



2019 Audit Wrap Up Presentation and Discussion

Employees' Retirement Fund of the City of Dallas



Audit Timeline & Scope

February – March 2020	Client continuance/Planning	<ul style="list-style-type: none">• Client continuance procedures• Independence verification• Materiality determination
March – April 2020	Preliminary risk assessment procedures/Interim fieldwork	<ul style="list-style-type: none">• Significant Risks Identified• Inquiries of management• Developed an audit plan that addresses risk areas
April – June 2020	Final fieldwork	<ul style="list-style-type: none">• Performed final phase of audit and year-end fieldwork procedures (see subsequent slides for details)
June 2020	Deliverables	<ul style="list-style-type: none">• Issuance of Financial Statements• Present Results of Audit

Significant Risks

The following provides an overview of the areas of significant audit focus based on our risk assessments.

Areas of focus	Results
Investments	Confirmation with Fund's custodian (Northern Trust) and investment managers. Verification of fair value: <ul style="list-style-type: none">• Market quotes for equities and fixed-income securities• Recalculation of net assets value from audited financial statements for private equity, real estate, and commingled index funds.• Test leveling of investments, confirm with Harvest investments• Use GT's internal Pricing Group (NYPG) to test fair value of investments
Participant Benefits	Examination of benefits on a test basis Test of eligibility of participants
Actuarial Valuation	Review of assumptions and methodology used by actuary. Use GT's internal Compensation and Benefits Group to review actuarial assumptions and methodology Test of census data used in the calculation for accuracy Review related disclosures

Other Required Communications

Professional standards require that we communicate the following matters to you, as applicable.

Going concern matters
Fraud and noncompliance with laws and regulations
Significant deficiencies and material weaknesses in internal control over financial reporting
Use of other auditors
Use of internal audit
Related parties and related party transactions



Other Required Communications

(continued)

Disagreements with management
Management's consultations with other accountants
Significant issues discussed with management
Significant difficulties encountered during the audit
Other significant findings or issues that are relevant to you and your oversight responsibilities
Modifications to the auditor's report
Other information in documents containing audited financial statements



Quality of Accounting Practices

Accounting policies	Accounting policies were consistent and appropriate in their application
Accounting estimates	Actuarially determined amounts, including net pension liability and changes in net pension liability. Fair value of investments, including private equity and real estate. We perform tests to satisfy ourselves that these amounts are free from material misstatement.
Disclosures	Disclosures are consistent and appropriate in their application



Internal Controls Matters

Responsibility

We are responsible for obtaining reasonable assurance about whether the financial statements are free of material misstatement. Our audit included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we express no such opinion. Control deficiencies that are of a lesser magnitude than a significant deficiency will be communicated to management.

Definitions

- A deficiency in internal control ("control deficiency") exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect, misstatements on a timely basis.
- A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis.

Use of Other Auditors

Specialists

GT firm actuary reviews the actuarial valuation reports prepared by Gabriel, Roeder Smith & Company

GT consults with our pricing group to assist with the valuation of selected investments

GT consults with Harvest Investments to review the fair value leveling of investments in accordance with GASB 72

Subcontractor

As part of our commitment to participation of minority-owned firms, we engaged Owens & Thurman, PC to perform audit procedures under our direction

COVID-19 pandemic

Accounting considerations

Subsequent Event and Disclosures: Funds/Plans have a responsibility to consider events that occur subsequent to year-end. The audit team identified the following items that should be disclosed in the financial statements:

-Investments — financial markets have had significant declines and volatility in 2020 due to COVID-19

Audit considerations

Going Concern: The pandemic had an adverse effect on investment holdings throughout the country. GT determined that given the diversified nature of the investments held by the Fund, the recent changes in Fund benefits, and the funded status of the plan, no going concern risks are imminent.

We will ensure disclosure around the change in investment values subsequent to end of year.

Commitment to Promote Ethical and Professional Excellence

We are committed to promoting ethical and professional excellence. To advance this commitment, we have put in place a phone and internet-based hotline system.

The Ethics Hotline (1.866.739.4134) provides individuals a means to call and report ethical concerns.

The EthicsPoint URL link can be accessed from our external website or through this link:

https://secure.ethicspoint.com/domain/en/report_custom.asp?clientid=15191

Disclaimer: EthicsPoint is not intended to act as a substitute for a company's "whistleblower" obligations.

EMPLOYEES' RETIREMENT FUND OF THE CITY OF DALLAS

Financial Statements

As of December 31, 2019 and 2018

With Independent Certified Public Accountant's Report Thereon

MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)
(Required Supplementary Information)

MANAGEMENT’S DISCUSSION AND ANALYSIS (UNAUDITED)

The Management’s Discussion and Analysis of the Employees’ Retirement Fund of the City of Dallas (“the Plan”) financial performance provides an overview of the financial activities and funding conditions for the fiscal years ended December 31, 2019, 2018, and 2017. The intent of this discussion and analysis is to give a narrative overview and analysis of the Plan’s financial performance as a whole. For more detailed information regarding performance, readers should also review the Financial Statements, Notes to the Financial Statements, and Required Supplementary Information in order to enhance their understanding of the Plan’s financial performance.

FINANCIAL STATEMENTS

The Plan is a defined benefit plan that provides retirement, disability, and death benefits to full-time and permanent part-time civilian employees of the City of Dallas (“the City”). The Plan has two basic Financial Statements:

- A Statement of Fiduciary Net Position that provides information about the fair value and composition of plan assets, plan liabilities, and fiduciary net position; and
- A Statement of Changes in Fiduciary Net Position that provides information about the year-to-year Changes in Fiduciary Net Position.

There are also notes to the Financial Statements that include a brief Plan description, a summary of significant accounting policies, and information about contributions, legally required reserves, investment concentrations, and the net pension liability. The report also contains required supplementary information in addition to the basic financial statements. Collectively, this information presents the Net Position Restricted for Pension Benefits and summarizes the Changes in Net Position for those benefits.

FINANCIAL HIGHLIGHTS

Fiscal year 2019 experienced an increase in investments. The Plan’s Financial Highlights for fiscal year ended December 31, 2019 are as follows:

- The Plan had a return of 17.6% for the year, a 5-year return of 6.5% and 10-year return of 8.6%.
- The Net Position Restricted for Pension Benefits was \$3.7 billion as of December 31, 2019. This amount reflects an increase of \$376 million from last year. This growth is primarily the result of net increases in investments.
- Total contributions for fiscal year 2019 were \$120.5 million, an increase of approximately \$2.8 million from last fiscal year. This is primarily attributed to a merit pay increase.
- Pension benefits paid to retirees and beneficiaries increased \$14 million in 2019 compared to 2018, bringing the total benefit payments to \$278 million. Refunds of contributions paid to former members after termination of employment were \$10 million for 2019 and \$9 million for 2018.
- Net Investment Income (net appreciation/(depreciation) in the fair value of investments, plus interest and dividend income, less investment expenses) increased \$719 million compared to last fiscal year.
- Administrative Expenses of \$7.5 million in 2019 were slightly higher than 2018.

CONDENSED FINANCIAL INFORMATION

(\$ in thousands)

As of and for the FY Ended December 31,	2019	2018	2017
Fiduciary Net Position			
Assets	\$4,325,968	\$4,120,996	\$4,381,562
Liabilities	667,880	838,683	769,302
Fiduciary Net Position for Pension Benefits	<u>\$3,658,088</u>	<u>\$3,282,313</u>	<u>\$3,612,260</u>
Changes in Fiduciary Net Position			
Additions:			
Employer contributions	\$62,177	\$60,924	\$58,966
Employee contributions	58,314	56,772	55,175
Investment & other income, net	551,243	(167,662)	413,717
Deductions:			
Benefit payments	278,007	263,981	253,534
Refund of contributions	10,436	8,515	8,156
Administrative expenses	7,513	7,484	5,951
Depreciation expense	3	1	-
Change in Fiduciary Net Position Restricted for Pension Benefits	\$375,775	(\$329,947)	\$260,217
Net Position, Beginning of Year	3,282,313	3,612,260	3,352,043
Net Position, End of Year	<u>\$3,658,088</u>	<u>\$3,282,313</u>	<u>\$3,612,260</u>

FINANCIAL POSITION AND RESULTS OF OPERATIONS

The Plan's total investment return for fiscal year 2019 was 17.6% as compared to -4.4% in 2018 and 13.3% in 2017. The one-year return was below the policy benchmark of 18.3%. The Plan has performed well over longer time periods. The Plan's 5-year return is 6.5% and the 10-year return is 8.6%, which is above the policy benchmark of 6.3% and 8.3%, respectively.

Overall, all of the Plan's asset classes recorded gains for the year. The best performing asset classes in 2019 were Domestic Equity and Global Equity, returning 29.1% and 22.8%, respectively. High Yield Fixed Income returned 14.1% for the year.

The Plan's Fiduciary Net Position increased from \$3.3 billion in fiscal year 2018 to \$3.7 billion in 2019, an increase of approximately \$0.4 billion. This growth is primarily due to an increase in the fair value of equity investments, specifically Domestic, International, and Global Low Volatility. Additions to the Plan's Fiduciary Net Position consist of employer and employee contributions and investment income. For fiscal year 2019, additions to Fiduciary Net Position reflect an increase of \$722 million, in comparison to 2018. City and employee contributions for fiscal year 2019 were \$62 million and \$58 million, respectively. Total contributions for 2019 were \$120 million compared to \$118 million in 2018 and \$114 million in 2017.

Net investment income/(loss) is presented net of investment expenses and is comprised of interest, dividend income, gains/(losses) from the sale of investments, net unrealized appreciation/(depreciation) in the fair value of investments, and net income from securities lending activities. For fiscal year 2019, the Plan had a net investment income of \$551 million, (excluding non-investment income of \$301 thousand) compared to a net investment loss of \$168 million in fiscal year 2018.

Fiscal year 2019 liabilities of \$668 million showed a decrease of 20% from fiscal year 2018 liabilities of \$839 million. Liabilities for 2018 increased \$218 million or 9.7% over 2017. The decrease in 2019 was primarily due to decreases in currency contracts, currency contracts, and securities lending collateral. Year-end balances for securities purchased were \$15 million in 2019, \$9 million in 2018 and \$13 million in 2017. Foreign currency contracts at year end were \$433 million in 2019, \$548 million in 2018 and \$458 million in 2017. The changes were due to investment managers' portfolio management.

Deductions from Fiduciary Net Position are largely from benefit payments. During fiscal year 2019, of the 2019 increase is attributable to new retirements, as was the increase between 2018 and 2017.

New retirements were 376, 314 and 354 respectively for fiscal years 2019, 2018 and 2017. Cost of Living Adjustments ("COLA") were 2.7% in 2019, 2.1% in 2018 and 1.4% in 2017. A COLA is granted effective January 1 of each year if there is an increase in the Consumer Price Index for Urban Wage Earners and Clerical Workers ("CPI-W") based on the greater of either a) the change from October of the prior year to October of the current year; b) the monthly average change; or c) zero. During fiscal year 2019, refunds of contributions amounted to \$10.4 million (726 refunds), compared to 2018 refunds of \$8.5 million (626 refunds) and 2017 refunds of \$8.2 million (546 refunds). The fiscal year 2019 refund amount reflects an increase in the number of members requesting refunds as compared to fiscal year 2018. Administrative expenses of approximately \$7.5 million represent approximately 2.5% of total deductions for the year.

CURRENT ENVIRONMENT

Plan membership for active members decreased during fiscal year 2019. Active membership as of December 31, 2019 decreased from 7,584 to 7,427 members, a decrease of 1.0%. For 2019, the number of new retirements was 376 compared to 314 in 2018. The trend of benefit payments continues to increase. Similar to most mature plans, benefit payments exceed the level of contribution revenue received, and cash generated from investments is needed in order to meet benefit payments.

An actuarial valuation of the Plan's assets and benefit obligations is performed annually by an independent firm, Gabriel Roeder Smith & Company ("GRS"). Based on the actuarial value of assets, the funded ratio of the Plan decreased from 80.0% in 2018 to 75.7% in 2019 primarily due to changes to the Plan's actuarial assumptions. The Unfunded Actuarial Accrued Liability ("UAAL") increased from \$907 million as of December 31, 2018 to \$1.18 billion as of December 31, 2019. Based on accounting principles generally accepted in the United States ("GAAP") requirements, the Plan Fiduciary Net Position as a percentage of the Total Pension Liability was 64.65% in 2019 as compared to 59.16% in 2018. This is due to a blended discount rate of 5.93% in 2019. See Note 10 (c) for more information regarding the discount rate.

