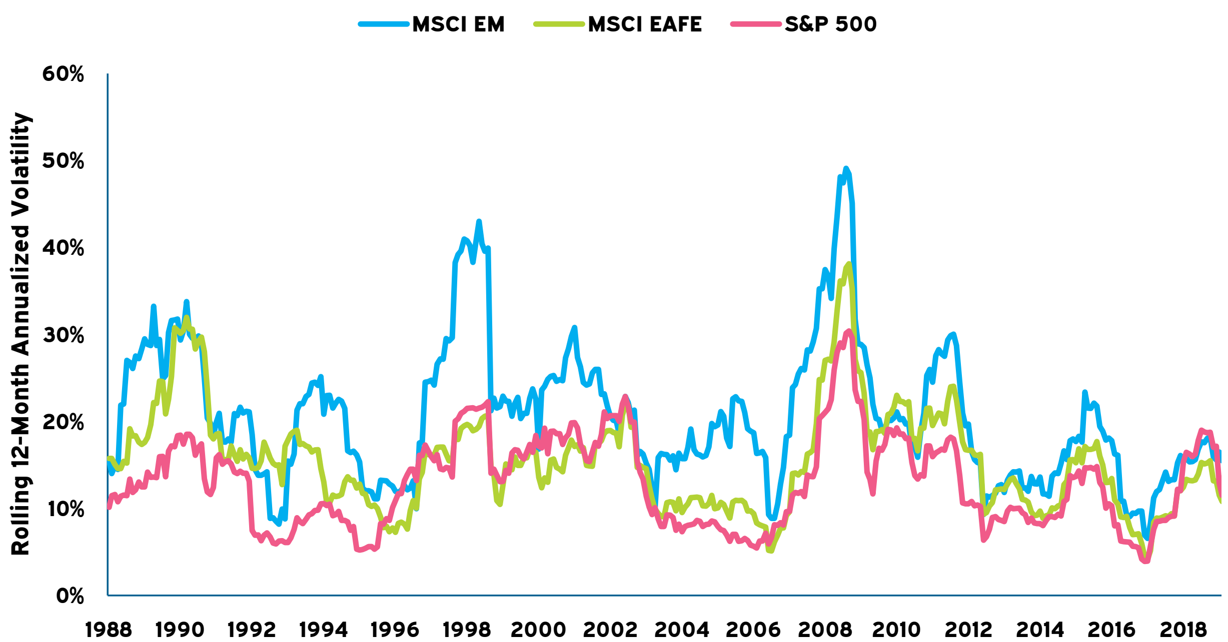
Volatility

- Emerging markets equities have historically been more volatile than US and International Developed Markets.

MSCI Emerging Markets Volatility[1]



[1] Source: Bloomberg.

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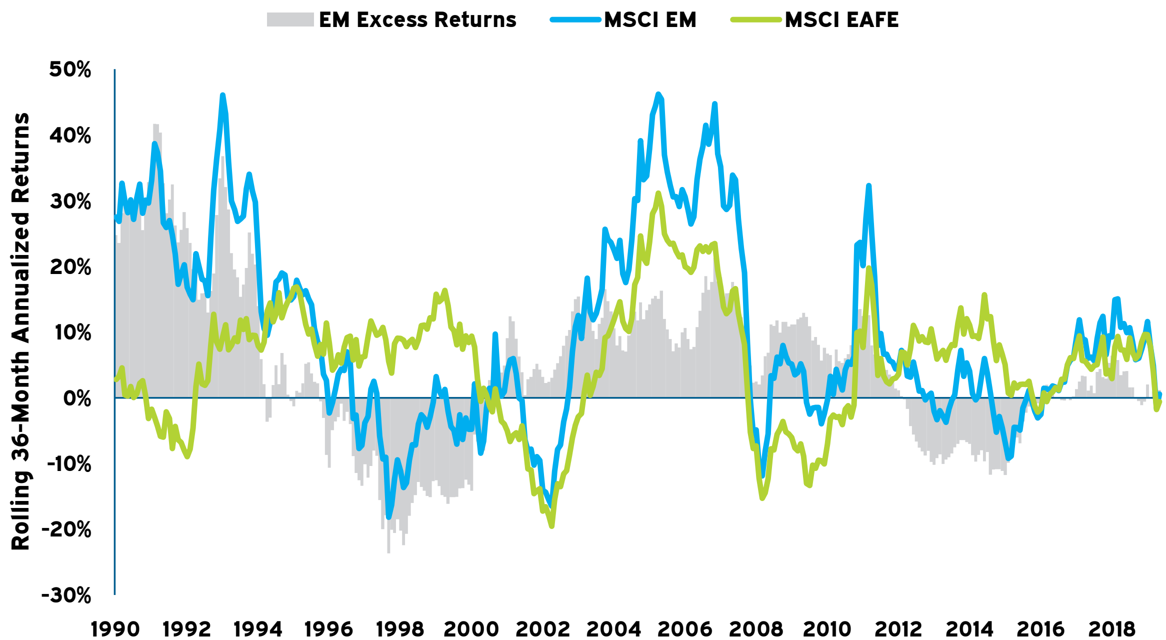
Cyclicality

- Emerging markets equities experience long periods of outperformance and underperformance relative to international developed markets.

Rolling 36-month Annualized Returns[1]



[1] Source: Bloomberg.

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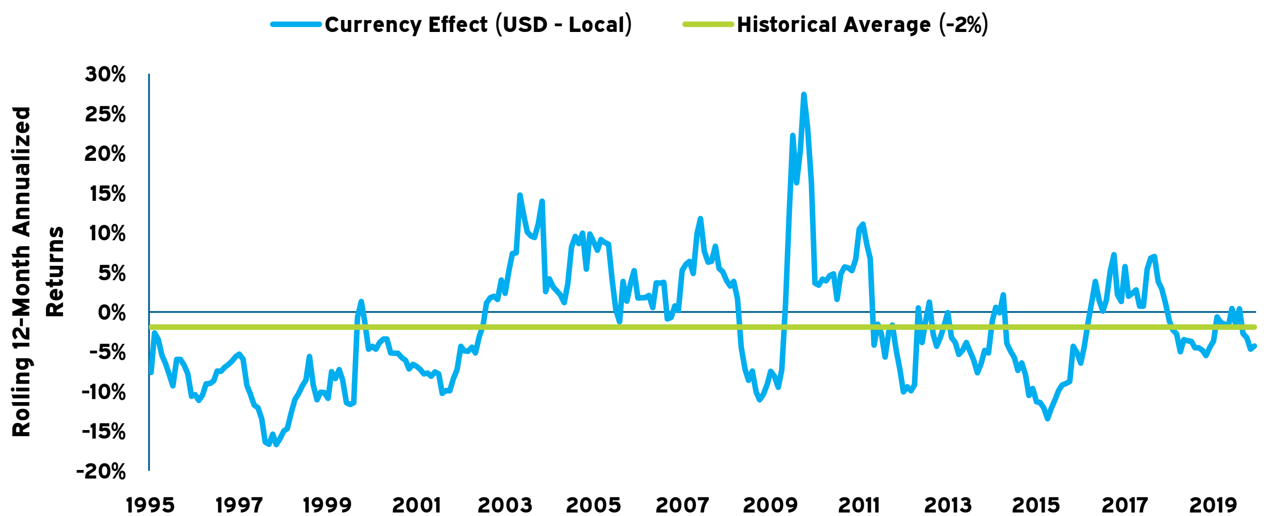
Currency Effect

- Investments in international markets expose US investors to currency risk, generated by the market fluctuations of the US Dollar relative to international currencies.
- The relative strength of the US Dollar over the last ~25 years has generated negative currency effects on average to US investors exposed to emerging market equities. EM currencies are undervalued today.
  - EM currencies have been considered too costly to hedge.

Currency Effect: MSCI EM USD – MSCI EM Local Currency Returns[1]



[1] Source: Bloomberg.

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Event and Political Risks

- Historically, emerging market countries have been at the center of several past financial crises, such as the Asian financial crisis and Russian default of the 1990s.
- Political risks are present whenever investing outside the US.
  - Civil insurrection and wars (cold or hot) can flare up and affect non-US investments.
  - In the extreme, different political system can result in events such as state seizure of assets.
  - Different business practices may lead to higher levels of corruption, graft, and theft/fraud.
- A current consideration is the ongoing disputes between the US and China.
- Regardless of the outcome of these disputes, this tension can lead to greater volatility in the short term and potentially harm long-term returns.
  - On the other hand, some of this may be priced in the markets already and progress toward a favorable resolution may produce a rally.

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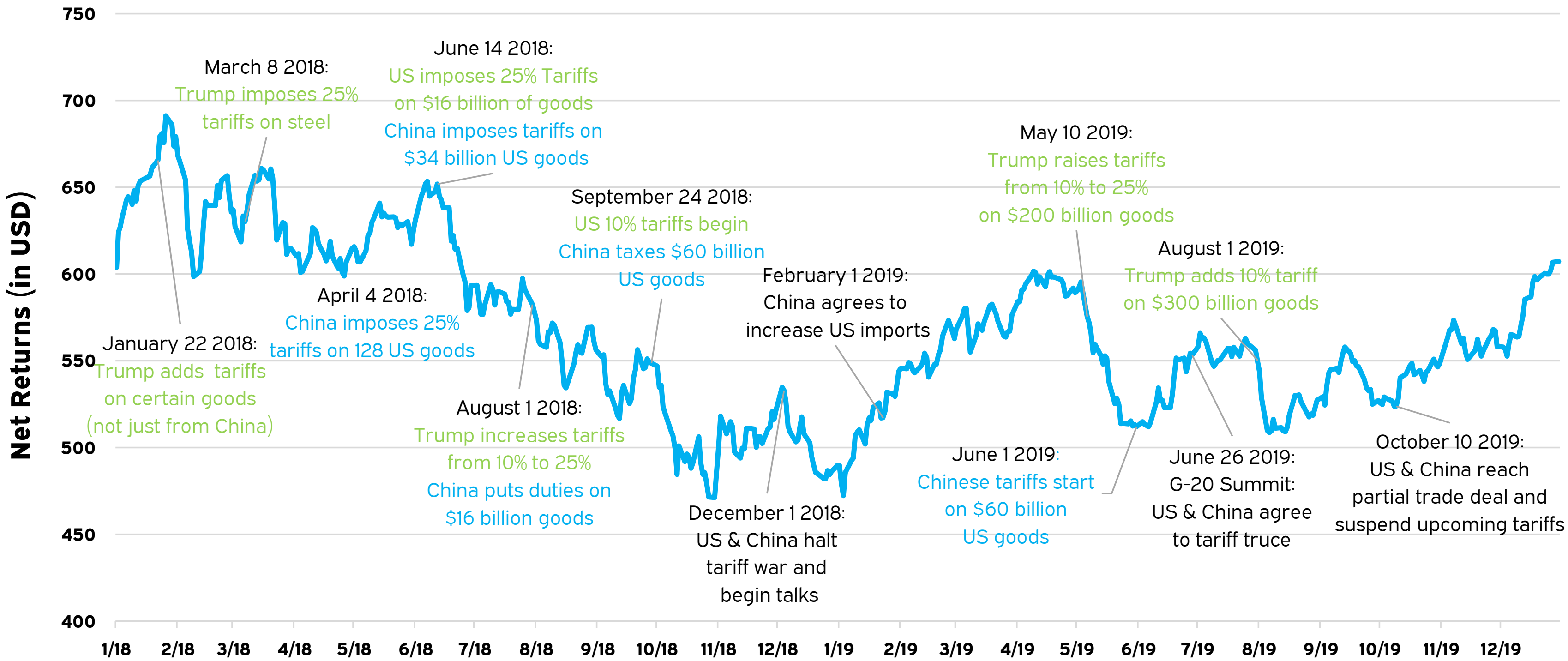
Political Risks

- Political events such as those surrounding a trade war between the US and China can have a major impact on emerging market equity returns.

Chinese Stock Market Performance for 2018-2019[1]



[1] Source: Bloomberg. Returns are for the MSCI China index.

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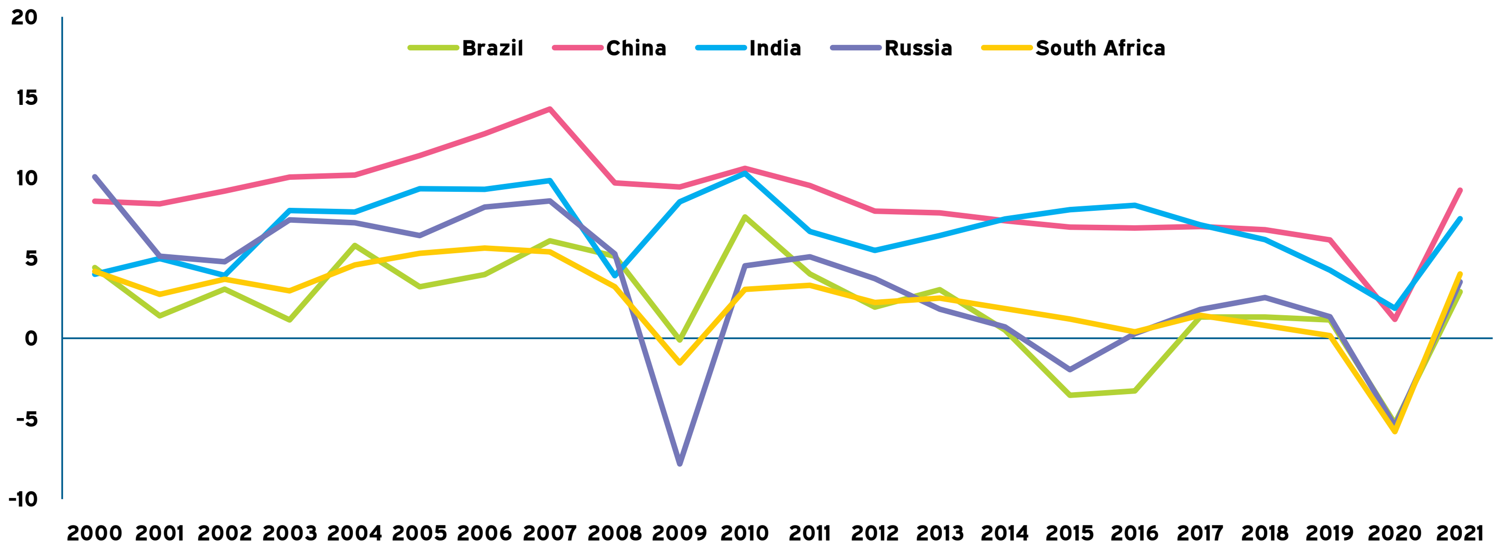
Emerging Markets Equity Education

Impact from Covid-19

- The true impact from Covid-19 is still unkown.
- Because of different starting positions, and the different paths they can pursue, we anticipate a wide range of outcomes among emerging market countries.

Historical and Projected GDP Growth[1]



[1] Source: Source: IMF, World Economic Outlook Database, April 2020. Data for 2020 and 2021 are estimates.

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Emerging Markets Equity Education

Summary

- The main driver for the thesis for emerging market equities is growth.
  - Emerging market economies are continuing to grow as a percentage of the world's population and economic output.
    - Even with recent cuts to global growth, emerging market economies are expected to grow faster than the developed world.
- The higher expected return for emerging markets allows funds to target higher returns without higher allocations to private equity.
- Emerging market equities are priced attractively relative to their own history and versus foreign developed equities.
  - Cyclically adjusted price-to-earnings ratios have been a good predictor of long-term returns, but they do not provide much insight into near-term returns.
- One major long-term concern is whether strong economic growth will translate into equally strong investment returns for public equity shareholders.
  - EM stocks may be "cheap" because the market is skeptical of this.

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Appendix – Return Expectations

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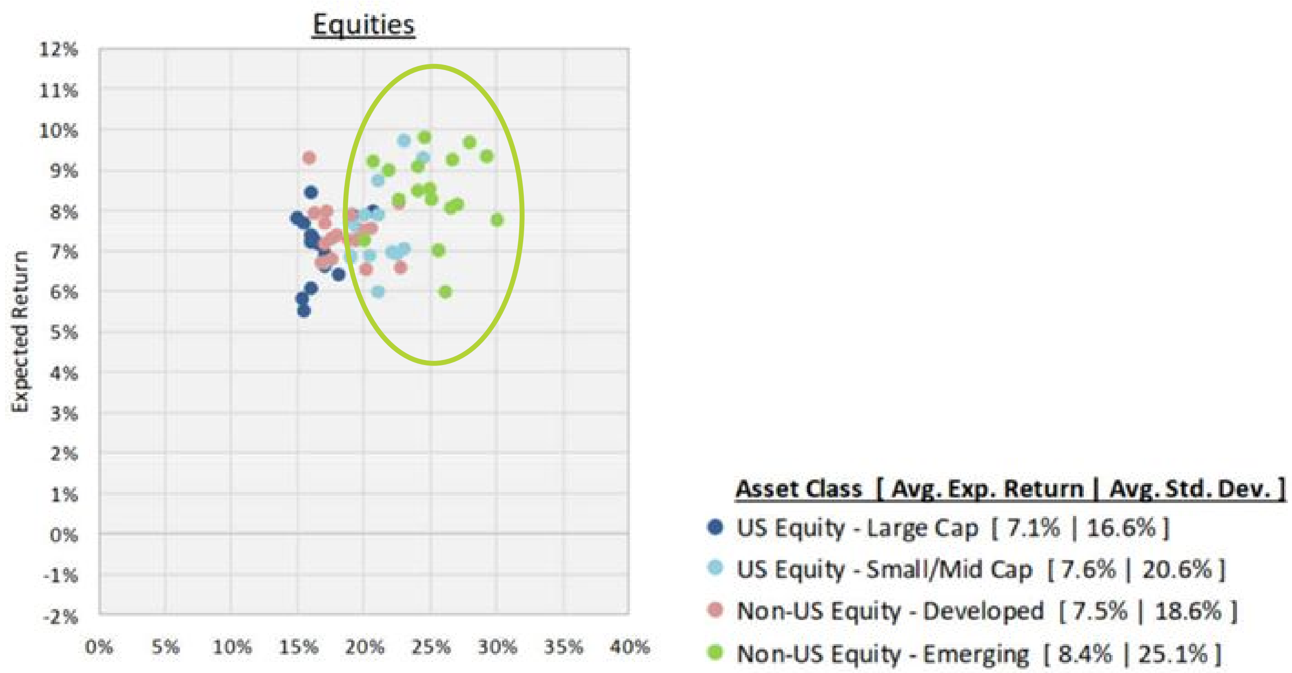
Industry-wide Return Expectations



- According to the most recent industry Survey of Capital Market Expectations (2020) by Horizon Actuarial Services, the majority of participants believe emerging market equities will have the highest twenty-year return, along with the highest expected standard deviation.

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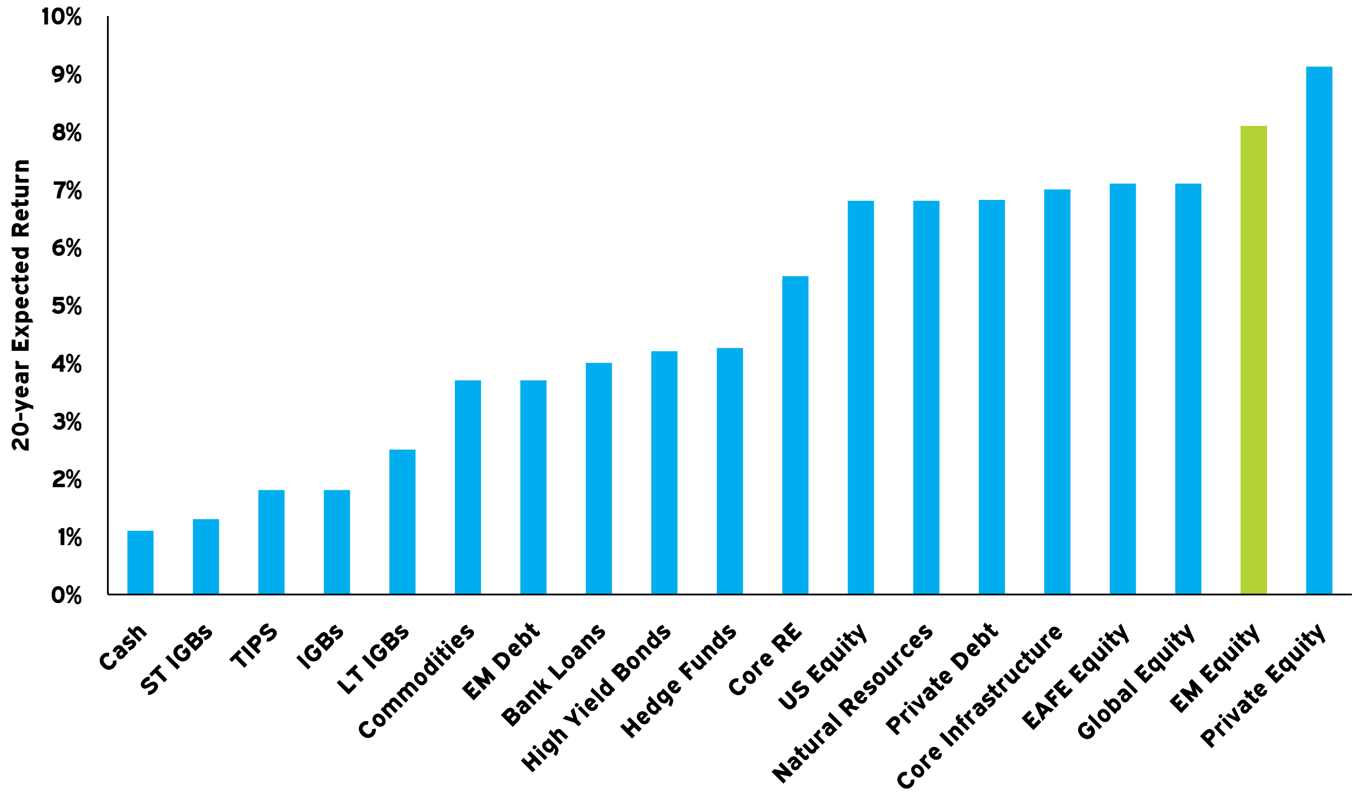
Meketa Return Expectations



- Meketa has a similar outlook on emerging market equities.

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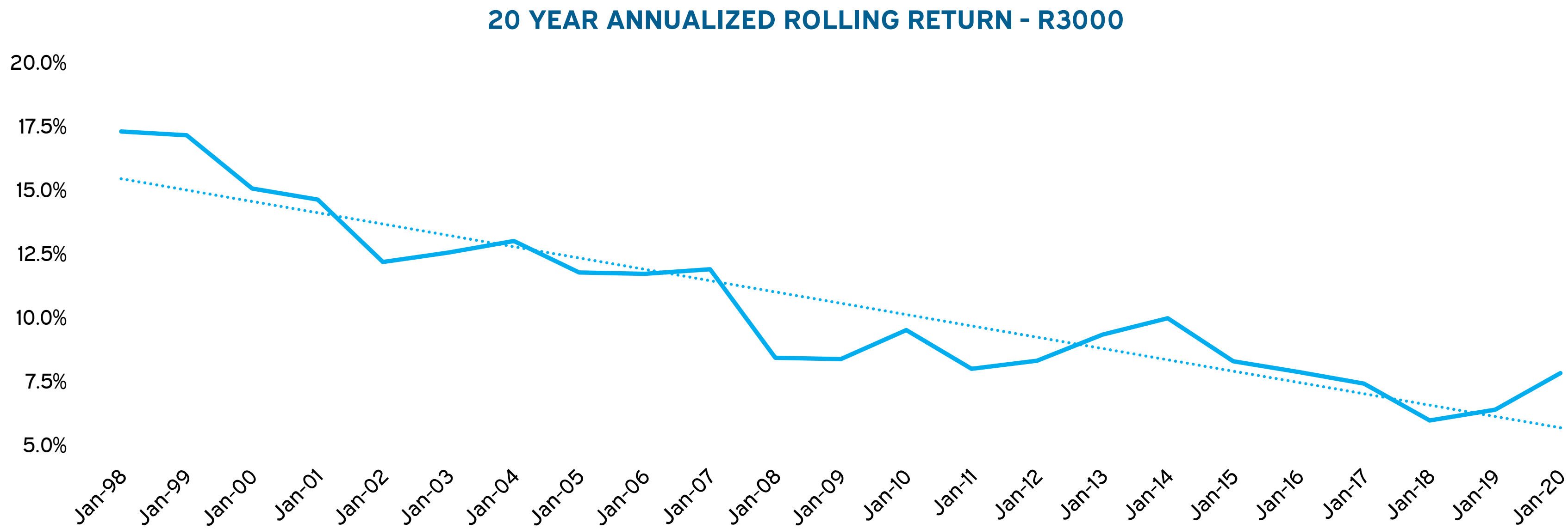
US Equity Annual Returns



- Long term 20-year returns for US equities have been declining over the past few decades.
- The last few 20-year rolling returns have hovered around 6% to 8% per year, on average.

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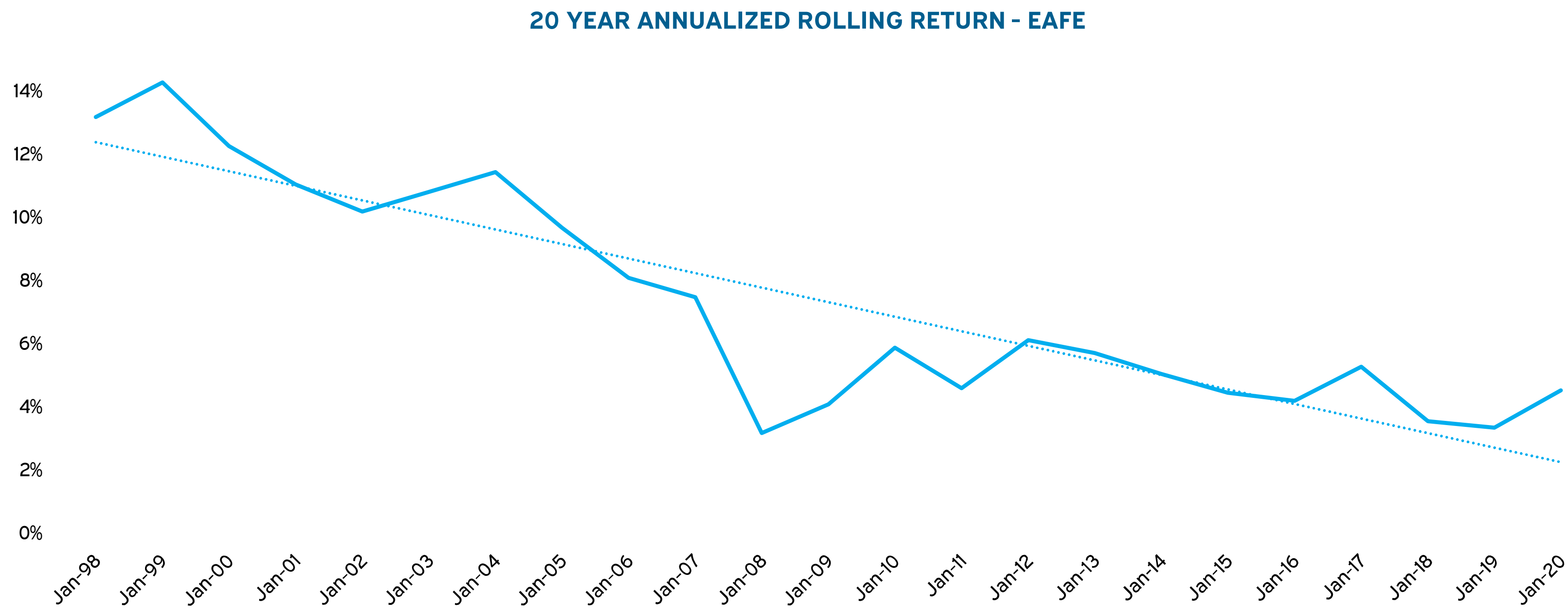
Int'l Developed Markets Annual Returns



- Overseas, developed market stocks have fared even worse, on US dollar terms, declining to annualized 20-year average returns between 3% to 5%.
- Returns have been also slightly more volatile than in the US.

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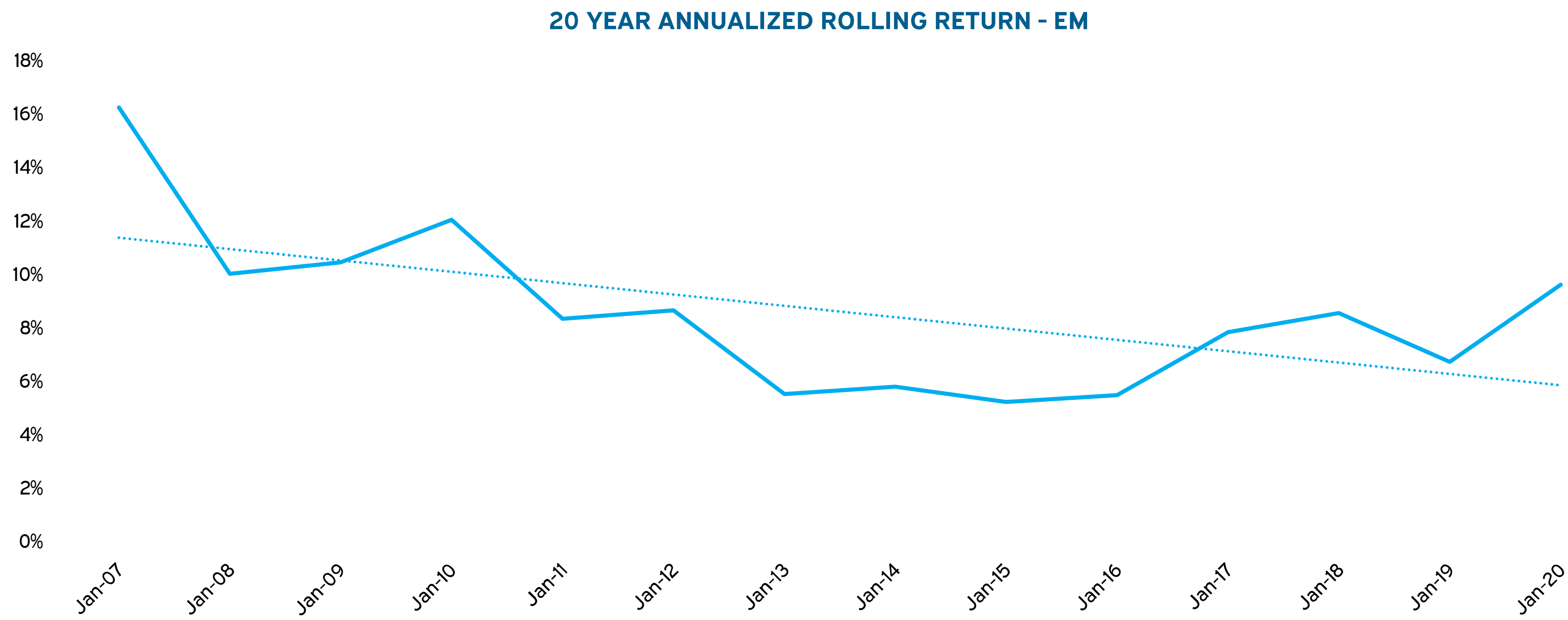
Emerging Markets Annual Returns



- Emerging market returns have also come down, on US dollar terms, but over the last few rolling periods have increased to annualized 20-year average returns between 7-10%.
- Returns have been much more volatile than in the US.

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Emerging Markets Equity Education

20-Year Annualized Rolling Returns[1]

Period Ending	US Equity (%)	Non US Developed (%)	Emerging Markets(%)
12/31/1998	17.3	13.2	
12/31/1999	17.1	14.3	
12/31/2000	15.1	12.2	
12/31/2001	14.6	11.0	
12/31/2002	12.2	10.2	
12/31/2003	12.5	10.8	
12/31/2004	13.0	11.4	
12/31/2005	11.8	9.7	
12/31/2006	11.7	8.1	
12/31/2007	11.9	7.4	16.2
12/31/2008	8.4	3.1	10.0
12/31/2009	8.4	4.1	10.4
12/31/2010	9.5	5.8	12.0
12/31/2011	8.0	4.6	8.3
12/31/2012	8.3	6.1	8.6
12/31/2013	9.3	5.7	5.5
12/31/2014	10.0	5.0	5.8
12/31/2015	8.3	4.4	5.2
12/31/2016	7.9	4.2	5.5
12/31/2017	7.4	5.2	7.8
12/31/2018	6.0	3.5	8.5
12/31/2019	6.4	3.3	6.7
12/31/2020	7.8	4.5	9.6

- Over all available rolling 20-year periods, domestic equities, as proxied by the Russell 3000 index, have beaten those of other developed economies, most notably Europe and Japan (the MSCI EAFE index).
- In all but four rolling 20-year periods, emerging market stocks have edged US equities.

[1] US Equity = S&P 500 Index, Non US Developed Market = MSCI EAFE Index, Emerging Market = MSCI Emerging Markets. MSCI Emerging Markets Index inception date is 1/1/1988.

20-Year Annualized Rolling Returns – Summary Stats[1]

Since 1/1/1979[2]

	US Equity	Non US Developed
Average	10.55	7.30
Median	9.50	5.85
Std. Dev.	17.45	18.72

- Historically, US stocks have outperformed other developed stocks, with slightly less volatility.

20-Year Annualized Rolling Returns – Summary Stats[1]

Since 1/1/1988[3]

	US Equity	Non US Developed	Emerging Markets
Average	8.39	4.79	8.59
Median	8.29	4.53	8.42
Std. Dev.	16.54	18.06	25.42

- Historically, emerging market stocks have performed similar to US stocks but with much more volatility.
- Both US and emerging market stocks have outperformed Non-US developed markets.

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[1] US Equity = S&P 500 Index, Non US Developed Market = MSCI EAFE Index, Emerging Market = MSCI Emerging Markets.

[2] Longest common period inception date is 1/1/1979..

[3] MSCI Emerging Markets Index inception date is 1/1/1988.

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Periodic Table of Investment Returns

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Trailing 20 Year	Meketa 20 Yr CME
Emerging Equity 25.6%	Emerging Equity 34.0%	Private Equity 33.8%	Emerging Equity 39.4%	Bonds 5.2%	Emerging Equity 78.5%	Private Equity 19.8%	Real Estate 14.3%	Emerging Equity 18.2%	US Equity 32.4%	US Equity 13.7%	Real Estate 13.3%	High Yield 17.1%	Emerging Equity 37.3%	Private Equity 11.3%	US Equity 31.5%	US Equity 18.4%	Private Equity 9.9%	Private Equity 9.1%
Private Equity 25.4%	Private Equity 22.2%	Emerging Equity 32.2%	Private Equity 23.4%	Cash 1.3%	High Yield 58.2%	Emerging Equity 18.9%	TIPS 13.6%	EAFE Equity 17.3%	EAFE Equity 22.8%	Private Equity 12.6%	Private Equity 9.8%	US Equity 12.0%	EAFE Equity 25.0%	Real Estate 6.7%	EAFE Equity 22.0%	Emerging Equity 18.3%	Emerging Equity 9.7%	Emerging Equity 8.1%
EAFE Equity 20.2%	Commodities 21.4%	EAFE Equity 26.3%	Commodities 16.2%	TIPS -2.4%	EAFE Equity 31.8%	Commodities 16.8%	Bonds 7.8%	EM Debt 17.2%	Private Equity 21.9%	Real Estate 11.8%	US Equity 1.4%	Commodities 11.8%	US Equity 21.8%	Cash 1.9%	Emerging Equity 18.4%	Private Equity 13.7%	Real Estate 8.4%	EAFE Equity 7.1%
EM Debt 17.2%	Real Estate 20.2%	Real Estate 16.8%	Real Estate 15.8%	Real Estate -6.5%	US Equity 26.5%	US Equity 15.1%	Private Equity 7.7%	US Equity 16.0%	Real Estate 11.0%	Bonds 6.0%	Bonds 0.5%	Emerging Equity 11.2%	Private Equity 20.6%	Bonds 0.0%	Private Equity 17.7%	Hedge Funds 11.7%	EM Debt 8.1%	Real Estate 6.9%
Real Estate 14.7%	EAFE Equity 13.5%	US Equity 15.8%	EM Debt 12.0%	EM Debt -8.6%	EM Debt 26.0%	High Yield 15.1%	High Yield 5.0%	High Yield 15.8%	Hedge Funds 9.1%	TIPS 3.6%	Cash 0.0%	EM Debt 10.2%	EM Debt 12.7%	TIPS -1.3%	High Yield 14.3%	TIPS 11.0%	High Yield 7.9%	US Equity 6.8%
High Yield 11.1%	Hedge Funds 9.3%	Hedge Funds 12.9%	TIPS 11.6%	Hedge Funds -19.0%	Hedge Funds 20.0%	EM Debt 13.8%	EM Debt 2.8%	Private Equity 13.2%	High Yield 7.4%	Hedge Funds 3.0%	EAFE Equity -0.8%	Private Equity 9.0%	Hedge Funds 8.6%	High Yield -2.1%	EM Debt 14.0%	EAFE Equity 7.8%	US Equity 7.5%	Hedge Funds 4.3%
US Equity 10.9%	EM Debt 8.3%	EM Debt 12.6%	EAFE Equity 11.2%	High Yield -26.2%	Commodities 18.9%	Real Estate 13.1%	US Equity 2.1%	Real Estate 10.7%	Cash 0.0%	High Yield 2.5%	Hedge Funds -1.1%	Real Estate 8.0%	High Yield 7.5%	US Equity -4.4%	Hedge Funds 10.4%	Bonds 7.5%	Hedge Funds 5.6%	High Yield 4.2%
Commodities 9.1%	US Equity 4.9%	High Yield 11.8%	Hedge Funds 10.0%	Private Equity -27.1%	Private Equity 14.7%	Hedge Funds 10.2%	Cash 0.0%	TIPS 7.0%	Bonds -2.0%	EM Debt 0.7%	TIPS -1.4%	Hedge Funds 5.4%	Real Estate 7.0%	Hedge Funds -4.5%	Bonds 8.7%	High Yield 7.1%	TIPS 5.4%	EM Debt 3.8%
Hedge Funds 9.0%	Cash 3.2%	Cash 5.0%	Bonds 7.0%	Commodities -35.6%	TIPS 11.4%	EAFE Equity 7.8%	Hedge Funds -5.3%	Hedge Funds 6.4%	Emerging Equity -2.6%	Cash 0.0%	High Yield -4.5%	TIPS 4.7%	Bonds 3.5%	EM Debt -5.2%	TIPS 8.4%	EM Debt 4.0%	Bonds 4.9%	Commodities 3.7%
TIPS 8.5%	TIPS 2.8%	Bonds 4.3%	US Equity 5.5%	US Equity -37.0%	Bonds 5.9%	Bonds 6.5%	EAFE Equity -12.1%	Bonds 4.2%	EM Debt -7.1%	Emerging Equity -2.2%	EM Debt -7.1%	Bonds 2.6%	TIPS 3.0%	Commodities -11.2%	Commodities 7.7%	Real Estate 1.6%	EAFE Equity 4.7%	Bonds 1.8%
Bonds 4.3%	High Yield 2.7%	Commodities 2.1%	Cash 4.4%	EAFE Equity -43.4%	Cash 0.1%	TIPS 6.3%	Commodities -13.3%	Cash 0.1%	TIPS -8.6%	EAFE Equity -4.9%	Emerging Equity -14.9%	EAFE Equity 1.0%	Commodities 1.7%	EAFE Equity -13.8%	Real Estate 6.4%	Cash 0.5%	Cash 1.4%	TIPS 1.8%
Cash 1.4%	Bonds 2.4%	TIPS 0.4%	High Yield 1.9%	Emerging Equity -53.3%	Real Estate -17.0%	Cash 0.1%	Emerging Equity -18.4%	Commodities -1.1%	Commodities -9.5%	Commodities -17.0%	Commodities -24.7%	Cash 0.3%	Cash 0.9%	Emerging Equity -14.6%	Cash 2.1%	Commodities -3.1%	Commodities -0.4%	Cash 1.1%

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Dallas Police and Fire Pension System

June 2021

2021 Asset Allocation Additional Analysis

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Dallas Police and Fire Pension System

2021 Asset Allocation – Additional Analysis

History

- Meketa, Staff and the Investment Advisory Committee analyzed DPFP's expected future net cash flow requirements, the size of the Safety Reserve®, capital market expectations, liquidity, and other DPFP-specific constraints.
- Robust discussion occurred at the April 2021 special Investment Advisory Committee among Meketa, Staff, and IAC members.
- After much discussion, the IAC favored the asset mix with the largest reduction in the Safety Reserve® and the largest increase in target to public global equity.
- In May 2021, Meketa presented to the Board a comprehensive asset allocation and liability review.
- The Board requested additional analysis on emerging market equities and inclusion of additional asset mix(es) with "market weight" to emerging market equities (vs. the then proposed overweight).

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2021 Asset Allocation – Additional Analysis

Possible New Target Asset Allocation Policies

	Adjusted NAV 5/31 DPFP Exposure (%)	Existing Target (%)	"Mix B" from May (%)	Mix C (%)	Mix D (%)
Global Equity	37	40	50	53	55
Emerging Market Equity	3	10	10	7	5
Private Equity	7	5	5	5	5
Cash	4	3	3	3	3
Short Term Investment Grade Bonds	11	12	6	6	6
Investment Grade Bonds	4	4	4	4	4
Bank Loans	4	4	4	4	4
High Yield	4	4	4	4	4
Global Bonds	0	4	0	0	0
Emerging Markets Debt	2	4	4	4	4
Private Debt	<1	0	0	0	0
Real Estate	15	5	5	5	5
DPFP Agriculture[1]	6	5	5	5	5
Infrastructure	2	0	0	0	0
Total Exposure	100	100	100	100	100

[1] Custom DPFP Agriculture input has expected return of 10% and expected standard deviation of 18.2%. Expected return assumption provided by Staff (based on 30-year history with the strategy). Standard deviation of custom DPFP Agriculture based on Meketa's assumed standard deviation of Farmland, but scaled up by the ratio of 1.5 to account for the same degree of increase on the return assumption relative to Meketa's Farmland return assumption. Correlation of Farmland used.

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2021 Asset Allocation – Additional Analysis

Possible New Target Asset Allocation Policies (continued)

	Adjusted NAV 5/31 DPFP Exposure[1] (%)	Existing Target (%)	"Mix B" from May (%)	Mix C (%)	Mix D (%)
Global Equity	37	40	50	53	55
Emerging Market Equity	3	10	10	7	5
Rest of the Portfolio	60	50	40	40	40

20 Year Expected Return	-	6.45%	6.98%	6.93%	6.89%
10 Year Expected Return	-	5.79%	6.25%	6.19%	6.14%
Expected Standard Deviation	-	12.62%	14.23%	14.10%	14.02%
Sharpe Ratio (20 YR)	-	0.42	0.41	0.41	0.41
Size of Safety Reserve	15%	15%	9%	9%	9%

[1] Expected return projections not run for current exposure because of the uncertainty of outcomes of the legacy assets

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2021 Asset Allocation – Additional Analysis

Regional Look Through at Full Allocation

	MSCI ACWI IMI (%)	"Mix B" from May (%)	Mix C (%)	Mix D (%)
US and International Developed Equity	88	81	85	87
EM Equity	12	19	15	13

- Assumed Structure:
  - 7% weight to each global equity manager.
  - 4% weight to each small cap manager.
  - Remainder allocated to Northern Trust ACWI IMI Index and RBC as follows:
    - In Mix B: 10% weight to RBC, 14% weight to NT ACWI IMI Index.
    - In Mix C: 7% weight to RBC, 17% weight to NT ACWI IMI Index.
    - In Mix D: 5% weight to RBC, 19% weight to NT ACWI IMI Index.
- Variables/Assumptions:
  - Regional allocations are based on current exposure and may not hold into the future.
  - US small cap manager assumed to be 100% US.
  - International developed small cap equity manager assumed to be 100% non-US developed.
- Caveats:
  - Emerging markets targets above 5% may warrant hiring a complementary strategy to RBC.

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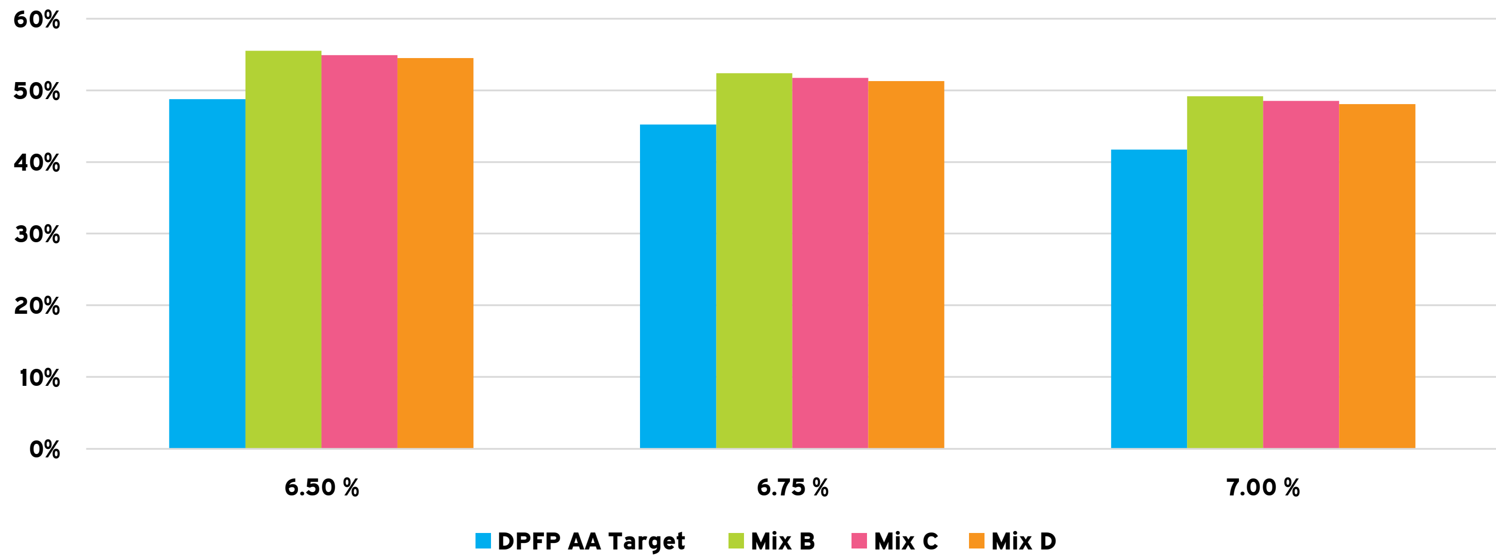
2021 Asset Allocation – Additional Analysis

20 Year Return Probability Matrix– w/ 20-year capital market assumptions



	DPFP AA Target (%)	Mix B (%)	Mix C (%)	Mix D (%)
6.5% or greater	48.8	55.5	54.9	54.5
6.75% or greater	45.2	52.4	51.7	51.3
7.0% or greater	41.7	49.2	48.5	48.1

- There is slightly less than 50% probability of earning 7.0% over twenty years with Mixes B, C and D.

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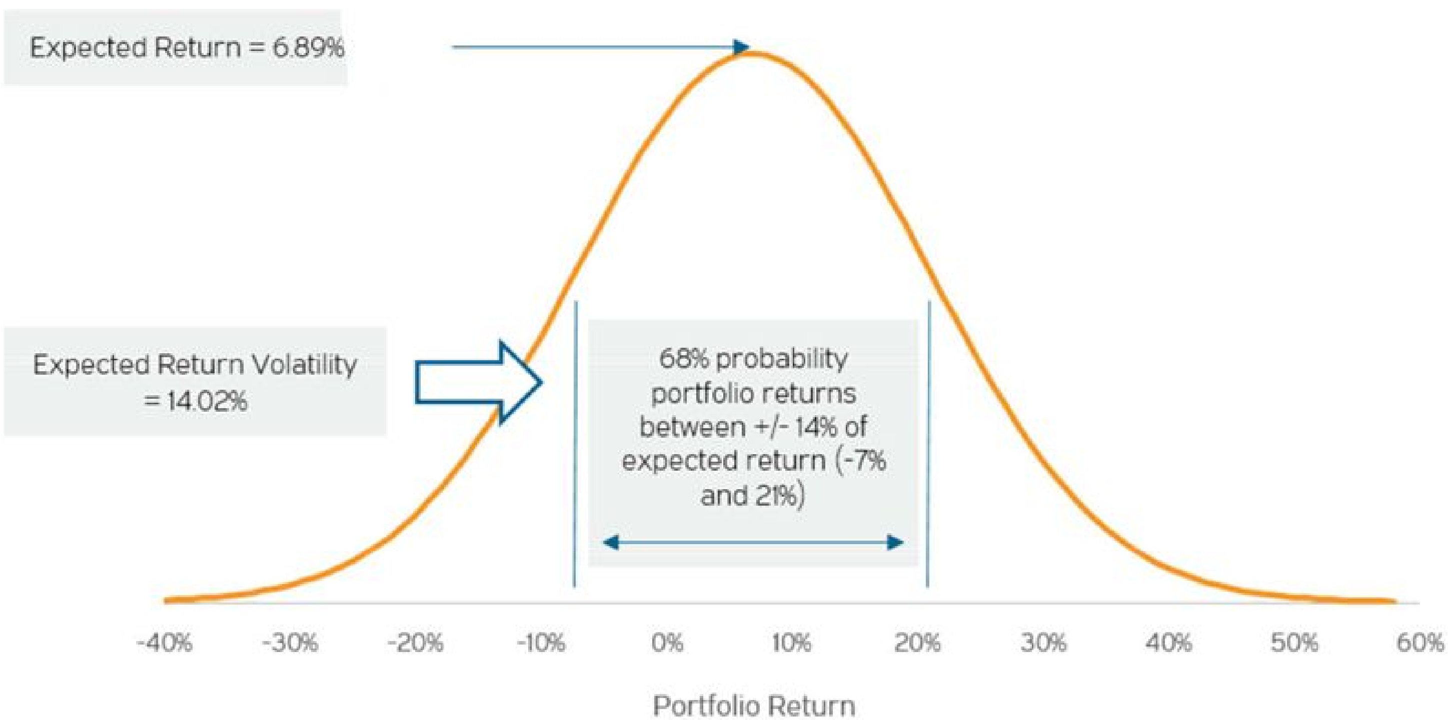
2021 Asset Allocation – Additional Analysis

Return Probability – Normal Distribution



- There is a 68% probability[1] returns will fall within one standard deviation of the expected return, each year.
- This analysis is based on Mix D. We evaluated the other mixes but the results are not materially different.

[1] Assuming normal distribution of returns.

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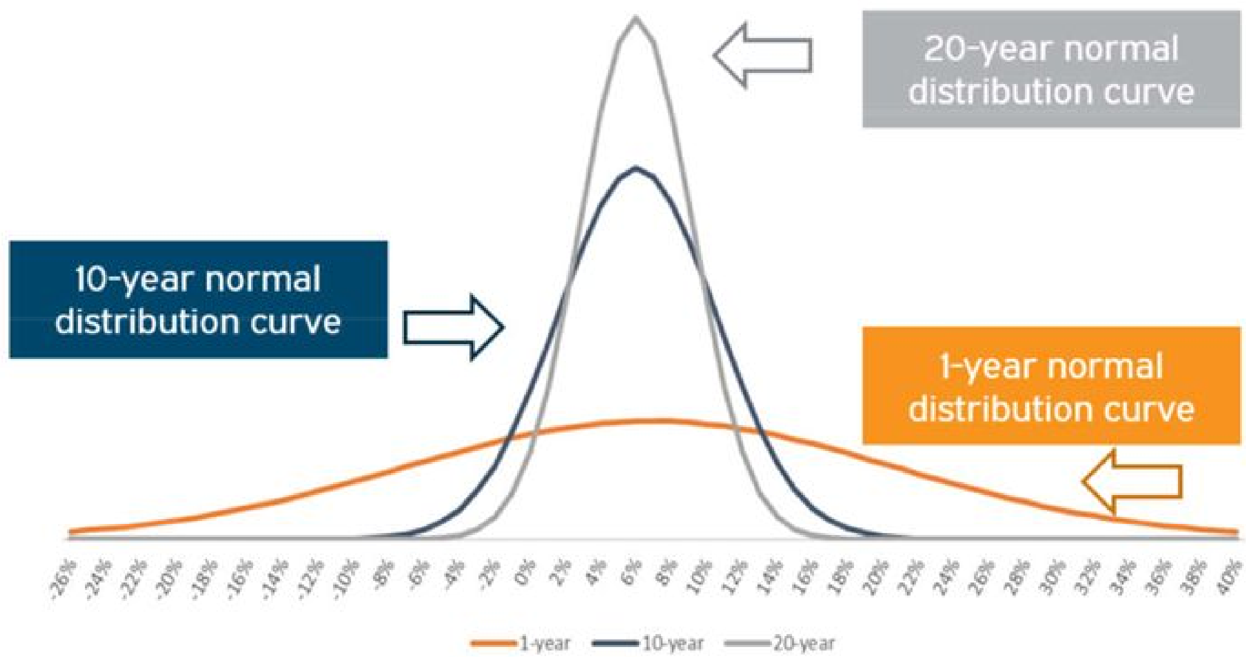
2021 Asset Allocation – Additional Analysis

10 and 20 Year Return Probability – Normal Distribution



- Over the ten and twenty year periods, the range of outcomes moves closer to the expected return (based on the assumption of normal distribution of returns).

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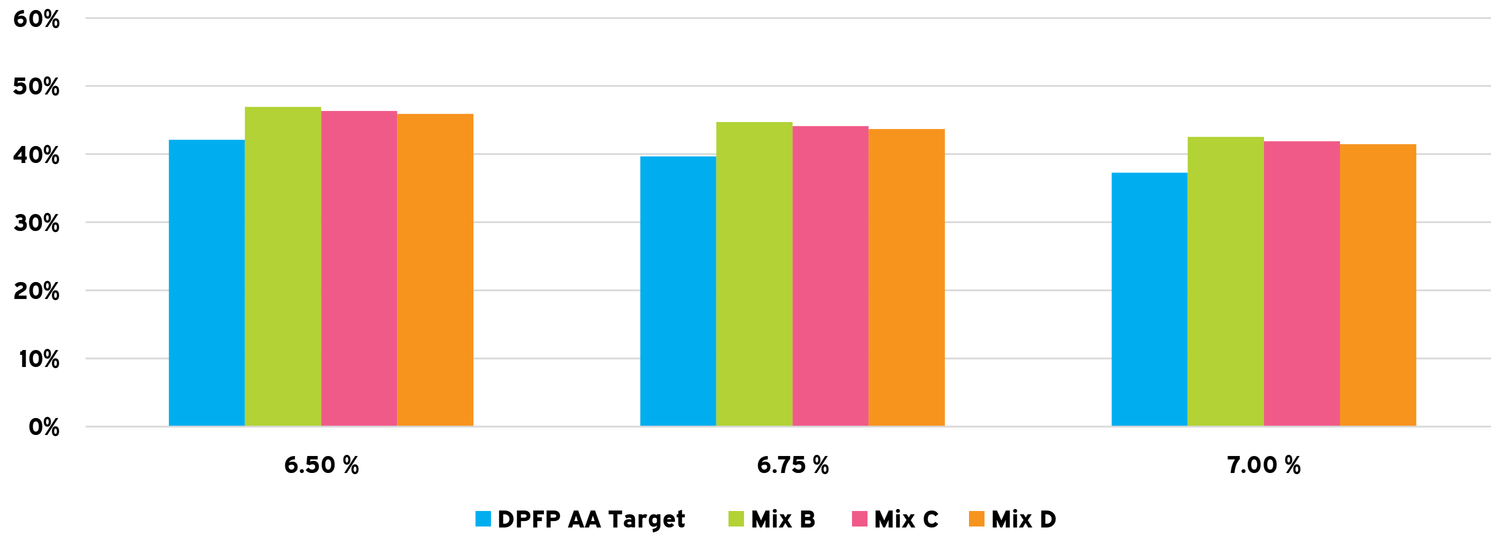
2021 Asset Allocation – Additional Analysis

10 Year Return Probability Matrix– w/ 10-year capital market assumptions



	DPFP AA Target (%)	Mix B (%)	Mix C (%)	Mix D (%)
6.5% or greater	42.1	47.0	46.3	45.9
6.75% or greater	39.7	44.7	44.1	43.7
7.0% or greater	37.3	42.5	41.9	41.5

- The probability of achieving 7.0% over the next ten years (using the ten-year assumptions) is well below 50% for all the mixes.

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2021 Asset Allocation – Additional Analysis

Summary

- Meketa and Staff consider each proposed allocation option as additive vs. the current Target Policy Allocation for meeting DPFP's investment objectives as defined in the IPS.
- The different weights to emerging market equities in the proposed mixes have a minor impact on expected long-term returns.
- Adjusted for risk, all three proposed mixes appear to be equivalent (similar Sharpe ratio).
- There are attractive and less attractive aspects to each allocation option.
- Meketa will be pleased to elaborate on these observations at the upcoming Board meeting.

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2021 Asset Allocation – Additional Analysis

Appendix – Probability Matrix

Probability of Exceeding Given Return over a 20 Year Period

Return (%)	Probability Based on Current Target Asset Mix (%)	Probability Based on Mix B (%)	Probability Based on Mix C (%)	Probability Based on Mix D (%)
4.00	81	83	83	82
4.50	76	78	78	78
5.00	69	73	73	73
5.50	63	68	67	67
6.00	56	62	61	61
6.50	49	56	55	54
6.75	45	52	52	51
7.00	42	49	49	48

- Probabilities assume no additional return is generated from manager “alpha,” or tactical overweight/underweighting of select target asset classes over twenty-year period.

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Disclaimer

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.

Asset Allocation Implementation

Implementation – Pace of Safety Reserve Reduction

How quickly should we move to implement 6% reduction in Safety Reserve target?

Quarterly cash outflows expected to be ~1.5%. It would take about a year to reduce Safety Reserve by 6% to new target by simply funding cash outflows from this portfolio.

- **Staff recommends implementing the Safety Reserve reduction by end of 2021**. This is a reasonable amount of time to transition out of Safety Reserve through a combination of natural depletion from net benefit outflows and liquid asset reinvestment.
- Target 3% reduction to 12% level by end of Q3 and additional 3% reduction to 9% by end of year.
- Safety Reserve would be reduced from current level to new 9% target by
  - Benefit outflows thru year-end **AND** phased approach to reallocate ~$53M from Safety Reserve into other liquid asset classes over the course of 2021.

Implementation – Reallocation Plan

How to Reallocate Safety Reserve and Private Market Distributions into Liquid Asset Classes:

- Fund roughly equal amounts in Global Equity, EM Equity and EM Debt until:
  - EM Equity reaches 5% (Possible Asset Allocation target to EM Equity, Proposed cap to RBC), and
  - EM Debt reaches 4% target, then
  - Any excess flows into Global Equity.

Safety Reserve Reduction / Reallocation thru Year End

Asset Allocation	5/31/2021 Adj. NAV $ (M)	5/31/2021 Adj. NAV %	A: Net Benefit Outflows	B: Additional Safety Reserve Liquidation	C: Projected Private Market Distributions	D: Cash Redeployment	12/31/2021 $ (M)	12/31/2021 %	Possible New Target %
Equity	**$958**	**48.1%**				**$84**	**$1,042**	**54.0%**	**65%**
Global Equity	$745	37.4%				$52	$797	41.3%	53%/55%
Emerging Markets Equity	$65	3.3%				$32	$97	5.0%	7%/5%
Private Equity*	$148	7.4%					$148	7.7%	5%
Fixed Income	**$560**	**28.1%**	**($63)**	**($53)**	**($3)**	**$44**	**$485**	**25.2%**	**25%**
Cash	$73	3.7%	($14)				$59	3.0%	3%
ST Investment Grade Bonds	$218	10.9%	($49)	($53)			$116	6.0%	6%
Investment Grade Bonds	$75	3.8%				$2	$77	4.0%	4%
Bank Loans	$75	3.8%				$2	$77	4.0%	4%
High Yield Bonds	$76	3.8%				$1	$77	4.0%	4%
Emerging Markets Debt	$38	1.9%				$39	$77	4.0%	4%
Private Debt*	$6	0.3%			($3)		$3	0.1%	0%
Real Assets*	**$474**	**23.8%**			**($72)**		**$402**	**20.8%**	**10%**
Real Estate*	$305	15.3%			($72)		$233	12.1%	5%
Natural Resources*	$126	6.3%					$126	6.5%	5%
Infrastructure*	$43	2.1%					$43	2.2%	0%
NET ASSET VALUE	**$1,992**	**100.0%**	**($63)**	**($53)**	**($75)**	**$128**	**$1,929**	**100.0%**	**100%**
Safety Reserve	$290	14.6%	($63)	($53)			$174	9.0%	9%
Private Markets*	$627	31.5%			($75)		$552	28.6%	15%

A) $63M liquidation in Safety Reserve to pay net benefit outflows thru year-end
B) $53M liquidation from Safety Reserve over course of year to fund Equity and EM Debt reinvestment
C) $75M in estimated private market distributions thru year-end to be redeployed
D) $128M ($53M + $75M) redeployed into Global Equity, EM Equity (up to 5%) and EM Debt up to 4% target. Small rebalancing redeployments into other Fixed Income asset classes.

DALLAS POLICE & FIRE PENSION SYSTEM

Asset Allocation Next Steps

- Update Investment Policy Statement to reflect new Asset Allocation targets, ranges, implementation - July Board
- Update Global Equity Structure Study based on increased target - Q3 2021
- Possible EM Equity Structure Review based on ultimate target allocation. - Q3/Q4 2021
- International Small Cap Search - Q3/Q4 2021

Appendix - Glide Path Model Summary

DPFP Asset Allocation $	Adj. NAV 5/31/2021	Q2 21 6/30/2021	Q3 21 9/30/2021	Q4 21 12/31/2021	Q1 22 3/31/2022	Q2 22 6/30/2022	Q3 22 9/30/2022	Q4 22 12/31/2022
Equity	**958**	**968**	**1,001**	**1,042**	**1,043**	**1,046**	**1,046**	**1,059**
Global Equity	745	750	767	797	820	868	868	902
Emerging Markets Equity	65	70	86	97	97	97	97	91
Private Equity*	148	148	148	148	126	81	81	66
Fixed Income	**560**	**556**	**526**	**485**	**482**	**482**	**465**	**455**
Cash	73	64	64	59	59	59	56	54
ST Investment Grade Bonds	218	218	172	116	116	116	114	110
Investment Grade Bonds	75	75	75	77	77	77	74	73
Bank Loans	75	75	75	77	77	77	74	73
High Yield Bonds	76	76	76	77	77	77	74	73
Emerging Markets Debt	38	43	59	77	77	77	74	73
Private Debt*	6	6	6	3	(0)	(0)	(0)	(0)
Real Assets*	**474**	**459**	**429**	**402**	**377**	**347**	**337**	**307**
Real Estate*	305	290	260	233	223	208	198	183
Natural Resources*	126	126	126	126	121	106	106	101
Infrastructure*	43	43	43	43	33	33	33	23
Total	**1,992**	**1,983**	**1,956**	**1,929**	**1,902**	**1,875**	**1,848**	**1,821**

DPFP Asset Allocation %	Adj. NAV 5/31/2021	Q2 21 6/30/2021	Q3 21 9/30/2021	Q4 21 12/31/2021	Q1 22 3/31/2022	Q2 22 6/30/2022	Q3 22 9/30/2022	Q4 22 12/31/2022
Equity	**48.1%**	**48.8%**	**51.2%**	**54.0%**	**54.8%**	**55.8%**	**56.6%**	**58.2%**
Global Equity	37.4%	37.8%	39.2%	41.3%	43.1%	46.3%	47.0%	49.5%
Emerging Markets Equity	3.3%	3.5%	4.4%	5.0%	5.1%	5.2%	5.2%	5.0%
Private Equity*	7.4%	7.4%	7.6%	7.7%	6.6%	4.3%	4.4%	3.6%
Fixed Income	**28.1%**	**28.0%**	**26.9%**	**25.2%**	**25.4%**	**25.7%**	**25.2%**	**25.0%**
Cash	3.7%	3.2%	3.3%	3.0%	3.1%	3.1%	3.0%	3.0%
ST Investment Grade Bonds	10.9%	11.0%	8.8%	6.0%	6.1%	6.2%	6.1%	6.0%
Investment Grade Bonds	3.8%	3.8%	3.9%	4.0%	4.1%	4.1%	4.0%	4.0%
Bank Loans	3.8%	3.8%	3.8%	4.0%	4.1%	4.1%	4.0%	4.0%
High Yield Bonds	3.8%	3.8%	3.9%	4.0%	4.0%	4.1%	4.0%	4.0%
Emerging Markets Debt	1.9%	2.2%	3.0%	4.0%	4.0%	4.1%	4.0%	4.0%
Private Debt*	0.3%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
Real Assets*	**23.8%**	**23.1%**	**21.9%**	**20.8%**	**19.8%**	**18.5%**	**18.2%**	**16.9%**
Real Estate*	15.3%	14.6%	13.3%	12.1%	11.7%	11.1%	10.7%	10.1%
Natural Resources*	6.3%	6.3%	6.4%	6.5%	6.4%	5.6%	5.7%	5.5%
Infrastructure*	2.1%	2.2%	2.2%	2.2%	1.7%	1.7%	1.8%	1.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Safety Reserve	**14.6%**	**14.2%**	**12.0%**	**9.0%**	**9.2%**	**9.3%**	**9.2%**	**9.0%**
***Private Market Assets**	**31.5%**	**30.9%**	**29.8%**	**28.6%**	**26.4%**	**22.8%**	**22.6%**	**20.5%**

Source: JP Morgan Custodial Data, Staff Calculations. Assumes zero investment returns.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C3

Topic: **January 1, 2021 Actuarial Valuation Assumptions**

Attendees: Jeff Williams, Vice President and Actuary, Segal Consulting

Discussion: An Actuarial Valuation is performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and it is an important part of the annual financial audit. Segal Consulting is preparing the January 1, 2021 Actuarial Valuation for the Regular Plan (Combined Plan) and the Supplemental Plan. Many economic and demographic assumptions are required to prepare the valuation. Pursuant to Article 16, Section 67 (f)(3) of the Texas Constitution, the Board determines the assumptions used in the valuation.

Segal presented a five-year Review of Actuarial Experience at the May 2020 Board meeting and based on that study, Segal recommended modifications to certain economic and demographic assumptions. Based on the Actuarial Experience Review and the recommendations of Segal, the Board revised the assumptions used to prepare the January 1, 2020 Actuarial Valuation. In addition, the Board lowered the discount rate/assumed rate of return from 7.25% to 7.00% for the January 1, 2020 Actuarial Valuation.

DISCUSSION SHEET

ITEM #C3
(continued)

Segal believes the assumptions used for the January 1, 2020 Actuarial Valuation remain appropriate and has not recommended changes to the assumptions for the January 1, 2021 Actuarial Valuation, but supports reviewing the appropriateness of the 7% discount rate/assumed rate of return given changing market factors and the asset allocation considerations.

Staff Recommendation: **Direct** Segal to use its recommended assumptions in preparing the January 1, 2021 Actuarial Valuation for the Regular Plan (Combined Plan) and the Supplemental Plan and give Segal further direction on the discount rate to be used.

Segal

Jeffrey S. Williams
Vice President and Actuary
T 678.306.3147
jwilliams@segalco.com

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Building One, Suite 1400
Atlanta, GA 30339-4053
segalco.com

Memorandum

To: Board of Trustees - Dallas Police & Fire Pension System

From: Jeffrey S. Williams, Vice President and Actuary

Date: June 4, 2021

Re: Discount Rate Assumption for January 1, 2021 Actuarial Valuation

The chart on the following page shows the impact of 0.25% drops in the discount rate/long-term investment return assumption from 7.00% to 6.00% based on the results of the January 1, 2020 actuarial valuation. Actual results will differ for the January 1, 2021 actuarial valuation, but the relative impact of each 0.25% drop in the discount rate should be approximately the same.

Each 0.25% decline in the discount rate represents increases of approximately 6.8% to 6.9% in the total normal cost, 2.7% to 2.8% in the actuarial accrued liability, and 4.4% to 4.5% in the actuarial determined contribution. The funding ratio on the market value of assets decreases approximately 110 to 114 basis points and on the actuarial value of assets decreases approximately 115 to 120 basis points for each 0.25% decline in the discount rate.

The actuarial calculations were completed under my supervision. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render this actuarial opinion.

cc: Kelly Gottschalk
Brenda Barnes
Caitlin Grice - Segal

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Impact of Discount Rate Change on Total Recommended Contribution

	Description	January 1, 2020 Valuation Results	Discount Rate Change to 6.75%	Discount Rate Change to 6.50%	Discount Rate Change to 6.25%	Discount Rate Change to 6.00%
1	Actuarial Accrued Liability (AAL)	$4,723,972,480	$4,851,136,772	$4,981,917,597	$5,118,891,463	$5,262,443,801
2	Actuarial Value of Assets (AVA)	2,160,125,611	2,160,125,611	2,160,125,611	2,160,125,611	2,160,125,611
3	Unfunded Actuarial Accrued Liability (UAAL): [(1) – (2)]	$2,563,846,869	$2,691,011,161	$2,821,791,986	$2,958,765,852	$3,102,318,190
4	Employer Normal Cost	15,495,082	19,609,463	24,022,785	28,797,445	33,965,045
5	Payment on UAAL	163,765,670	167,967,114	172,056,224	176,177,182	180,332,715
6	**Total Recommended Contribution, Adjusted for Timing: [(4) + (5) + Interest]**	**$185,428,764**	**$193,803,916**	**$202,351,257**	**$211,283,009**	**$220,633,048**
7	Recommended Contribution as a % of Projected Payroll	46.71%	48.82%	50.98%	53.23%	55.58%
8	Projected Payroll	$396,954,743	$396,954,743	$396,954,743	$396,954,743	$396,954,743
9	**Funded Ratio – AVA Basis**	**45.73%**	**44.53%**	**43.36%**	**42.20%**	**41.05%**
10	**Funded Ratio – MVA Basis***	**43.56%**	**42.42%**	**41.31%**	**40.20%**	**39.10%**

For each scenario, all assumptions, plan provisions, and methods used are the same as those used in the January 1, 2020 valuation, other than the discount rates as noted

* Based on market value of assets of $2,057,857,317 as of January 1, 2020

9281694

Segal

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C4

Topic: **First Quarter 2021 Investment Performance Analysis and Fourth Quarter 2020 Private Markets & Real Assets Review**

Portions of the discussion under this topic may be closed to the public under the terms of Section 551.072 of the Texas Government Code.