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Statements of Fiduciary Net Position
As of December 31, 2019 and 2018
(\$ in thousands)

	2019	2018
ASSETS:		
Cash and short-term investments	\$ 111,496	\$ 102,781
Collateral on loaned securities	208,368	270,118
	319,864	372,899
Capital Assets:		
Construction In Progress	5,431	3,186
Furniture and Fixtures, net	14	17
Total capital assets (net)	5,445	3,203
Receivables:		
Currency contracts	433,426	547,775
Accrued dividends	4,586	3,664
Accrued interest	9,293	9,819
Accrued real estate income	588	-
Accrued securities lending	82	113
Securities sold	4,161	2,789
Employer contributions	2,307	2,058
Employee contributions	2,164	1,903
Total receivables	456,607	568,121
Investments, at fair value:		
Commingled index funds	176,734	152,656
Domestic equities	1,361,555	1,210,491
United States and foreign government fixed income securities	199,586	198,090
Domestic corporate fixed-income securities	797,531	713,543
International equities	511,041	419,497
Investments, at estimated fair value:		
Private equities	267,422	245,809
Real estate	230,183	236,687
Total investments	3,544,052	3,176,773
Total assets	4,325,968	4,120,996
LIABILITIES:		
Accounts payable	7,267	7,455
Payable for securities purchased	14,884	8,597
Investment fees payable	3,563	3,564
Currency contracts	433,426	547,775
Currency contract losses	372	1,174
Securities lending collateral	208,368	270,118
Total liabilities	667,880	838,683
NET POSITION		
Net Investment in capital assets	5,445	3,203
Unrestricted	3,652,643	3,279,110
Net position RESTRICTED for PENSION benefits	\$ 3,658,088	\$ 3,282,313

(A Schedule of Net Pension Liability is presented on page 52)

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Statements of Changes in Fiduciary Net Position
As of December 31, 2019 and 2018
(\$ in thousands)

	<u>2019</u>	<u>2018</u>
Additions:		
Contributions:		
Employer	\$ 62,177	\$ 60,924
Employee	58,314	56,772
Total contributions	<u>120,491</u>	<u>117,696</u>
Net investment income:		
Dividends	59,827	57,666
Interest	47,373	46,217
Real estate dividend income	6,622	6,268
Net appreciation/(depreciation) in fair value of investments	453,838	(261,974)
Securities lending rebates paid by borrowers	(5,972)	(5,419)
Securities lending income	7,383	7,144
Total investment income/(loss)	<u>569,071</u>	<u>(150,098)</u>
Less investment expenses:		
Investment management fees	(17,270)	(16,825)
Custody fees	(125)	(126)
Consultant fees	(452)	(389)
Securities lending management fees	(282)	(345)
Total investment expenses	<u>(18,129)</u>	<u>(17,685)</u>
Net investment income/(loss)	<u>550,942</u>	<u>(167,783)</u>
Other income	301	121
Total additions	<u>671,734</u>	<u>(49,966)</u>
Deductions:		
Benefit payments	278,007	263,981
Refund of contributions	10,436	8,515
Administrative expenses	7,513	7,484
Depreciation expense	3	1
Total deductions	<u>295,959</u>	<u>279,981</u>
Net increase/(decrease) in net position restricted for pension benefits	<u>375,775</u>	<u>(329,947)</u>
Net position RESTRICTED FOR PENSION benefits		
Beginning of year	<u>3,282,313</u>	<u>3,612,260</u>
End of year	<u>\$ 3,658,088</u>	<u>\$ 3,282,313</u>

The accompanying notes are an integral part of these financial statements.

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

1) Description of the Plan

a) General

The Employees' Retirement Fund of the City of Dallas ("ERF" or the "Plan") is a single-employer defined benefit pension plan that provides retirement, disability, and death benefits to its members, and is sponsored by the City of Dallas, Texas (the "City"). All employees of the City are members in the Plan, except police officers, firefighters, elected officers, non-salaried appointee members of administrative boards or commissions, part-time employees working less than one-half time, temporary employees, individuals working under contract, and individuals whose salaries are paid in part by another government agency. Members are entitled to retirement benefits after five years of service and to survivor benefits after two years of service or at the date of eligibility for retirement. The Plan was established and derives its authority to continue in operation from Chapter 40A of the Dallas City Code ("Chapter 40A"). The description of the Plan provisions in this report is for financial disclosure only. It is not intended to create or reduce legal rights. The rights and responsibilities of the Board of Trustees, the Plan, the members and the retirees are governed by the Plan as set forth in Chapter 40A. As of December 31, 2019 and 2018, the Plan's membership consisted of:

	<u>2019</u>	<u>2018</u>
Retirees and beneficiaries currently receiving benefits and inactive members entitled to benefits but not yet receiving them	9,071	8,716
Current members:		
Vested	4,302	4,420
Non-vested	<u>3,125</u>	<u>3,164</u>
Total current members	<u>7,427</u>	<u>7,584</u>
Total membership	<u>16,498</u>	<u>16,300</u>

b) Plan Administration

The Plan is governed by seven Board members, consisting of three members appointed by the City Council who may be Council members, three employee members of the Plan (elected by the membership) and the City Auditor (serving ex officio). The Board has general powers and duties to administer the Plan, including appointing an administrator to carry out the business of the Board, investing the assets of the Plan, making expenditures from the Plan, and determining members' eligibility for benefits.

Based on a Plan amendment passed by the voters of the City of Dallas in November 2004, the Board annually increases or decreases contribution rates in a ratio where the City pays 63% and the employee pays 37% of the contribution rate as determined by the actuarial valuation. The Plan requires notice to the City of the contribution rates and provides procedures by which the City may review and challenge those rates; codifying the Board's policies and procedures relating

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

to the Plan's actuarial process and the City's participation in the selection of an actuarial firm to perform a peer review/audit; increasing the Board from five members to seven by adding another employee-elected representative and another council-appointed representative effective March 1, 2005; increasing from three to four the number of Board members required to constitute a quorum; increasing the terms of the employee-elected representatives from two to three years; requiring Council approval before the Board may grant temporary or permanent discretionary adjustments to retirement benefits over and above the regular cost-of-living increases; correcting section references to the term "qualified recipient"; and authorizing either the Council or the Board to propose amendments to Chapter 40A, subject to approval by the Board, the Council, and the voters of the City.

Based on a Plan amendment passed by the voters of the City of Dallas in November 2016, a new tier of benefits was added to the Plan (Tier B), effective January 1, 2017. Benefits provided to each tier of membership are outlined below.

The Plan may be terminated only by ordinance recommended by the Board, adopted by the City Council, and approved by a majority of the voters of the City voting in a general or special election. The Plan does not address allocation of the net position in the event of termination.

c) Pension Benefits

Tier A

Members of the Plan hired before January 1, 2017, are entitled to pension benefits equal to 2.75% of the average monthly earnings for each year of credited service. Average monthly earnings are based on the most beneficial to the member and are determined based on the member's earnings for the highest three calendar years, last 6,240 hours of credited services, or the length of credited service if less than three years. Normal retirement age is 55 if credited service began before May 9, 1972 or age 60.

Tier A members are also eligible to retire at age 50 if the sum of the member's age and credited service is equal to or greater than 78. Members who have completed 30 years of credited service may alternatively elect retirement before age 50; however, the pension benefits will be actuarially reduced based on the member's age at retirement.

Tier B

Members of the Plan hired on or after January 1, 2017 are entitled to pension benefits equal to 2.5% of the average monthly earnings of the member for each year of credited service. Average monthly earnings are based on the most beneficial to the member and are determined based on the member's earnings for the five highest calendar years, last 10,400 hours of credited service, or the length of credited service if less than five years. Normal retirement age is 65 with five years of credited service.

Tier B members who have completed 40 years of credited service may elect retirement at any age and are entitled to full pension benefits. Members who elect retirement before age 65 are

EMPLOYEES' RETIREMENT FUND OF
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Notes to the Financial Statements
December 31, 2019 and 2018

entitled to an actuarially reduced pension benefits depending upon the age of the member. Active members may also elect to retire with actuarially reduced benefit once a combination of their age and years of service equal at least 80.

d) Cost of Living Adjustments

Cost of living adjustments for retirees are made each year on the first of January by adjusting the pension base by the percentage change of the Consumer Price Index ("CPI"), not to exceed 5% for Tier A and 3% for Tier B members. The cost of living adjustment effective January 2019 was 2.69% and 2.05% effective January 2018.

e) Disability and Death Benefits

Members who become totally and permanently disabled may qualify for a service-connected disability with no minimum service requirement, or a non-service connected disability with five or more years of credited service. Non-service connected benefits are based on actual credited service or a minimum of 10 years. Service-connected benefits are equal to normal retirement benefits or a minimum of \$1,000.

Upon the death of an active married member with less than 15 years of service, the joint and one-half survivor option is the automatic death benefit.

If an active member has at least 15 years of service and is eligible to retire, the member may elect the joint and full survivor option. Under this option, the member receives a reduced base pension payment which is actuarially computed based on the member's age, average monthly earnings, years of credited service at retirement, and the relative age of the spouse. Upon the death of the member, this option pays the full amount of the member's pension payment to the surviving spouse for life.

Upon the death of a member before retirement, death benefits equal to the normal retirement benefit will be paid to a qualified recipient: surviving spouse, minor child under age 18, a disabled child who became disabled before age 18, a dependent parent, or a parent over age 65. Death benefits vary depending on the beneficiary. The surviving spouse, the disabled child, or the dependent parent will receive a lifetime benefit unless the ten-year option is taken. The minor child under age 18 will receive the normal retirement benefit for ten years or until reaching age 18. If the member has less than two years of credited service, the member's contributions will be refunded.

Upon the death of a retired member, a death benefit is paid in accordance with the option selected by the member at retirement. If there are no qualified recipients at the time of death and benefits have not been paid for ten years, death benefits are paid to the designee (an estate, a person or an entity) named by the member. The designee will receive a lump-sum payment based on ten years of benefit payments when the member's death occurs before retirement. If death occurs after retirement, the designee will receive a commuted lump-sum payment representing the balance of a guaranteed ten-year period starting from the date of retirement.

EMPLOYEES' RETIREMENT FUND OF
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If a member does not have an eligible beneficiary, death benefits will be paid to the designee or member's estate in one commuted value payment. Benefit payments will vary depending on whether death occurred before or after retirement. Upon the death of a member before retirement, the designee or member's estate will receive a lump-sum payment based on ten years of benefit payments. Upon the death of a retired member, the designee or estate will receive a commuted value lump-sum payment representing the balance of a guaranteed ten-year period starting from the date of retirement.

f) Contributions

If employment ends before attaining five years of service and before attaining eligibility for retirement, the member's contributions will be refunded upon written request to the Plan.

If a member's employment is terminated after five years of service, the member may elect a refund of contributions upon a written request, or the member may elect to receive pension benefits at normal retirement age equal to the amount accrued to the date of termination.

Based on the authorization in the Plan, the annual actuarial valuation will establish any new contribution rates for employees and the City. The new rates, which became effective October 1, 2019, are 13.32% for employees and a combined rate of 22.68% of pay for the City. The City's 22.68% is divided into 14.20% to the Plan and 8.48% for debt service payments on the pension obligation bonds. The former rates, effective October 1, 2018, were 13.32% of pay for employees and a combined rate of 22.68% of pay for the City.

The percent contributed may vary from the legally required rate as the annual required contribution is based upon covered payroll as of the actuarial valuation date, December 31, whereas contributions are calculated and paid based upon actual payrolls throughout the year. Certain factors, such as changes in benefit provisions, the size or composition of the population covered by the Plan or the actuarial assumptions used, may significantly affect the identification of trends in the amounts reported in the Schedule of Net Pension Liability and Schedule of Changes in Net Pension Liability located in the Required Supplementary Information section.

2) Summary of Significant Accounting Policies

a) Basis of Accounting

The accompanying financial statements are prepared on the economic resources measurement focus and accrual basis of accounting. Accordingly, interest earned but not received and dividends declared but not received as of the Plan's fiscal year end are recorded as accrued interest and dividends receivable, respectively. Contributions owed but not received as of the Plan's fiscal year end are recorded as contributions receivable. Benefits and refunds are recorded when paid. In addition, unsettled investment purchases and sales are accrued.

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
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December 31, 2019 and 2018

b) Administrative Expenses

Administrative expenses are paid from the Plan's contributions. The contribution rates calculated by the actuary take into consideration the expected administrative expenses.

c) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from those estimates.

d) Investments and Investment Income

The Plan's investment policy requires that investments comply at all times with applicable local, state and federal regulations. The Plan's investment policy is based upon an asset allocation study that considers the current and expected condition of the Plan, the expected long-term capital market outlook and the Plan's risk tolerance. Unless specifically permitted in the investment manager guidelines or other governing document, the investment policy prohibits the purchase of non-negotiable securities, short sales, selling on margin, puts, calls, straddles, options, or "letter" (restricted) stock. Also, unless specifically authorized in a manager's individual guidelines, the investment policy prohibits the use of derivatives (See derivatives disclosure in footnote 3).