Attendees: Leandro Festino, Managing Principal - Meketa Investment Group
Aaron Lally, Principal - Meketa Investment Group

Discussion: Meketa and Investment Staff will review investment performance.

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INVESTMENT GROUP

Dallas Police & Fire Pension System

March 31, 2021

Fund Evaluation Report

BOSTON CHICAGO LONDON MIAMI NEW YORK PORTLAND SAN DIEGO MEKETA.COM

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Agenda

1. Executive Summary as of March 31, 2021
2. Performance Update as of March 31, 2021

Executive Summary

As of March 31, 2021

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Dallas Police and Fire Pension System

Executive Summary

DPFP 1Q21 Flash Summary

Category	Results	Notes
Total Fund Performance Return	Positive	1.9%
Performance vs. Policy Index	Underperformed	1.9% vs. 2.6%
Performance vs. Peers[1]	Underperformed	1.9% vs. 3.3% median (90th percentile in peer group)
Asset Allocation vs. Targets	Positive	Underweight Global Bonds and EM Debt helped while equity underweight hurt
Safety Reserve Exposure	Sufficient	$310 million (approximately 16%)
Public Active Management	Mixed	5/10 public managers beat benchmarks
DPFP Public Markets vs. 60/40[2]	Outperformed	2.4% vs. 1.2%
DPFP Public Markets vs. Peers	Underperformed	2.4% vs. 3.3% median (80th percentile in peer group)
Compliance with Targets	No	Global Bonds below policy range[3]

[1] InvestorForce Public DB $1-5 billion net

[2] Performance of Total Fund excluding private market investments relative to a 60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index.

[3] Allocation of zero previously approved by Board. Target to Global Bonds is being eliminated.

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Dallas Police and Fire Pension System

Executive Summary

DPFP Trailing One-Year Flash Summary

Category	Results	Notes
Total Fund Performance Return	Positive	11.3%
Performance vs. Policy Index	Underperformed	11.3% vs. 31.4%
Performance vs. Peers[1]	Underperformed	11.3% vs. 33.0% median (99th percentile in peer group)
Asset Allocation vs. Targets	Detracted	Overweight Real Estate and underweight Public Equities hurt
Public Active Management	Helped	5/8 public managers beat benchmarks
DPFP Public Markets vs. 60/40[2]	Underperformed	32.6% vs. 34.3%
DPFP Public Markets vs. Peers	Underperformed	32.6% vs. 33.0% median (53rd percentile in peer group)

[1] InvestorForce Public DB $1-5 billion net.
[2] Performance of Total Fund excluding private market investments relative to a 60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index.

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Dallas Police and Fire Pension System

Executive Summary

DPFP Trailing Three-Year Flash Summary

Category	Results	Notes
Total Fund Performance Return	Positive	4.3%
Performance vs. Policy Index	Underperformed	4.3% vs. 7.9%
Performance vs. Peers[1]	Underperformed	4.3% vs. 8.9% median (99th percentile in peer group)
Public Active Management	Mixed	4 of 8 public managers beat their benchmarks
DPFP Public Markets vs. 60/40[2]	Outperformed	8.7% vs. 8.6%
DPFP Public Markets vs. Peers	Underperformed	8.7% vs. 8.9% median (56th percentile in peer group)

[1] InvestorForce Public DB $1-5 billion net
[2] Performance of Total Fund excluding private market investments relative to a 60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index.

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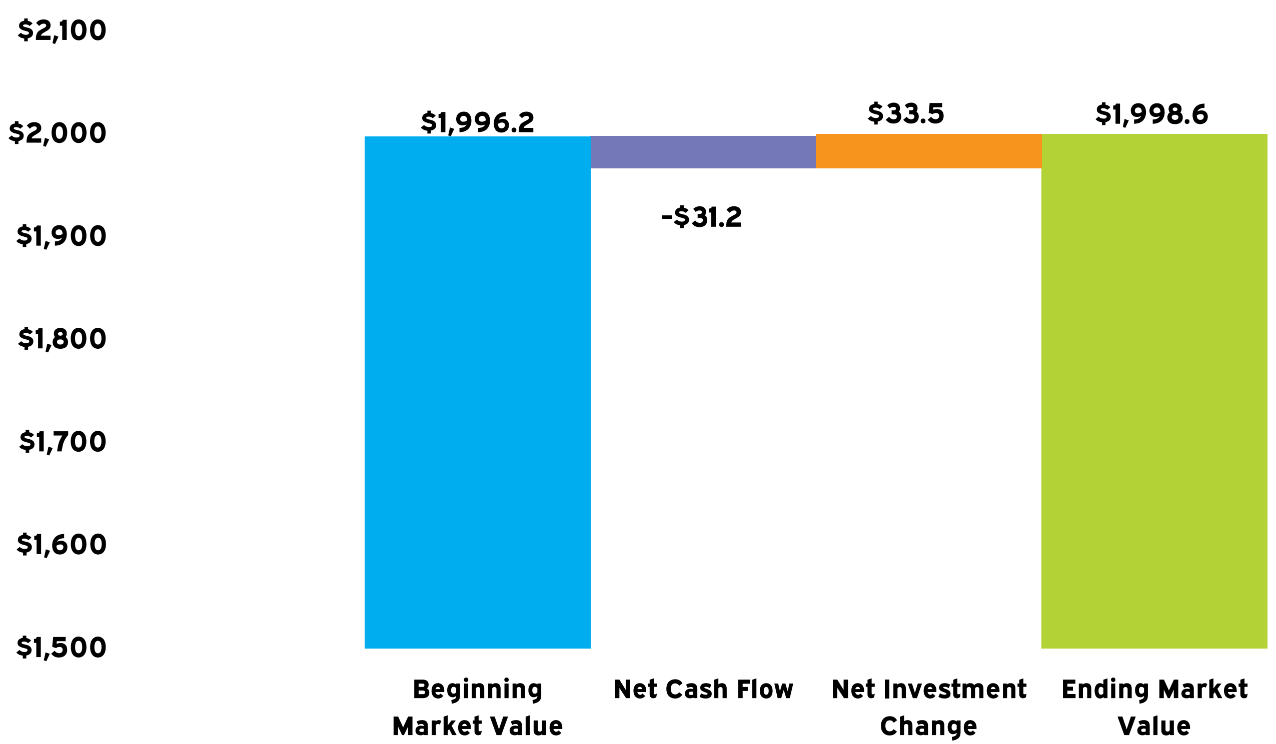
Executive Summary

Quarterly Change in Market Value



- Total market value increased due to positive investment performance.

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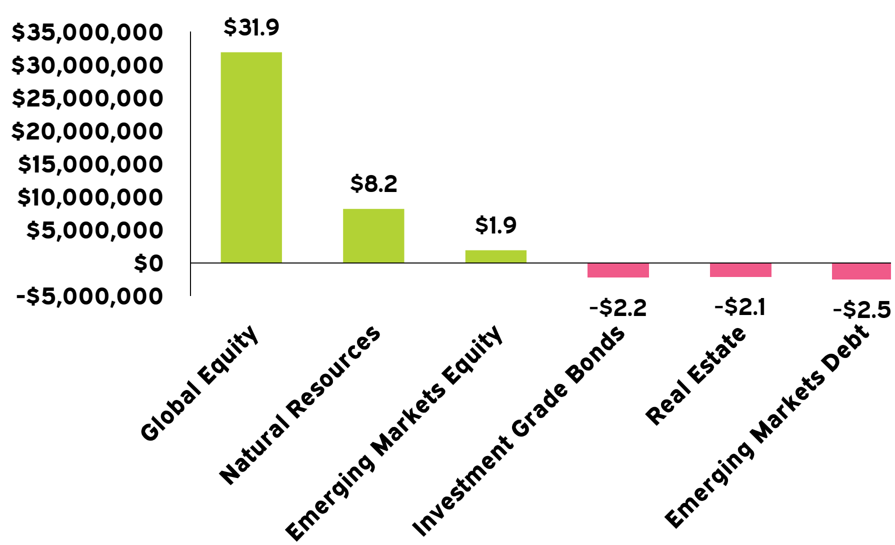
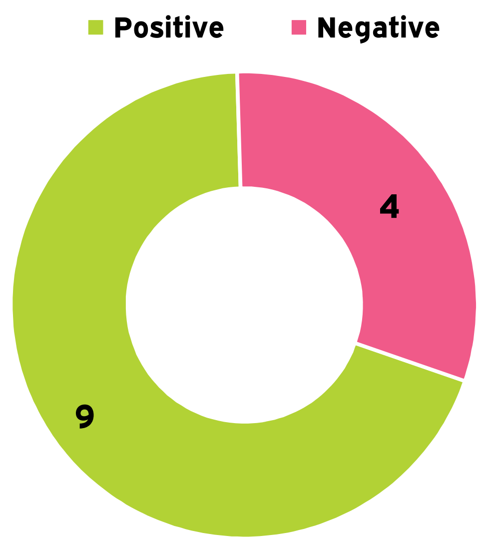
Executive Summary

Quarterly Absolute Performance

Asset Classes Dollar Gain/ Loss[1] Top Three and Bottom Three	Asset Class Absolute Performance





- In absolute terms, Global Equity appreciated the most, gaining approximately $31.9 million in market value.
- Emerging Market Debt depreciated the most, losing approximately $2.5 million in value.

[1] Estimated Gain/ Loss calculated by multiplying beginning market value by quarterly performance.

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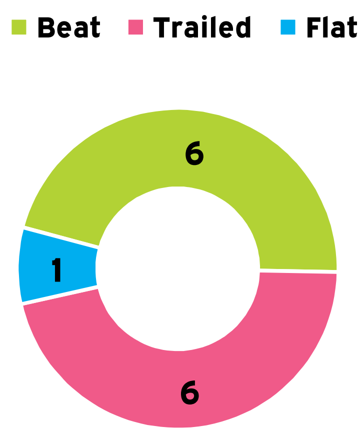
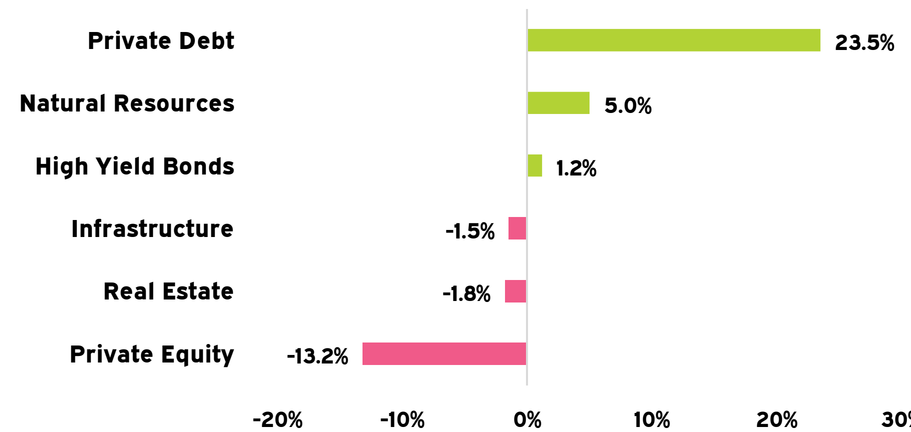
Executive Summary

Quarterly Relative Performance

Asset Classes vs Benchmarks	Asset Classes vs Benchmarks Top Three and Bottom Three





- Six of thirteen asset classes delivered positive relative performance versus respective benchmarks.
- Private Debt, Natural Resources and High Yield bonds had the best relative performance for the quarter.
- Over the quarter, Private Equity, Real Estate and Infrastructure had the worst relative performance.

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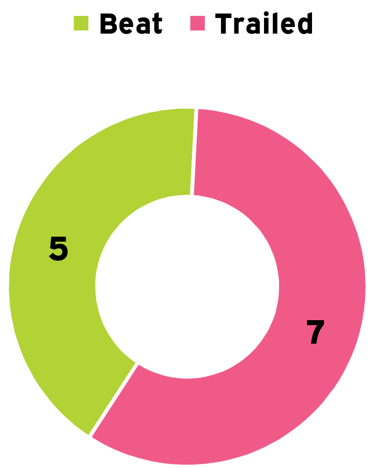
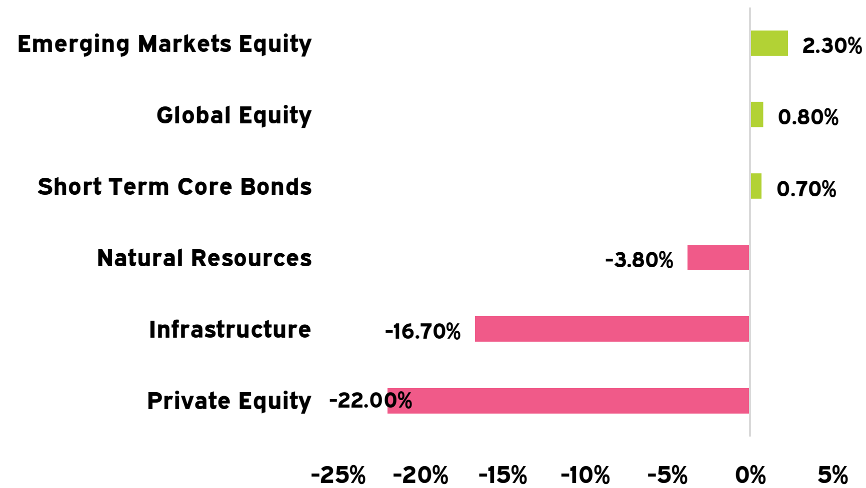
Executive Summary

Trailing 3 Year Relative Performance

Asset Classes vs Benchmarks[1]	Asset Classes vs Benchmarks Top Three and Bottom Three





- Five of the twelve asset classes with trailing three-year return history delivered positive relative performance versus respective benchmarks, led by Emerging Markets Equity, Global Equity and Short Term Core Bonds.
- Private Equity, Infrastructure and Natural Resources had the worst relative performance over the trailing three-year period.

[1] Analysis excludes asset classes with a performance history of less than three years.

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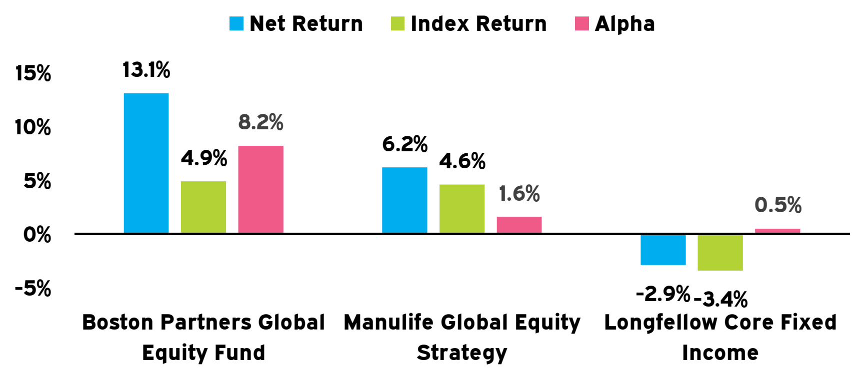
Executive Summary

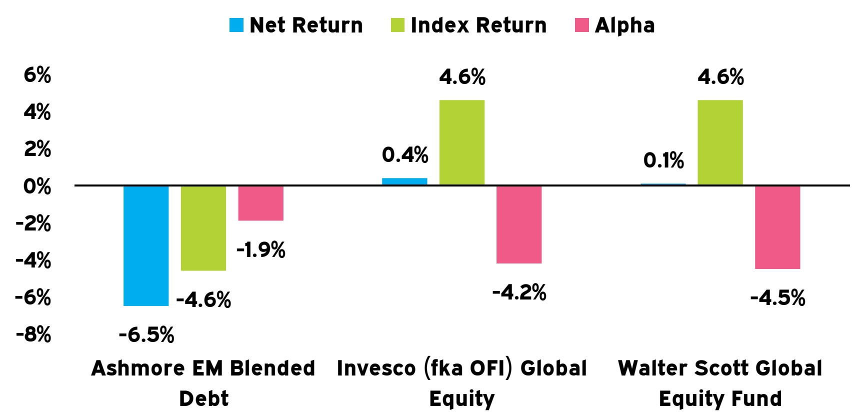
Public Manager Alpha

Top Three Outperformers in Quarter



$345 million
Combined exposure

Bottom Three Underperformers in Quarter



$287 million
Combined exposure

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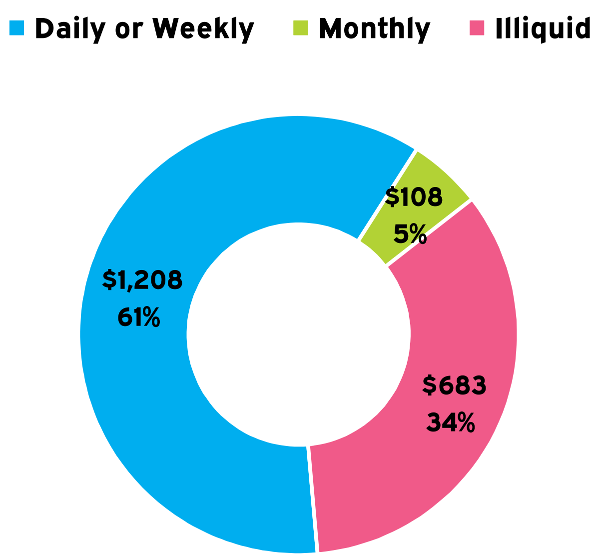
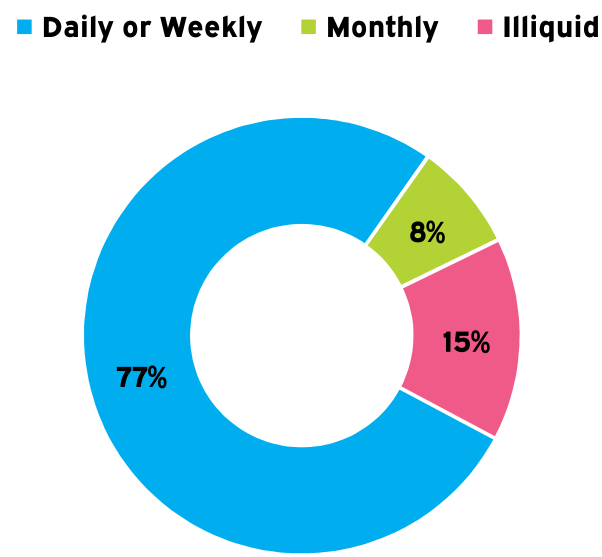
Dallas Police and Fire Pension System

Executive Summary

Liquidity Exposure
As of March 31, 2021

Exposure ($ mm)	Targets





- Approximately 34% of the System's assets are illiquid versus 15% of the target allocation.

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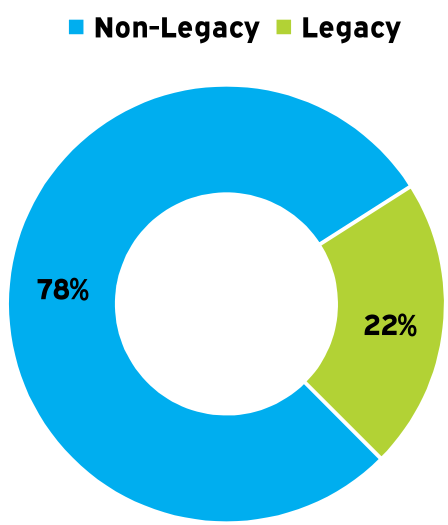
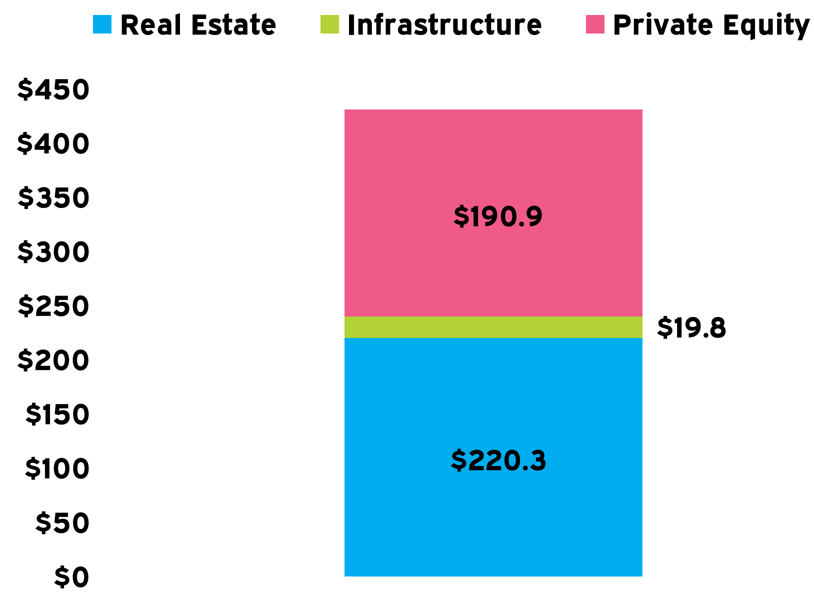
Dallas Police and Fire Pension System

Executive Summary

Legacy Assets





$430 million

Net Asset Value of Legacy Assets

Performance Update
As of March 31, 2021

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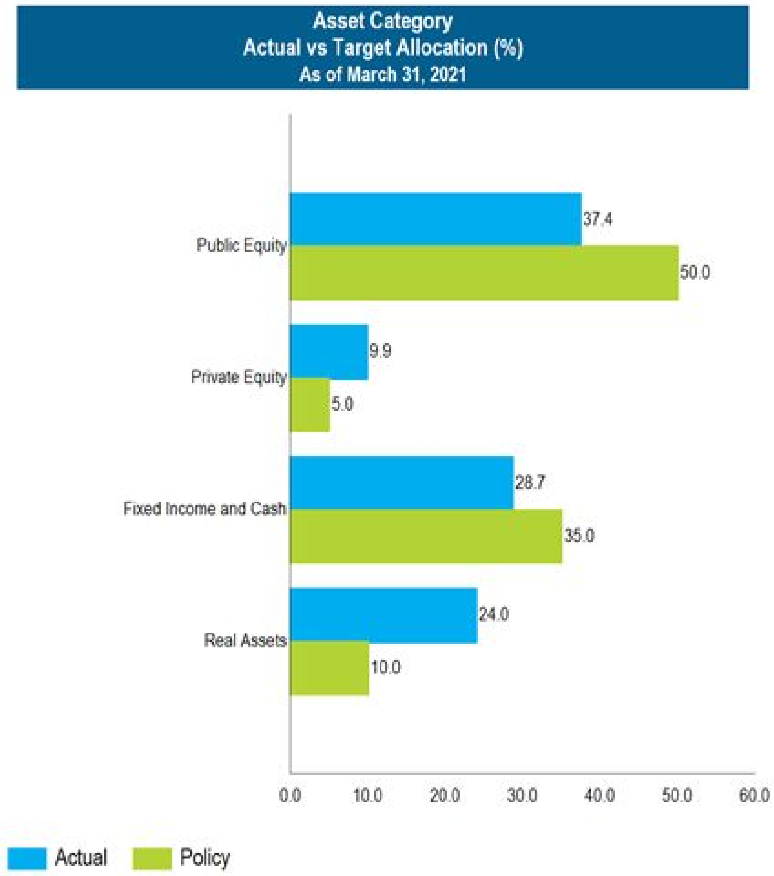
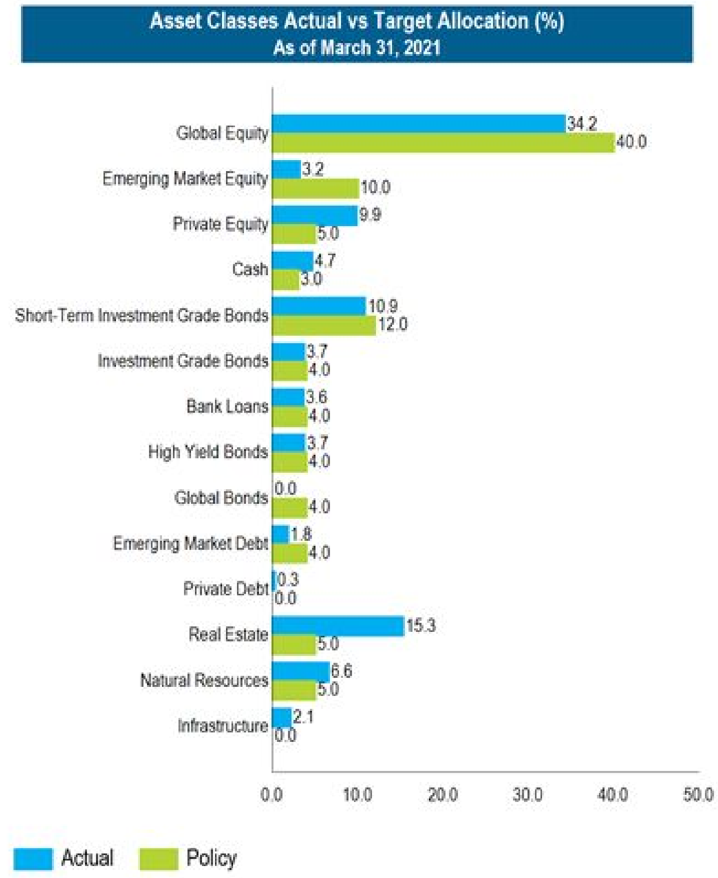
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021





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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Allocation vs. Targets and Policy	Current Balance	Current Allocation	Policy	Policy Range	Within IPS Range?
Equity	**$945,545,346**	**47%**	**50%**		
Global Equity	$684,370,966	34%	40%	22% - 48%	Yes
Emerging Market Equity	$63,779,343	3%	10%	3% - 12%	Yes
Private Equity	$197,395,037	10%	5%		
Fixed Income and Cash	**$573,382,898**	**29%**	**35%**		
Cash	$93,553,466	5%	3%	0% - 5%	Yes
Short-Term Investment Grade Bonds	$216,856,551	11%	12%	5% - 15%	Yes
Investment Grade Bonds	$74,463,653	4%	4%	2% - 6%	Yes
Global Bonds	--	--	4%	2% - 6%	No
Bank Loans	$72,461,003	4%	4%	2% - 6%	Yes
High Yield Bonds	$74,659,167	4%	4%	2% - 6%	Yes
Emerging Market Debt	$35,835,209	2%	4%	0% - 6%	Yes
Private Debt	$5,553,860	0%	0%		
Real Assets	**$479,686,654**	**24%**	**10%**		
Real Estate	$305,769,514	15%	5%		
Natural Resources	$131,356,859	7%	5%		
Infrastructure	$42,560,281	2%	0%		
Total	**$1,998,614,899**	**100%**	**100%**		

As of 3/31/2021 the Safety Reserve exposure was approximately $310.4 million (16%).
Rebalancing ranges are not established for illiquid assets (Private Equity, Private Debt, Natural Resources, Infrastructure and Real Estate)

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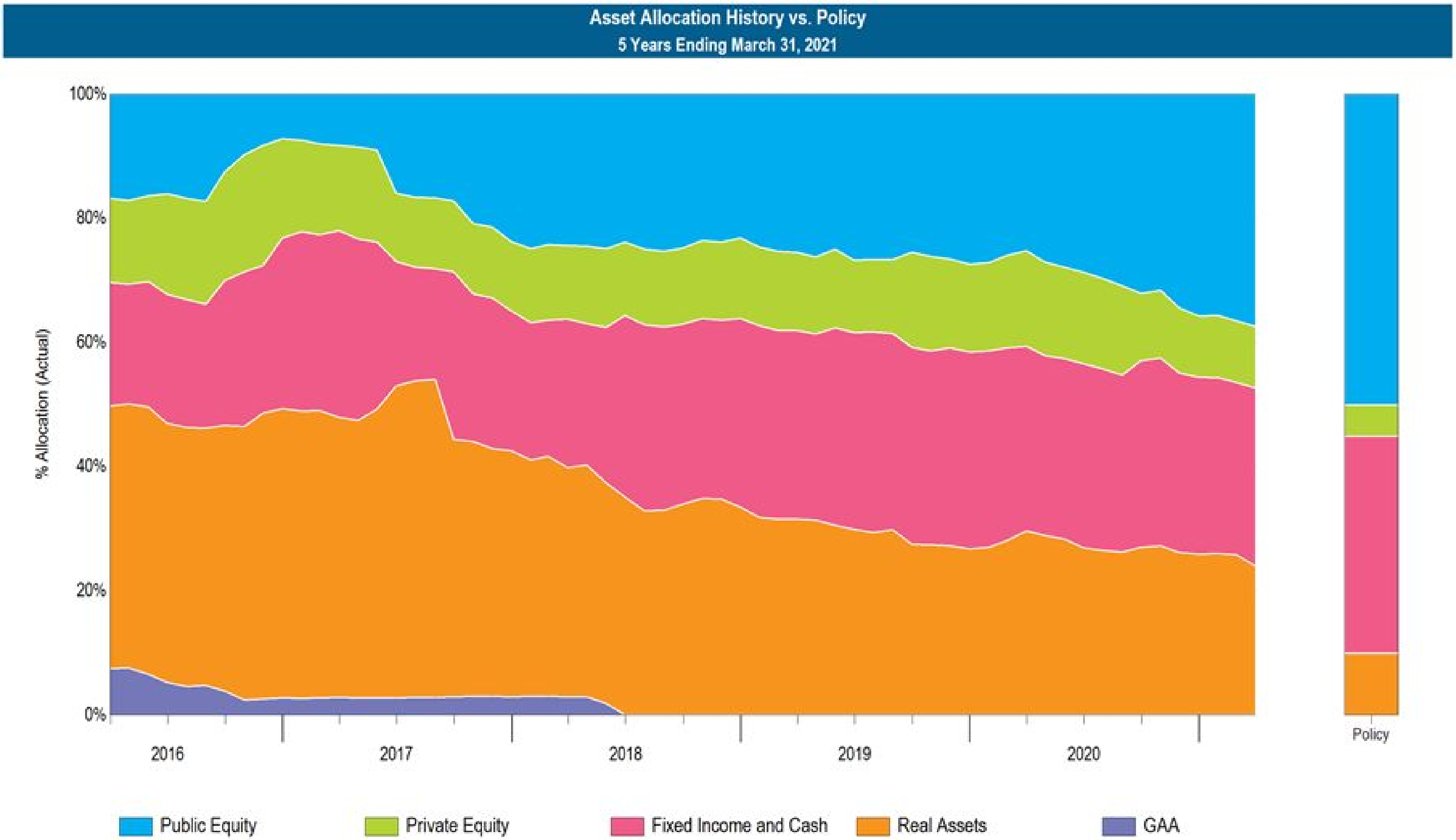
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021



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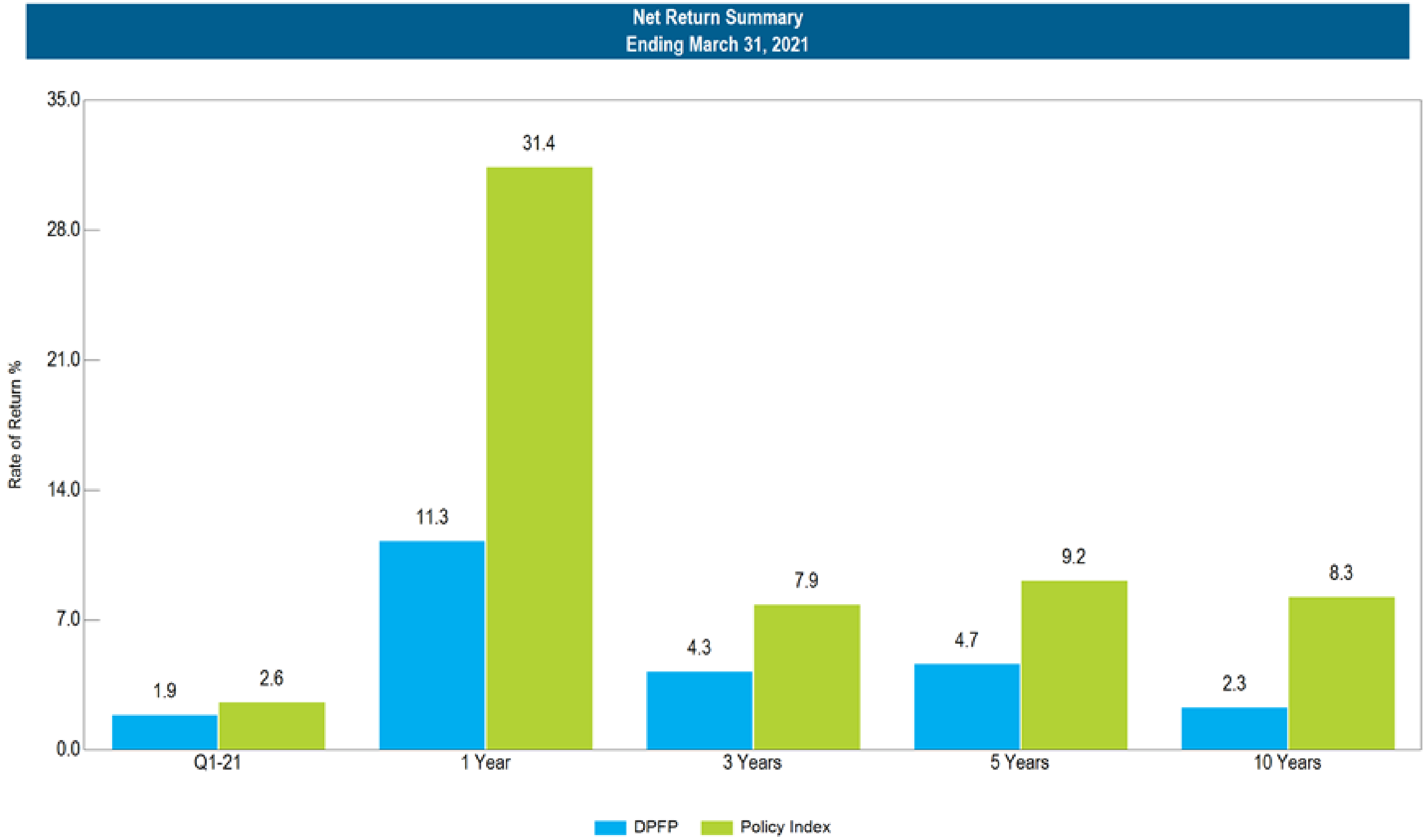
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021



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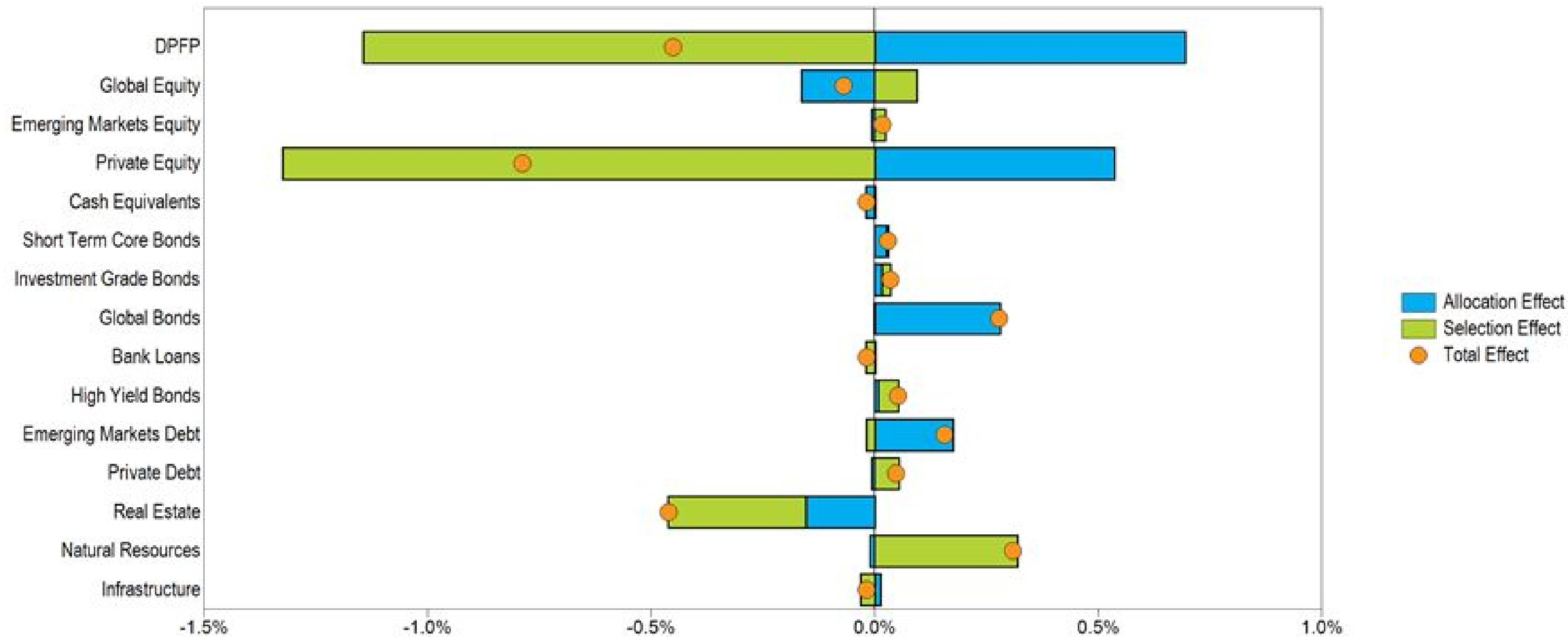
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Attribution Effects vs. Policy Benchmark
3 Months Ending March 31, 2021



Attribution Summary
3 Months Ending March 31, 2021

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Total Effects
Total	**1.9%**	**2.4%**	**-0.5%**	**-1.1%**	**0.7%**	**-0.5%**

The performance calculation methodology in attribution tables is different from the standard time weighted returns (geometric linkage of monthly returns) found throughout the rest of the report. In attribution tables, the average weight of each asset class (over the specified time period) is multiplied by the time period performance of that asset class and summed. Values may not sum due to rounding.