Marketable securities are valued at fair value based on quoted market prices, where available. Purchases and sales of securities and any resulting gain or loss are recorded on a trade-date basis. Net appreciation/(depreciation) include the Plan's gains and losses on investments bought and sold as well as held during the year. In November 2019, the Plan modified the asset allocation. At December 31, 2019, the Plan was in the process of adjusting its portfolio to align with the new asset allocation. The Plan's asset allocation is shown in the following table.

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

Asset Class	Allocation Percent
US Equity	
Domestic Equity	12.5
Real Assets	12.5
REITs	2.5
Private Equity	7.5
Marketable Alternatives	<u>2.5</u>
Total US Equity	<u>37.5</u>
Non-US Equity	
International	12.5
Global	7.5
Global Low Volatility	<u>12.5</u>
Total Non-US Equity	<u>32.5</u>
Total Equity	<u>70.0</u>
Credit Opportunities	5.0
Global Investment Grade	15.0
High Yield	<u>10.0</u>
Total Fixed Income	<u>30.0</u>
Total Fund Allocation	<u>100.0</u>

e) Private Equity

To enhance the potential for earning higher rates of return relative to its other asset classes and to provide for broader portfolio diversification, the Plan allocates 7.5% of its total Plan portfolio to private equity. Recognizing that private equity investments have higher risk levels, this target of 7.5% is to be allocated within an acceptable range of 5.0% to 10.0% of private equity-oriented investments. Funding of committed capital in the private equity portfolio can occur over an extended time period and may take several years before the total allocation is fully invested. In order to reach the allocation target, a “committed” allocation up to 1.5 times the allocation is authorized. The Plan had three private equity managers at December 31, 2019.

Investments in these funds as a limited partner are carried at estimated fair value. Estimated fair values of investments in private limited partnerships are determined by the fund managers or general partner based on the latest investee information available, including audited financial statements and other similar data necessary to the valuation process. The private equity value at December 31, 2019 and December 31, 2018 was \$267 million and \$246 million, respectively.

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f) Real Assets

The Plan is authorized to allocate 12.5% of its portfolio to Real Assets. The Plan had two managers that manage Real Asset Funds for a value of \$230 million at December 31, 2019 and \$237 million at December 31, 2018. The Plan invests in Heitman's core real estate fund, Invesco's core fund, and in Invesco II which manages 1900 McKinney, LLC.

Estimated fair values of investments in these funds are determined by the fund managers based on their best estimates using fair value estimation techniques substantiated, in part, by their audited financial statements and supported by the due diligence of the Plan investment staff.

g) Foreign Currency Transactions

The Plan may enter into forward foreign currency exchange contracts for the purchase or sale of a specific foreign currency at a fixed price on a future date as a hedge against specific transactions or to position the portfolio to protect the Plan against adverse currency movements. Entering into these arrangements involves the risk of dealing with counterparties and their ability to meet the terms of the contracts. These contracts are valued at fair value at the financial statement date, and any realized and unrealized gains and losses are recorded when they are incurred.

Investments denominated in foreign currencies at December 31, 2019 and 2018 were converted to U.S. dollars at the foreign exchange rates quoted at December 31, 2019 and 2018. These foreign exchange gains and losses are included in net appreciation/(depreciation) in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

h) Securities Lending

The Board has authorized the Plan to enter into an agreement with The Northern Trust Company ("Northern Trust") for the lending of certain of the Plan's securities (the "Securities Lending Program" or "Program") including, but not limited to, stocks and bonds to counterparty brokers and banks ("borrowers") for a predetermined period of time and fee.

In 2009, the Board capped the securities lending exposure at \$538.2 million.

i) Rate of Return

For the year ended December 31, 2019, the annual money-weighted rate of return on pension plan investment, net of investment fees, was 17.33%. The money-weighted rate of return expresses investment performance, net of investment expenses, adjusted for the changing amounts actually invested.

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Schedule of Money-Weighted Investment Returns

<u>For Year</u> <u>Ended December 31</u>	<u>Annual Investment</u> <u>Returns*</u>
2016	8.88%
2017	13.08%
2018	-4.99%
2019	17.33%

* This schedule is intended to include information for ten years. Additional years will be included as they become available.

j) Capital Assets

Capital Assets, which include furniture, fixture, and software, are reported in the Plan's Financial Statements. Capital Assets are defined by the Plan as assets with an initial, individual cost of more than \$5,000 and an estimated useful life in excess of two years. As the Plan constructs or develops additional Capital Assets each period, they are capitalized and reported at historical cost. The reported value excludes normal maintenance and repairs which are essentially amounts spent in relation to capital assets that do not increase the capacity or efficiency of the item or increase its estimated useful life.

Furniture and fixtures are depreciated using the straight line method over an estimated useful life of 5-20 years. Software is depreciated using the straight line method over an estimated useful life of 5-15 years. Construction in progress is not depreciated.

3) Derivatives

Derivatives are generally defined as contracts whose values depend on, or are derived from, the value of an underlying asset, reference rate, or index. The Plan has classified the following as derivatives:

a) Currency Forward Contracts

A Currency Forward is a contractual agreement between two parties to pay or receive specific amounts of foreign currency at a future date in exchange for another currency at an agreed upon exchange rate. Forward commitments are not standardized and carry credit risk due to the possible nonperformance by one of the counterparties. The maximum potential loss is the aggregate face value in U.S. dollars at the time the contract was opened; however, the likelihood of such loss is remote. No such losses occurred during fiscal years 2019 and 2018. Currency forwards are usually traded over-the-counter. These transactions are entered into in order to hedge risks from exposure to foreign currency rate fluctuation and to facilitate trade settlement of foreign security transactions. Currency forwards carry market risk resulting from adverse fluctuations in foreign exchange rates. Recognition of realized gain or loss depends on whether the currency exchange rate has moved favorable or unfavorable to the contract holder upon termination of the contract. Prior to termination of the contract, the Plan records the unrealized currency translation gain or loss based on the applicable exchange rates.

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The Plan recognized a net realized gain on currency forward contracts of \$2.6 million as of December 31, 2019 and a net realized loss of \$2.5 million as of December 31, 2018. As of December 31, 2019, the Plan had a net unrealized loss on currency forward contracts of \$159 thousand and a net unrealized gain of \$959 thousand at December 31, 2018. These gains and losses are included in net appreciation/(depreciation) in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

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Currency forward contracts outstanding at December 31, 2019 and 2018 were approximately \$433 million and \$548 million, respectively (\$ in thousands).

Currency	<u>2019</u> Currency Forward Contracts Outstanding	<u>2018</u> Currency Forward Contracts Outstanding
Australian Dollar	\$26,396	\$ 36,152
Brazilian Real	5,318	1,642
Canadian Dollar	21,157	31,866
Chile Peso	2,619	4,651
Chinese Yuan renminbi	-	2,038
Columbian Peso	4,814	2,341
Czech Koruna	1,494	2,985
Denmark Krone	97	249
Euro	21,973	29,519
Hong Kong Dollars	5,540	4,509
Hungary Forint	671	337
Indonesia-Rupiahs	899	1,088
Indian Rupee	10,483	11,484
Israel Shekel	5	1,221
Japanese Yen	22,748	32,826
Mexican Peso	17,233	6,082
New Zealand Dollar	6,200	23,178
Norwegian Krone	19,361	22,238
Philippine Peso	4,153	1,429
Poland Zloty	2,021	1,928
Russia Ruble	6,445	3,061
Saudi Ryal	1,546	0
Singapore Dollar	1,671	3,501
South Africa Rand	6,193	4,561
South Korea Won	3,300	5,031
Swedish Krona	7,303	19,532
Switzerland Franc	2,200	11,255
Thailand Baht	166	152
Turkey Lira	963	519
Taiwan New Dollar	1,038	556
UK Pound	15,635	16,004
US Dollar	213,784	265,840
Totals	\$433,426	\$547,775

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b) Other Forward Contracts

Forward Contracts other than Currency Forward Contracts include rights and warrants and various other contractual agreements between two parties to buy or sell an asset at a specified price on a certain future date. Forward Contracts carry credit risk due to the possible nonperformance by one of the counterparties. The maximum potential loss is the aggregate face value in U.S. dollars at the time the contract was opened; however, the likelihood of such loss is remote. No such losses occurred during fiscal years 2019 and 2018. Forward contracts are usually traded over-the-counter. These transactions are entered into in order to hedge risks from exposure to fluctuations in prices in securities, commodities, or other financial instruments. Forward Contracts carry market risk resulting from adverse fluctuations in price. Recognition of realized gain or loss depends on whether the price of the asset has moved favorably or unfavorably to the contract holder upon termination of the contract. Prior to termination of the contract, the Plan records the unrealized gain or loss based on the applicable rates.

The Plan recognized a net realized gain on Other Forward Contracts of \$1.4 million as of December 31, 2019. As of December 31, 2019, the Plan had a net unrealized gain on Forward Contracts of \$306 thousand. These gains are included in net appreciation/(depreciation) in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

c) Swaps

A Swap is an agreement between two or more parties to exchange a sequence of cash flows over a period of time in the future. No principal is exchanged at the beginning of the Swap. The cash flows that the counterparties exchange are tied to a "notional" amount. The agreements provide, at predetermined future dates, the Plan pays interest based upon a notional principal amount and receives a return based upon the underlying instrument. Notional amounts represent the volume of outstanding transactions and do not represent the potential gain or loss associated with market risk or credit risk of such instruments. Risk associated with Swaps includes adverse movements in the underlying instrument.

The Plan recognized a net realized loss on Swaps of \$70 thousand. As of December 31, 2019, the Plan had a net unrealized gain on Swaps of \$27 thousand. The gains and losses are included in net appreciation/(depreciation) in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

d) Futures

Financial Futures are agreements to purchase or sell a specific amount of an asset at a specified delivery or maturity date for an agreed upon price. These derivative securities are used to improve yield, adjust the duration of the Fixed Income portfolio, circumvent changes in interest rates, or to replicate an index. Futures Contracts are standardized and traded on organized exchanges, thereby minimizing the Plan's risk. There were no outstanding Futures Contracts at December 31, 2019 and December 31, 2018.

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The Plan recognized a net realized gain of \$791 thousand. The gain is included in net appreciation/(depreciation) in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

As of December 31, 2019 and 2018 open derivatives contracts values were as follows (\$ in thousands):

Derivative Type	12/31/2019		12/31/2018	
	Total Notional Value	Total Fair Value	Total Notional Value	Total Fair Value
Forward Contracts	\$433,426	(\$159)	\$547,775	(\$959)
Other Forwards	56,523	306	8,384	95
Swap Agreements	-	27	-	(310)
Totals	\$489,949	\$174	\$556,159	(\$1,174)

4) Deposit and Investment Risk Disclosures

Deposits and investments of state and local governments are exposed to risks that have the potential to result in losses. The common deposit and investment risks include Custodial Credit Risk, Credit Risk, Concentration of Credit Risk, Foreign Currency Risk and Interest Rate Risk. The required disclosures related to these risks and the Plan's exposures to these risks are disclosed in the following sections.

a) Custodial Credit Risk

In the event of a failure of the counterparty, Custodial Credit Risk is the risk that the Plan will not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. The Plan's custodial credit risk policy is set forth in Chapter 40A of the Dallas City Code and in the master custody agreement which includes the Securities Lending Program. All investments are registered in the name of Employees' Retirement Fund of the City of Dallas or in the name of the Plan's custodian established through a master trust custodial agreement. The securities are held by the custodian in the name of the Plan.

As of December 31, 2019 the Plan had \$3.6 million or 0.1% of its approximate \$3.6 billion total investments (excluding short term investments) exposed to Custodial Credit Risk. The Custodial Credit Risk exposure at December 31, 2018 was \$2.2 million or 0.1% of total investments (excluding short term investments) of approximately \$3.2 billion. These exposures were uninsured and uncollateralized deposits held by custodian banks outside of the United States. The Plan has experienced no losses on these deposits during the year.

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b) Concentration of Risk

Concentration of Credit Risk is the risk of loss attributed to the magnitude of an investment in a single issuer. A concentration of investments in any one single issuer of debt securities presents a greater risk for loss in the event that the issuer fails on its obligations.

The Board has contracted with third party investment managers to manage the investment portfolio of the Plan, subject to the policies and guidelines established by the Board. The Plan's Concentration of Credit Risk policy is communicated to individual managers in their guidelines through limitations or restrictions to securities, sectors, debt ratings, and other factors that may be applicable to a particular manager. As the Plan's custodian bank, Northern Trust has responsibility for the safekeeping of certain investments, handling of transactions based on the instructions of investment managers, and recordkeeping for the investment transactions.

The Plan had no investments that individually represent 5% or more of the net position available for Plan benefits at December 31, 2019.

c) Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. Credit quality ratings for the Plan's investments in Fixed Income securities as of December 31, 2019 and 2018 are included in the following schedule. Securities are rated using Standard and Poor's quality ratings as presented following in the rating scale.

The Plan's strategic Fixed Income Investment Policy allocates 30% of the total assets to Fixed Income. The Plan's Investment Policy provides for investment of up to 15% of the Fixed Income allocation in investment grade assets, up to 10% of the Fixed Income allocation in High Yield (below Investment Grade) assets, and up to 5% for Opportunistic Credit. The Investment Grade allocation also allows selected managers to invest in non-US dollar issues on an opportunistic basis up to 20% of their portfolio assets.

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Long term bond ratings as of December 31, 2019 and 2018 are as follows (in thousands):

Quality Rating	Fair Value	<u>2019</u>	Fair Value	<u>2018</u>
		Percentage of Bond Portfolio		Percentage of Bond Portfolio
AAA	\$36,777	3.69%	\$57,599	6.32%
AA+	158,783	15.92	17,386	1.91
AA	3,490	0.35	4,828	0.53
AA-	7,134	0.72	6,344	0.70
A+	4,221	0.42	6,919	0.76
A	11,090	1.11	5,692	0.62
A-	27,103	2.72	23,476	2.58
BBB+	23,644	2.37	16,478	1.81
BBB	17,590	1.76	16,429	1.80
BBB-	17,343	1.74	20,193	2.22
BB+	21,242	2.13	28,069	3.08
BB	51,300	5.15	43,445	4.77
BB-	57,767	5.79	56,002	6.14
B+	53,685	5.39	45,113	4.95
B	33,181	3.33	40,248	4.42
B-	32,453	3.26	36,414	3.99
CCC+	10,898	1.09	11,647	1.28
CCC	2,488	0.25	2,716	0.30
CCC-	187	0.02	71	0.01
CC	0	0	226	0.02
C	0	0	371	0.04
DDD	0	0	149	0.02
D	482	0.05	1,455	0.16
Not rated (NR)*	234,837	23.55	257,858	28.29
U.S. Government fixed income securities (NR)**	191,422	19.20	212,505	23.31
	<u>\$997,117</u>	<u>100.00%</u>	<u>\$911,633</u>	<u>100.00%</u>

* NR-Investments that are not rated.

**NR-U.S. Treasury Bonds and Notes are obligations of the U. S government or explicitly guaranteed by the US. government and therefore are not considered to have a credit risk.

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d) Foreign Currency Risk

Foreign Currency Risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or deposit. The Plan's Foreign Currency Risk policy is communicated to those managers who are authorized to hedge currencies in their guidelines and sets specific parameters for each manager individually.

The Plan's investment policies limit the aggregate amount that can be invested in each class of investments. The Equity Investment Policy sets an allocation of 12.5% of assets to International Equity, 7.5% of assets to Global Equity and 12.5% to Global Low Volatility Equity.

The Plan's positions in International Equity securities, directly and through commingled funds, were 14.42% and 13.21% of invested assets at December 31, 2019 and 2018, respectively. The Plan's position in Global Equity securities was 4.14% and 3.75% of invested assets at December 31, 2019 and 2018, respectively. The Plan's position in Global Low Volatility Equity was 10.54% at December 31, 2019 and 10.57% at 2018. The Plan's positions in Global Fixed Income assets were 5.163% and 6.24% of invested assets at December 31, 2019 and 2018, respectively.

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Non-US Dollar denominated investments at December 31, 2019 and 2018 were as follows (\$ in thousands):

Currency	2019			2018		
	Equities	Fixed	Currency Forward Contracts	Equities	Fixed	Currency Forward Contracts
Australian Dollar	21,768		26,396	\$10,060	\$3,001	\$36,152
Brazil Real	12,848		5,318	4,332	-	1,642
British Pound Sterling	72,815		15,635	43,953	1,899	16,004
Canadian Dollar	37,723	\$6,510	21,157	30,783	-	31,866
Chile Peso	1,202		2,619	-	-	4,651
Columbia Peso			4,814	-	-	2,341
Czech Republic-Koruna	2,200		1,494	1,739	-	2,985
Denmark Krone	8,493		97	7,443	-	249
Euro	143,099		21,973	88,926	13,243	29,519
Hong Kong Dollars	51,616		5,540	39,485	-	4,509
Hungary-Forint	1,408		671	893	-	337
Indian Rupee	7,129		10,483	-	-	11,484
Indonesia-Rupiahs	2,442		899	2,606	3,934	1,088
Israel Shekel	5,108		5	5,006	-	1,221
Japanese Yen	124,027		22,748	81,183	-	32,826
Malaysia Ringgit	1,826			1,802	-	-
Mexican Peso	2,363	2,257	17,233	1,793	-	6,082
New Zealand Dollar	4,391		6,200	4,203	-	23,178
Norwegian Krone	6,671		19,361	5,256	-	22,238
Offshore-Chinese-Renminbi	6,192			3,153	-	2,038
Philippines-Pesos	1,015		4,153	1,029	-	1,429
Poland-Zloty	1,012		2,021	1,006	-	1,928
Qatar-Ryal	804			800	-	-
Russian Ruble			6,445	3,928	-	3,061
Saudi Ryal			1,546			
Singapore Dollar	5,156		1,671	2,406	-	3,501
South Africa Rand	4,178		6,193	4,206	4,258	4,561
South Korea-Won	24,200		3,300	14,810	-	5,031
Swedish Krona	11,800		7,303	13,005	-	19,532
Swiss Franc	44,710		2,200	30,817	-	11,255
Taiwan New Dollar	8,626		1,038	3,609	-	556
Thailand Baht	7,587		166	7,846	-	152
Turkish Lira	2,682		963	585	-	519
United Arab-Dirham	163			159	-	-
Total	\$625,254	\$8,767	\$ 219,642	\$ 416,822	\$26,335	\$ 281,935

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e) Interest Rate Risk

Interest Rate Risk is the risk that future changes in prevailing market rates of interest will have an adverse effect on the fair value of debt investments. The fair value of securities with long terms to maturity may be highly sensitive to interest rate changes.

As of December 31, 2019 and 2018 the weighted-average maturity of the bonds by bond type are as follows (\$ in thousands):

Bond Category	2019		2018	
	Fair Value 12/31/2019	Weighted Average Maturity (years)	Fair Value 12/31/2018	Weighted Average Maturity (years)
Asset Backed Securities	\$35,985	11.89	\$ 32,791	12.20
Bank Loans	22,159	4.88	25,806	5.45
Commercial Mortgage- Backed	32,264	28.21	29,389	27.36
Corporate Bonds	545,278	7.61	493,235	7.97
Government Agencies	99,371	37.01	56,211	18.95
Government Bonds	133,870	8.76	151,413	13.33
Government Mortgage- Backed Securities	72,918	21.40	91,145	20.47
Index Linked Government Bonds	1,062	29.15	7,635	11.93
Municipal/ Provincial Bonds	22,071	19.71	13,729	20.80
Non-Government Backed CMOs	32,139	22.89	<u>10,279</u>	24.23
Total	<u>\$997,117</u>		<u>\$911,633</u>	
Portfolio weighted average maturity		11.74		11.90

Government Mortgage Backed Securities are most sensitive to changes in interest rates as their prepayments can vary significantly with interest rate changes. This change in prepayments will generally cause the duration, or Interest Rate Risk, of these securities to increase when interest rates rise and decrease when interest rates fall. These securities represent 10.95% and 11.81% of the total fixed income portfolio for 2019 and 2018 at year end. Their fair values at year end 2019 and 2018 were \$109.2 million and \$107.7 million, respectively. The Plan's Interest Rate Risk policy is communicated to the Fixed Income managers through the Fixed Income Asset Policy and each manager's guidelines.

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5) Appreciation or (Depreciation) of Investments

In 2019 and 2018, the Plan's investments, including investments bought, sold, and held during the year, appreciated (depreciated) in value as follows (\$ in thousands):

	2019	2018
Investments, at fair value:		
Commingled index funds	\$28,549	(\$14,086)
Domestic equities	194,224	(175,581)
United States and foreign government fixed income securities	10,777	(14,947)
Domestic corporate fixed-income securities	52,599	(39,187)
International equities	125,399	(42,464)
Short-term investments	430	(447)
Currency contracts	(510)	260
	\$411,468	(\$286,452)
Investments, at estimated fair value:		
Real assets*	\$8,091	\$11,876
Private equity	34,279	12,602
	\$453,838	(\$261,974)

Note:

*Real assets included MLPs in 2018 and excluded MLPs in 2019.

6) Fair Value Measurement

The Plan's investments are measured and categorized according to fair value hierarchy guidelines established by Generally Accepted Accounting Principles.

The definition of fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

These guidelines recognize a three-tiered fair value hierarchy, as follows:

- *Level 1:* Quoted prices for identical investments in active markets;
- *Level 2:* Observable inputs other than quoted market prices in active market; and,
- *Level 3:* Significant unobservable inputs.

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At December 31, 2019, the Plan had the following recurring fair value measurements (\$ in thousands):

	Total 12/31/2019	Fair Value Measurements Using		
		Level 1	Level 2	Level 3
Investments by Fair Value Level				
Cash and Short Term Investment:				
Short-Term Investment Fund	\$111,496	\$111,496	-	-
Total Cash and Short Term Investment	\$111,496	\$111,496	-	-
Fixed Income:				
Foreign Government Bonds	\$8,164	-	\$8,164	-
US Government and Agency Obligations	191,422	-	191,422	-
Corporate and Taxable Municipal Bonds	749,152	-	749,061	91
Total Fixed Income	\$948,738	-	\$948,647	\$91
Equity:				
Domestic Common and Preferred Stock	\$1,153,068	\$1,150,914	\$244	\$1,910
International Common and Preferred Stock	503,270	502,896	374	-
Total Equity	\$1,656,338	\$1,653,810	\$618	\$1,910
Directly-Owned Real Estate	\$236,687	-	-	\$236,687
Total Investments by Fair Value Level	\$2,953,259	\$1,765,306	\$949,265	\$238,688
Investments Measured at Net Asset Value				
Commingled Funds:				
Index Funds	\$176,734			
Fixed Income	48,379			
Domestic Equity and Collective Trust	208,487			
International Equity	7,771			
Total Commingled Funds	\$441,371			
Alternative Investments - Private Equity	267,422			
Total Investments Measured at Net Asset Value	\$708,793			

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7) Securities Lending

During the year, Northern Trust lent, on behalf of the Plan, securities held by Northern Trust as Plan custodian and received cash, United States government securities, agency securities, and irrevocable bank letters of credit as collateral. Northern Trust did not have the ability to pledge or sell collateral securities absent a borrower default. Northern Trust's Core USA Collateral Section establishes requirements for participation, collateralization levels, cash and non-cash collateral guidelines, and investment guidelines for the collateral received from borrowers. Borrowers were required to put up collateral for each loan equal to: (i) in the case of loaned securities, the collateral for which is all denominated in the same currency as the loaned securities, 102% of the fair market value of the loaned securities plus any accrued but unpaid distributions thereon, and (ii) in the case of loaned securities denominated in a different currency from the loaned securities, 105% of the fair market value of the loaned securities plus any accrued but unpaid distributions thereon. Additionally, the guidelines set maturity/liquidity requirements for the collateral received from borrowers. The following table shows for open loans at December 31, 2019 and 2018, the type of collateral held, the fair value of the securities on loan, and the fair value of the collateral held (\$ in thousands).

Collateral Type	Fair Value	<u>12/31/2019</u>		Fair Value	<u>12/31/2018</u>	
		Collateral Market Value	Collateral Percentage		Collateral Market Value	Collateral Percentage
Cash	\$202,972	\$208,368	103%	\$264,410	\$270,118	102%

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The following represents the balances relating to the Securities Lending transactions as of December 31, 2019 and 2018 (\$ in thousands):

Securities Lent	12/31/2019			12/31/2018		
	Underlying Securities	Securities Collateral Value	Cash Collateral Investment Value	Underlying Securities	Securities Collateral Value	Cash Collateral Investment Value
Lent for cash collateral:						
Domestic equities	\$103,943	\$ -	\$106,349	\$119,521	\$ -	\$121,813
Domestic corporate fixed income	48,876		50,051	80,135	-	81,783
Global corporate fixed income	1,197		1,280	2,476	-	2,598
Global government fixed income	2,125		2,270	6,062	-	6,396
International equities	3,353		3,558	8,408	-	8,848
Global Agencies	205		215	199	-	203
US Agencies				497	-	505
US government fixed	<u>43,273</u>		<u>44,645</u>	47,112	-	47,971
Subtotal	\$202,972	\$ -	\$208,368	\$264,410	\$ -	\$270,118

Disclosure of securities lending income is shown gross with the associated reductions for investment expenses on the Statements of Changes in Fiduciary Net Position, and the cash collateral and associated securities lending payable is shown on the Statements of Fiduciary Net Position for December 31, 2019 and 2018. The net income from securities lending in 2019 was \$1.1 million compared to \$1.4 million in 2018.