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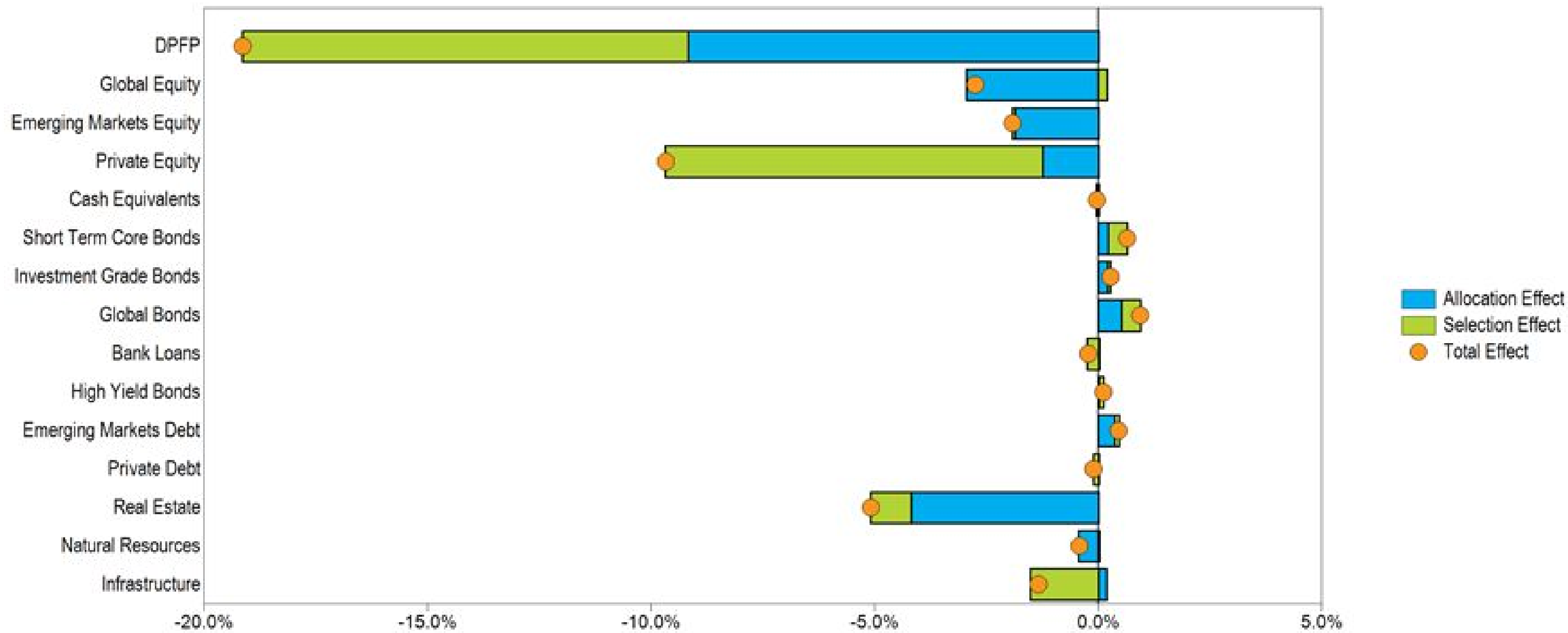
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Attribution Effects vs. Policy Benchmark
1 Year Ending March 31, 2021



Attribution Summary
1 Year Ending March 31, 2021

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Total Effects
Total	11.3%	30.5%	-19.1%	-10.0%	-9.2%	-19.1%

The performance calculation methodology in attribution tables is different from the standard time weighted returns (geometric linkage of monthly returns) found throughout the rest of the report. In attribution tables, the average weight of each asset class (over the specified time period) is multiplied by the time period performance of that asset class and summed. Values may not sum due to rounding.

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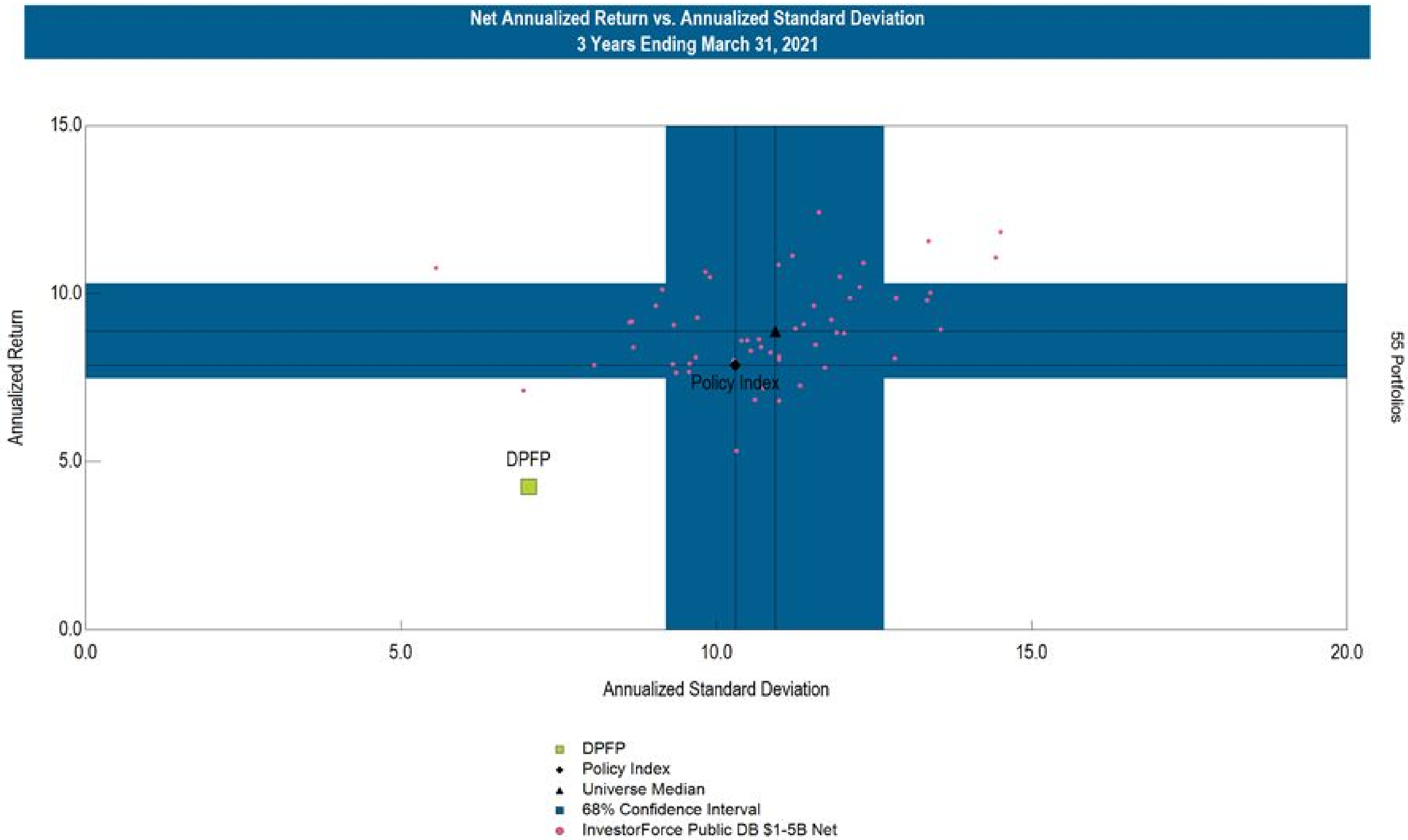
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021



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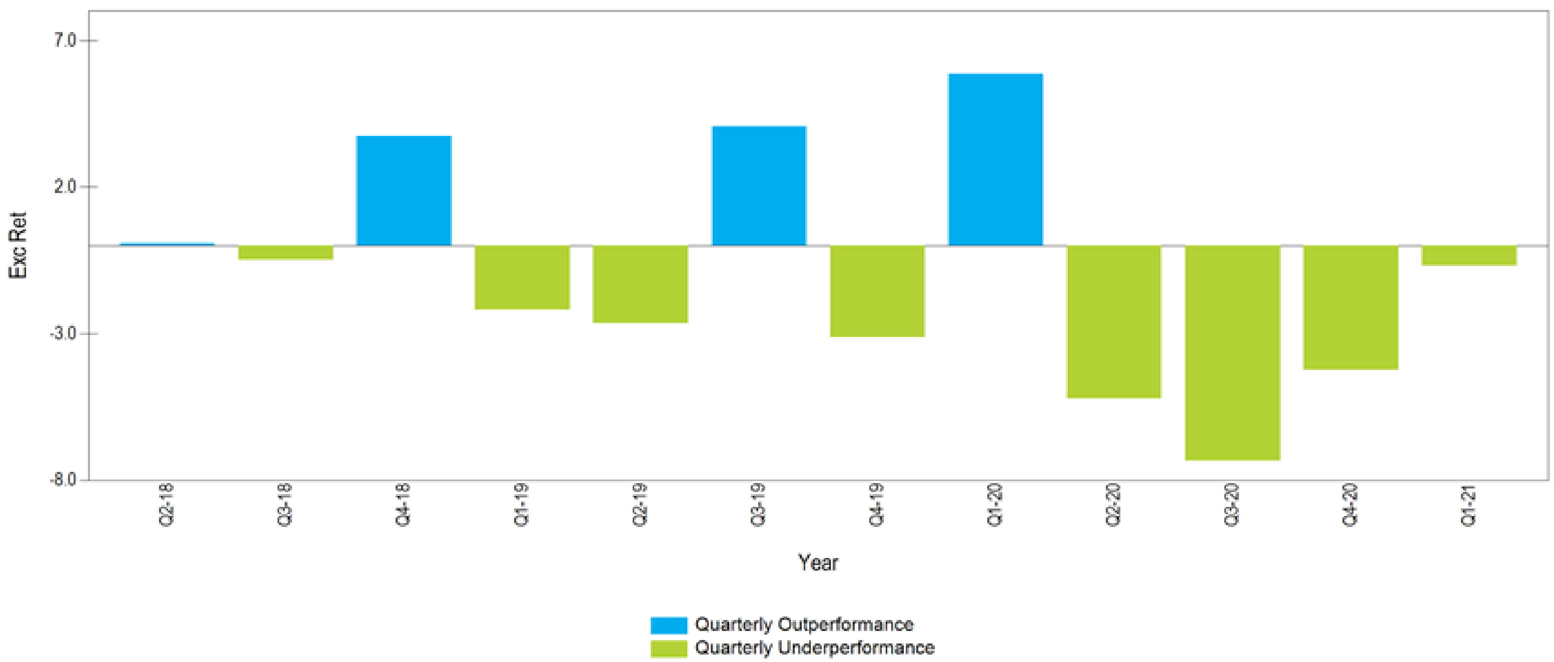
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Quarterly Excess Performance vs. Policy Benchmark



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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Total Fund Correlation Matrix
1 Year Ending March 31, 2021

	DPFP	Policy Index	60% MSCI ACWI/40% Barclays Global Agg
DPFP	1.00	--	--
Policy Index	0.86	1.00	--
60% MSCI ACWI/40% Barclays Global Agg	0.86	0.99	1.00

Total Fund Correlation Matrix
3 Years Ending March 31, 2021

	DPFP	Policy Index	60% MSCI ACWI/40% Barclays Global Agg
DPFP	1.00	--	--
Policy Index	0.81	1.00	--
60% MSCI ACWI/40% Barclays Global Agg	0.82	0.99	1.00

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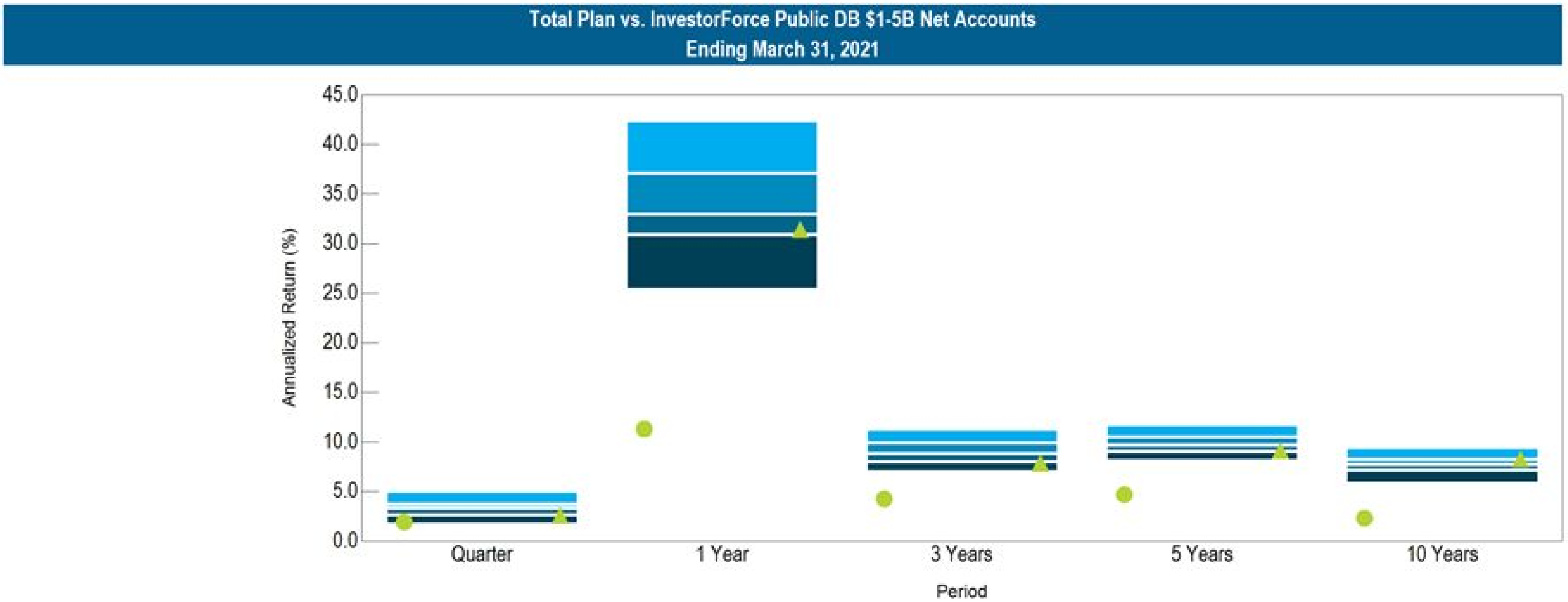
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021



	Return (Rank)									
5th Percentile	5.0		42.4		11.3		11.7		9.4	
25th Percentile	3.7		37.1		9.9		10.5		8.2	
Median	3.3		33.0		8.9		9.7		7.7	
75th Percentile	2.7		30.9		8.1		9.1		7.2	
95th Percentile	1.7		25.4		7.0		8.1		5.9	
# of Portfolios	55		55		55		55		49	
DPFP	1.9	(90)	11.3	(99)	4.3	(99)	4.7	(99)	2.3	(99)
Policy Index	2.6	(78)	31.4	(68)	7.9	(84)	9.2	(74)	8.3	(23)

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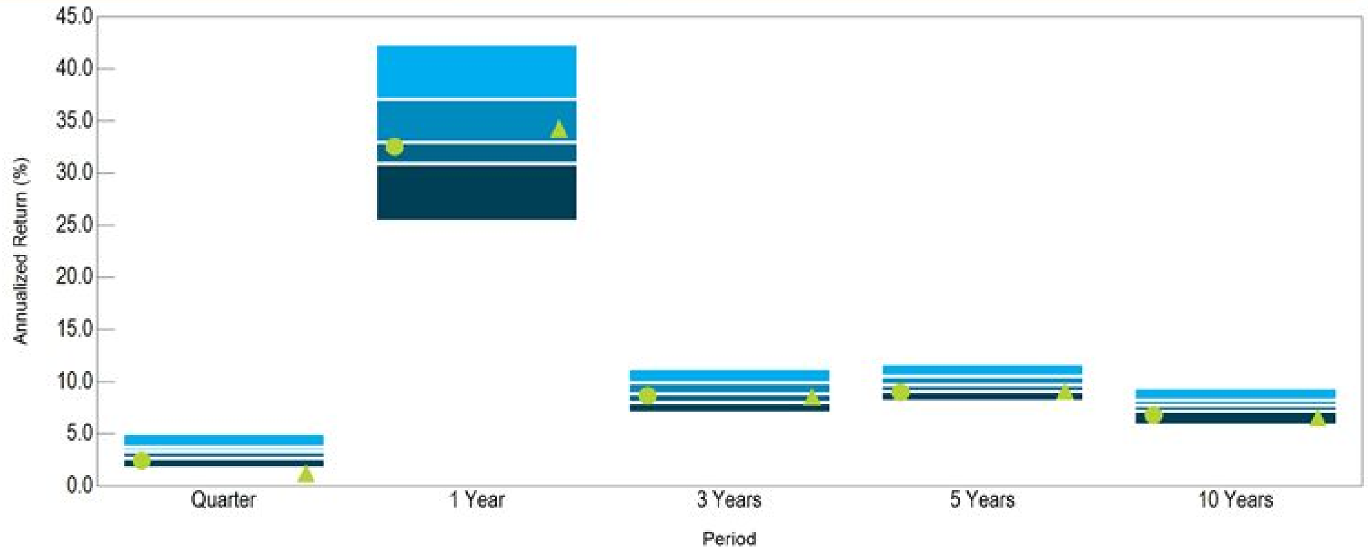
Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Total Plan ex Privates vs. InvestorForce Public DB $1-5B Net Accounts
As of March 31, 2021



	Quarter Return	(Rank)	1 Year Return	(Rank)	3 Years Return	(Rank)	5 Years Return	(Rank)	10 Years Return	(Rank)
5th Percentile	5.0		42.4		11.3		11.7		9.4	
25th Percentile	3.7		37.1		9.9		10.5		8.2	
Median	3.3		33.0		8.9		9.7		7.7	
75th Percentile	2.7		30.9		8.1		9.1		7.2	
95th Percentile	1.7		25.4		7.0		8.1		5.9	
# of Portfolios	55		55		55		55		49	
● Total Fund ex Privates	2.4	(80)	32.6	(53)	8.7	(56)	9.0	(79)	6.8	(86)
▲ 60% MSCI ACWI IMI Net/40% Barclays Global	1.2	(99)	34.3	(42)	8.6	(60)	9.1	(74)	6.6	(90)

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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Asset Class Performance Summary (Net)

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
DPFP	**1,998,614,899**	**100.0**	**1.9**	**11.3**	**4.3**	**4.7**	**2.3**	**5.8**	**Jun-96**
Policy Index			*2.6*	*31.4*	*7.9*	*9.2*	*8.3*	*--*	*Jun-96*
Total Fund Ex Private Markets			*2.4*	*32.6*	*8.7*	*9.0*	*6.8*	*5.9*	*Jun-96*
60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index			*1.2*	*34.3*	*8.6*	*9.1*	*6.6*	*6.5*	*Jun-96*
Global Equity	**684,370,966**	**34.2**	**4.9**	**55.6**	**12.7**	**14.3**	**9.9**	**7.7**	**Jul-06**
MSCI ACWI IMI Net USD			*5.1*	*57.6*	*11.9*	*13.2*	*9.2*	*7.4*	*Jul-06*
Emerging Markets Equity	**63,779,343**	**3.2**	**3.1**	**56.2**	**8.6**	**--**	**--**	**7.6**	**Jan-18**
MSCI Emerging Market IMI Net			*2.9*	*61.1*	*6.3*	*11.7*	*3.6*	*6.2*	*Jan-18*
Private Equity	**197,395,037**	**9.9**	**-0.1**	**-32.9**	**-6.1**	**-9.3**	**-5.8**	**-1.8**	**Oct-05**
Cambridge Associates US All PE (1 Qtr Lag)			*13.1*	*23.6*	*15.9*	*15.6*	*14.0*	*13.4*	*Oct-05*
Cash Equivalents	**93,553,466**	**4.7**	**0.0**	**0.3**	**1.5**	**1.3**	**--**	**1.3**	**Apr-15**
91 Day T-Bills			*0.0*	*0.1*	*1.4*	*1.1*	*0.6*	*1.0*	*Apr-15*
Short Term Core Bonds	**216,856,551**	**10.9**	**0.0**	**4.3**	**3.6**	**--**	**--**	**2.9**	**Jun-17**
BBgBarc US Aggregate 1-3 Yr TR			*-0.1*	*1.2*	*2.9*	*2.0*	*1.6*	*2.3*	*Jun-17*
Investment Grade Bonds	**74,463,653**	**3.7**	**-2.9**	**2.2**	**--**	**--**	**--**	**3.7**	**Oct-19**
BBgBarc US Aggregate TR			*-3.4*	*0.7*	*4.7*	*3.1*	*3.4*	*2.7*	*Oct-19*
Global Bonds	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**Dec-10**
BBgBarc Global Aggregate TR			*-4.5*	*4.7*	*2.8*	*2.7*	*2.2*	*2.3*	*Dec-10*
Bank Loans	**72,461,003**	**3.6**	**1.5**	**14.7**	**4.2**	**6.1**	**--**	**4.3**	**Jan-14**
Credit Suisse Leveraged Loan			*2.0*	*20.8*	*4.1*	*5.3*	*--*	*4.1*	*Jan-14*
High Yield Bonds	**74,659,167**	**3.7**	**0.2**	**27.5**	**4.5**	**8.2**	**5.7**	**6.2**	**Dec-10**
BBgBarc Global High Yield TR			*-1.0*	*24.7*	*4.7*	*6.8*	*6.0*	*6.2*	*Dec-10*
Emerging Markets Debt	**35,835,209**	**1.8**	**-6.5**	**22.1**	**-0.4**	**4.1**	**2.5**	**2.9**	**Dec-10**
50% JPM EMBI/50% JPM GBI-EM			*-5.6*	*14.5*	*1.7*	*4.1*	*3.0*	*3.2*	*Dec-10*
Private Debt	**5,553,860**	**0.3**	**23.0**	**3.1**	**4.2**	**-1.3**	**--**	**-0.9**	**Jan-16**
Barclays Global High Yield +2%			*-0.5*	*27.2*	*6.8*	*8.9*	*--*	*9.4*	*Jan-16*

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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Asset Class Performance Summary (Net)

	Market Value ($)	% of Portfolio	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Real Estate	**305,769,514**	**15.3**	**-0.6**	**-2.6**	**1.4**	**2.9**	**-3.5**	**3.5**	**Mar-85**
NCREIF Property (1-quarter lagged)			*1.2*	*1.6*	*4.9*	*5.9*	*9.0*	*7.8*	*Mar-85*
Natural Resources	**131,356,859**	**6.6**	**6.6**	**3.2**	**1.1**	**0.4**	**3.2**	**4.0**	**Dec-10**
NCREIF Farmland Total Return Index 1Q Lag			*1.6*	*3.1*	*4.9*	*5.6*	*10.4*	*10.8*	*Dec-10*
Infrastructure	**42,560,281**	**2.1**	**1.5**	**-17.1**	**-11.0**	**3.7**	**--**	**2.7**	**Jul-12**
S&P Global Infrastructure TR USD			*3.0*	*37.0*	*5.7*	*6.8*	*6.3*	*7.3*	*Jul-12*

[1] Please see the Appendix for composition of the Custom Benchmarks. [2] As of 3/31/2021, the Safety Reserve exposure was approximately $310.4 million (16%).
[3] All private market data is one quarter lagged, unless otherwise noted. [4] Lone Star Funds 12/31/2019 valuation used [5] North Texas Fund, Museum Tower, Huff Alternative Fund and Huff Energy Fund 9/30/2020 valuation used.

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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

Trailing Net Performance

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
DPFP	**1,998,614,899**	**100.0**	**--**	**1.9**	**11.3**	**4.3**	**4.7**	**2.3**	**5.8**	**Jun-96**
Policy Index				*2.6*	*31.4*	*7.9*	*9.2*	*8.3*	*--*	*Jun-96*
Total Fund Ex Private Markets				*2.4*	*32.6*	*8.7*	*9.0*	*6.8*	*5.9*	*Jun-96*
60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index				*1.2*	*34.3*	*8.6*	*9.1*	*6.6*	*6.5*	*Jun-96*
InvestorForce Public DB $1-5B Net Rank				*90*	*99*	*99*	*99*	*99*	*97*	*Jun-96*
Total Equity	**945,545,346**	**47.3**	**47.3**	**3.7**	**22.2**	**7.6**	**4.2**	**4.9**	**5.3**	**Dec-10**
MSCI ACWI IMI Net USD				*5.1*	*57.6*	*11.9*	*13.2*	*9.2*	*9.4*	*Dec-10*
Public Equity	**748,150,309**	**37.4**	**79.1**	**4.8**	**55.7**	**12.6**	**14.2**	**9.9**	**7.7**	**Jul-06**
MSCI ACWI IMI Net USD				*5.1*	*57.6*	*11.9*	*13.2*	*9.2*	*7.4*	*Jul-06*
eV All Global Equity Net Rank				*54*	*55*	*46*	*34*	*43*	*43*	*Jul-06*
Global Equity	**684,370,966**	**34.2**	**91.5**	**4.9**	**55.6**	**12.7**	**14.3**	**9.9**	**7.7**	**Jul-06**
MSCI ACWI IMI Net USD				*5.1*	*57.6*	*11.9*	*13.2*	*9.2*	*7.4*	*Jul-06*
eV All Global Equity Net Rank				*52*	*55*	*45*	*34*	*43*	*43*	*Jul-06*
Boston Partners Global Equity Fund	136,389,795	6.8	19.9	13.1	66.5	8.2	--	--	8.9	Jul-17
MSCI World Net				*4.9*	*54.0*	*12.8*	*13.4*	*9.9*	*12.7*	*Jul-17*
MSCI World Value				*9.6*	*48.3*	*6.7*	*9.1*	*7.1*	*6.9*	*Jul-17*
eV Global Large Cap Value Eq Net Rank				*29*	*26*	*38*	*--*	*--*	*40*	*Jul-17*
Manulife Global Equity Strategy	134,494,926	6.7	19.7	6.2	48.2	11.5	--	--	9.9	Jul-17
MSCI ACWI Net				*4.6*	*54.6*	*12.1*	*13.2*	*9.1*	*12.4*	*Jul-17*
MSCI ACWI Value NR USD				*8.9*	*48.8*	*6.2*	*9.0*	*6.4*	*6.8*	*Jul-17*
eV Global Large Cap Value Eq Net Rank				*83*	*75*	*15*	*--*	*--*	*26*	*Jul-17*

[1] All Private Equity market values are one quarter lagged unless otherwise noted.

[2] 60% MSCI ACWI IMI Net/40% Barclays Global Aggregate Index composed of 60% MSCI ACWI (Net)/ 40% Barclays Global Aggregate in periods before 2/1/1997.

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	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Invesco (fka OFI) Global Equity	121,718,795	6.1	17.8	0.4	63.7	14.4	17.0	11.4	8.2	Oct-07
MSCI ACWI Net				*4.6*	*54.6*	*12.1*	*13.2*	*9.1*	*5.9*	*Oct-07*
MSCI ACWI Growth				*0.3*	*59.0*	*17.5*	*17.1*	*11.7*	*8.0*	*Oct-07*
eV Global Large Cap Growth Eq Net Rank				*84*	*30*	*86*	*59*	*90*	*63*	*Oct-07*
Walter Scott Global Equity Fund	129,382,951	6.5	18.9	0.1	43.4	15.2	14.9	11.2	11.0	Dec-09
MSCI ACWI Net				*4.6*	*54.6*	*12.1*	*13.2*	*9.1*	*9.8*	*Dec-09*
MSCI ACWI Growth				*0.3*	*59.0*	*17.5*	*17.1*	*11.7*	*12.2*	*Dec-09*
eV Global Large Cap Growth Eq Net Rank				*85*	*92*	*82*	*89*	*91*	*89*	*Dec-09*
NT ACWI Index IMI	162,384,499	8.1	23.7							
Emerging Markets Equity	**63,779,343**	**3.2**	**8.5**	**3.1**	**56.2**	**8.6**	**--**	**--**	**7.6**	**Jan-18**
MSCI Emerging Market IMI Net				*2.9*	*61.1*	*6.3*	*11.7*	*3.6*	*6.2*	*Jan-18*
eV Emg Mkts Equity Net Rank				*53*	*80*	*29*	*--*	*--*	*37*	*Jan-18*
RBC Emerging Markets Equity	63,779,343	3.2	100.0	3.1	56.2	8.6	--	--	7.6	Jan-18
MSCI Emerging Market IMI Net				*2.9*	*61.1*	*6.3*	*11.7*	*3.6*	*6.2*	*Jan-18*
eV Emg Mkts Equity Net Rank				*53*	*80*	*29*	*--*	*--*	*37*	*Jan-18*
Private Equity	**197,395,037**	**9.9**	**20.9**	**-0.1**	**-32.9**	**-6.1**	**-9.3**	**-5.8**	**-1.8**	**Oct-05**
Cambridge Associates US All PE (1 Qtr Lag)				*13.1*	*23.6*	*15.9*	*15.6*	*14.0*	*13.4*	*Oct-05*

[1] All Private Equity market values are one quarter lagged unless otherwise noted.

[2] Lone Star Funds 12/31/2019 valuation used.

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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Total Fixed Income and Cash	**573,382,898**	**28.7**	**28.7**	**-0.4**	**9.7**	**3.2**	**4.3**	**4.3**	**5.1**	**Jul-06**
BBgBarc Multiverse TR				*-4.3*	*5.5*	*2.9*	*2.9*	*2.4*	*3.8*	*Jul-06*
eV All Global Fixed Inc Net Rank				*39*	*70*	*72*	*57*	*39*	*37*	*Jul-06*
Cash Equivalents	**93,553,466**	**4.7**	**16.3**	**0.0**	**0.3**	**1.5**	**1.3**	**--**	**1.3**	**Apr-15**
91 Day T-Bills				*0.0*	*0.1*	*1.4*	*1.1*	*0.6*	*1.0*	*Apr-15*
Public Fixed Income	**474,275,572**	**23.7**	**82.7**	**-0.8**	**11.0**	**3.4**	**5.9**	**4.7**	**5.1**	**Dec-10**
BBgBarc Multiverse TR				*-4.3*	*5.5*	*2.9*	*2.9*	*2.4*	*2.5*	*Dec-10*
eV All Global Fixed Inc Net Rank				*42*	*63*	*69*	*26*	*31*	*26*	*Dec-10*
Short Term Core Bonds	**216,856,551**	**10.9**	**45.7**	**0.0**	**4.3**	**3.6**	**--**	**--**	**2.9**	**Jun-17**
BBgBarc US Aggregate 1-3 Yr TR				*-0.1*	*1.2*	*2.9*	*2.0*	*1.6*	*2.3*	*Jun-17*
IR&M 1-3 Year Strategy	216,856,551	10.9	100.0	0.0	4.3	3.6	--	--	2.9	Jul-17
BBgBarc US Aggregate 1-3 Yr TR				*-0.1*	*1.2*	*2.9*	*2.0*	*1.6*	*2.3*	*Jul-17*
eV US Short Duration Fixed Inc Net Rank				*27*	*34*	*22*	*--*	*--*	*26*	*Jul-17*
Investment Grade Bonds	**74,463,653**	**3.7**	**15.7**	**-2.9**	**2.2**	**--**	**--**	**--**	**3.7**	**Oct-19**
BBgBarc US Aggregate TR				*-3.4*	*0.7*	*4.7*	*3.1*	*3.4*	*2.7*	*Oct-19*
eV US Core Fixed Inc Net Rank				*25*	*70*	*--*	*--*	*--*	*26*	*Oct-19*
Longfellow Core Fixed Income	74,463,653	3.7	100.0	-2.9	--	--	--	--	-0.9	Jul-20
BBgBarc US Aggregate TR				*-3.4*	*0.7*	*4.7*	*3.1*	*3.4*	*-2.1*	*Jul-20*
eV US Core Fixed Inc Net Rank				*25*	*--*	*--*	*--*	*--*	*35*	*Jul-20*
Global Bonds	--	--	--							

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Dallas Police & Fire Pension System

DPFP | As of March 31, 2021

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Bank Loans	**72,461,003**	**3.6**	**15.3**	**1.5**	**14.7**	**4.2**	**6.1**	**--**	**4.3**	**Jan-14**
Credit Suisse Leveraged Loan				*2.0*	*20.8*	*4.1*	*5.3*	*--*	*4.1*	*Jan-14*
eV US Float-Rate Bank Loan Fixed Inc Net Rank				*56*	*84*	*18*	*5*	*--*	*12*	*Jan-14*
Pacific Asset Management Corporate (Bank) Loans	72,331,390	3.6	99.8	1.5	15.0	4.0	--	--	4.2	Aug-17
Credit Suisse Leveraged Loan				*2.0*	*20.8*	*4.1*	*5.3*	*--*	*4.2*	*Aug-17*
eV US Float-Rate Bank Loan Fixed Inc Net Rank				*52*	*81*	*27*	*--*	*--*	*26*	*Aug-17*
Loomis Sayles Senior Rate and Fixed Income	129,613	0.0	0.2							
High Yield Bonds	**74,659,167**	**3.7**	**15.7**	**0.2**	**27.5**	**4.5**	**8.2**	**5.7**	**6.2**	**Dec-10**
BBgBarc Global High Yield TR				*-1.0*	*24.7*	*4.7*	*6.8*	*6.0*	*6.2*	*Dec-10*
eV Global High Yield Fixed Inc Net Rank				*77*	*26*	*82*	*9*	*85*	*48*	*Dec-10*
Loomis US High Yield Fund	74,659,167	3.7	100.0	0.4	--	--	--	--	0.4	Jan-21
BBgBarc US High Yield 2% Issuer Cap TR				*0.9*	*23.6*	*6.8*	*8.0*	*6.5*	*0.9*	*Jan-21*
eV US High Yield Fixed Inc Net Rank				*76*	*--*	*--*	*--*	*--*	*76*	*Jan-21*
Emerging Markets Debt	**35,835,198**	**1.8**	**7.6**	**-6.5**	**22.1**	**-0.4**	**4.1**	**2.5**	**2.9**	**Dec-10**
50% JPM EMBI/50% JPM GBI-EM				*-5.6*	*14.5*	*1.7*	*4.1*	*3.0*	*3.2*	*Dec-10*
eV All Emg Mkts Fixed Inc Net Rank				*82*	*26*	*80*	*67*	*69*	*66*	*Dec-10*
Ashmore EM Blended Debt	35,835,198	1.8	100.0	-6.5	22.1	-0.4	--	--	0.4	Dec-17
Ashmore Blended Debt Benchmark				*-4.6*	*13.3*	*1.7*	*3.9*	*2.9*	*2.2*	*Dec-17*
eV All Emg Mkts Fixed Inc Net Rank				*82*	*26*	*80*	*--*	*--*	*89*	*Dec-17*
Private Debt	**5,553,860**	**0.3**	**1.0**	**23.0**	**3.1**	**4.2**	**-1.3**	**--**	**-0.9**	**Jan-16**
Barclays Global High Yield +2%				*-0.5*	*27.2*	*6.8*	*8.9*	*--*	*9.4*	*Jan-16*

[1] The Loomis Sayles Senior Rate and Fixed Income market value is a residual balance.

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DPFP | As of March 31, 2021

	Market Value ($)	% of Portfolio	% of Sector	QTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	S.I. (%)	S.I. Date
Total Real Assets	**479,686,654**	**24.0**	**24.0**	**1.4**	**-2.4**	**0.2**	**3.3**	**-1.7**	**-1.7**	**Dec-10**
Total Real Assets Policy Index				*1.4*	*2.3*	*4.9*	*5.7*	*9.7*	*10.0*	*Dec-10*
Real Estate	**305,769,514**	**15.3**	**63.7**	**-0.6**	**-2.6**	**1.4**	**2.9**	**-3.5**	**3.5**	**Mar-85**
NCREIF Property (1-quarter lagged)				*1.2*	*1.6*	*4.9*	*5.9*	*9.0*	*7.8*	*Mar-85*
Natural Resources	**131,356,859**	**6.6**	**27.4**	**6.6**	**3.2**	**1.1**	**0.4**	**3.2**	**4.0**	**Dec-10**
NCREIF Farmland Total Return Index 1Q Lag				*1.6*	*3.1*	*4.9*	*5.6*	*10.4*	*10.8*	*Dec-10*
Infrastructure	**42,560,281**	**2.1**	**8.9**	**1.5**	**-17.1**	**-11.0**	**3.7**	**--**	**2.7**	**Jul-12**
S&P Global Infrastructure TR USD				*3.0*	*37.0*	*5.7*	*6.8*	*6.3*	*7.3*	*Jul-12*

[1] All Private Market market values are one quarter lagged unless otherwise noted.

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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.

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Credit Risk: Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security).

Duration: Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

Information Ratio: This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

Jensen's Alpha: A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk. Portfolio Return- [Risk Free Rate+Beta*(market return-Risk Free Rate)].

Market Capitalization: For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

Market Weighted: Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

Maturity: The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

Prepayment Risk: The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

Price-Book Value (P/B) Ratio: The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

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Price-Earnings (P/E) Ratio: A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about is future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

Quality Rating: The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

Sharpe Ratio: A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

STIF Account: Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

Standard Deviation: A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

Style: The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

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Yield to Maturity: The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a "basis book." For example, a 5% bond pays $5 a year interest on each $100 par value. To figure its current yield, divide $5 by $95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay $100 for the bond that can be bought now for $95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{\text{5\% (discount)}}{\text{5 (yrs. to maturity)}} = \begin{matrix}\text{1\% pro rata, plus} \\ \text{5.26\% (current yield)}\end{matrix} = \text{6.26\% (yield to maturity)}$$

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: Investment Terminology, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

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Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.

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Dallas Police & Fire Pension System

As of December 31, 2020

Private Markets Review

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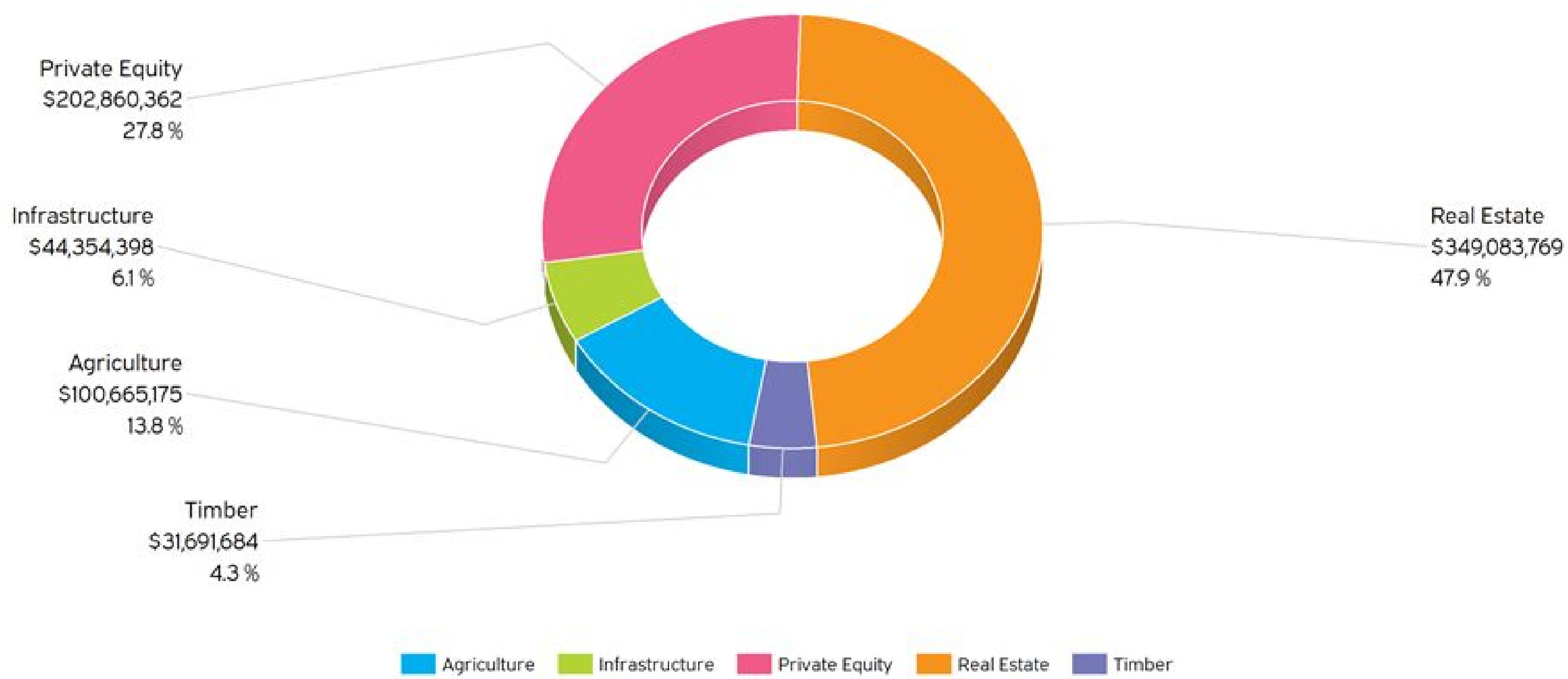
Dallas Police & Fire Pension System

Private Markets Review | As of December 31, 2020

Private Market Investments as of December 31, 2020
Market Value Allocation by Asset Class



1. Private Equity is composed of Private Equity and Private Debt

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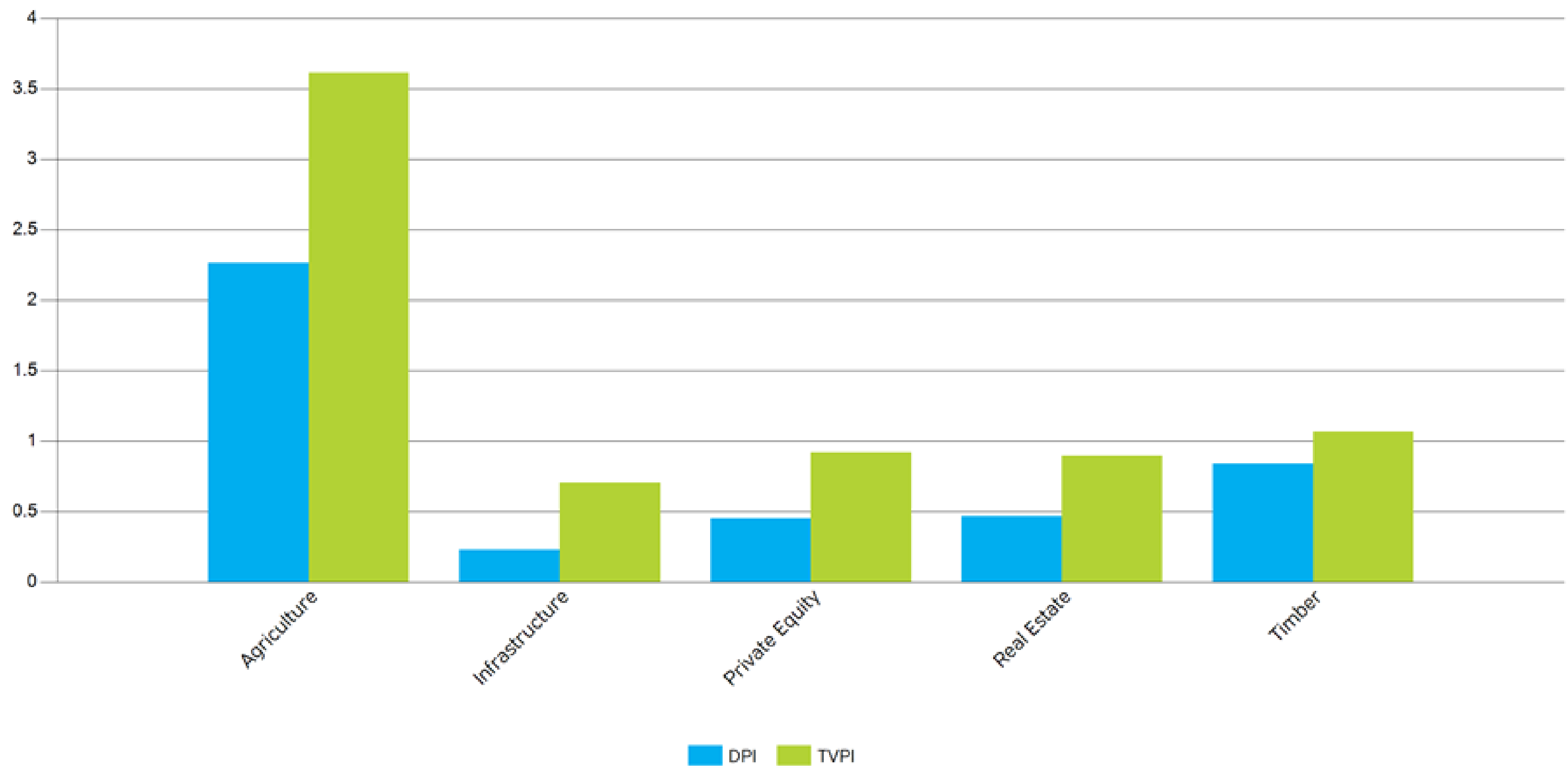
Dallas Police & Fire Pension System

Private Markets Review | As of December 31, 2020

Private Market Investments as of December 31, 2020
DPI and TVPI by Asset Class



1. Private Equity is composed of Private Equity and Private Debt
2. Private markets performance reflected is composed of active investments only

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Dallas Police & Fire Pension System

Private Markets Review | As of December 31, 2020

Private Market Investments Overview											
Active Funds	Commitments		Distributions & Valuations				Performance				
Asset Class	Commitment ($)	Paid In Capital ($)	Distributions ($)	Valuation ($)	Total Value ($)	Gain/Loss ($)	Call Ratio	DPI	TVPI	IRR (%)
Total Agriculture	74,420,001	74,420,001	168,592,840	100,665,175	269,258,015	194,838,014	1.00	2.27	3.62	14.93
Total Infrastructure	97,000,000	93,370,822	21,669,031	44,354,398	66,023,429	-27,347,393	0.96	0.23	0.71	-5.71
Total Private Equity	414,534,369	446,210,016	195,244,579	202,860,362	398,104,941	-48,105,075	1.08	0.44	0.89	-1.90
Total Real Estate	825,129,666	814,490,922	378,046,882	349,083,769	727,130,651	-87,360,271	0.99	0.46	0.89	-1.56
Total Timber	142,522,504	142,522,504	119,730,209	31,691,684	151,421,893	8,899,389	1.00	0.84	1.06	1.12
Total	**1,553,606,540**	**1,571,014,265**	**883,283,540**	**728,655,389**	**1,611,938,929**	**40,924,664**	**1.01**	**0.56**	**1.03**	**0.40**

1. Private Equity is composed of Private Equity and Private Debt
2. Private markets performance reflected is composed of active investments only
3. Commitment value is equal to paid in capital for direct investments made outside of a traditional limited partnership fund structure.

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Dallas Police & Fire Pension System

Active Funds with Unfunded Commitments Overview | As of December 31, 2020

Active Funds with Unfunded Commitments				
Active Funds		Commitments		
Investment Name	Vintage Year	Commitment ($)	Paid In Capital ($)	Unfunded Commitment ($)
Infrastructure				
TRG AIRRO	2008	37,000,000	37,566,772	2,760,659
TRG AIRRO II	2013	10,000,000	7,219,074	2,368,615
JPM Maritime Fund, LP	2009	50,000,000	48,584,975	1,365,941
Total Infrastructure		**97,000,000**	**93,370,822**	**6,495,215**
Private Equity				
Huff Energy Fund LP	2006	100,000,000	99,039,897	119,979
Industry Ventures Partnership IV	2016	5,000,000	3,629,985	1,130,000
Lone Star Growth Capital	2006	16,000,000	26,679,375	2,240,000
Riverstone Credit Partners LP	2016	10,000,000	12,242,390	514,296
Yellowstone Capital	2008	5,283,254	5,112,307	170,947
Total Private Equity		**136,283,254**	**146,703,954**	**4,175,222**
Real Estate				
Hearthstone MS II Homebuilding Investors	1999	10,000,000	7,973,058	1,008,131
Hearthstone MS III Homebuilding Investors	2003	10,000,000	1,221,446	1,997,675
Total Real Estate		**20,000,000**	**9,194,504**	**3,005,806**
Total		**253,283,254**	**249,269,279**	**13,676,243**

1. Private markets performance reflected is composed of active investments only
2. The funds and figures above represent investments with unfunded capital commitments

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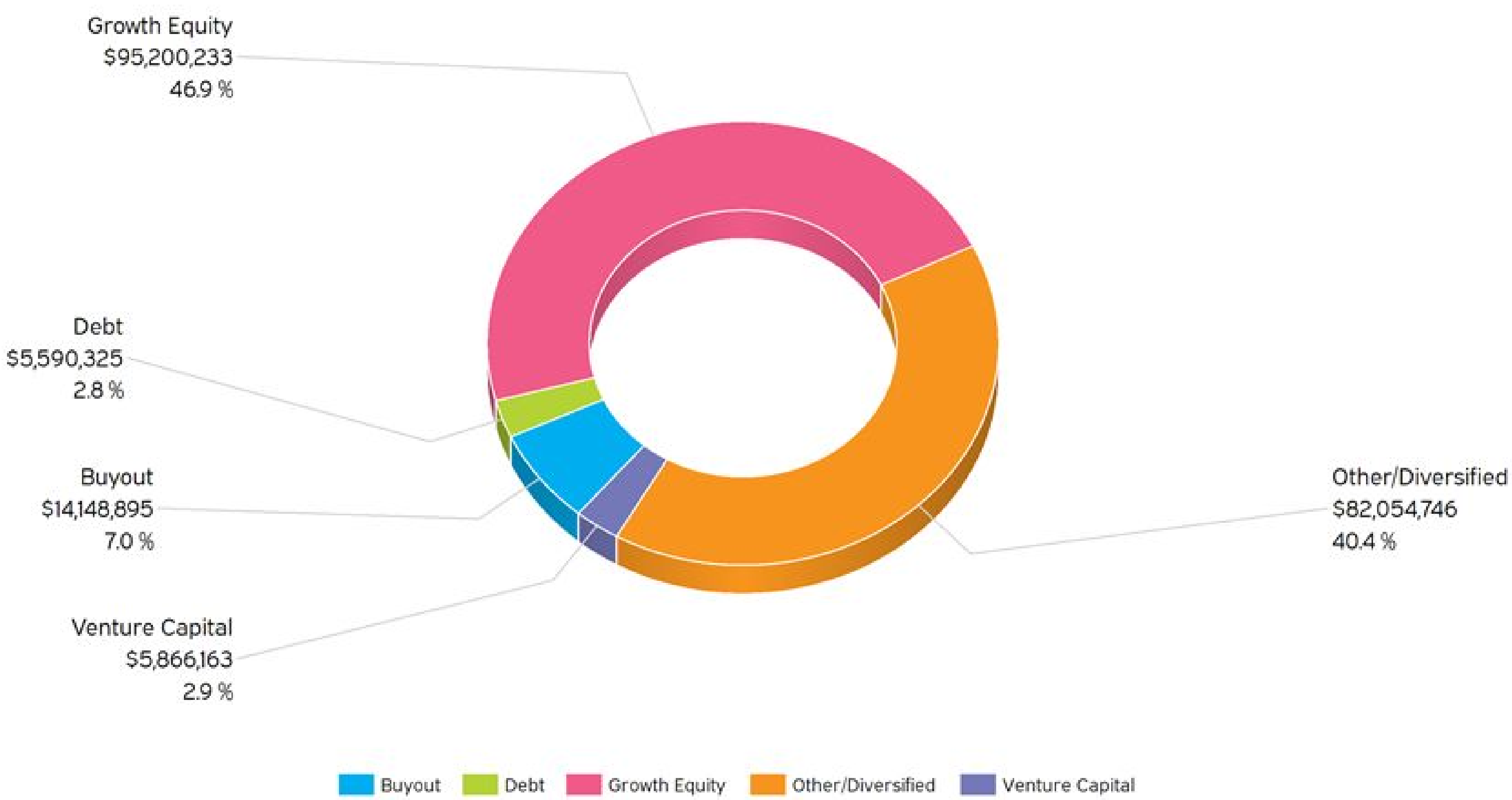
Dallas Police & Fire Pension System

Private Equity and Debt | As of December 31, 2020

Private Equity and Debt Investments as of December 31, 2020
Market Value Allocation by Strategy



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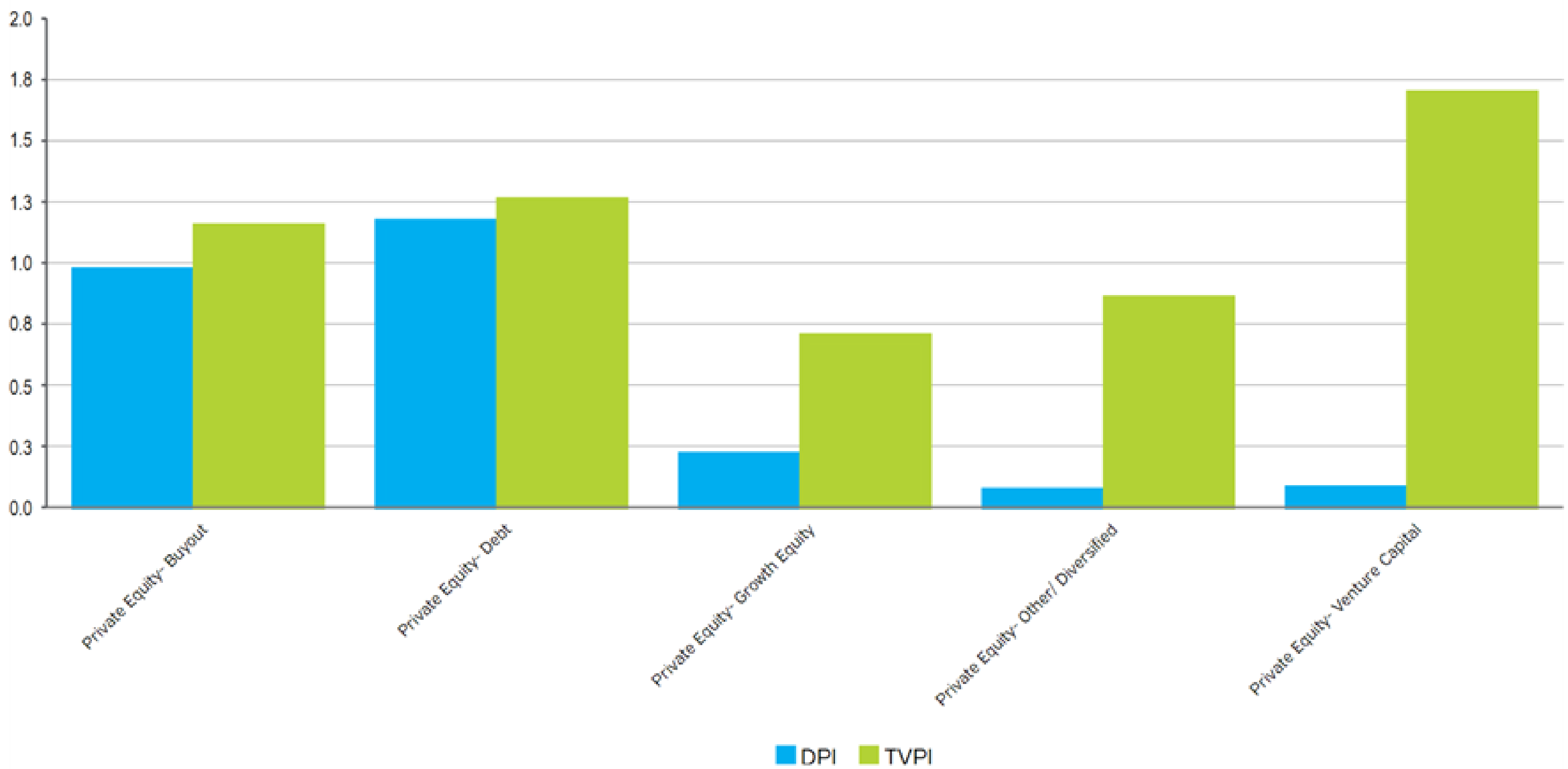
Dallas Police & Fire Pension System

Private Equity and Debt | As of December 31, 2020

Private Equity and Debt Investments as of December 31, 2020
DPI and TVPI by Strategy



1. Private markets performance reflected is composed of active investments only

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Dallas Police & Fire Pension System

Private Equity and Debt | As of December 31, 2020

Private Equity and Debt Investments Overview

Active Funds		Commitments		Distributions & Valuations				Performance			
Investment Name	Vintage Year	Commitment ($)	Paid In Capital ($)	Distributions ($)	Valuation ($)	Total Value ($)	Gain/Loss ($)	Call Ratio	DPI	TVPI	IRR (%)
Buyout											
Huff Alternative Fund	2000	66,795,718	78,833,017	75,678,933	14,148,895	89,827,828	10,994,811	1.18	0.96	1.14	1.58
Total Buyout		**66,795,718**	**78,833,017**	**75,678,933**	**14,148,895**	**89,827,828**	**10,994,811**	**1.18**	**0.96**	**1.14**	**1.58**
Debt											
Highland Crusader Fund	2003	50,955,397	50,955,397	64,514,016	1,331,907	65,845,923	14,890,526	1.00	1.27	1.29	4.38
Riverstone Credit Partners LP	2016	10,000,000	12,242,390	8,698,657	4,258,418	12,957,075	714,685	1.22	0.71	1.06	3.29
Total Debt		**60,955,397**	**63,197,787**	**73,212,673**	**5,590,325**	**78,802,998**	**15,605,211**	**1.04**	**1.16**	**1.25**	**4.32**
Growth Equity											
Hudson Clean Energy	2009	25,000,000	24,994,470	4,732,352	1,010,970	5,743,322	-19,251,148	1.00	0.19	0.23	-22.07
Lone Star CRA	2008	50,000,000	58,869,580	12,928,698	78,230,000	91,158,698	32,289,118	1.18	0.22	1.55	10.81
Lone Star Growth Capital	2006	16,000,000	26,679,375	12,800,000	9,995,307	22,795,307	-3,884,068	1.67	0.48	0.85	-4.98
Lone Star Opportunities V	2012	75,000,000	75,153,125	531,444	3,839,000	4,370,444	-70,782,681	1.00	0.01	0.06	-53.82
Lone Star Bridge Loan	2020	500,000	500,000	0	551,146	551,146	51,146	1.00	0.00	1.10	0.21
North Texas Opportunity Fund	2000	10,000,000	10,000,000	9,127,239	1,573,810	10,701,049	701,049	1.00	0.91	1.07	0.75
Total Growth Equity		**176,500,000**	**196,196,550**	**40,119,733**	**95,200,233**	**135,319,966**	**-60,876,584**	**1.11**	**0.20**	**0.69**	**-9.07**
Other/Diversified											
Huff Energy Fund LP	2006	100,000,000	99,039,897	4,477,394	82,054,746	86,532,140	-12,507,757	0.99	0.05	0.87	-1.27
Yellowstone Capital	2008	5,283,254	5,112,307	1,465,725	0	1,465,725	-3,646,582	0.97	0.29	0.29	-31.26
Total Other/Diversified		**105,283,254**	**104,152,204**	**5,943,119**	**82,054,746**	**87,997,865**	**-16,154,339**	**0.99**	**0.06**	**0.84**	**-1.60**
Venture Capital											
Industry Ventures Partnership IV	2016	5,000,000	3,629,985	244,921	5,866,163	6,111,084	2,481,099	0.73	0.07	1.68	20.56
Total Venture Capital		**5,000,000**	**3,629,985**	**244,921**	**5,866,163**	**6,111,084**	**2,481,099**	**0.73**	**0.07**	**1.68**	**20.56**
Unclassified											
Miscellaneous Private Equity Expenses	2016		200,473	45,200							
Total Unclassified			**200,473**	**45,200**							
Total		**414,534,369**	**446,210,016**	**195,244,579**	**202,860,362**	**398,104,941**	**-48,105,075**	**1.08**	**0.44**	**0.89**	**-1.90**

1. Private Markets performance reflected is composed of active investments only.
2. LSGC valuation from LSGC 12/31/19 audited financials. Other Lone Star valuations are as of 12/31/19, providedby Conway Mackenzie.
3. Huff Alternative Fund, North Texas Opportunity Fund and Huff Energy Fund LP valuations are as of 9/30/2020.

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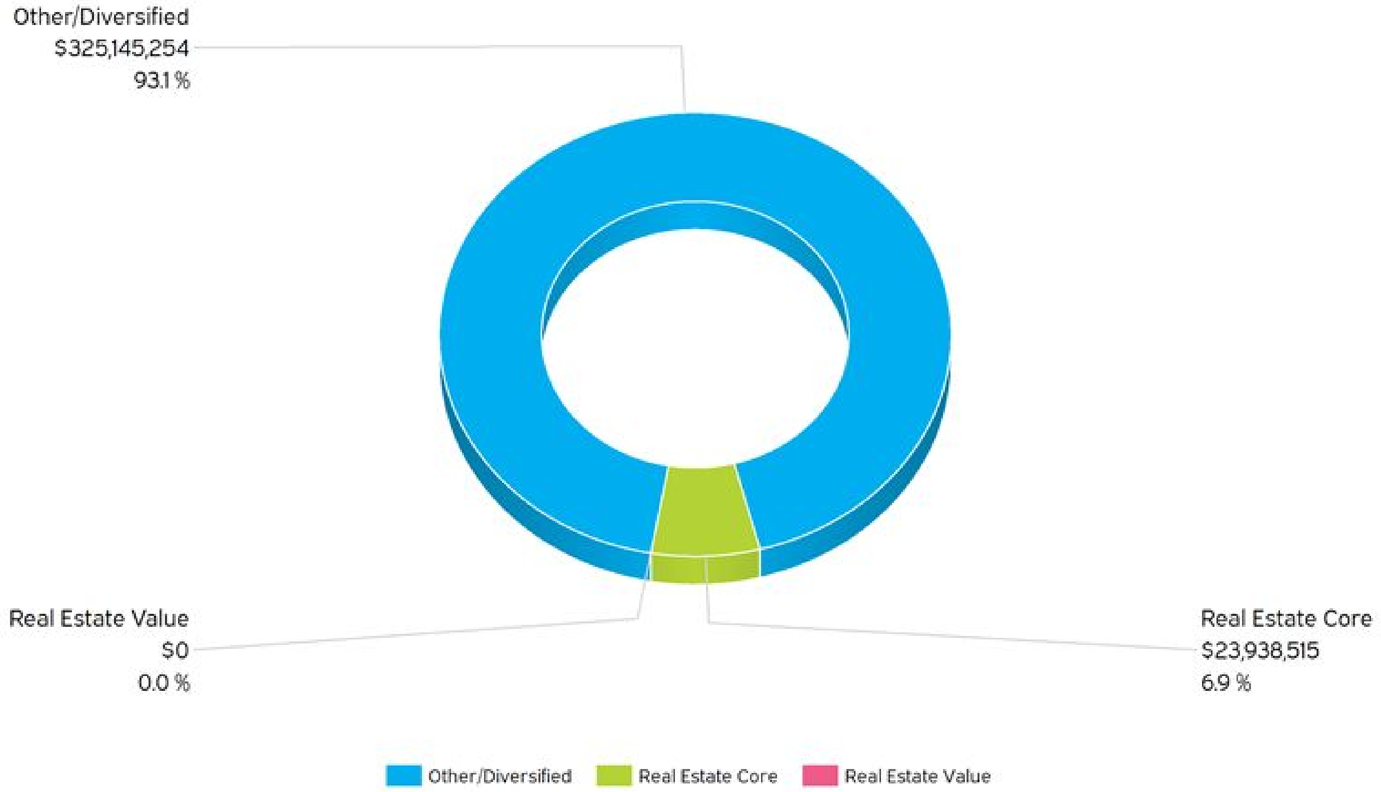
Dallas Police & Fire Pension System

Real Estate | As of December 31, 2020

Real Estate Investments as of December 31, 2020
Market Value Allocation by Strategy



1. Other/Diversified is composed of direct real estate investments made by the fund

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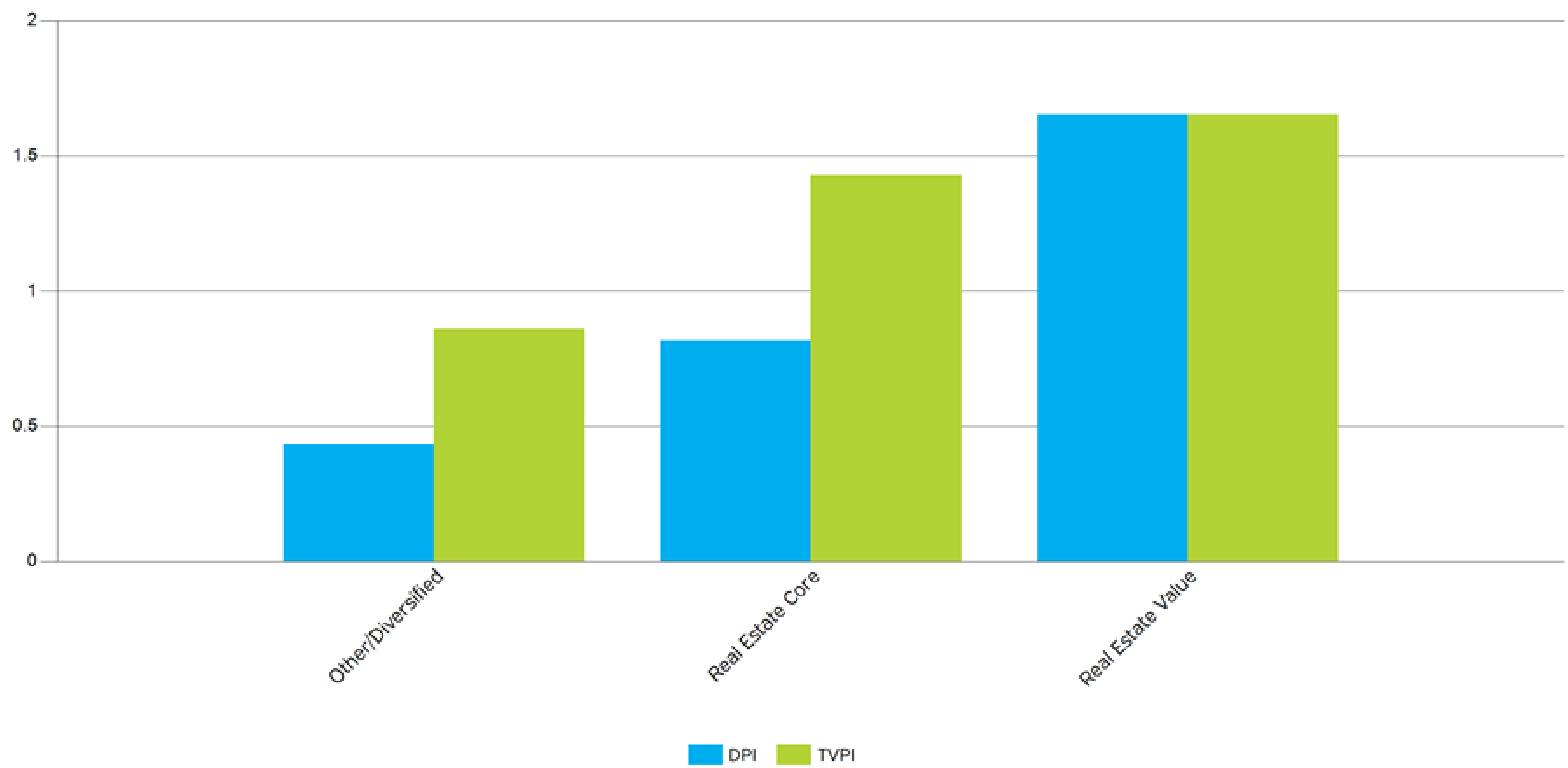
Dallas Police & Fire Pension System

Real Estate | As of December 31, 2020

Real Estate Investments as of December 31, 2020
DPI and TVPI by Strategy



1. Other/Diversified is composed of direct real estate investments made by the fund
2. Private markets performance reflected is composed of active investments only

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Dallas Police & Fire Pension System

Real Estate | As of December 31, 2020

Real Estate Investments Overview											
Active Funds	Commitments		Valuations				Performance				
Investment Name	Commitment ($)	Paid In Capital ($)	Distributions ($)	Valuation ($)	Total Value ($)	Gain/Loss ($)	Call Ratio	DPI	TVPI	IRR (%)
Total Other/Diversified	765,614,967	765,614,967	329,882,447	325,145,254	655,027,701	-110,587,266	1.00	0.43	0.86	-2.08
Real Estate Core										
Total Real Estate Core	39,514,699	39,514,699	32,212,353	23,938,515	56,150,868	16,636,169	1.00	0.82	1.42	4.90
Real Estate Value										
Total Real Estate Value	20,000,000	9,194,504	15,206,576	0	15,206,576	6,012,072	0.46	1.65	1.65	25.93
Total	**825,129,666**	**814,490,922**	**378,046,882**	**349,083,769**	**727,130,651**	**-87,360,271**	**0.99**	**0.46**	**0.89**	**-1.56**

1. Private markets performance reflected is composed of active investments only.

2. Commitment value is equal to paid in capital for direct investments made outside of a traditional limited partnership fund structure.