8) Federal Income Tax Status

The Internal Revenue Service issued a determination letter dated May 24, 2016, stating that the Plan was designed in accordance with applicable Internal Revenue Code requirements as of that date. The Plan is currently designed and being operated in compliance with the applicable requirements of the Internal Revenue Code. Therefore, the Plan was qualified and the related trust was tax-exempt as of the financial statement dates.

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9) Capital Assets

Capital Assets activity for the year ended December 31, 2019, was as follows (\$ in thousands).

	Balance 12/31/2018	Increases	Decreases	Balance 12/31/2019
Capital Assets not being depreciated:				
Construction in progress	\$ 3,186	\$ 2,245	\$ -	\$ 5,431
Capital Assets being depreciated:				
Furniture and fixtures	18	-	-	18
Less: Accumulated Depreciation for:				
Furniture and Fixtures	(1)	(3)	-	(4)
Total Capital Assets being depreciated, net of Accumulated Depreciation	17	(3)	-	14
Total Capital Assets, net of Accumulated Depreciation	\$ 3,203	\$ 2,242	\$ -	\$ 5,445

10) Schedule of Net Pension Liability

a) The components of the net pension liability of the City at December 31, 2019 and 2018 respectively were as follows (\$ in thousands).

<u>Description</u>	<u>2019</u>	<u>2018</u>
Total Pension Liability	\$5,658,726	\$5,547,964
Plan Fiduciary Net Position	3,658,088	3,282,313
Net Pension Liability	2,000,638	2,265,651
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	64.65%	59.16%

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

b) Actuarial Methods and Assumptions:

Valuation date	December 31, 2018 for most recent Actuarially Determined Employer Contribution ("ADEC") shown on Schedule of Contributions, December 31, 2019 for Net Pension Liability
Actuarial cost method	Entry Age Normal
Asset valuation method	5-year smoothed market
Amortization method	The ADEC is initially based on a 30-year open amortization period. As specified in the Plan's governing documents, the rate may not change from year to year if the calculated rate is less than 300 basis points different from the current rate.
Remaining Amortization Period	Not determined, see description of amortization method
Investment rate of return	7.75%
Salary increases	3.25% to 6.25%, including inflation
Inflation	2.75% per year
Retirement Age	Experienced-based table of rates that are specific to the type of eligibility condition. Last updated for the December 31, 2019 valuation pursuant to an experience study of the 5-year period ended December 31, 2019.
Mortality	<p>For Actives:</p> <p>Males – RP-2000 Employee Mortality Table for male employees, set forward 4 years.</p> <p>Females – RP-2000 Employee Mortality Table for female employees, set back 5 years.</p> <p>For Healthy Retirees:</p> <p>Males – RP-2000 Combined with Blue Collar Adjustment for male annuitants, with a 109% multiplier and fully generational mortality using improvement scale BB.</p> <p>Females – RP-2000 Combined with Blue Collar Adjustment for female annuitants, with a 103% multiplier and fully generational mortality using improvement scale BB.</p> <p>For Disabled Lives:</p> <p>RP-2000 Disabled Mortality Table for male annuitants, set forward one year.</p>

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

Other Information

Notes:

There were no benefit changes during the year.

The assumptions described above were for the most recent ADEC shown in the schedule of contributions. The assumptions used in determining the Net Pension Liability as of December 31, 2019 were those used in the actuarial valuation as of December 31, 2019. Please see the actuarial valuation report for a complete description of those assumptions.

The long term rate of return on pension plan investments was estimated using a building block methodology in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long term expected rate of return by weighting the expected future real return rates by the target asset allocation percentage and by adding expected inflation. The following table shows the best estimates of arithmetic real rates of return for each of the Plan's asset classes.

Asset Class	Long-Term Expected Real Rate of Return
Domestic Equity	6.00%
International Equity	6.75
Global Equity	6.45
Low Volatility Global Equity	6.41
Private Equity	8.05
Core Fixed Income	2.70
High Yield Fixed Income	4.20
Credit Opportunities	5.35
REITS	4.70
Private Real Estate - Core	5.40
Private Real Estate – Value Add	8.00
MLPs	7.60
Global Public Infrastructure	7.23
Marketable Alternative	4.42

- c) Discount rate: A single discount rate of 5.93% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.25% and the municipal bond rate of 2.75%. The projection of cash flows used to determine this single discount rate assumed that plan member contributions and employer contributions will be made at the projected future contribution rates assuming that the Plan annually earns 7.25% on its market value of assets and that the number of active members remains constant in the future. Based on these assumptions and the Plan's funding policy, the last year in the single discount rate projection period for which projected benefit payments were fully funded was 2058, and the resulting single discount rate is 5.93%.

EMPLOYEES' RETIREMENT FUND OF
THE CITY OF DALLAS
Notes to the Financial Statements
December 31, 2019 and 2018

- d) Sensitivity of the net pension liability to changes in the discount rate. Below is a table providing the sensitivity of the net pension liability to changes in the discount rate. In particular, the table presents the plan's net pension liability, if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher than the single discount rate:

Sensitivity of the Net Pension Liability
To the Single Discount Rate Assumption
(\$000)

<u>1% Decrease</u>	<u>Current Single Discount Rate</u>	<u>1% Increase</u>
4.93%	5.93%	6.93%
\$2,748,259	\$2,000,639	\$1,382,052

11. Subsequent Events

The Plan has evaluated its December 31, 2019 financial statements for subsequent events through June 5, 2020, the date the financial statements were available to be issued. The Plan is not aware of any subsequent events which would require recognition or disclosure in the financial statements, except as mentioned below.

In March 2020, the World Health Organization declared the outbreak of a novel coronavirus (COVID-19) as a pandemic, which continues to spread throughout the United States. The spread of COVID-19 has caused significant volatility in U.S. and international markets. To date there has not been a material decline in investment values, however, future values and volatility are uncertain.

REQUIRED SUPPLEMENTARY INFORMATION
(Unaudited)

Schedule of Changes in Net Pension Liability and Related Ratios

(\$ in thousands)

FY ended December 31,	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
Total Pension Liability						
Service Cost	\$121,319	\$84,843	\$81,178	\$133,457	\$78,020	\$62,065
Interest on the Total Pension Liability	325,678	332,011	325,620	305,826	313,847	290,948
Difference between Expected and Actual Experience Assumption	(4,760)	4,793	(59,066)	(38,327)	(26,829)	(21,967)
Changes in Benefit Payments	(43,302)	1,020,969	-	(1,227,079)	1,238,431	292,137
Refunds	(278,007)	(263,981)	(253,534)	(243,775)	(235,106)	(225,614)
	(10,436)	(8,515)	(8,156)	(5,864)	(4,854)	(4,629)
Net Change in Total Pension Liability	110,762	1,170,121	86,042	(1,075,762)	1,363,509	392,940
Total Pension Liability - Beginning	5,547,964	4,377,844	4,291,802	5,367,564	4,004,055	3,611,115
Total Pension Liability – Ending (a)	\$5,568,726	\$5,547,964	\$4,377,844	\$4,291,802	\$5,367,564	\$4,004,055
Plan Fiduciary Net Position						
Employer Contributions	\$62,177	\$60,924	\$58,966	\$56,130	\$50,721	\$45,833
Employee Contributions	58,314	56,772	55,175	53,436	50,742	46,536
Pension Plan Net Investment Income	550,942	(167,783)	413,511	294,918	(53,344)	207,992
Benefit Payments	(278,007)	(263,981)	(253,534)	(243,775)	(235,106)	(225,614)
Refunds	(10,436)	(8,515)	(8,156)	(5,864)	(4,598)	(4,629)
Pension Plan Administrative Expense	(7,513)	(7,485)	(5,951)	(5,343)	(4,598)	(4,150)
Other	298	121	207	333	162	157
Net Change in Plan Fiduciary Position	375,775	(329,947)	260,217	149,835	(196,277)	66,125
Plan Fiduciary Net Position - Beginning	3,282,313	3,612,260	3,352,043	3,202,208	3,398,485	3,332,360

Plan Fiduciary Net Position – Ending (b)	3,658,088	3,282,313	3,612,260	3,352,043	3,202,208	3,398,485
Net Pension Liability – Ending (a)-(b)	\$2,000,638	\$2,265,651	\$765,584	\$939,759	\$2,165,356	\$605,570
Plan Fiduciary Net Position as Percentage of Total Pension Liability	64.65%	59.16%	82.51%	78.10%	59.66%	84.68%
Covered Employee Payroll	433,890	423,083	\$410,913	\$402,077	\$383,669	\$363,109
Net Pension Liability as a Percentage of Covered Employee Payroll	461.09	535.51%	186.31%	233.73%	564.38%	168.95%

Notes to Schedule:

The covered employee payroll is the sum of the active members' pay for valuation purposes as of the measurement date. An active member's valuation pay is the greater of their actual pay for the just completed calendar year or their current annual rate of pay.

SCHEDULE OF MONEY-WEIGHTED RATES OF RETURN

	2019	2018	2017	2016	2015	2014
Rate of Return	17.33	-4.99%	13.08%	8.88%	-1.92%	6.52%

Note to Schedule: This schedule is intended to show information for ten years. Additional years' information will be displayed as it comes available.

Schedule of the Net Pension Liability (Historical)

Last 10 Fiscal Years
(\$ in thousands)

FY Ending December 31,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2014	\$4,004,055	\$3,398,485	\$605,570	84.68%	\$353,650	171.23%
2015	5,367,564	3,202,208	2,165,356	59.66%	383,669	564.38%
2016	4,291,802	3,352,043	939,759	78.10%	402,077	233.73%
2017	4,377,844	3,612,260	765,584	82.51%	410,913	186.31%
2018	5,547,964	3,282,313	2,265,651	59.16%	423,083	535.51%
2019	5,658,726	3,658,088	2,000,638	64.65%	433,890	461.09%

Notes to Schedule:

The covered employee payroll is the sum of the active members' pay for valuation purposes as of the measurement date. An active member's valuation pay is the greater of their actual pay for the just completed calendar year or their current annual rate of pay.

This schedule is intended to show information for ten years. Additional years' information will be displayed as it comes available.

Schedule of Contributions

Last 10 Fiscal Years

(\$ in thousands)

FY Ending December 31,	Actuarially Determined Contribution ¹	Actual Contributions ²	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2010	\$33,952	\$27,323	\$6,629	\$336,490	8.12%
2011	33,612	27,302	6,310	312,380	8.74%
2012	41,570	30,363	11,207	319,274	9.51%
2013	56,394	37,823	18,571	340,748	11.05%
2014	61,747	45,833	15,914	353,650	12.62%
2015	64,648	50,721	13,927	383,669	13.22%
2016	84,316	56,130	28,186	402,077	13.96%
2017	86,785	58,966	27,819	410,913	14.35%
2018	90,328	60,924	29,404	423,083	14.40%
2019	97,558	62,177	35,381	433,591	14.34%

Notes to Schedule:

1. The Actuarially Determined Contribution (Actuarially Determined Employer Contribution, or "ADEC") shown is the employer contribution based on a 30-year open amortization period and actual payroll.

2. Since the City's fiscal year is October 1 to September 30 and the Plan's fiscal year is the calendar year, the contribution amounts shown above are a blend of the City's two fiscal year rates that occur during the calendar year.

Retirement Plan for the Employees' Retirement Fund of the City of Dallas

Actuarial Valuation Report
as of December 31, 2019





June 1, 2020

Board of Trustees
Employees' Retirement Fund of the City of Dallas
1920 McKinney Avenue
10th Floor
Dallas, Texas 75201

Dear Members of the Board:

We are pleased to present our report of the actuarial valuation of the Employees' Retirement Fund of the City of Dallas ("ERF" or the "Fund") as of December 31, 2019.

This valuation provides information on the funding status of ERF. It includes a determination of the actuarially calculated contribution rates for the 2020 calendar year. In addition, it also contains the information necessary to determine the current total obligation rate and the current adjusted total obligation rate for the fiscal year beginning October 1, 2020 per City Ordinance. This rate is a function of the previous year's adjusted total obligation rate, this year's actuarially calculated contribution rate, and the rate necessary to make the debt service payment on the previously issued pension obligation bonds for fiscal year 2021.

In addition, the report provides various summaries of the data. A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67 and 68. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of December 31st, the last day of the ERF plan year. This report was prepared at the request of the Board and is intended for use by the ERF staff and those designated or approved by the Board. This report may be provided to parties other than ERF staff only in its entirety and only with the permission of the Board.

As authorized in Chapter 40A-4(a)(16) of the Dallas City Code, the actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary. An experience investigation was performed for the five year period ending December 31, 2019. As a result of that study, revised assumptions were adopted by the Board effective with the valuation as of December 31, 2019. We believe the assumptions are internally consistent, reasonable, and, where appropriate, based on the actual experience of the ERF. All of the assumptions and methods used in this valuation were selected in compliance with the Actuarial Standards of Practice. All actuarial assumptions and methods are described under Section P of this report.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions.

Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. Due to the limited scope of this assignment, GRS did not perform an analysis of the potential range of such possible future differences. The actuarial calculations are intended to provide information for rational decision making. Other than the sensitivity analysis shown in Section L, this report does not include a more robust assessment of the future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

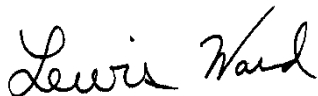
This report does not reflect the recent and still developing impact of the COVID-19 pandemic, which may significantly impact the demographic and economic experience occurring after this valuation date.

This valuation is based on the provisions of ERF in effect as of the valuation date, data on the ERF membership and information on the asset values of the Fund as of December 31, 2019. The member, annuitant and asset data used in the valuation were all prepared and furnished by ERF staff. While certain checks for reasonableness were performed, the data used was not audited.

To the best of our knowledge, this report is complete and accurate and was conducted in accordance with the Actuarial Standards of Practice as set forth by the Actuarial Standards Board and in compliance with the provisions of the Dallas City Code. The undersigned are independent actuaries and consultants. Mr. Randall is an Enrolled Actuary and a Member of the American Academy of Actuaries and he meets the Qualification Standards of the American Academy of Actuaries. Both Mr. Randall and Mr. Ward have significant experience in performing valuations for large public retirement systems.

We would like to thank the ERF staff for their assistance in providing all necessary information to complete this valuation. Their courteous help is very much appreciated. We look forward to discussing this actuarial valuation report with you at your convenience. Please do not hesitate to let us know if you have any questions or need additional information.

Respectfully submitted,



Lewis Ward
Consultant



Mark R. Randall, MAAA, FCA, EA
Chief Executive Officer



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EXECUTIVE SUMMARY

(\$ in 000s)

The key results from the actuarial valuation of the Employees' Retirement Fund of the City of Dallas as of December 31, 2019 may be summarized as follows:

	<u>December 31, 2018</u>	<u>December 31, 2019</u>
· Members		
- Actives	7,584	7,427
- Benefit recipients	7,224	7,405
- Deferred vested*	819	877
- Other terminated*	<u>673</u>	<u>789</u>
- Total	16,300	16,498
· Covered payroll (including overtime)	\$ 423,723	\$ 433,890
· Normal cost	\$ 81,299	\$ 87,509
as % of expected payroll	19.56%	20.50%
· Actuarial accrued liability	\$ 4,526,996	\$ 4,863,326
· Actuarial value of assets	\$ 3,620,319	\$ 3,682,959
· Market value of assets	\$ 3,265,402	\$ 3,658,088
· Unfunded actuarial accrued liability (UAAL)	\$ 906,677	\$ 1,180,367
· Estimated yield on assets (market value basis)	(5.15)%	17.30%
· Estimated yield on assets (actuarial value basis)	5.23%	6.74%
· Contribution Rates		
- Prior Adjusted Total Obligation Rate	36.00%	36.00%
- Current Total Obligation Rate	43.07%	43.92%
- Current Adjusted Total Obligation Rate	36.00%	36.00%
· Actuarial gains/(losses)		
- Assets	\$ (88,729)	\$ (35,798)
- Actuarial liability experience	\$ (11,356)	\$ 6,156
- Assumption and method changes	\$ -	\$ (205,391)
· 30-year level % of pay funding cost	\$ 146,729	\$ 157,348
as % of payroll (Employee + City)	34.59%	35.38%
· Funded ratio		
- Based on actuarial value of assets	80.0%	75.7%
- Based on market value of assets	72.1%	75.2%

* *Deferred vested are members who have applied for a deferred pension. Other terminations are other members who have terminated and still have contribution balances in the Fund.*



PURPOSES OF THE ACTUARIAL VALUATION

At your request, we have performed the actuarial valuation of the Employees' Retirement Fund of the City of Dallas ("ERF" or the "Fund") as of December 31, 2019.

The purposes of an actuarial valuation are as follows:

- To determine the funding status of ERF as of the valuation date;
- To develop the actuarially determined level of contributions for ERF for the 2020 calendar year; and
- To develop the current total obligation rate and the current adjusted total obligation rate for the fiscal year beginning October 1, 2020.

REPORT HIGHLIGHTS

(\$ in 000s)

The following is a set of key actuarial results from the prior year's valuation as compared to the current year:

	Valuation Date	
	December 31, 2018	December 31, 2019
Contribution Rates (% of Payroll)		
Normal Cost (including administrative expense)	20.95%	22.23%
Total Actuarial Contribution Rate	34.59%	35.38%
Total Projected Actuarial Contribution	\$146,729	\$157,348
Funded Status (on AVA basis)		
Actuarial Accrued Liability	\$4,526,996	\$4,863,325
Actuarial Value of Assets	3,620,319	3,682,959
Unfunded Actuarial Accrued Liability	\$906,677	\$1,180,366
Funded Ratio	79.97%	75.73%



FUNDING PROCESS

Based on the previous work of the Employees' Retirement Fund Study Committee, which was ratified by the ERF Board, the Dallas City Council and the voters of Dallas, a new funding process commenced October 1, 2005. From this date forward, a new "current adjusted total obligation rate" will be contributed jointly by the City (63%) and the Membership (37%). This current adjusted total obligation rate will cover both the debt service tied to the pension obligation bonds issued in 2005 and the contributions to the ERF. In subsequent years, the contribution rate changes only if the actuarial valuation develops a "current total obligation rate" which differs from the "prior adjusted total obligation rate" by more than 3.00% (plus or minus).

As shown in Section N – Table 3 and discussed later in this report, the "current total obligation rate" (Item 4 in Table 3) exceeds the "prior adjusted total obligation rate" (Item 1 in Table 3) as of December 31, 2019. This means that the "current adjusted total obligation rate" will remain at 36.00% of active member payroll for the fiscal year beginning October 1, 2020. It should be noted that under the contribution corridor methodology, the "current adjusted total obligation rate" would have been higher if not for the maximum rate of 36.00% allowed under Chapter 40A of the Dallas City Code.

ACTUARIAL CONTRIBUTIONS

As shown in Section N – Table 2, the Actuarially Required Contribution Rate developed in this actuarial valuation is 35.38% of active member payroll. This rate excludes the amount needed to make the City’s debt service payment on the pension obligation bonds in fiscal year 2021. This rate is the total level rate of pay (member + City) that would need to be contributed each of the next 30 years to pay off the unfunded liability of the Fund over that 30-year period. Note that because the total rate is assumed to remain level and the average normal cost as a percentage of pay is expected to decline over that time period (due to the new Tier B), the payment towards the unfunded liability as a percentage of pay is expected to increase over the 30-year period.

As shown in Section N -Table 3 of this report, the debt service payment is determined to be 8.54% of projected payroll. The sum of these rates is 43.92% (the Current Total Obligation Rate), which is 7.92% more than the Prior Adjusted Total Obligation Rate of 36.00%. Because the total contribution rate cannot exceed 36.00%, the total contribution rate in fiscal year 2021 (the Current Adjusted Total Obligation Rate) to fund the ERF and make the debt service payment on the pension obligation bonds will be 36.00%, which is the maximum rate allowed under Chapter 40A of the Dallas City Code.

The members contribute 37% of the Current Adjusted Total Obligation Rate and the City contributes 63%. Hence, the members’ portion of the 36.00% total contribution rate will be 13.32% and the City portion will be 22.68%. All of the member contribution rate will be contributed to the ERF. As noted above, 8.54% of the City’s contribution rate will go towards the debt service on the pension obligation bonds and the remaining 14.14% will be contributed towards the ERF. This means a total contribution rate of 27.46% will be contributed to the ERF, which compares to the actuarially calculated rate of 35.38%.

ACTUARIAL ASSUMPTIONS

Section P of this report includes a summary of the actuarial assumptions and methods used in this valuation. In short, costs are determined using the Entry Age Normal actuarial cost method. The assumed annual investment return rate is 7.25% and includes an annual assumed rate of inflation of 2.50%.

All actuarial assumptions and methods have been updated to reflect the five-year experience study recommendations that were adopted by the Board on May 22, 2020 to be effective with the December 31, 2019 actuarial valuation. Please see the experience study report dated June 2020 for a complete description of the new assumptions as well as the rationale for their selection. The adoption of the new actuarial assumptions increased the liabilities of the Fund by \$205 million.

Please see Section P of this report for a summary description of these assumptions and methods.

ERF BENEFITS

As the reader may be aware, City of Dallas voters approved a new tier of benefits for City of Dallas municipal employees hired after December 31, 2016.

There were no changes in the benefit provisions of ERF since the prior valuation. Please see Section Q for a summary description of the ERF benefits.

EXPERIENCE DURING PREVIOUS YEARS

An Actuarial (Gain)/Loss Analysis [(G)/L] reviews the effects of the actual experience that differs from the assumed experience based on the actual results for the year. If any difference increases assets or reduces liabilities, we have an actuarial gain. The reverse is an actuarial loss.

On a market value return basis, the Fund returned approximately 17.30% (calculated on a dollar-weighted basis, net of investment expenses). Given this return, the actual investment income was much higher than the expected investment income on the market value of assets; therefore, an investment excess occurred. However, because the prior year was a shortfall, the current year's excess income was offset dollar for dollar against the prior year shortfall. Please see Table 6 for the determination of the actuarial value of assets (AVA) and page 47 for a description of the AVA methodology. As developed on Table 9A, there was a \$35.8 million loss on the actuarial value of assets as of December 31, 2019. The rate of return on the actuarial value of assets for 2019 was 6.74% (calculated on a dollar-weighted basis, net of investment expenses). This result was less than the prior year's investment return assumption of 7.75%.

As developed on Table 8, ERF experienced an overall actuarial experience loss in calendar year 2019 in the amount of \$29.6 million. Since there was a \$35.8 million loss on the actuarial value of assets, this implies there was a liability actuarial gain of about \$6.2 million derived from demographic assumptions and non-investment economic assumptions (cost-of-living-adjustment). Please see Table 9B for an analysis of the experience loss by source.

The total (G)/L for the prior 5 years is broken down as follows (\$ in millions):

	2015	2016	2017	2018	2019
1) Actuarial (Gain)/Loss on Assets	\$31.24	(\$16.41)	(\$19.85)	\$88.73	\$35.80
2) Actuarial (Gain)/Loss on Liabilities	(26.83)	(32.35)	(61.02)	11.35	(6.16)
3) Total Actuarial (Gain) or Loss (1+2)	\$4.41	(\$48.76)	(\$80.87)	\$100.08	\$29.64

The unfunded actuarial accrued liability (UAAL) also increased \$30 million due to the shortfall between the calculated contribution rate and the actual contributions during 2019.

ASSET INFORMATION

The assets of the Fund (on a market value basis) increased from \$3,265 million as of December 31, 2018 to \$3,658 million as of December 31, 2019.

The assets recognized for actuarial valuation purposes (known as “the actuarial value of assets”) were equal to the market value of assets in the December 31, 2017 valuation. Beginning with the December 31, 2018 valuation, a new smoothing method is now being used to recognize future asset gains and losses. The purpose of such a smoothing method is to allow the use of market values, but to dampen the effect of the typical year-to-year market fluctuations. Please see page 47 of this report for a description of the new smoothing method (actuarial value of asset method). See Table 6 in Section N of this report for the determination of the actuarial value of assets as of December 31, 2019.

The actuarial value of assets has increased from \$3,620 million to \$3,683 million during 2019. The actuarial assets are less than the expected actuarial assets, \$3,719 million, due to recognition of the prior year’s deferred investment losses. This resulted in an actuarial loss on the actuarial assets of \$35.8 million.