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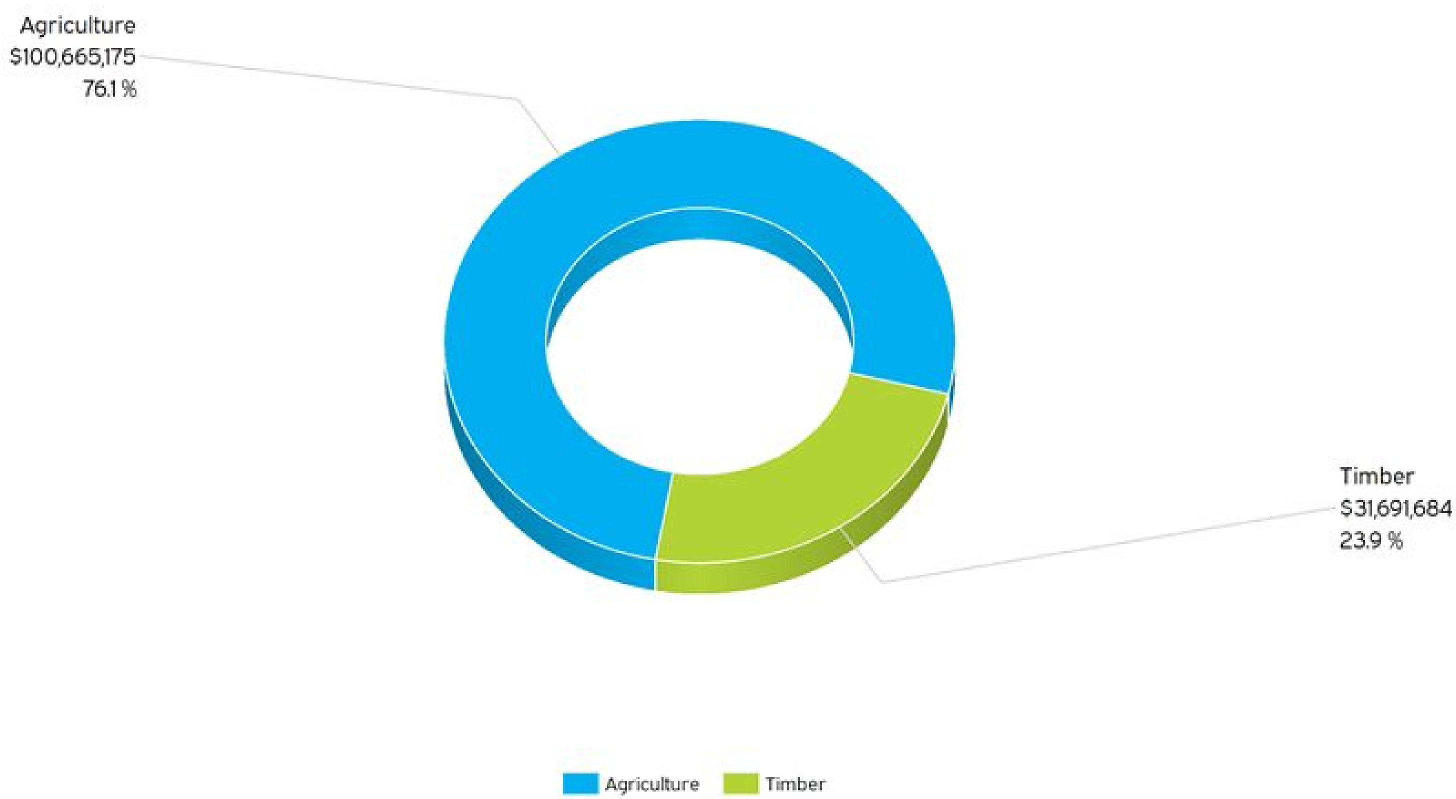
Dallas Police & Fire Pension System

Natural Resources | As of December 31, 2020

Natural Resources Investments as of December 31, 2020
Market Value Allocation by Asset Class



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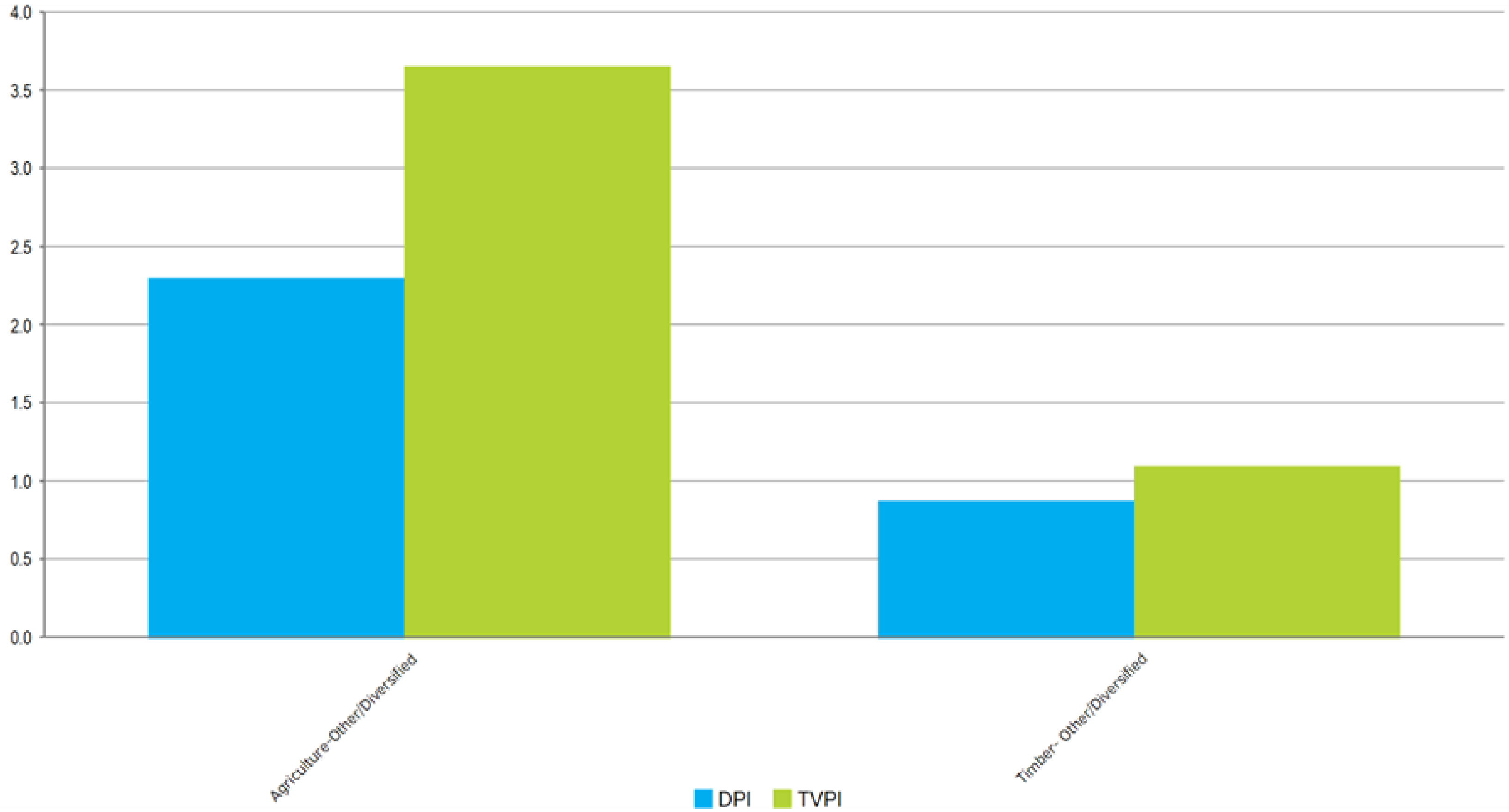
Dallas Police & Fire Pension System

Natural Resources | As of December 31, 2020

Natural Resource Investments as of December 31, 2020
DPI and TVPI by Strategy



1. Agriculture 'Other/Diversified' is composed of permanent and row crops exposure.
2.Timber 'Other/Diversified' is composed of domestic and global timber exposure.
3. Private markets performance reflected is composed of active investments only

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Dallas Police & Fire Pension System

Natural Resources | As of December 31, 2020

Natural Resource Investments Overview												
Active Funds		Commitments		Valuations				Performance				
Investment Name	Vintage Year	Commitment ($)	Paid In Capital ($)	Distributions ($)	Valuation ($)	Total Value ($)	Unrealized Gain/Loss ($)	Call Ratio	DPI	TVPI	IRR (%)
Agriculture											
Hancock Agricultural	1998	74,420,001	74,420,001	168,592,840	100,665,175	269,258,015	194,838,014	1.00	2.27	3.62	14.93
Total Agriculture		**74,420,001**	**74,420,001**	**168,592,840**	**100,665,175**	**269,258,015**	**194,838,014**	**1.00**	**2.27**	**3.62**	**14.93**
Timber											
BTG Pactual	2006	82,872,808	82,872,808	18,300,000	27,861,535	46,161,535	-36,711,273	1.00	0.22	0.56	-7.56
Forest Investment Associates	1992	59,649,696	59,649,696	101,430,209	3,830,149	105,260,358	45,610,662	1.00	1.70	1.76	7.44
Total Timber		**142,522,504**	**142,522,504**	**119,730,209**	**31,691,684**	**151,421,893**	**8,899,390**	**1.00**	**0.84**	**1.07**	**1.12**
Total		**216,942,505**	**216,942,505**	**288,323,049**	**132,356,859**	**420,679,908**	**203,737,404**	**1.00**	**1.33**	**1.94**	**8.82**

1. Private markets performance reflected is composed of active investments only
2. Commitment value is equal to paid in capital for direct investments made outside of a traditional limited partnership fund structure.

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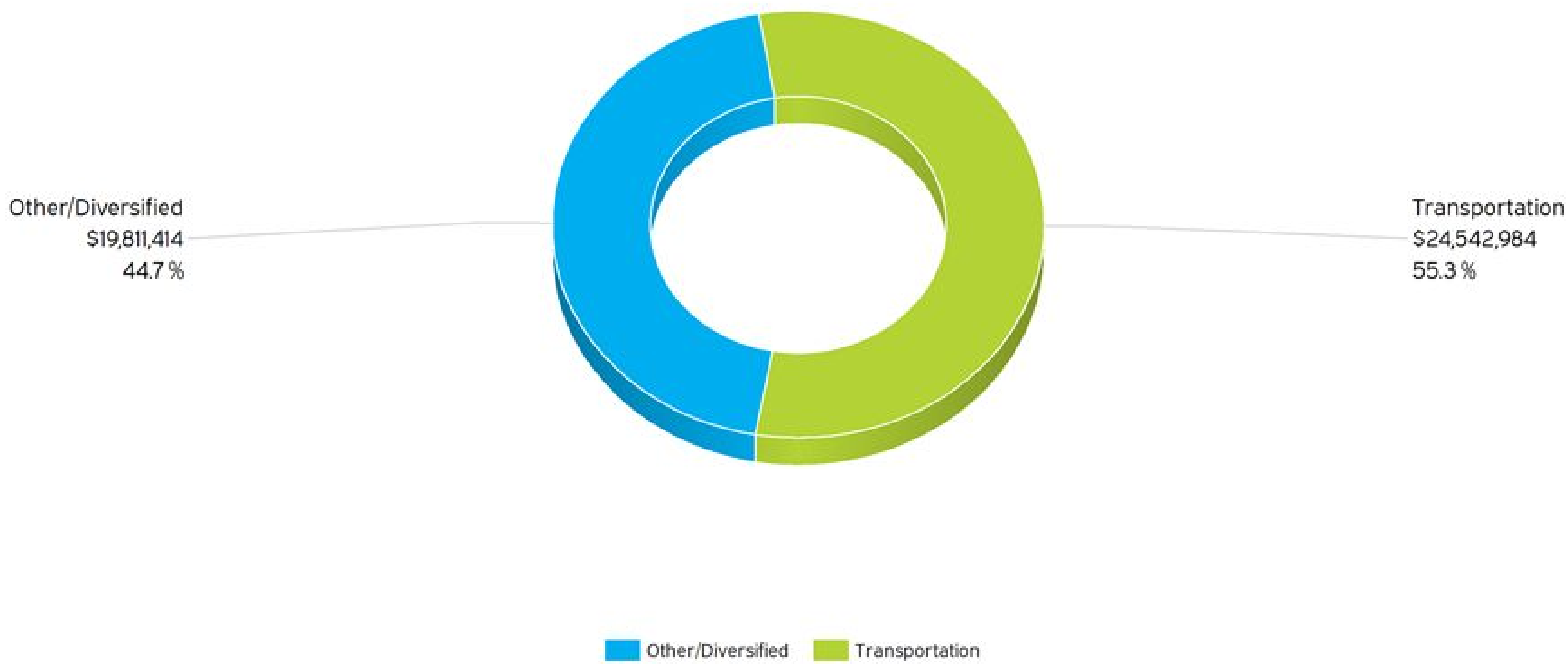
Dallas Police & Fire Pension System

Infrastructure | As of December 31, 2020

Infrastructure Investments as of December 31, 2020
Market Value Allocation by Strategy



1.'Other/Diversified' is composed of various operating and developing infrastructure project exposure

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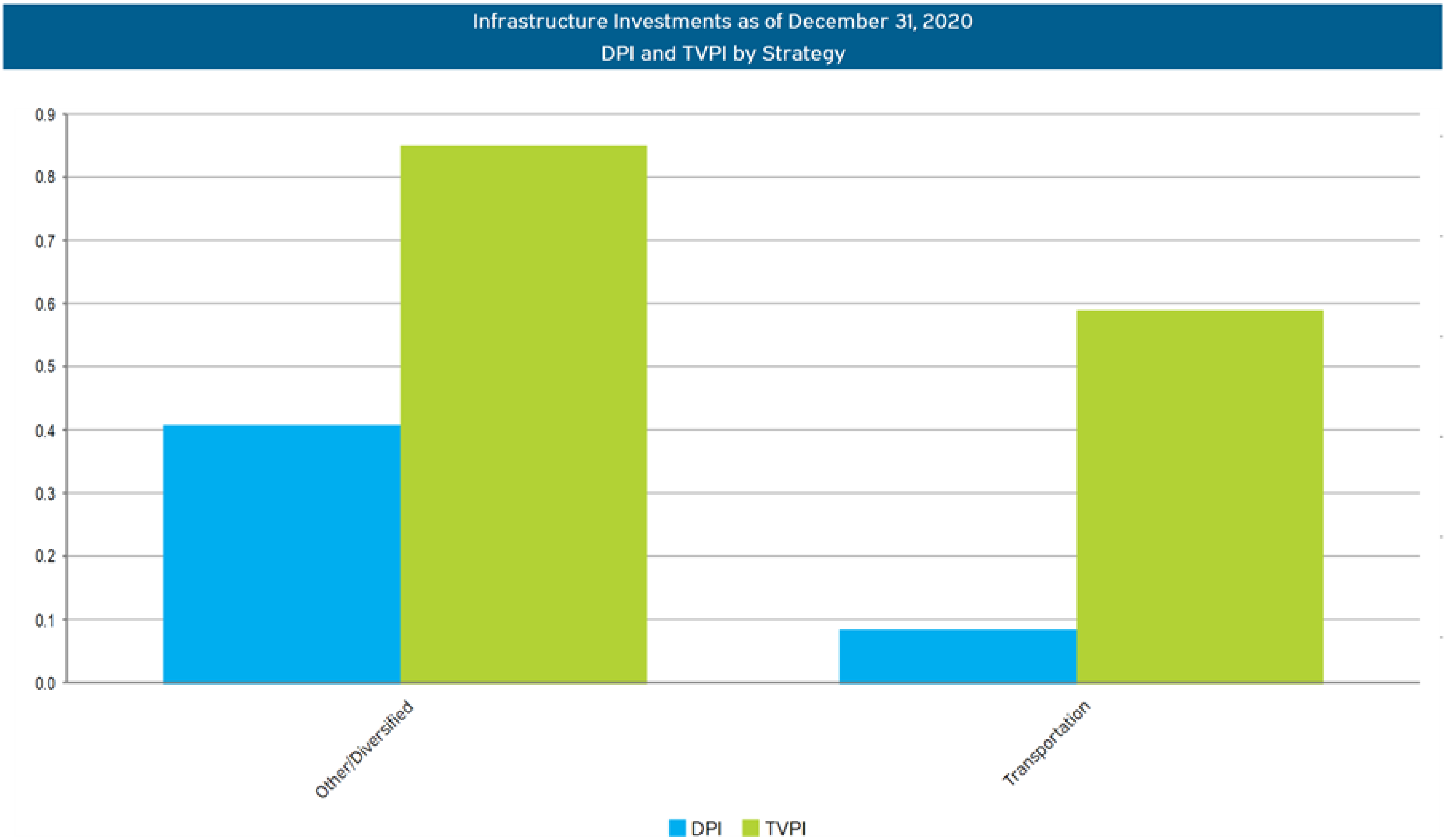
Dallas Police & Fire Pension System

Infrastructure | As of December 31, 2020



1. Other/Diversified' is composed of various operating and developing infrastructure project exposure
2. Private markets performance reflected is composed of active investments only

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Dallas Police & Fire Pension System

Infrastructure | As of December 31, 2020

Infrastructure Investments Overview

Active Funds		Commitments		Distributions & Valuations				Performance			
Investment Name	Vintage Year	Commitment ($)	Paid In Capital ($)	Distributions ($)	Valuation ($)	Total Value ($)	Gain/Loss ($)	Call Ratio	DPI	TVPI	IRR (%)
Infrastructure											
TRG AIRRO	2008	37,000,000	37,566,772	17,873,234	16,213,332	34,086,566	-3,480,206	1.02	0.48	0.91	-1.44
TRG AIRRO II	2013	10,000,000	7,219,074	58,731	3,598,082	3,656,813	-3,562,261	0.72	0.01	0.51	-9.54
JPM Maritime Fund, LP	2009	50,000,000	48,584,975	3,737,066	24,542,984	28,280,050	-20,304,926	0.97	0.08	0.58	-9.21
Total Infrastructure		**97,000,000**	**93,370,822**	**21,669,031**	**44,354,398**	**66,023,429**	**-27,347,393**	**0.96**	**0.23**	**0.71**	**-5.71**

1. Private markets performance reflected is composed of active investments only

Private Markets Review
List of Completed Funds

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Dallas Police & Fire Pension System

Private Markets Review | As of December 31, 2020

Total Real Assets Program

Completed Funds	Vintage Year	Commitment Amount	Paid in Capital	Capital to be Funded	Addtnl Fees	Cummulative Distributions	Valuation	Total Value	Gain/Loss	DPI Ratio	TVPI Ratio	IRR
AEW Creative Holdings	2007	13,035,849	13,035,849	0	0	0	0	0	-13,035,849	0.00	0.00	N/A
Barings Lake Luciana	2006	95,025,191	95,025,191	0	0	17,872,293	0	17,872,293	-77,152,898	0.19	0.19	-19.89%
Barings Lake P&F Real Estate	2010	18,112,486	18,112,486	0	0	4,227,991	0	4,227,991	-13,884,495	0.23	0.23	-15.79%
BTG U.S. Timberland	2007	22,230,000	22,230,000	0	0	33,065,920	0	33,065,920	10,835,920	1.49	1.49	4.82%
CDK Multifamily I	2014	10,559,876	10,617,376	0	0	10,025,434	0	10,025,434	-591,942	0.94	0.94	-1.99%
Clarion 1210 South Lamar	2014	10,500,000	10,201,489	0	0	13,214,065	0	13,214,065	3,012,576	1.30	1.30	12.85%
Clarion 4100 Harry Hines Land	2006	3,088,810	3,092,788	0	0	3,641,946	0	3,641,946	549,158	1.18	1.18	1.69%
Clarion Beat Lofts	2005	8,729,783	8,730,183	0	0	1,137,817	0	1,137,817	-7,592,366	0.13	0.13	-30.76%
Clarion Bryan Street Lofts	2005	5,112,048	5,112,048	0	0	4,163,659	0	4,163,659	-948,389	0.81	0.81	-2.23%
Clarion Four Leaf	2005	16,892,767	16,892,767	0	0	3,733,148	0	3,733,148	-13,159,619	0.22	0.22	-39.69%
Clarion The Tribute	2007	29,929,676	29,929,676	0	0	47,138,778	0	47,138,778	17,209,102	1.57	1.57	4.84%
Hearthstone Dry Creek	2005	52,303,043	52,303,043	0	0	8,973,059	0	8,973,059	-43,329,984	0.17	0.17	-38.78%
Hearthstone Nampa	2006	11,666,284	11,666,284	0	0	2,562,654	0	2,562,654	-9,103,630	0.22	0.22	-31.90%
JP Morgan Infrastructure Investments Fund	2007	37,000,000	37,000,000	0	-5,658	44,302,131	0	44,302,131	7,307,789	1.20	1.20	2.48%
L&B Realty Advsiors Beach Walk	2006	33,013,796	33,013,796	0	0	36,752,690	0	36,752,690	3,738,894	1.11	1.11	2.19%
L&B Realty Advisors KO Olina	2008	28,609,658	28,609,658	0	0	30,529,136	0	30,529,136	1,919,478	1.07	1.07	1.11%
L&B Realty Advisors West Bay Villas	2007	8,712,411	8,712,411	0	0	3,785,480	0	3,785,480	-4,926,931	0.43	0.43	-8.29%
LBJ Infrastructure Group Holdings, LLC (LBJ)	2009	50,000,000	44,346,229	0	0	77,892,000	0	77,892,000	33,545,771	1.76	1.76	12.77%
Lone Star Fund III (U.S.), L.P.	2000	20,000,000	19,827,576	0	0	40,701,250	0	40,701,250	20,873,674	2.05	2.05	31.88%
Lone Star Fund IV (U.S.), L.P.	2001	20,000,000	19,045,866	0	0	43,898,442	0	43,898,442	24,852,576	2.30	2.30	30.15%
Lone Star Fund V (U.S.), L.P.	2005	22,500,000	22,275,229	0	0	20,605,895	0	20,605,895	-1,669,334	0.93	0.93	-1.41%
Lone Star Fund VI (U.S.), L.P.	2008	25,000,000	20,034,018	0	0	31,712,968	0	31,712,968	11,678,950	1.58	1.58	21.76%
Lone Star Real Estate Fund (U.S.), L.P.	2008	25,000,000	20,743,769	0	0	25,403,707	0	25,403,707	4,659,938	1.22	1.22	5.15%
Lone Star Real Estate Fund II	2011	25,000,000	22,169,907	0	0	32,789,371	0	32,789,371	10,619,464	1.48	1.48	24.73%
Lone Star Real Estate Fund III	2014	25,000,000	23,490,784	0	0	26,638,028	0	26,638,028	3,147,244	1.13	1.13	8.20%
M&G Real Estate Debt Fund II	2013	29,808,841	21,523,663	0	0	17,088,107	0	17,088,107	-4,435,556	0.79	0.79	-15.04%
NTE 3a-3b	2012	50,000,000	23,794,565	0	0	28,186,978	0	28,186,978	4,392,413	1.18	1.18	16.03%
NTE Mobility Partners Holding, LLC (NTE)	2009	50,000,000	43,397,054	0	0	105,890,000	0	105,890,000	62,492,946	2.44	2.44	19.33%
Olympus II-Hyphen Solutions	2007	836,511	836,511	0	0	1,418,149	0	1,418,149	581,638	1.70	1.70	5.96%
P&F Housing IV	2006	134,015,889	134,015,889	0	0	83,179,802	0	83,179,802	-50,836,087	0.62	0.62	-8.44%
RREEF North American Infrastructure Fund	2007	50,000,000	50,000,000	0	846,289	55,238,755	0	55,238,755	4,392,466	1.09	1.09	12.59%
Sungate	2005	6,481,568	6,481,568	0	0	308,624	0	308,624	-6,172,944	0.05	0.05	-22.30%
Tucson Loan	2014	4,500,000	4,500,000	0	0	5,082,785	0	5,082,785	582,785	1.13	1.13	5.75%
Total Completed Funds		**942,664,487**	**880,767,673**	**0**	**840,631**	**861,161,062**	**0**	**861,161,062**	**-20,447,242**	**0.98**	**0.98**	

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Dallas Police & Fire Pension System

Private Markets Review | As of December 31, 2020

Private Equity & Debt Funds												
Completed Funds	**Vintage Year**	**Commitment Amount**	**Paid in Capital**	**Capital to be Funded**	**Addtnl Fees**	**Cummulative Distributions**	**Valuation**	**Total Value**	**Gain/Loss**	**DPI Ratio**	**TVPI Ratio**	**IRR**
Ashmore Global Special Situations Fund IV	2007	70,000,000	70,012,300	0	0	39,652,711	0	39,652,711	-30,359,589	0.57	0.57	-10.12%
BankCap Partners Fund I	2007	20,000,000	20,000,000	0	0	24,960,986	0	24,960,986	4,960,986	1.25	1.25	2.58%
BankCap Partners Opportunity Fund, LP	2013	20,000,000	19,587,052	0	0	18,266,454	0	18,266,454	-1,320,598	0.93	0.93	-5.69%
CDK Southern Cross	2008	1,535,316	1,535,316	0	0	0	0	0	-1,535,316	0.00	0.00	-20.08%
Highland Credit Ops	2006	35,348,165	35,348,165	0	0	29,994,190	0	29,994,190	-5,353,975	0.85	0.85	-2.06%
HM Capital Sector Performance Fund	2008	47,300,000	44,354,248	0	1,933,378	39,792,545	0	39,792,545	-6,495,081	0.86	0.86	-4.01%
Huff Alternative Income Fund	1994	40,000,000	40,000,000	0	2,018,676	66,940,198	0	66,940,198	24,921,522	1.59	1.59	17.82%
Kainos Capital Partners, L.P.	2013	35,000,000	30,316,015	0	0	43,263,688	0	43,263,688	12,947,673	1.43	1.43	24.76%
Levine Leichtman Capital Partners IV	2008	50,000,000	38,009,085	0	0	78,916,788	0	78,916,788	40,907,703	2.08	2.08	20.12%
Levine Leichtman Capital Partners V, L.P.	2013	25,000,000	19,181,272	0	-4,405	24,506,336	0	24,506,336	5,329,469	1.28	1.28	15.26%
Levine Leichtman Deep Value Fund	2006	75,000,000	75,000,000	0	11,025,662	88,688,224	0	88,688,224	2,662,562	1.03	1.03	0.73%
Levin Leichtman Private Capital Solutions II, L.P.	2012	25,000,000	17,961,807	0	-175	18,691,764	0	18,691,764	730,132	1.04	1.04	1.30%
Lone Star Fund IX (U.S.), L.P.	2014	35,000,000	24,241,467	0	0	23,459,730	0	23,459,730	-781,737	0.97	0.97	-3.28%
Lone Star Fund VII (U.S.), L.P.	2011	25,000,000	23,469,024	0	0	41,624,566	0	41,624,566	18,155,542	1.77	1.77	47.54%
Lone Star Fund VIII (U.S.), L.P.	2013	25,000,000	22,564,537	0	0	28,017,551	0	28,017,551	5,453,014	1.24	1.24	16.26%
Merit Energy Partners E-I	2004	7,018,930	7,031,052	0	-1,741	14,975,776	0	14,975,776	7,946,465	2.13	2.13	14.48%
Merit Energy Partners F-I	2005	8,748,346	8,749,275	0	0	3,801,206	0	3,801,206	-4,948,069	0.43	0.43	-17.19%
Merit Energy Partners G, LP	2008	39,200,000	39,320,050	0	0	26,756,651	0	26,756,651	-12,563,399	0.68	0.68	-9.96%
Merit Energy Partners H, LP	2010	10,000,000	10,033,415	0	0	6,870,451	0	6,870,451	-3,162,964	0.68	0.68	-13.78%
Oaktree Fund IV	2001	50,000,000	50,000,000	0	0	82,516,590	0	82,516,590	32,516,590	1.65	1.65	28.36%
Oaktree Loan Fund 2X	2007	60,000,000	60,004,628	0	0	65,066,951	0	65,066,951	5,062,323	1.08	1.08	2.24%
Oaktree Power Fund III	2011	30,000,000	16,167,147	0	0	23,839,959	0	23,839,959	7,672,812	1.47	1.47	12.35%
Pharos Capital Co-Investment, LLC	2007	20,000,000	20,000,000	0	0	10,019,157	0	10,019,157	-9,980,843	0.50	0.50	-9.92%
Pharos Capital Co-Investment, LP	2008	40,000,000	40,000,000	0	0	67,459,271	0	67,459,271	27,459,271	1.69	1.69	8.42%
Pharos Capital Partners IIA, L.P.	2005	20,000,000	20,080,306	0	0	17,715,199	0	17,715,199	-2,365,107	0.88	0.88	-2.39%
Pharos Capital Partners III, LP	2012	50,000,000	28,397,038	0	-54,286	20,196,932	0	20,196,932	-8,145,820	0.71	0.71	-19.95%
Total Completed Funds		**864,150,757**	**781,363,199**	**0**	**14,917,109**	**905,993,874**	**0**	**905,993,874**	**109,713,566**	**1.14**	**1.14**	

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Disclaimer

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.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C5

Topic: **Chairman's Discussion Item**

Trustee Resignation

Discussion: The Chairman will brief the Board on this item.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C6

Topic: **Board Chairman, Vice Chairman and Deputy Vice Chairman Election**

Discussion: Section 3.01(g) of Article 6243a-1 requires the Board in June of every odd year to elect from among its trustees a chairman, vice chairman, and a deputy vice chairman, each to serve for two-year terms.

DISCUSSION SHEET

ITEM #C7

Topic: **Legislative Update**

Discussion: Staff will brief the Board on pension bills that have been filed which may bear on DPFP.

Regular Board Meeting – Thursday, June 10, 2021

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

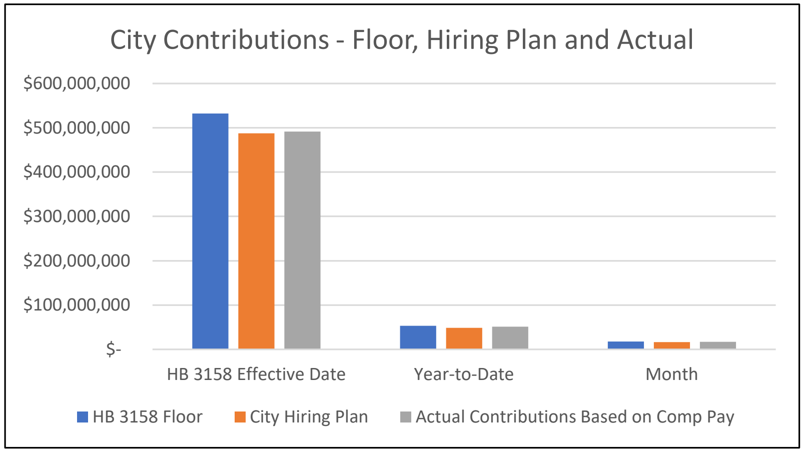
ITEM #C8

Topic: **Monthly Contribution Report**

Discussion: Staff will review the Monthly Contribution Report.

Regular Board Meeting – Thursday, June 10, 2021

Contribution Tracking Summary - June 2021 (April 2021 Data)



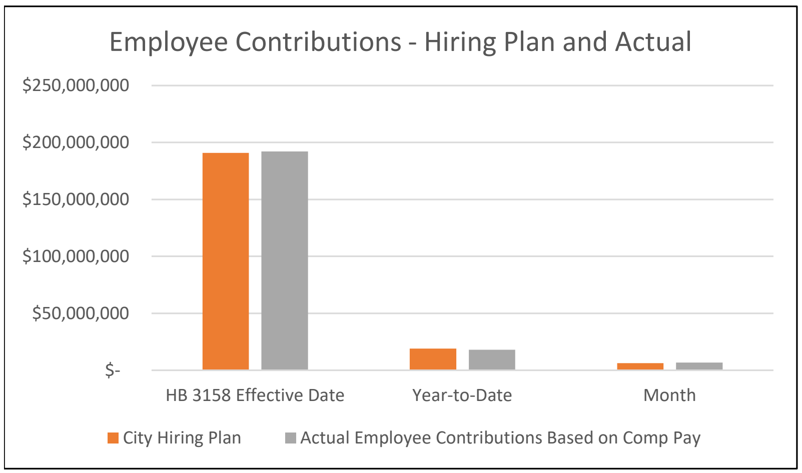
Actual Comp Pay was 101% of the Hiring Plan estimate since the effective date of HB 3158.

In the most recent month Actual Comp Pay was 105% of the Hiring Plan estimate and 97% of the Floor amount.

The Hiring Plan Comp Pay estimate increased by 3.03% in 2021. The Floor increased by 2.76%.

Through 2024 the HB 3158 Floor is in place so there is no City Contribution shortfall.

The combined actual employees was 153 less than the Hiring Plan for the pay period ending May 11, 2021. Fire was over the estimate by 48 fire fighters and Police under by 201 officers.



Employee contributions exceeded the Hiring Plan estimate for the month, the year and since inception.

There is no Floor on employee contributions.

Contribution Summary Data

City Contributions

Apr-21	Number of Pay Periods Beginning in the Month	HB 3158 Floor	City Hiring Plan	Actual Contributions Based on Comp Pay	Additional Contributions to Meet Floor Minimum	Comp Pay Contributions as a % of Floor Contributions	Comp Pay Contributions as a % of Hiring Plan Contributions
Month	3	$ 17,646,000	$ 16,241,538	$ 17,099,837	$ 546,163	97%	105%
Year-to-Date		$ 52,938,000	$ 48,724,615	$ 50,958,949	$ 1,821,051	96%	105%
HB 3158 Effective Date		$ 532,109,000	$ 487,485,000	$ 491,757,892	$ 40,424,814	92%	101%

Due to the Floor through 2024, there is no cumulative shortfall in City Contributions
Does not include the flat $13 million annual City Contribution payable through 2024.
Does not include Supplemental Plan Contributions.