The rate of return on investments for 2019 on the actuarial value of assets was 6.74%, compared to 5.23% in 2018. The detailed determinations of asset values utilized in this valuation and the change in assets in the last year are exhibited in Tables 4 and 5 of Section N of this report.

FUNDED STATUS

The funded status of ERF is measured by the Funded Ratio and the Unfunded Actuarial Accrued Liability (UAAL). The Funded Ratio is the ratio of the actuarial value of assets available for benefits to the actuarial accrued liability (AAL) of the Fund on the valuation date. Therefore, it reflects the portion of the AAL that is covered by ERF assets. The UAAL is the difference between these two amounts.

A Funded Ratio of 100% means that the funding of ERF is precisely on schedule as of the particular valuation date. In addition, an increasing funded ratio from year-to-year may also mean that the funding of ERF is on schedule. By monitoring changes in the Funding Ratio each year, we can determine whether or not funding progress is being made.

Based on the market value of assets, the Funded Ratio of ERF increased from 72.1% as of December 31, 2018 to 75.2% as of December 31, 2019. Based on the actuarial value of assets, the Funded Ratio of ERF decreased from 80.0% as of December 31, 2018 to 75.7% as of December 31, 2019.

The UAAL increased from \$906.7 million as of December 31, 2018 to \$1180.4 million as of December 31, 2019. Since the UAAL is positive, this implies the actuarial accrued liabilities exceed the actuarial assets of the Fund as of December 31, 2019.

The primary reason for the increase in the UAAL and the decrease in the funded ratio was the adoption of new actuarial assumptions, including the decrease in the investment return assumption from 7.75% to 7.25%. The recognition of prior year's deferred investment losses and the shortfall between the actuarially determined contribution rate and the actual contribution rate were also contributing factors.

GASB DISCLOSURE

Governmental Accounting Standards Board (GASB) Statement Numbers 67 and 68 detail the current accounting standards for ERF and the Fund's sponsor, the City of Dallas, Texas. These new standards were effective with the plan year ending December 31, 2014 for the Fund and the fiscal year ending September 30, 2015 for the City. The new standards created a clear distinction between the funding requirements of a pension plan and the accounting requirements. Because of these changes, the GASB disclosure information will no longer be included in the actuarial valuation report, but will instead be provided under separate cover.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The Current Adjusted Total Obligation Rate shown in the Executive Summary may be considered as a minimum contribution rate that complies with Chapter 40A of the Dallas City Code. However, due to the contribution rate cap, this is less than the actuarially calculated rate. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Several generally accepted plan maturity measures are described below and are followed by a table showing a 10-year history of the measurements for Dallas ERF.

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees, resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives, resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

DURATION OF PRESENT VALUE OF BENEFITS

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

ADDITIONAL RISK ASSESSMENT

Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. While a robust measurement of additional risk assessment is outside the scope of the annual actuarial valuation, we have included a scenario test of a 1% increase or 1% decrease in the investment return assumption. The results of this test are shown at the end of this section.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Ratio of the market value of assets to total payroll	8.43	7.71	8.55	8.13	8.12	9.34	9.72	9.01	8.87	8.90
Ratio of actuarial accrued liability to payroll	11.21	10.68	10.39	10.48	10.50	11.03	10.55	10.64	10.95	10.18
Ratio of actives to retirees and beneficiaries	1.00	1.05	1.11	1.10	1.11	1.09	1.08	1.09	1.09	1.17
Ratio of net cash flow to market value of assets	-4.8%	-5.1%	-4.3%	-4.4%	-4.5%	-4.2%	-4.4%	-5.1%	-5.3%	-4.6%
Duration of the actuarial present value of benefits*	12.84	12.37	NA	NA	NA	NA	NA	NA	NA	NA

*Duration measure not available prior to 2018

Impact on Funding Metrics of Investment Return Assumption +/- 1%

Cost Item	Investment Return Assumption		
	6.25%	7.25%	8.25%
Normal Cost % (excluding admin expenses)	25.35%	20.50%	16.84%
UAAL (\$ in millions)	\$1,765.1	\$1,180.4	\$695.4
30-year funding rate (employee + City)	44.46%	35.38%	26.40%
Funded Ratio	67.60%	75.73%	84.12%
Funding Period	Infinite	65 years	23 years



CLOSING COMMENTS

The unfunded actuarial accrued liability of the Fund has increased since the prior valuation primarily due to the adoption of the new actuarial assumptions including the lowering of the investment return assumption to 7.25%.

The calculated contribution rate necessary to pay the Fund's normal cost and amortize the UAAL over 30 years is 35.38% of pay. When the debt service payment on the Pension Obligation Bonds is considered, the total contribution rate is 43.92% of payroll. However, Chapter 40A of the Dallas City Code limits the contribution rate to 36.00% of payroll, therefore, the total rate to be contributed by the employees and the City for fiscal year 2019 will be 36.00% of pay.

Additionally, the calculated contribution rate is above the 36.00% of pay maximum. When the Pension Obligation Bond debt is repaid, the calculated contribution rate is expected to drop between 8.50% - 9.00% of pay. However, that is not expected to happen until fiscal year 2035.

Following adoption of the proposed changes by the ERF Board, the Dallas City Council, and approval by the City of Dallas voters, the new tier of benefits became effective for employees hired after December 31, 2016 and the outlook for the ERF improved. Based on our projections, reflecting the new tier of benefits and assuming the actuarial assumptions are exactly met (including a 7.25% return on the actuarial value of assets), ERF is expected to be fully funded in approximately 65 years.

ACTUARIAL TABLES

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Summary of Actuarial Values
As of December 31, 2019
(\$ in 000s)

	Entry Age Actuarial Values			
	APV* of Projected Benefits	Actuarial Accrued Liability (AAL)	Normal Cost \$	Normal Cost % of Pay**
1 Active Members				
a. Retirement	\$ 1,917,069	\$ 1,460,755	\$ 63,862	14.96%
b. Death	18,931	11,437	1,037	0.25%
c. Disability	12,111	4,615	1,036	0.24%
d. Termination	139,829	(3,187)	19,182	4.50%
e. Health Subsidy	48,485	34,729	2,392	0.55%
Total	\$ 2,136,425	\$ 1,508,349	\$ 87,509	20.50%
2 Benefit Recipients	3,228,576	3,228,576		
3 Other Inactive	126,400	126,400		
4 Total Actuarial Values of Benefits	\$ 5,491,401	\$ 4,863,325	\$ 87,509	20.50%
5 Actuarial Value of Assets		\$ 3,682,959		
6 Unfunded Actuarial Accrued Liability (4 - 5)		\$ 1,180,366		
7 Funding Ratio		75.73%		
8 Market Value Measurements				
UAAL on market value		\$ 1,205,237		
Funded Ratio on market value		75.22%		

* APV – Actuarial Present Value

** Percentage of expected payroll for continuing active members.



Demonstration of Actuarially Determined Contribution Rate for FY 2021

Valuation as of December 31,	Actuarially Determined Total Contribution Rate	Projected Compensation for Plan Year (in Millions)	Total Contributions to Fund for Plan Year (in Millions)	Actuarial Accrued Liability (AAL \$M)	Actuarial Value of Assets (AVA \$M)	Unfunded Actuarial Accrued Liability (UAAL \$M)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2019	35.38%	\$ 433.9	\$ 153.5	\$ 4,863.3	\$ 3,683.0	\$ 1,180.4
2020	35.38%	445.0	157.4	4,996.9	3,788.6	1,208.3
2021	35.38%	457.2	161.8	5,132.0	3,897.8	1,234.3
2022	35.38%	469.7	166.2	5,260.8	4,002.6	1,258.2
2023	35.38%	482.5	170.7	5,383.7	4,103.6	1,280.0
2024	35.38%	495.7	175.4	5,500.3	4,200.8	1,299.5
2025	35.38%	509.2	180.2	5,610.4	4,294.0	1,316.4
2026	35.38%	523.1	185.1	5,714.0	4,383.4	1,330.5
2027	35.38%	537.4	190.1	5,811.2	4,469.6	1,341.7
2028	35.38%	552.2	195.4	5,902.7	4,553.1	1,349.6
2029	35.38%	567.6	200.8	5,989.4	4,635.3	1,354.1
2030	35.38%	583.2	206.3	6,071.9	4,717.2	1,354.7
2031	35.38%	599.5	212.1	6,151.1	4,799.9	1,351.2
2032	35.38%	616.1	218.0	6,227.1	4,884.0	1,343.1
2033	35.38%	632.6	223.8	6,299.7	4,969.7	1,330.0
2034	35.38%	649.4	229.8	6,369.0	5,057.4	1,311.5
2035	35.38%	666.6	235.8	6,435.2	5,147.9	1,287.3
2036	35.38%	684.3	242.1	6,498.7	5,241.9	1,256.9
2037	35.38%	702.5	248.5	6,560.1	5,340.4	1,219.7
2038	35.38%	721.1	255.1	6,619.9	5,444.6	1,175.2
2039	35.38%	740.4	262.0	6,678.9	5,556.0	1,122.9
2040	35.38%	760.2	269.0	6,738.1	5,676.0	1,062.1
2041	35.38%	780.7	276.2	6,798.0	5,806.0	992.0
2042	35.38%	801.5	283.6	6,859.5	5,947.6	911.9
2043	35.38%	823.0	291.2	6,923.4	6,102.2	821.2
2044	35.38%	845.3	299.1	6,990.9	6,272.1	718.8
2045	35.38%	868.1	307.1	7,063.8	6,459.8	604.1
2046	35.38%	891.3	315.4	7,143.3	6,667.5	475.8
2047	35.38%	915.0	323.7	7,230.4	6,897.4	333.0
2048	35.38%	939.0	332.2	7,326.0	7,151.3	174.7
2049	35.38%	963.4	340.9	7,430.5	7,430.9	(0.4)



**Information for City Ordinance 25695
For the Fiscal Year Commencing October 1, 2020**

1 Prior Adjusted Total Obligation Rate	36.00%
2 Actuarially Required Contribution Rate*	35.38%
3 Debt Service	
a Scheduled Debt Service Payment for FY 2021	\$ 37,987,077
b Projected Payroll	\$ 444,737,003
c Pension Obligation Bond Credit Rate (a/b)	8.54%
4 Current Total Obligation Rate (2 + 3c)	43.92%
5 Current Adjusted Total Obligation Rate	36.00% **
6 Allocation of Contribution Rates Commencing October 1, 2020	
a Employee (5 x .37)	13.32%
b City (5 x .63)	22.68%

* Actuarially determined level contribution rate as demonstrated on Table 2.

** If the absolute value of the difference between the Prior Adjusted Total Obligation Rate (PATOR) and the Current Total Obligation Rate (CTOR) is less than or equal to 3.0% then:

Current Adjusted Total Obligation Rate (CATOR) = PATOR

otherwise:

1) If $PATOR - CTOR > 3.00\%$ then the CATOR is set equal to the greater of:

- a) the average of the Prior Adjusted Total Obligation Rate and the Current Total Obligation Rate; or
- b) 90% of the Prior Adjusted Total Obligation Rate

or

2) If $PATOR - CTOR < -3.00\%$ then the CATOR is set equal to the lesser of:

- a) the average of the Prior Adjusted Total Obligation Rate and the Current Total Obligation Rate; or
- b) 110% of the Prior Adjusted Total Obligation Rate

Additionally, the CATOR cannot exceed 36.00%.



Excerpts from City Ordinance 25695

ACTUARIALLY REQUIRED CONTRIBUTION RATE – means, for any fiscal year, a rate of contribution to the fund, expressed as a percentage of members’ projected wages for such fiscal year, which is the sum of the following as determined in the actuarial valuation report for the preceding plan year:

- (A) the actuarial present value of the pension plan benefits and expenses that are allocated to a valuation period by the actuarial cost method; and
- (B) the contribution that will amortize the difference between the actuarial accrued liability of the fund and the actuarial value of the assets of the fund over the period of years required by generally accepted accounting principles.

CITY CONTRIBUTIONS – means, for each pay period ending during a transition year, the city shall contribute to the retirement fund an amount equal to:

- (A) 63% times the current total obligation rate for that fiscal year times the members’ wages for the pay period, minus
- (B) The pension obligation bond credit rate for that fiscal year times the members’ wages for the pay period;

and, for each pay period ending during each fiscal year, except for a transition year, the city shall contribute to the retirement fund an amount equal to:

- (C) 63% times the current adjusted total obligation rate for that fiscal year times the members’ wages for the pay period, minus
- (D) The pension obligation bond credit rate for that fiscal year times the members’ wages for the pay period.