Employee Contributions

Apr-21	Number of Pay Periods Beginning in the Month	City Hiring Plan	Actual Employee Contributions Based on Comp Pay	Actual Contribution Shortfall Compared to Hiring Plan	Actuarial Valuation Contribution Assumption	Actual Contributions as a % of Hiring Plan Contributions	Actual Contributions as a % of Actuarial Val Assumption
Month	3	$ 6,355,385	$ 6,688,092	$ 332,707	$ 6,355,386	105%	105%
Year-to-Date		$ 19,066,154	$ 17,916,450	$ 968,758	$ 19,066,158	94%	94%
HB 3158 Effective Date		$ 190,755,000	$ 192,267,894	$ 1,512,894	$ 185,645,800	101%	104%

Potential Earnings Loss from the Shortfall based on Assumed Rate of Return $ (506,070)

Does not include Supplemental Plan Contributions.

Reference Information

City Contributions: HB 3158 Bi-weekly Floor and the City Hiring Plan Converted to Bi-weekly Contributions

	HB 3158 Bi-weekly Floor	City Hiring Plan-Bi-weekly	HB 3158 Floor Compared to the Hiring Plan	Hiring Plan as a % of the Floor	% Increase/ (decrease) in the Floor	% Increase/ (decrease) in the Hiring Plan
2017	$ 5,173,000	$ 4,936,154	$ 236,846	95%		
2018	$ 5,344,000	$ 4,830,000	$ 514,000	90%	3.31%	-2.15%
2019	$ 5,571,000	$ 5,082,115	$ 488,885	91%	4.25%	5.22%
2020	$ 5,724,000	$ 5,254,615	$ 469,385	92%	2.75%	3.39%
2021	$ 5,882,000	$ 5,413,846	$ 468,154	92%	2.76%	3.03%
2022	$ 6,043,000	$ 5,599,615	$ 443,385	93%	2.74%	3.43%
2023	$ 5,812,000	$ 5,811,923	$ 77	100%	-3.82%	3.79%
2024	$ 6,024,000	$ 6,024,231	$ (231)	100%	3.65%	3.65%

The HB 3158 Bi-weekly Floor ends after 2024

Employee Contributions: City Hiring Plan and Actuarial Val. Converted to Bi-weekly Contributions

		City Hiring Plan Converted to Bi-weekly Employee Contributions	Actuarial Valuation Assumption Converted to Bi-weekly Employee contributions	Actuarial Valuation as a % of Hiring Plan
2017		$ 1,931,538	$ 1,931,538	100%
2018		$ 1,890,000	$ 1,796,729	95%
2019		$ 1,988,654	$ 1,885,417	95%
2020		$ 2,056,154	$ 2,056,154	100%
2021		$ 2,118,462	**$ 2,118,462**	100%
2022		$ 2,191,154	**$ 2,191,154**	100%
2023		$ 2,274,231	**$ 2,274,231**	100%
2024		$ 2,357,308	**$ 2,357,308**	100%

The information on this page is for reference. The only numbers on this page that may change before 2025 are the Actuarial Valuation Employee Contributions Assumptions for the years 2020-2024 and the associated percentage.

Reference Information - Actuarial Valuation and GASB 67/68 Contribution Assumptions

Actuarial Assumptions Used in the Most Recent Actuarial Valuation - These assumptions will be reevaluated annually & may change.

City Contributions are based on the Floor through 2024, the Hiring Plan from 2025 to 2037, after 2037 an annual growth rate of 2.75% is assumed

Employee Contributions for 2018 are based on the 2017 actual employee contributions inflated by the growth rate of 2.75% and the Hiring Plan for subsequent years until 2038, when the 2037 Hiring Plan is increased by the 2.75 growth rate for the next 10 years

Actuarial/GASB Contribution Assumption Changes Since the Passage of HB 3158

	Actuarial Valuation	GASB 67/68
YE 2017 (1/1/2018 Valuation)		
2018 Employee Contributions Assumption - based on 2017 actual plus growth rate not the Hiring Plan Payroll	$ (2,425,047)	*
2019 Estimate (1/1/2019 Valuation)		
2019 Employee Contribution Assumption	$ 9,278	*

**90% of Hiring Plan was used for the Cash Flow Projection for future years in the 12/31/2017 GASB 67/68 calculation. At 12-31-17, 12-31-18 and 12-31-2019 this did not impact the pension liability or the funded percentage.*

The information on this page is for reference. It is intended to document contribution related assumptions used to prepare the Actuarial Valuation and changes to those assumptions over time, including the dollar impact of the changes. Contribution changes impacting the GASB 67/68 liability will also be included.

City Hiring Plan - Annual Computation Pay and Numbers of Employees						
	Computation Pay			**Number of Employees**		
Year	**Hiring Plan**	**Actual**	**Difference**	**Hiring Plan**	**Actual EOY**	**Difference**
2017	$ 372,000,000	Not Available	Not Available	5,240	4,935	(305)
2018	$ 364,000,000	$ 349,885,528	$ (14,114,472)	4,988	4,983	(5)
2019	$ 383,000,000	$ 386,017,378	$ 3,017,378	5,038	5,104	66
2020	$ 396,000,000	$ 421,529,994	$ 25,529,994	5,063	4,988	(75)
2021	$ 408,000,000			5,088		
2022	$ 422,000,000			5,113		
2023	$ 438,000,000			5,163		
2024	$ 454,000,000			5,213		
2025	$ 471,000,000			5,263		
2026	$ 488,000,000			5,313		
2027	$ 507,000,000			5,363		
2028	$ 525,000,000			5,413		
2029	$ 545,000,000			5,463		
2030	$ 565,000,000			5,513		
2031	$ 581,000,000			5,523		
2032	$ 597,000,000			5,523		
2033	$ 614,000,000			5,523		
2034	$ 631,000,000			5,523		
2035	$ 648,000,000			5,523		
2036	$ 666,000,000			5,523		
2037	$ 684,000,000			5,523		

Comp Pay by Month - 2021	**Annual Divided by 26 Pay Periods**	**Actual**	**Difference**	**2020 Cumulative Difference**	**Number of Employees - EOM**	**Difference**
January	$ 31,384,615	$ 33,074,493	$ 1,689,878	$ 1,689,878	4960	(128)
February	$ 31,384,615	$ 33,017,462	$ 1,632,847	$ 3,322,725	4926	(162)
March	$ 31,384,615	$ 32,960,217	$ 1,575,602	$ 4,898,327	4929	(159)
April	$ 47,076,923	$ 49,564,745	$ 2,487,822	$ 7,386,148	4935	(153)
May				$ 7,386,148		
June				$ 7,386,148		
July				$ 7,386,148		
August				$ 7,386,148		
September				$ 7,386,148		
October				$ 7,386,148		
November				$ 7,386,148		
December				$ 7,386,148		

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C9

Topic: **Board approval of Trustee education and travel**

a. Future Education and Business-related Travel
b. Future Investment-related Travel

Discussion:

a. Per the Education and Travel Policy and Procedure, planned Trustee education and business-related travel and education which does not involve travel requires Board approval prior to attendance.

Attached is a listing of requested future education and travel noting approval status.

b. Per the Investment Policy Statement, planned Trustee travel related to investment monitoring, and in exceptional cases due diligence, requires Board approval prior to attendance.

There is no future investment-related travel for Trustees at this time.

Future Education and Business Related Travel & Webinars
Regular Board Meeting – June 10, 2021

ATTENDING APPROVED

1. Conference: **TEXPERS Summer Conference**
Dates: August 29-31, 2021
Location: San Antonio, TX
Cost: TBD

2. Conference: **NCPERS Accredited Fiduciary (NAF) Program**
Dates: September 25-26, 2021
Location: Scottsdale, AZ
Cost: TBD

3. Conference: **NCPERS Fall Conference**
Dates: September 26-28, 2021
Location: Scottsdale, AZ
Cost: TBD

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C10

Topic: **Board Members' reports on meetings, seminars and/or conferences attended**

Discussion:

Conference: **TEXPERS Annual Conference** **KH**
Dates: May 21-26, 2021
Location: Austin, TX

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C11

Topic: **Financial Audit Status**

Discussion: The Chief Financial Officer will provide a status update on the annual financial audit.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #C12

Topic: **Legal issues - In accordance with Section 551.071 of the Texas Government Code, the Board will meet in executive session to seek and receive the advice of its attorneys about pending or contemplated litigation or any other legal matter in which the duty of the attorneys to DPFP and the Board under the Texas Disciplinary Rules of Professional Conduct clearly conflicts with Texas Open Meeting laws.**

Discussion: Counsel will brief the Board on these issues.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #D1

Topic: **Public Comment**

Discussion: Comments from the public will be received by the Board.

Regular Board Meeting – Thursday, June 10, 2021

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #D2

Topic: **Executive Director's report**

a. Associations' newsletters
- NCPERS Monitor (June 2021)
- NCPERS PERSist (Spring 2021)

b. Open Records

c. Office Update and Reopening Status

d. CIO Recruitment

Discussion: The Executive Director will brief the Board regarding the above information.

THE NCPERS
MONITOR
The Latest in Legislative News
June 2021

In This Issue

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On May 20, President Joe Biden issued an Executive Order on Climate-Related Financial Risk (EO). The action signaled a fresh look at the complex intersection of sustainable investing, often referred to as Environmental, Social, and Governance, or ESG for short.

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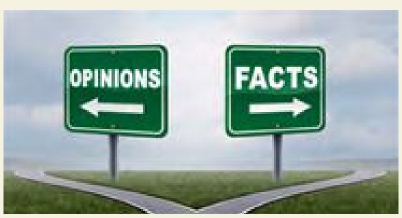
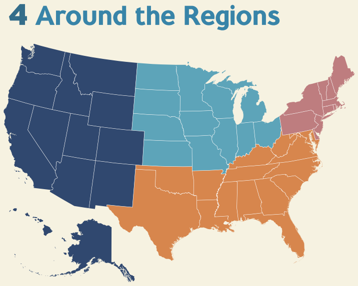


When the harsh glare of the spotlight falls on a public pension system, all of us in the pension community feel the pain.



This month, we will highlight New York, Nebraska, Texas and California.

Report Evaluates Strengths and Weaknesses of Hybrid Retirement Plans

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The creation of hybrid retirement plans for state and local government employees has been a mixed bag for sponsors and participants, according to a report from the National Institute on Retirement Security.

Some governments have planned carefully to establish hybrid plans and have created plans that should effectively enhance retirement security for employees while helping governments recruit and retain a qualified workforce, NIRS said. Some, however, have shifted to hybrid designs without properly evaluating the long-term implications of the plan changes.

NIRS noted that "hybrid" is an umbrella term that covers a range of plan designs. "Some hybrids are defined benefit (DB) pensions with risk-sharing provisions, while others blend attributes of DB and defined contribution (DC) plans," NIRS said in the report, "The Hybrid Handbook."

"The bottom line is that not all hybrid are created equal," NIRS said. Some hybrid plans "will shift more risk from one party to another. Risk-shifting is not the same as risk-sharing, and a well-designed plan can do the latter and avoid the former."

CONTINUED ON PAGE 6

Twists and Turns on ESG Investing

By Tony Roda

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On May 20, President Joe Biden issued an Executive Order on Climate-Related Financial Risk (EO). The action signaled a fresh look at the complex intersection of sustainable investing, often referred to as Environmental, Social, and Governance, or ESG for short, and financial risk, specifically risk to physical assets, publicly traded securities, private investments, and companies, as well transition risk to workers, communities, and companies as the global shift from carbon-intensive energy sources and industrial processes accelerates.

In part, the EO states, "(t)he failure of financial institutions to appropriately and adequately account for and measure these physical and transition risks threatens the competitiveness of U.S. companies and markets, the life savings and pensions of U.S. workers and families, and the ability of U.S. financial institutions to serve communities." The EO instructs the Secretary of the Treasury, as the Chair of the Financial Stability Oversight Council (FSOC), to consider these risks to the financial stability of the federal government and the stability of the U.S. financial system. This is an approach that is similar to legislation introduced earlier this year by Senator Dianne Feinstein (D-CA), S. 588, which was endorsed by NCPERS.

An important part of the EO, Section 4, requires the Secretary of Labor to identify agency actions that can be taken under the Employee Retirement Income Security Act (ERISA) to protect the life savings and pensions of U.S. workers and families from the threats of climate-related financial risk and to consider publishing, by September 2021, for public notice and comment a proposed rule to suspend, revise, or rescind the Trump Administration's final rules on Financial Factors in Selecting Plan Investments and Fiduciary Duties Regarding Proxy Voting and Shareholder Rights. Earlier this year, the Biden Administration announced that it would not enforce either of these rules and would, instead, develop its own regulatory guidance on these policy questions. While state and local governmental plans are not governed by ERISA, policymakers and plan fiduciaries often look to the federal regulatory structure under ERISA as a guidepost for their decisions.

The Financial Factors in Selecting Plan Investments rule began as a proposed rule targeted specifically at ESG investments. It generated thousands of public comments, most of them calling the rule antiquated and potentially harmful to investors. The final rule, while stripped of its ESG-specific language, would still have resulted in a chill on these investments due to the onerous documentation requirements required to justify an investment that was not based solely on pecuniary factors.

Prior to the Trump DOL rule the guiding regulatory interpretation was that ESG factors could be used as a tiebreaker between or among otherwise indistinguishable investments. The philosophy of the Trump Administration in issuing the proposed and then the scaled-back final rule was that such a tie is rare or unlikely to ever occur. Therefore, under the Trump rule, in order to justify using non-pecuniary factors in reaching an investment decision the fiduciaries would have to document: (i) why pecuniary factors were not sufficient to select the investment; (ii) how the selected investment compares to alternative investments, including factors

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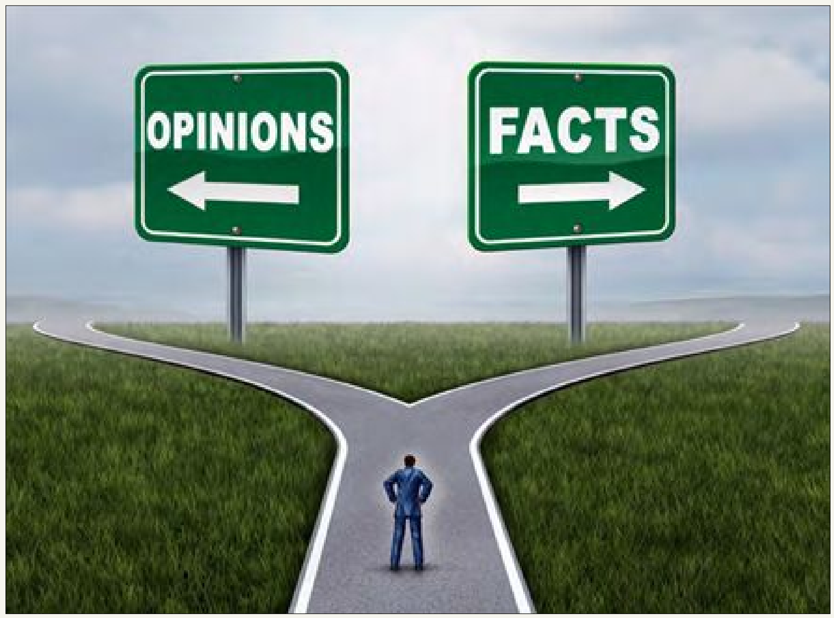
NCPERS **Executive Directors Corner**

Withhold Judgment Until Facts Are in about Pension System Investigation



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When the harsh glare of the spotlight falls on a public pension system, all of us in the pension community feel the pain. Negative coverage can quickly beget more negative coverage, with or without benefit of supporting facts. For several months now, the Pennsylvania Public School Employees' Retirement System has found itself blinking into the bright lights of relentless media coverage. Opinions are swirling about what it all means. The answer is: We don't know yet, and it's important to maintain a clear-headed perspective.

This is a good time to remember that there is a big difference between facts and theories, and that jumping to conclusions on the basis of speculation is risky and potentially damaging. It takes time for processes to play out and for facts to emerge. Gradually our understanding will grow and lessons will be gleaned, but speculation is unproductive. As public pension systems, we participate in guessing games at our own risk.

We do know a few things for certain, because PSERS has disclosed or confirmed them.

This is a good time to remember that there is a big difference between facts and theories, and that jumping to conclusions on the basis of speculation is risky and potentially damaging.

We know that PSERS recently discovered a small calculation error in its fund performance. PSERS restated its nine-year annualized return by 4 basis points, from 6.38% to 6.34%, due to a consultant's error, and that the lower rate of return has forced an increase in contributions from school employees hired since 2011.

We also know that PSERS disclosed the calculation error, immediately took corrective action, and initiated an internal investigation. Common sense tells us that these are textbook examples of reacting responsibly to unfavorable news.

We know that PSERS is cooperating in an FBI investigation, but nothing has been confirmed about the investigation's scope and targets.

And we know that PSERS has had taken a loss on some alternative investments—and also that, as a category, alternative investments have enhanced rather than reduced PSERS' investment returns.

What we don't know is how these separate facts fit together. We know that much of the media coverage in the *Philadelphia Inquirer* and The *New York Times* has been inflammatory and has drawn connections and links without supporting them with facts. The headline "F.B.I. Asking Questions After a Pension Fund Aimed High and Fell Short" made it into *The New York Times* on the strength of anonymous sources; and despite the fact that there

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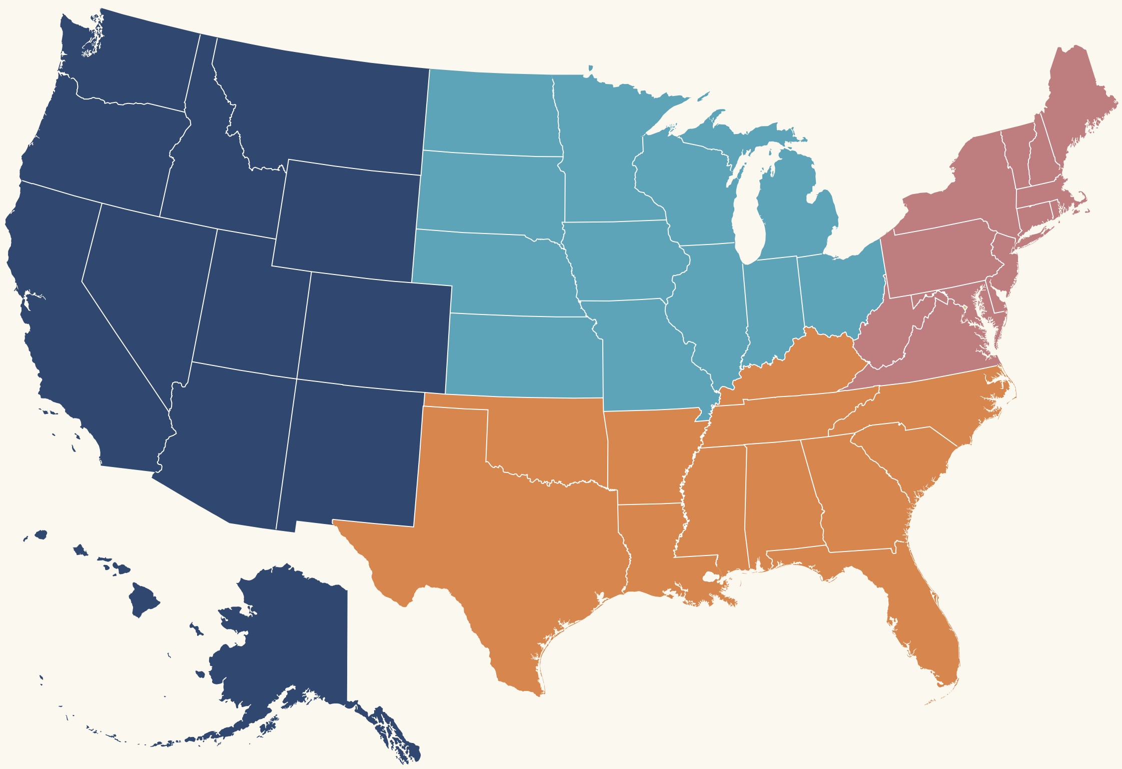
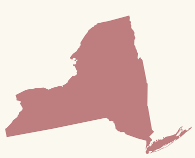
NCPERS Around the Regions

This month, we will highlight New York, Nebraska, Texas and California.



NORTHEAST: New York



The New York City Council voted April 30 to create an auto-IRA retirement savings plan for private-sector workers in the largest U.S. city, as well as a retirement security board to oversee it.

The authorizing legislation takes effect in 90 days (July 29), and the retirement security board has up to two years from that date to implement the plan. The law would require employers that do not offer retirement benefits to enable their employees to contribute a default amount equal to 5% of their pay to an auto-IRA. They could adjust the contribution up or down or opt out at any time. The annual contribution is limited to the annual IRA maximum of $6,000, or $7,000 for those age 50 or older.

Out of roughly 3.5 million private-sector workers in New York City, only 41% have access to an employer-sponsored retirement plan, the City Council said on its website. That is lower than the national average of 53% and down from 49% a decade ago. The City Council also noted that 40% of New Yorkers near retirement age have less than $10,000 saved for retirement.

The retirement savings board would consist of three members appointed by the mayor. They would work with the New York City Comptroller to select the investment strategies and policies. The board would be required to report annually on its activities and actions.

"Even in our beloved but expensive city where the cost of living is high, every New Yorker should be able to save for retirement, says Council Member Ben Kallos, who is an ERISA lawyer. "This legislation is a huge first step in helping generations of New Yorkers working for small businesses to save and be that much more ready to be self-sufficient when it is time to retire. With this legislation, New York City is leading the way by providing residents something in addition to their Social Security."

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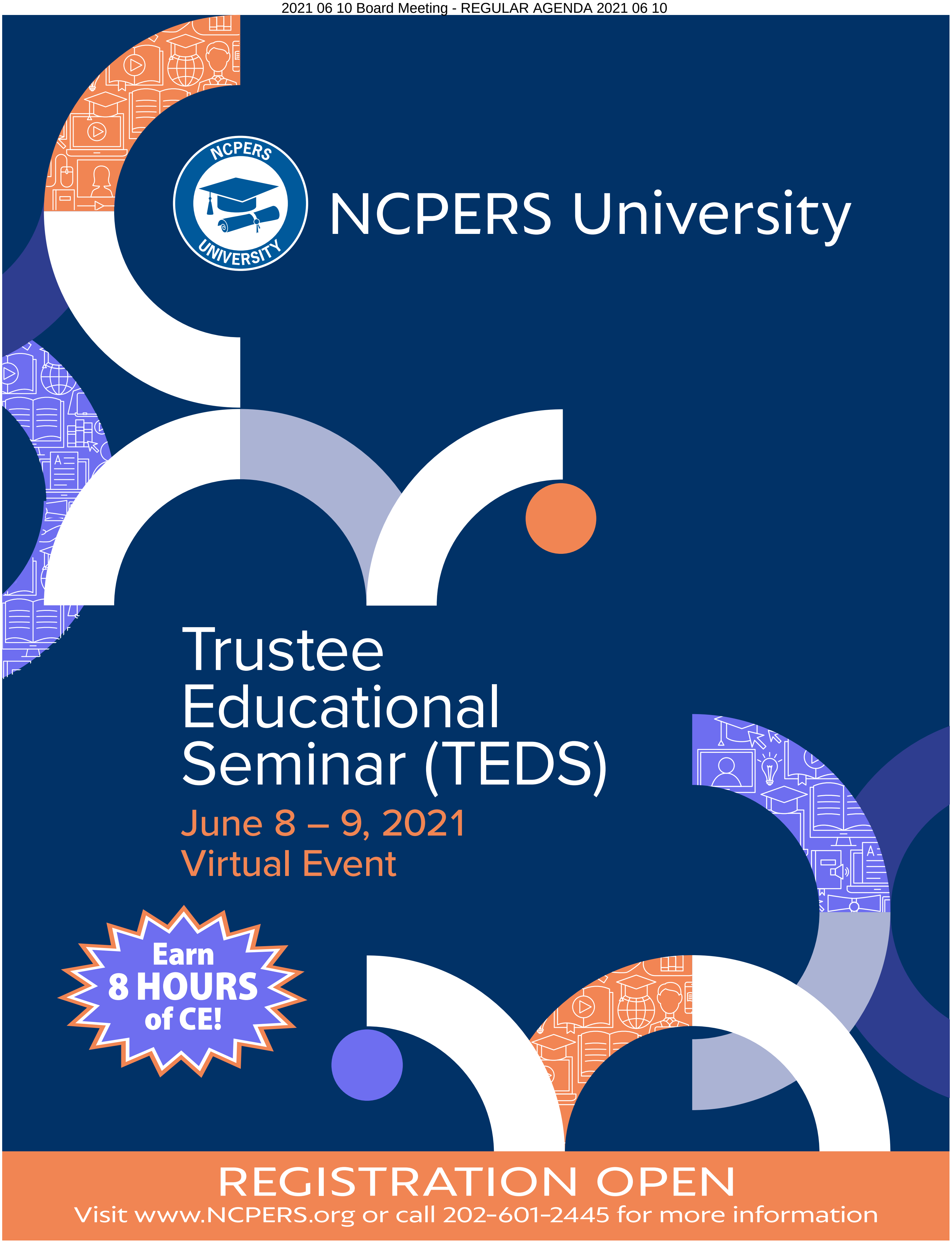
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HYBRID RETIREMENT PLANS CONTINUED FROM PAGE 1

Hybrid plans have been around for decades, NIRS pointed out, noting that the Texas Municipal Retirement Plan dates to 1947. However, the report is timely because hybrids have received increased attention as jurisdictions seek to redesign retirement benefits for various reasons, including managing costs. Hybrids are frequently proposed as an alternative to existing state and local government DB plans.

The report compares the key features of various retirement benefits and structures. It also includes an overview of hybrid plan design, which it said could help state and local officials make informed decisions if they are considering adopting a hybrid model.

Sections of the report cover the design of DB vs. DC plans; cash balance plans, combined arrangements such as vertical and horizontal hybrids; and risk-sharing DB plans, among other topics. The report also examines how DB benefits can be relevant to non-career employees.

"We know that public employees place a high value on their retirement benefits, and a move in the wrong direction on benefits could be a detriment to hiring and retaining the public workforce," said Dan Doonan, NIRS executive director and co-author of the report. He said it is critically important to examine the details of a hybrid plan or proposal since there isn't a simple template for them.

The 35-page report noted that discussion regarding hybrids "thus far has focused on the goals of creating the system in terms of the benefits. But it is imperative that discussion also consider the risks, or costs, in offering a hybrid plan. These risks should be considered from both a plan sponsor's perspective and that of the members." ◆

ESG INVESTING CONTINUED FROM PAGE 2

such as portfolio diversification, asset liquidity, cash flow, and projected return relative to plan funding objectives, and (iii) how the chosen non-pecuniary factors are consistent with the interests of participants and beneficiaries in their retirement income or financial benefits under the plan. This daunting documentation requirement would, in my view, have resulted in many plan fiduciaries avoiding ESG investments entirely.

Meanwhile in Congress, new legislation was recently introduced that is designed to end the regulatory see-saw on ESG investments that plan fiduciaries have endured for decades. The bill, S. 1762, was introduced by Senator Tina Smith (D-MN). Senator Patty Murray (D-WA), who chairs the Committee on Health, Education, Labor, and Pensions (HELP), is an original cosponsor of the legislation. Senator Smith also serves on the HELP Committee. The House version of the legislation, H.R. 3387, was introduced by Rep. Suzan DelBene (D-WA).

The legislation would amend ERISA, over which the HELP Committee has jurisdiction, to make clear that pension plans may consider ESG factors in their investment decisions when they are expected to have an impact on investment outcomes, provided fiduciaries consider such investments in a prudent manner consistent with their fiduciary obligations. The bill would also codify the tiebreaker rule and formally repeal the Trump Administration's fiduciary rule, both of which are discussed above.

In her press release, Sen. Smith states that, "According to the U.S. SIF's 2020 report on sustainable investing practices, sustainable investments grew by 42% among U.S. investors from 2019 to 2020 – now representing a third of all U.S. invested funds, or $17.2 trillion." The fresh look at the policy issues related to ESG investing, first by the Biden Administration and now by Congress, is a recognition that these types of investments are here to stay.

NCPERS will continue to keep you apprised of developments in this important public policy area. ◆

Tony Roda is a partner at the Washington, D.C. law and lobbying firm Williams & Jensen, where he specializes in federal legislative and regulatory issues affecting state and local governmental pension plans. He represents NCPERS and statewide, county, and municipal pension plans in California, Colorado, Georgia, Kentucky, Ohio, Tennessee, and Texas. He has an undergraduate degree in government and politics from the University of Maryland, J.D. from the Catholic University of America, and LL.M (tax law) from Georgetown University.

EXECUTIVE DIRECTORS CORNER CONTINUED FROM PAGE 3

is no implication that PSERS did anything wrong; and even though the FBI probe appears to be unrelated to the fund's performance and investment strategy.

We do know that the news media likes to throw around the term "alternative investments" as a scare tactic, characterizing them as "high risk" without bothering to look actually understand them. Alternative investments—a term that sweeps in private equity, venture capital, hedge funds, real estate, and commodities—have been used in Pennsylvania and elsewhere to diversify and reduce the portfolio volatility that would come from investing in only one asset class, such as stocks. They've not only lowered risks—but they have also increased returns.

There are voices of reason trying to be heard above the din and commotion of speculation. Aaron Brown, a hedge fund risk manager and a financial columnist, has decried the misinformation being spread in much of the PSERS coverage. Writing for the political news website RealClearMarkets, Brown noted that journalists have exaggerated the proportion of PSERS assets investment in alternatives and have suggested conspiracies that would be hard to pull off. It stretches belief to imagine that mistakes made more than nine years ago were somehow intended to move a 2020 figure just below a key threshold, which didn't exist nine years ago.

As Brown points out, the underlying story at PSERS is all too familiar. Until 2000, it was adequately funded to pay out all future benefits. Then, 2001, the legislature slashed contributions and began paying out more in benefits, setting PSERS up to develop a deficit over the long term.

Currently, there is much more heat than light and much more politics than finance in the PSERS coverage. Let's wait for more information to surface before rushing to judgment. ◆

NCPERS Around the Regions

AROUND THE REGIONS CONTINUED FROM PAGE 4

MIDWEST: Nebraska

The Nebraska Legislature on May 26 overrode a gubernatorial veto, clearing the way to transfer administration and management of the Omaha Public Schools pension plan to the state.

The 31-18 vote authorizes the transfer of the retirement system to the Public Employees Retirement Board effective September 1, 2024. Related measures were also enacted to describe the planning and tasks needed to accomplish the transfer. Senator Mark Kolterman, a Republican, sponsored the legislative package. The legislation authorizing the transfer stipulated that neither the state nor the Public Employees Retirement Board nor the Nebraska Public Employees Retirement System would be responsible for any funding requirements.

The override came a day after Governor Pete Ricketts vetoed the legislation. Ricketts, a Republican, denounced it as a "bailout," "poor public policy," and a "slippery slope" that could put Nebraska on the hook for shortfalls. He argued that the legislation would "shift the burden to the State of Nebraska to fix the school district's long-term pension disaster" and attributed the situation to "gross incompetence" by the Omaha School Employees Retirement Systems Board.

Kolterman called the veto a "disappointment" and made the motion to override it. He noted that the bill contains an explicit provision that Omaha Public Schools remains "at all times and in all circumstances solely liable" for all the plan's funding obligations, the legislature's official news site reported.

Kolterman said he "can't imagine a scenario" in which lawmakers would ever vote to take on the plan's unfunded liability. "I don't see that happening," Kolterman said. "There's nothing in this bill that results in a cost to the State of Nebraska."

The legislature had approved the bill on May 20 on a 38-3 vote, with eight not voting. Nebraska is the only state in the union with a unicameral legislature, meaning there is a single legislative body consisting of 49 Senators rather than an upper and lower house.

SOUTH: Texas

The Texas Legislature has passed legislation that would deny defined-benefit pensions to state workers hired after Sept. 1, 2022, shifting them instead into a cash-balance plan. The bill was sent to Gov. Greg Abbott, a Republican, for signature on June 1 and was expected to be enacted.

Unions and other pension advocates vigorously opposed the overhaul of the Employees Retirement System of Texas (ERST), arguing that it would undermine employee recruitment and retention.

The legislation, Senate Bill 321, also authorizes payments to the ERST of $510 million annually through 2054 to make up a $14.7 billion budget shortfall.

Three Democratic amendments were voted down on May 26. One would have created a commission to study and regularly report on employee satisfaction, turnover, and retirement security. Another would have delayed implementation of the cash-balance plan for two years while lawmakers studied its impacts.

Under the cash-balance plan, employees' accounts would be credited with a set percentage of their annual compensation, plus interest. This could lead to diminished benefits over time.

In other news, the Texas Legislature has passed legislation to require the state's pension funds to stop investing in firms that boycott energy companies. The action, occurring in the state that is the large U.S. provider and refiner of crude oil, runs counter to a trend among institutional investors of divesting from fossil fuel companies.

Pensions & Investments reported that the Texas House of Representatives voted 92-51 in favor of the bill on May 3. The Senate had approved the bill 26-4 on April 15.

The bill calls for the state's comptroller to "prepare and maintain, and provide to each state governmental entity, a list of all companies that boycott energy companies." The state's asset owners would be required to notify those companies of their inclusion on the list and given 90 days to amend their positions.

If a company did not change its positions within 90 days, the state funds would begin divesting all publicly traded securities of the company.

CONTINUED ON PAGE 9

NCPERS Around the Regions

AROUND THE REGIONS CONTINUED FROM PAGE 8

WEST: California

The California Secure Choice Retirement Savings Program program for private-sector workers is not governed or pre-empted by ERISA, the federal law on employee benefits, the U.S. Court of Appeals for the Ninth Circuit ruled May 6. The program, known as CalSavers, was created in 2017.

In a unanimous ruling, a three-judge panel ruled CalSavers is not an employee benefit plan under ERISA because it is established and maintained by the state and does not require private employers to create their own ERISA retirement plans. "Nor does CalSavers interfere with ERISA's core purposes. Accordingly, ERISA does not preempt the California law."

The ruling upholds a federal district court ruling that denied a challenge to the program and marks the first time a federal appeals court has ruled on whether ERISA covers state-run IRAs. The Howard Jarvis Taxpayers Association (HJTA) mounted the challenge.

"Nothing in law supports HJTA's effort to recast ERISA's preemption provision as a sword that would allow employers who do not offer their own retirement plans to thereby deprive their employees of the ability to participate in a state-run IRA savings program," Circuit Judge Daniel Bress wrote.

The opinion also rejected HJTA's argument that CalSavers nonetheless "competes with" ERISA plans and will "frustrate, not encourage the formation of" ERISA plans. "Even if this were true, it does not matter," Judge Bress wrote. "The Supreme Court has been clear that 'ERISA does not pre-empt' state laws that 'merely increase costs or alter incentives for ERISA plans without forcing plans to adopt any particular scheme of substantive coverage.'"

California employers that do not offer retirement savings plans are required to enroll their workers automatically in CalSavers. The program set the default payroll deduction at 5% of an employee's pay. Employees may increase or reduce the contribution, or opt out altogether. ◆

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Calendar of Events 2021

June

2021 Trustee Educational Seminar
June 8–9, 2021

June

WEBINAR: The Fallacies of Asset Allocation
June 15, 2021

2020-2021 Officers

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Dale Chase
First Vice President

James Lemonda
Second Vice President

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Will Pryor
Treasurer

Daniel Fortuna
Immediate Past President

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Stacy Birdwell
John Neal

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Teresa Valenzuela

Local Employees Classification
Sherry Mose
Thomas Ross
Ralph Sicuro

Police Classification
Kenneth Hauser
James Sklenar

Fire Classification
Dan Givens
Emmit Kane

Educational Classification
David Kazansky

Protective Classification
Peter Carozza, Jr.
Ronald Saathoff

Canadian Classification
Frank Ramagnano

The Voice for Public Pensions

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PERSist

The Voice for Public Pensions

Spring 2021 | Volume 34 | Number 2

NCPERS Message

Like everything in the last 15 months, NCPERS annual Legislative Conference was different than our usual programming. Still restricted by COVID-19, NCPERS decided to host a virtual live webcast on April 20, 2021, instead of our normal two day in-person meeting that is capped off with our Policy Day on Capitol Hill.

While the format was different, the substance and education were still first rate! First, we heard from Illinois Representative Rodney Davis (R). Rep. Davis has proposals to repeal the Windfall Elimination Provision (WEP) and the Government Pension Offset (GPO). "Through my years talking to people in Illinois about these issues, I've realized the damage these policies cause to so many of our public employees; our teachers, our police officers, firefighters, and more. Because of this, the first bill I introduced after being elected in 2012 was the Social Security Fairness Act, to completely repeal both WEP and the GPO."

Next, we heard from Kara Getz, majority chief counsel of the House Ways and Means Committee. Getz provided an overview of the committee's retirement agenda. Anthony Roda from Williams & Jensen walked us through NCPERS federal policy agenda for 2021. Roda discussed the tax agenda, COVID relief, infrastructure, and more.

In the second half of the program, Angela Antonelli, executive director of Georgetown University's Center for Retirement Initiative (CRI), updated us on the push to expand Secure Choice

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In This Issue

Take the PERSist Quiz on pages 10, 11, 12, 13 and 14

Submit Completed Quiz Here

Adding value to your interactions with the actuary

TAKE THE QUIZ

By: Elizabeth Wiley

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As public pension plan trustees or staff members, you likely interact with actuaries several times a year. They rely on you for information to help them analyze your system's financial health, prepare an annual valuation, and identify risks to your system.

As an insider, you are privy to the workings of your system better than any consultants, so the more detailed information you share with the actuaries, the more valuable their analysis will be.

You know if your system is contemplating hiring or salary freezes, if there have been changes in collective bargaining agreements or postemployment health benefits, or other elements of your members' compensation. Sharing this kind of information proactively with the system's actuaries will help them develop a better understanding of your plan's condition.

Offering information about the plan sponsor can also help the actuaries better understand your plan. For example, the sponsor may be considering changing the frequency of contributions from every payroll to annually.

Moreover, asking the actuaries questions will help you get the most value from your actuarial consultants because it will help them understand what information you need as fiduciaries and stewards of your plan.

Some sample questions to get you started:

- To what degree are each of the key actuarial assumptions based on the experience and characteristics of *your* system?
- How do the assumptions compare with your system's recent experience?
- How have any deviations affected your liabilities and contributions?
- What is the projected funded status of the system?

CONTINUED ON PAGE 10

__Elizabeth Wiley,__ has 16 years of experience working with public pension plans. She speaks frequently at the annual conferences of the National Conference on Public Employee Retirement Systems, the National Association of State Retirement Administrators, the National Council on Teacher Retirement, and the International Foundation of Employee Benefit Plans.

She holds positions in several professional associations including the American Academy of Actuaries, the Society of Actuaries, and the Conference of Consulting Actuaries. She joined Cheiron in March 2013.

She is a Fellow of the Society of Actuaries, a Fellow of the Conference of Consulting Actuaries, an Enrolled Actuary under ERISA, and a Member of the American Academy of Actuaries.

Six Common Drivers Found Responsible for Unexpected Portfolio Results

TAKE THE QUIZ

Photo Illustration © 2021 istock.com

As an investment manager that employs a quantitative risk-aware approach, Northern Trust Asset Management regularly partners with pensions and their consultants to a unique analysis of underlying risk components impacting their portfolios' ability to achieve intended outcomes.

After four years of conducting in-depth portfolio-level analysis for investors, several common themes and trends emerged across the data set whose more than 200 portfolios and $200 plus billion includes more than 1,000 investment strategies. We decided to look at the analyses in aggregate to quantify overarching trends. We then compiled our findings to inform other investors of hidden risks potentially affecting their outcomes.

The result is "The Risk Report," an aggregated global analysis of more than 200 institutional equity portfolios revealing six common drivers of unintended outcomes.

The more than 200 analyses at the heart of "The Risk Report" were conducted by identifying compensated and uncompensated risks in portfolios to inform adjustments needed, consistent with our core philosophy: Investors should be compensated for the risks they take — in all market environments and with any investment strategy.

The report's research demonstrates how underlying investments can inadvertently cause a drag on portfolios. It's especially timely for investors in today's environment given most we speak with have a heightened emphasis on finding and addressing hidden risks.

One finding that certainly surprised us is the fact that, on average, portfolios had nearly two times the amount of uncompensated risk versus compensated risk. This undoubtedly shows that investors were not getting paid for all the risks they were taking, due to overcrowded portfolios with uncompensated risks that tended to dilute the potential for excess returns. The harmful result was not only generally benchmark-like returns, but at active management fees to add salt to the wound.

Another finding is what we refer to as the cancellation effect. This is where the frequency of underlying holdings, style tilts and sector over- and under-weights cancel each other out partially or completely, as investment managers within a portfolio take opposing positions, essentially offsetting one another. For example, the high value bias in one strategy is offset by the high growth bias in another strategy. While this dynamic might not be new, the high degree of it found in portfolios and the magnitude of its impact on active risk was certainly surprising.

CONTINUED ON PAGE 11

Northern Trust Asset Management *is an investment management firm entrusted by investors around the globe to help them navigate changing market environments, so they can confidently realize their long-term objectives.*

NCPERS Emerging Manager

The Rise of Liquidity Management

TAKE THE QUIZ

By: Vijoy P. Chattergy

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Defined benefit public pension plans have a particular obligation to exist into perpetuity because of the nature of the members and beneficiaries they serve. As extensions of the government and the public good provided, these asset owners must think in terms of decades when developing policies and investment commitments. With this perspective, plans can consider strategic goals such as avoiding a major financial crisis or structural impediments such as long-term negative cash flows.

Over the past decade public pension plans have proved to be relatively innovative in portfolio design and asset allocation as compared to peer institutional asset owners. Faced with poorly funded status and enduring two major market dislocations, precipitated by technology and housing bubbles, public plans were forced to reform plan structure, governance procedures, and investment programs. During the decade of the 2010s, the most forward-thinking plans implemented a combination of contribution/benefit realignment and expansion of investment opportunities to be sustainable.

Public plans often moved into liquid passive beta strategies and/or selected active managers that explicitly offered additional sources of return, such as from factor exposures or behavioral anomalies. On the other end of the spectrum, public plans stepped up investments into highly illiquid structures such as private equity and real estate. In the case of plans confronting sustainability concerns, several created a crisis alpha or crisis risk offset allocations. These changes

Vijoy P. Chattergy, *has served in leadership positions with public, private, and nonprofit sector financial services entities, covering all major asset classes and working in the United States, Asia and Europe. He is the founder of Sakala Portfolio Solutions, LLC, working with asset owners to design and construct optimal investment portfolios.*

Mr. Chattergy was formerly the Chief Investment Officer at the multi-billion dollar Employees' Retirement System of the State of Hawai'i ("HIERS"). He restructured the investment program and office, improving performance to become a top quartile performing pension fund. He was awarded the 2017 Industry Innovation Award for the Public Defined Benefit Plans, and the 2015 Investor Intelligence Thought Leader Award by Institutional Investor. In 2013, he was designated a Rising Star of Public Funds by Money Management Intelligence.

He earned an MBA from Cornell University and an MSc from the London School of Economics. He graduated Phi Beta Kappa and cum laude *from the College of the Holy Cross. He holds a charter from the Chartered Alternative Investment Analyst Association.*

CONTINUED ON PAGE 11

TAKE THE QUIZ

Special Purpose Acquisition Company: A structure increasingly used to take companies public

By: Tad Fergusson, Frank Benham, and John Haggerty

Photo Illustration © 2021 istock.com

A Special Purpose Acquisition Company (SPAC) represents an alternative route for a company to go public. Sponsors form a SPAC, with no commercial operations, to raise capital through an Initial Public Offering (IPO) in order to buy another unidentified private company. Once a transaction is negotiated, the private company merges into the public SPAC. SPACs have been around for decades but historically have had a relatively poor reputation regarding the quality of the company or sponsor. The reputation of SPACs has improved materially recently as more reputable sponsors started raising SPACs.

Going public by way of SPAC is perceived to be quicker and easier as it avoids the release of financials to public scrutiny via an extensive road show, the cost of hiring underwriters, oversight from the SEC, etc. A SPAC can also provide a private company greater certainty regarding price and deal terms. As a SPAC is already public, a company can become public even when the traditional "IPO window" is closed.

Sponsors find SPACs appealing due to favorable economics, ease of fundraising, and a more streamlined ownership model. Sponsors generally gain a disproportionate share of economic benefits of the transaction as they commonly receive 20% of a SPAC's shares at listing for a minimal initial investment. The capital raising process for SPACs can often be easier than the traditional private equity roadshow made to institutional investors while ownership participation at the Board level may also be a less resource intensive model than the "hands on" approach of many private equity investors.

Historically, private companies have been staying private longer and experiencing higher growth before being accessible publicly. The SPAC phenomenon has brought more companies public earlier in their lifecycle and given public investors access to this higher growth. As these companies are often earlier in their life cycles, there can also be increased risks to investors. A wide range of outcomes are to be expected, and investors will have to assess the quality difference between SPAC opportunities. SPAC investors also appear to bear a larger proportion of costs, including the underwriting and ownership dilution.

CONTINUED ON PAGE 12

__Tad Fergusson__ is a private markets consultant and has 25 years of industry experience. Tad provides the full spectrum of services from investment policy and guideline development, preparing strategic and structural reviews, conducting partnership due diligence and selection, as well as overseeing performance reporting and manager monitoring. In addition, Tad conducts research on a spectrum of topics pertaining to the private equity asset class and is a member of the firm's Private Markets Research Committee. Prior to joining the firm, Tad provided administration services to 401(k) pension plans as a Defined Contributions Analyst with the firm Milliman & Robertson Inc. Tad received his BS in Economics and MBA from the University of Oregon. He holds the Chartered Financial Analyst designation and a member of the CFA Society of Portland. Contributing authors include __Frank Benham__, Director of Research and __John Haggerty__, Director of Private Markets.

TAKE THE QUIZ

Best Practices for Monitoring Your Securities Portfolio in 2021

By: Eduard Korsinsky


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Public pension funds have a fiduciary responsibility to monitor their investment portfolios, protect and maximize their assets, and ensure that no money that should have been awarded to their funds are left unclaimed.

But just like personal habits such as exercise, healthy eating, and saving, the act of monitoring, tracking, and understanding the legal ramifications affecting an investment portfolio can be complicated, time-consuming, and daunting for even the most sophisticated fund.

What can be done to ensure that your fund is not leaving millions behind in unclaimed awards? How do you ensure that your beneficiaries' interests are represented, and you are exercising the best portfolio monitoring practices? And most importantly, how do you do this with the limited resources, time, and knowledge at your disposal?

The answer is to implement best practices. Best practices are the equivalent of compound interest. The same way that money multiplies through compound interest, the effects of best practices multiply as you repeat them. They make little difference on any given day and yet the impact over months and years can be enormous.

The following ten items form the best portfolio monitoring practices. These practices will be expanded upon in future articles:

1. Solicit Monitoring Firms Through Requests for Proposals. The RFP process is an effective tool for selecting outside counsel.

2. Monitoring Agreements Should Be Non-Exclusive. Advice from multiple firms provides your fund with all available options and mitigates against the risk of receiving poor or self-interested legal advice.

3. Maintain Independent Decision-Making. Decision-making authority should always belong to your fund.

4. Focus on Technology. Easily navigable monitoring platforms with technological innovations can save time and simplify the decision-making process.

5. Receive Regular Updates from Monitoring Firms. Your fund should receive regular updates on your portfolio from your monitoring firms.

CONTINUED ON PAGE 13

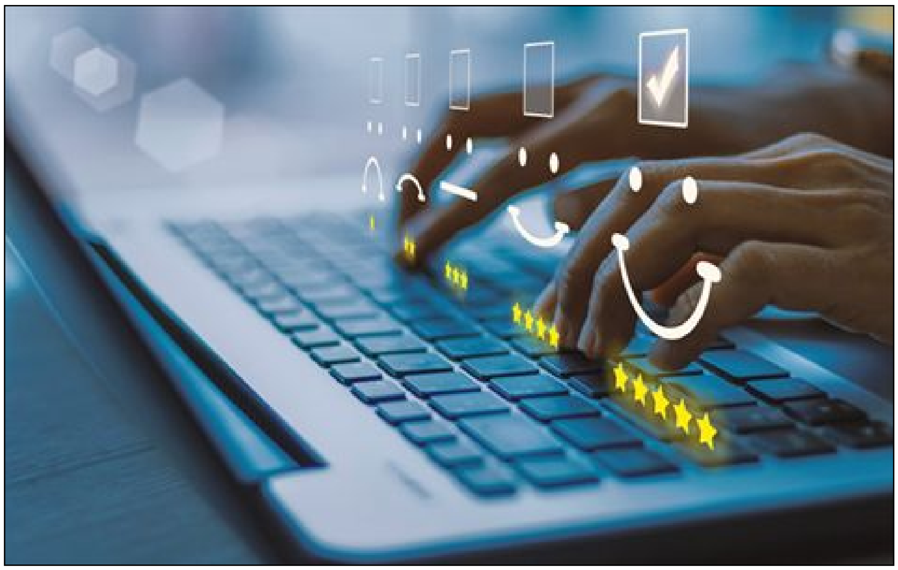
__Eduard Korsinsky__ is the Managing Partner and Co-Founder of Levi & Korsinsky LLP, a national securities firm that has recovered billions of dollars for investors since its formation in 2003. For more than 24 years Mr. Korsinsky has represented investors and institutional shareholders in complex securities matters. He has achieved significant recoveries for stockholders, including a $79 million recovery for investors of E-Trade Financial Corporation and a payment ladder indemnifying investors of Google, Inc. up to $8 billion in losses on a ground-breaking corporate governance case. His firm serves as lead counsel in some of the largest securities matters involving Tesla, US Steel, Kraft Heinz and others. He has been named a New York "Super Lawyer" by Thomson Reuters and is recognized as one of the country's leading practitioners in class action and derivative matters. Mr. Korsinsky received his LL.M. Master of Law(s) from New York University School of Law in 1997 and his J.D. from Brooklyn Law School in 1995.

Grading Your Pension Fund's Software System

TAKE THE QUIZ

By: John R. Reidy

As pension funds look to modernize their technology, it is important that Board of Trustees take an active role in helping select the software vendor that is best positioned to serve the changing needs of the fund, while protecting the personal data of the membership. Today, most pension software solutions that are marketed to the public sector all have similar functional capabilities that are designed to streamline and automate administrative processes. However, not all pension administration systems are deployed or secured in the same fashion.



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Some pension administration systems are installed systems that are deployed within the confines of the pension office. Installed software solutions rely on the technical infrastructure of the pension office to ensure that the system is adequately protected from cyber-attacks and always available for operational purposes. In today's world, effectively securing and maintaining an installed pension administration system is not usually within the core capacity of the pension office. Other types of pension administration systems are called web-based or hosted solutions. These types of solutions are typically deployed within a hosting facility that specialize in securing and maintaining applications that are accessed via the internet. However, not all hosted solutions meet the same levels of security and redundancy. This is an area in which greater due diligence should be applied by pension funds as they evaluate software vendors.

A few years ago, as web-based solutions began to gain popularity within the public pension industry, it became very common for auditors to request SOC1/SOC2 reports from the vendors that were maintaining pension fund data. Although these reports are very important, they are just the tip of the iceberg when it comes to the types of reports that pension funds should require their software vendors to provide on a regular basis. In addition to the SOC1/SOC2 reports, pension funds should also request Penetration Testing, WAF Grading, Vulnerability Scans, and Disaster Recovery Test Reports.

A Penetration Test "Pen Test" is a report that reveals how the software vendor's hosting environment holds up to a simulated cyber-attack. Pen Tests look for exploitable vulnerabilities that a hacker might use to gain access or control of the pension fund's data or system. Web Application Firewall "WAF" Grading Reports measure the effectiveness of the environment's firewalls. Vulnerability Scans are tests that can be conducted on a more frequent basis and the testing criteria can be modified to adjust for evolving threats within the cyber threat landscape. Finally, Disaster Recovery Tests are a time-measurable test that simulate the time it takes to recover from a disaster in the main production hosting facility to becoming operational in the failover facility. Just as pension fund trustees

CONTINUED ON PAGE 14

__John R. Reidy__ is a principal founder of the Pension Technology Group (PTG). Founded in 2006, PTG is a technology company that provides web-based pension administration software solutions to public employee pension funds. In his tenure, John has help oversee nearly 150 pension administration software projects at public employee pension funds throughout the United States. Over 100 of these projects have been for web-based pension administration solutions. For the past 15 years, John has managed the relationship with PTG's hosting partner Rackspace to ensure the security of PTG's client data. John has participated in and presented at numerous data security events and conferences geared towards public employees.

The Completion Portfolio: Tomorrow's Real Estate Strategy Today

TAKE THE QUIZ

Representing 17% of the U.S. investment marketplace, real estate is the third largest asset class behind bonds and equities. It has been a staple of pension plan portfolios for decades, providing diversification, reduced volatility, higher returns, income and inflation protection.

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But the real estate investment market has changed over the decades. A marketplace that was once built primarily on four sectors – retail, office, residential and industrial – has expanded in scope. Beyond the four basic "food groups," the new real estate marketplace includes fast-growing, 21st Century property sectors, such as cell phone towers and other infrastructure, data centers and e-commerce logistics facilities. It also includes health care facilities, single-family rental and manufactured homes.

Increasingly, investors are seeking to add these newer sectors to their real estate portfolios to complement the more traditional real estate types. This strategy *completes* the real estate allocation, equipping it to deliver more diversification, higher returns and reduced risk.

Building the Completion Portfolio

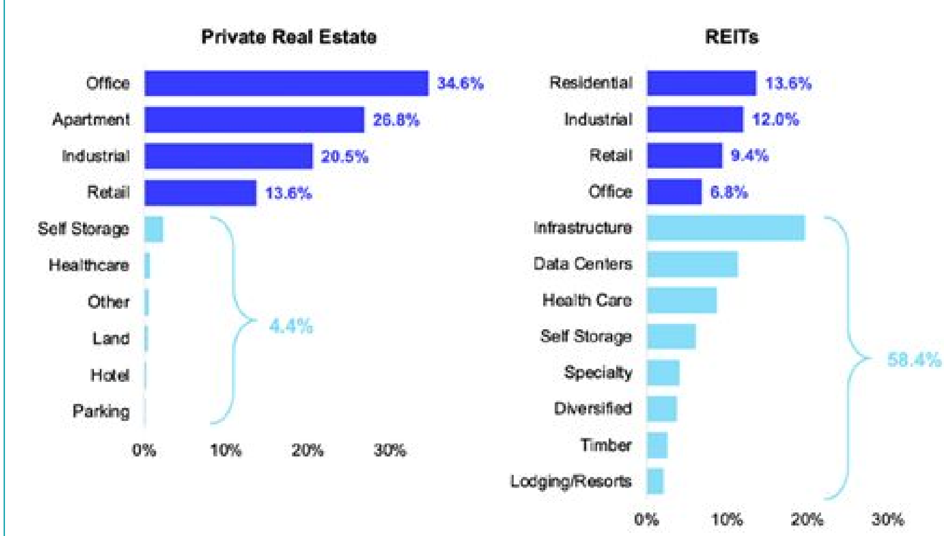
Private real estate core funds, which make up the lion's share of most institutional real estate portfolios, offer little exposure to the assets required to build a completion real estate portfolio. Although providers of private funds are becoming more interested in newer sectors of the real estate market, these assets currently represent only about 4% of the private real estate universe.

The public real estate market, however, offers ample opportunity to gain exposure to new economy assets, which represent approximately 58% of publicly listed U.S. REITs' equity market capitalization.

Institutional investors in growing numbers have turned to REITs to supplement their private real estate assets and to build completion portfolios. An estimated 60% of pension, endowment and foundation real estate portfolios on an asset-weighted basis are now a blend of public and private assets.

CONTINUED ON PAGE 14

Figure 1: Property Sector Diversification Comparing U.S. Private and Public Real Estate



Source: NCREIF Open End Diversified Core Equity ending market value as of Q3 2020 via NCREIF; FTSE Nareit All Equity Index, equity market capitalization as of September 30, 2020 via Factset.

NCPERS University

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MESSAGE FROM THE PRESIDENT CONTINUED FROM PAGE 1

for private-sector employees. Antonelli discussed the significant progress and effort in the states to advance retirement security.

We heard from the Honorable Cedric Richmond, Senior Advisor to President Biden and Director of the White House Office of Public Engagement. Richmond discussed President Biden's aggressive legislative agenda to address the pandemic, our economy, and funding streams for state and local governments.

Finally, we concluded the day with our 2020 Policy Maker of the Year recipient, Senator Sherrod Brown (D) of Ohio, and the Senate Banking Committee chairman. Sen. Brown announced the bipartisan legislation he is introducing to eliminate WEP and GPO.

At the conclusion of our program, executive director Hank Kim announced that NCPERS plans for in-person programs in the late summer and fall. NCPERS is planning the Public Pension Funding Forum in New York City, August 22 to 24, 2021. NCPERS is also planning to host our Financial, Actuarial, Legislative, and Legal (FALL) Conference in Scottsdale, Arizona, from September 26 to 28, 2021.

We look forward to seeing everyone in person soon! ◆

ACTUARY CONTINUED FROM PAGE 2

- What are the biggest financial risks that the plan faces? What are the differences in risks between the existing or legacy liabilities of the system compared with the ongoing risks?
- How do various classifications of pay, such as differential and overtime, affect the system?
- Can your system rehire retired members? If so, how does this affect their benefits, and the funding of the system?
- How has the composition of your membership changed over time? How has this affected your experience, and how are the changes likely to affect your future status?

Finally, don't hesitate to interrupt an actuary's presentations and ask for explanations of actuarial terminology or methodology. This will not only help you better understand the actuaries, but also help them understand your level of expertise and your needs. ◆

PERSist Quiz — Actuary

Why is it important for trustees and staff to ask their actuaries questions?

❍ A. Because trustees and staff are more familiar with their systems and likely to have better information about issues the actuary did not consider

❍ B. To ensure they understand the information their actuaries are presenting

❍ C. To improve their understanding of the implications of the actuarial findings

❍ D. All of the above

Answer: D

ASSET MANAGER CONTINUED FROM PAGE 3

The report also includes four other common causes of under-performance:

- Hidden portfolio risks caused unintended outcomes.
- Conventional style investing led to index-like performance –with higher fees.
- Over-diversification diluted performance.
- Possible attempts to "time" manager outperformance may have proved costly.

When looking at The Risk Report in total, the key message that the investors should derive from its six discoveries is that investors need to become more precise when providing external managers with a mandate as part of a portfolio. And, even with this, putting one's portfolio through an external in-depth analysis is advisable. ◆

PERSist Quiz — Asset Manager

The core tenet of Northern Trust Asset Management that led it to pursue The Risk Report is:

- ❍ **A.** Investors don't need to take risks with properly designed portfolios.
- ❍ **B.** Investors can get compensated for every risk they take, no matter how extreme.
- ❍ **C.** Investors should be compensated for the risks they take — in all market environments and with any investment strategy.
- ❍ **D.** Investors should focus solely on equities for maximum risk-return results.

Answer: C

EMERGING MANAGER CONTINUED FROM PAGE 4

resulted in improved funding conditions during the decade, and were especially resilient in the March 2020 sell-off.

Looking toward the 2020s, the investment portfolios of public pension plans will be increasingly depended upon to fill funding gaps between contributions and distributions. One large US West Coast city plan estimates negative cash flows to go from 2%-3% of assets today to 9%-10% over the next decade. Pennsylvania SERS recently adopted a Liability-Driven Policy Benchmark to enable investment decisions to prioritize meeting cash flow liabilities.

Essentially, liquidity management should become as important a concept to investment management as risk management is today. Establishment of a Liquidity Management Officer ("LMO") might come to occupy an essential seat on many Investment Committees. The role might entail a broad view of liquidity demands for an investment program. A LMO could monitor the stream of future liabilities or how private equity commitments balance with requirements to hold tradable assets. Additionally, the LMO could assist managing employer contributions levels, maintain a cash buffer, or create a cash flow model. A Liquidity Management Officer in tandem with the Chief Investment Officer and the Risk Management Officer could run an overlay program to meet anticipated and unanticipated liquidity demands.

Public plans will need to build on the legacy of innovation in the face of sustainability pressures. While a continuation of plan reforms will likely experience immediate politicized push-back, the investment programs will need to shoulder more of the funding burden. Plan trustees and management will need to be creative and deliberate in portfolio design. Investment solutions will still be tailored to each plan's circumstances, but with the common overall objective of survival. ◆

PERSist Quiz — Emerging Manager

What are portfolio design methods that investment staff can use to ease the negative impact of cash outflows?

- ❍ **A.** Create a cash buffer
- ❍ **B.** Manage a liquidity overlay program
- ❍ **C.** Structure liability matching investments
- ❍ **D.** All of the above

Answer: D

INVESTMENT CONSULTANTS/SERVICES
CONTINUED FROM PAGE 5

The volume of SPAC IPOs has grown dramatically, up from $14 billion in 2019, to $90 billion year-to-date 2021. (See figure 1)

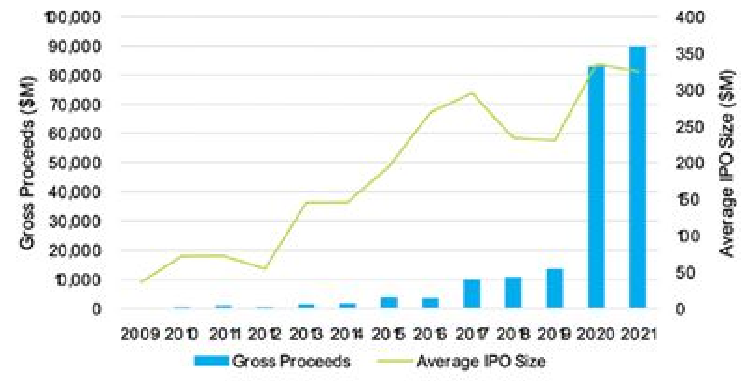
Of the SPACs listed in 2020/2021, 415 are currently searching for transactions, while 85 have announced transactions, and only 24 have completed transactions. (See figure 2)

Until 2020, proceeds generated by "traditional IPOs" outpaced SPACs. Year-to-date, SPACs are significantly outpacing IPOs. (See figure 3)

Individual SPACs have exhibited strong performance, but the overall results have been mixed. Studies found that SPACs raised prior to 2015 underperformed, as lower-quality firms were more likely to go public via SPAC, while more recent SPACs tended, on average, to lose a third of their value post-merger due to dilution, underwriting fees, and warrants.

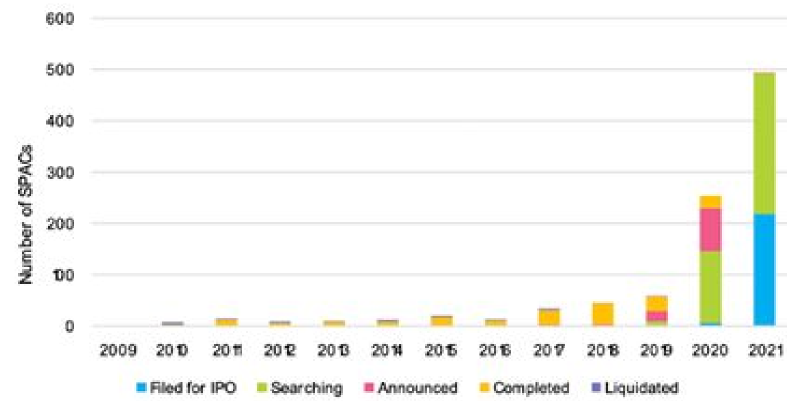
Currently, the majority of benefits appear to favor SPAC sponsors and acquisition targets, while SPAC investors appear to be bearing disproportionate costs. The economics of SPACs are expected to be "self-correcting" and result in better alignment for investors. Continued monitoring of SPACs is warranted as the market evolves. ◆

Figure 1: SPAC IPO Transactions: by year



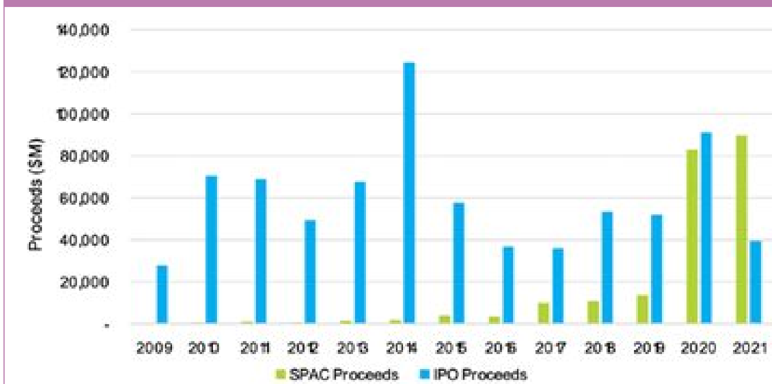
Source: SPACInsider, as of March 19, 2021

Figure 2: SPAC Status: by Year of IPO



Source: SPACInsider, as of March 19, 2021

Figure 3: Proceeds: SPAC vs "Traditional IPO"



Source: SPACInsider, ThomsonONE (Private Equity Backed IPOs), as of March 19, 2021

PERSist Quiz | Investment Consultants/Services

In the past two years, the volume of SPAC IPOs has grown by?

❍ **A.** 100%, ❍ **B.** 250% ❍ **C.** over 500%

Answer: C

LEGAL CONTINUED FROM PAGE 6

6. Actively Monitor Your Portfolio. It is important to remain actively and directly involved in the monitoring process and have direct access to any platforms used by monitoring firms.

7. Monitor Settlements to Determine Eligibility. A designated person or entity (such as monitoring firms) should monitor all settlements, regardless of whether your fund is a party to the lawsuit.

8. Designate a Person/Entity to Handle Proof of Claims. The best practice for avoiding forfeiture of eligible claims is to designate a person or entity (such as a monitoring firm) to handle the submission of all proof of claim forms.

9. Maintain Accurate Records. Accurate and accessible documentation of your purchasing and trading histories assists in determining your fund's eligibility in settlements.

10. Maintain Up-To-Date Security. To ensure protection of your members' sensitive information, you should utilize the most up-to-date security software.

Make your fund best in class in 2021 by following the above best practices for monitoring investment portfolios, upholding your fiduciary duties, and ensuring the protection of members' interests. ◆

PERSist Quiz | Legal

Considering the complexity of securities litigation monitoring, as a fund trustee or administrator, what should I be looking for in a monitoring service in order to best carry out my fiduciary duties?

❍ A. Service offering excellent legal talent

❍ B. Service offering excellent technology platform

❍ C. Service offering both.

Answer: C

PENSION ADMINISTRATION/ DATABASE CONTINUED FROM PAGE 7

measure the performance of their investment managers, they should also measure the performance of their software vendors. It is important to note that the reports mentioned within this article could contain sensitive security practices and procedures and should be kept confidential between the vendor and the fund and not disclosed to the public. ◆

PERSist Quiz | Pension Administration/Database

What are the some of the reports that pension funds should request from their technology vendors?

❍ A. WAF Grade ❍ B. SAT ❍ C. Penetration Test

Answer: C

REAL ESTATE CONTINUED FROM PAGE 8

The Public/Private Blend's Advantages

Nareit is the worldwide representative voice for REITs and listed real estate companies with an interest in U.S. real estate and capital markets.

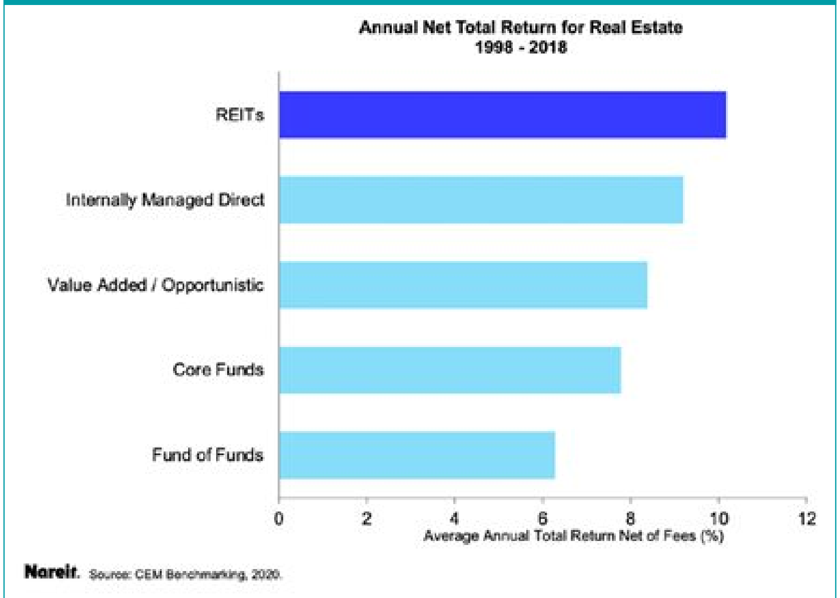
REITs also bring other benefits to investment portfolios. One of those is market liquidity. Many portfolio managers whose private real estate funds were gated during the pandemic and during the 2008 financial crisis experienced the challenge of being unable to rely on liquidity from those assets to help make adjustments in their portfolios. Unlike private funds, publicly listed REITs can provide immediate liquidity.

Finally, REITs have a proven track record of delivering lower costs and higher total returns net of fees than any style of private real estate. The results were documented in a recent Nareit-sponsored CEM Benchmarking study of realized investment returns and costs for approximately 200 major U.S. pension funds over a 21-year period, 1998-2018.

REIT investments delivered an average annual net return of 10.2% over the study period – nearly 270 basis points higher than the 7.5% average annual net return of private real estate. Every type of private real estate, both direct and LP/GP – style funds, underperformed REIT investments.

The real estate investment marketplace has changed significantly in recent decades. But the changes have brought new opportunity to real estate investors, and the evolution of the REIT market has made these opportunities readily available. ◆

Figure 2: REITs Outperform All other Real Estate Styles



PERSist Quiz | Real Estate

"New economy" sectors of the real estate market represent 4% of all private real estate assets and ___% of U.S. listed REITs' equity market capitalization.

❍ A. 3% ❍ B. 18% ❍ C. 58%

Answer: C

Don't Miss NCPERS' Social Media

The Voice for Public Pensions

Calendar of Events 2021

June

[2021 Trustee Educational Seminar]
June 8–9, 2021

June

[WEBINAR: The Fallacies of Asset Allocation]
June 15, 2021

The Voice for Public Pensions

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