EMPLOYEE CONTRIBUTIONS – means, for each pay period ending during a transition year, each member shall contribute to the retirement fund an amount equal to:

- (A) 37% times the current total obligation rate for that fiscal year times the member’s wages for the pay period;

and, for each pay period ending during each fiscal year, except for a transition year, the member shall contribute to the retirement fund an amount equal to:

- (B) 37% times the current adjusted total obligation rate for that fiscal year times the member’s wages for the pay period.

CURRENT ADJUSTED TOTAL OBLIGATION RATE – means, for any fiscal year, the rate determined by the board as follows, using whichever formula is applicable:

(A) If the current total obligation rate minus the prior adjusted total obligation rate is greater than three, then the current adjusted total obligation rate for such fiscal year is equal to the lesser of:

- (i) the prior adjusted total obligation rate plus one-half times the difference of the current total obligation rate minus the prior adjusted total obligation rate; or
- (ii) 110 percent times the prior adjusted total obligation rate; or
- (iii) 36 percent.

(B) If the difference between the current total obligation rate and the prior adjusted total obligation rate is less than three, then the current adjusted total obligation rate for such fiscal year is equal to the prior adjusted total obligation rate.

(C) If the prior adjusted total obligation rate minus the current total obligation rate is greater than three, then the current adjusted total obligation rate for such fiscal year is equal to the greater of:

- (i) the prior adjusted total obligation rate minus one-half times the difference of the prior adjusted total obligation rate minus the current total obligation rate; or
- (ii) 90 percent times the prior adjusted total obligation rate.

CURRENT TOTAL OBLIGATION RATE – means, for any fiscal year, the rate adopted by the board that is equal to the sum of the pension obligation bond credit rate for such fiscal year plus the actuarially required contribution rate for such fiscal year.

PENSION OBLIGATION BOND CREDIT RATE – means, for any fiscal year, the rate adopted by the board that is a percentage calculated by dividing:

- (A) the debt service due during such fiscal year on any pension obligation bonds, the proceeds of which have been deposited in the fund, by:
- (B) the total members' projected wages for such fiscal year, as reported in the relevant actuarial valuation report.

PRIOR ADJUSTED TOTAL OBLIGATION RATE – means:

- (A) for the fiscal year commencing October 1, 2006, the current total obligation rate that was effective for the prior fiscal year; and
- (B) for each fiscal year commencing on or after October 1, 2007, the current adjusted total obligation rate that was effective for the prior fiscal year.

PROJECTED PAYROLL – means the covered payroll for the valuation proceeding the fiscal year multiplied by the payroll growth assumption.

TRANSITION YEAR – means each of the following:

- (A) the first fiscal year in which debt service payments related to pension obligation bonds are due from the city;
- (B) the first fiscal year in which no debt service payments related to pension obligation bonds are due from the city; and
- (C) the fiscal year beginning October 1, 2005.

Net Assets Available for Benefits
(\$ in 000s)

	December 31, 2018	December 31, 2019
1 Assets		
a. Cash & Short-Term	\$ 102,781	\$ 325,309
2 Receivables		
a. Accrued Investment Income	\$ 14,201	\$ 14,467
b. Securities Sold	2,789	4,243
c. Employer Contribution	2,058	2,307
d. Employee Contribution	1,903	2,164
e. Pending Contracts	-	438,841
	\$ 20,951	\$ 462,022
3 Investments		
a. Index Funds	\$ 119,550	\$ 176,734
b. Fixed Income	911,461	997,117
c. Equities	1,871,968	1,872,596
d. Real Estate	232,171	230,183
e. Private Equity	27,111	267,422
	\$ 3,162,261	\$ 3,544,052
4 Total Assets	\$ 3,285,993	\$ 4,331,383
5 Liabilities		
a. Accounts Payable	\$ 7,434	\$ 7,267
b. Investment Transactions	13,157	666,028
	\$ 20,591	\$ 673,295
6 Net Assets Available For Benefits	\$ 3,265,402	\$ 3,658,088



Change in Assets Available for Benefits
Fiscal Year Ending December 31, 2019
(\$ in 000s)

	2018	2019
1 Assets Available at Beginning of Year	\$ 3,601,612	\$ 3,265,402
Adjustment *	<u>10,647</u>	<u>16,911</u>
	\$ 3,612,259	\$ 3,282,313
 2 Revenues		
a. Employer Contributions	\$ 60,924	\$ 62,177
b. Employee Contributions	56,760	58,314
c. Investment Income	104,544	114,123
d. Investment Expense	(14,446)	(18,129)
e. Realized and Unrealized Gains (Losses)	(272,937)	453,838
f. Other (Security Lending)	<u>1,381</u>	<u>1,411</u>
Total Revenues	\$ (63,774)	\$ 671,734
 3 Expenses		
a. Benefits	\$ 263,963	\$ 278,007
b. Refunds	8,443	10,436
c. Operating Expense	<u>10,677</u>	<u>7,516</u>
Total Expense	\$ 283,083	\$ 295,959
 4 Assets Available at End of Year (1 + 2 - 3)	<u>\$ 3,265,402</u>	<u>\$ 3,658,088</u>

* Change due to difference between unaudited asset value used for prior valuation and audited asset value reported the following year.

Development of Actuarial Value of Assets

(\$ in 000s)

December 31, 2019

1. Market value of assets at beginning of year	\$	3,265,402
2. External cashflow		
a. Contributions	\$	120,491
b. Benefits and refunds paid		(288,443)
c. Administrative and miscellaneous expenses		(7,513)
d. Subtotal		(175,465)
3. Assumed investment return rate for fiscal year		
		7.75%
4. Assumed investment income for fiscal year	\$	246,396
5. Expected Market Value at end of year (1+ 2 + 4)	\$	3,336,333
6. Market value of assets at end of year	\$	3,658,088
7. Difference (6 - 5)	\$	321,755

8. Development of amounts to be recognized as of December 31, 2019:

Fiscal Year	Remaining Deferrals of Excess (Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
End	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2015	\$ 0	\$ 0	\$ 0	1	\$ 0	\$ 0
2016	0	0	0	2	0	0
2017	0	0	0	3	0	0
2018	(354,917)	321,755	(33,162)	4	(8,291)	(24,871)
2019	321,755	(321,755)	0	5	0	0
Total	\$ (33,162)	\$ 0	\$ (33,162)		\$ (8,291)	\$ (24,871)

9. Final actuarial value of plan net assets, end of year (Item 6 - Item 8, Column 6)	\$	3,682,959
10. Ratio of actuarial value to market value		100.7%

Notes: Remaining deferrals in Column (1) for prior years are from last year's report Table 6, column 6. The number in the current year is Item 7, above. Column 2 is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.



Historical Investment Performance
Dollar Weighted Basis Net of Investment Expenses

<u>Calendar Year</u>	<u>On Market Value</u>	<u>On Actuarial Value</u>
2000	-3.45%	9.59%
2001	-5.46%	2.76%
2002	-9.81%	-5.37%
2003	27.05%	2.03%
2004	15.22%	9.38%
2005	7.93%	13.71%
2006	16.90%	13.03%
2007	3.56%	9.58%
2008	-31.31%	-3.76%
2009	30.35%	6.79%
2010	15.77%	4.30%
2011	0.86%	1.15%
2012	14.29%	2.82%
2013	16.75%	10.65%
2014	6.14%	10.29%
2015	-1.83%	7.02%
2016	8.65%	8.51%
2017*	12.34%	8.99%
2018	-5.15%	5.23%
2019	17.30%	6.74%
5-year average ending in 2019	5.92%	7.29%
10-year average ending in 2019	8.23%	6.53%

*The yield on the actuarial value of assets for 2017 includes the impact of the method change for the Actuarial Value of Assets.



**Analysis of Change in Unfunded
Actuarial Accrued Liability
For the Year Ending December 31, 2019
(\$ in 000s)**

1. UAAL as of December 31, 2018		\$ 906,677
2. Expected Change in UAAL during 2019		
a. Expected Amortization Payment for CY 2019	(59,385)	
b. Interest adjustments on 1 & 2a to Year End @ 7.75%	68,009	
c. Expected change in UAAL		8,624
3. Increase/(Decrease) in UAAL Due to Difference Between Calculated Contribution Rate and Actual Contribution		30,032
4. Net Actuarial Experience (Gains) & Losses		29,642
5. Assumption and Method Changes		205,391
6. UAAL as of December 31, 2019		\$ 1,180,366

Investment Experience (Gain) or Loss
(\$ in 000s)

Item	Valuation as of December 31, 2019
1. Actuarial assets, beginning of year	\$ 3,620,319
2. Contributions	120,491
3. Benefits and refunds paid with administrative expenses	(295,956)
4. Assumed net investment income at 7.75% on	
a. Beginning of year assets	280,575
b. Contributions	4,582
c. Benefits and refunds paid with administrative expenses	(11,254)
d. Total	\$ 273,903
5. Expected actuarial assets, end of year (Sum of Items 1 through 4)	3,718,757
6. Actual actuarial assets, end of year	3,682,959
7. Asset experience (gain)/loss for year	35,798

**Analysis of Actuarial (Gains) and Losses
For 2019
(\$ in 000s)**

	2019
Investment Return	\$ 35,798
Salary Increase	35,205
Age and Service Retirement	(1,775)
General Employment Termination	(5,315)
Disability Incidence	(124)
Active Mortality	(152)
Benefit Recipient Mortality	(2,131)
Actual vs. Expected Cost of Living Adjustment (COLA)*	(23,237)
Other	(8,627)
Total Actuarial (Gain)/ Loss	\$ 29,642
Actuarial Assumption Change	\$ 205,391

* Actual COLA of 1.64% versus expected COLA of 2.75%

Schedule of Funding Status
(\$ in 000s)

End of Year	Actuarial Value of Assets (a)	AAL (b)	UAAL (b-a)	Funding Ratio (a/b)	Payroll* (c)	UAAL as % of Payroll ((b-a)/c)
1998	\$1,617,468	\$1,750,430	\$132,962	92.40%	\$275,547	48.30%
1999	1,862,644	1,873,998	11,353	99.39%	282,127	4.00%
2000	1,997,828	2,038,078	40,250	98.03%	298,355	13.50%
2001	2,017,041	2,276,488	259,447	88.60%	332,842	77.90%
2002	1,863,701	2,399,569	535,868	77.67%	324,615	165.08%
2003	1,843,099	2,489,071	645,972	74.05%	318,492	202.82%
2004	2,482,082	2,488,270	6,188	99.75%	331,201	1.87%
2005	2,739,269	2,606,173	(133,096)	105.11%	332,446	-40.04%
2006	2,998,099	2,761,404	(236,695)	108.57%	344,997	-68.61%
2007	3,183,260	2,915,164	(268,096)	109.20%	370,150	-72.43%
2008	2,957,506	3,075,385	117,879	96.17%	389,362	30.27%
2009	3,031,652	3,192,120	160,468	94.97%	375,164	42.77%
2010	3,027,439	3,282,126	254,687	92.24%	332,045	76.70%
2011	2,916,746	3,391,652	474,906	86.00%	318,972	148.89%
2012	2,846,124	3,518,356	672,232	80.89%	340,452	197.45%
2013	3,074,284	3,610,845	362,477	85.14%	352,486	102.83%
2014	3,241,053	4,004,055	763,002	80.94%	374,002	204.01%
2015	3,320,387	4,129,133	808,746	80.41%	404,981	199.70%
2016	3,451,463	4,291,802	840,339	80.42%	420,693	199.75%
2017	3,601,612	4,377,844	776,232	82.27%	432,854	179.33%
2018	3,620,319	4,526,996	906,677	79.97%	435,375	208.25%
2019	3,682,959	4,863,325	1,180,366	75.73%	444,737	265.41%

Summary of Data Characteristics

As of December 31,	<u>2017</u>	<u>2018</u>	<u>2019</u>
Active Members			
Number	7,838	7,584	7,427
Total Annualized Earnings of Members as of 12/31 (000s)	\$ 421,269	\$ 423,723	\$ 433,890
Average Earnings	53,747	55,871	58,421
Benefit Recipients			
Number	7,042	7,224	7,405
Total Annual Retirement Income (000s)	\$ 244,768	\$ 258,085	\$ 269,263
Total Annual Health Supplement (000s)	10,220	10,523	10,984
Average Total Annual Benefit	36,223	37,200	37,871
Inactive Members*			
Deferred Vested	793	819	877
Deferred Nonvested	455	673	789
Total	1,248	1,492	1,666

* The number of inactives on 12/31/2019 includes 877 members who have applied for a deferred pension and 789 other members who have terminated and still have contribution balances in the Fund.

Distribution of Active Members and Payroll by Age and Years of Service

Age	Years of Service							Totals	
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29		30 & Over
Under 20									0
									\$0
20-24	86	73	2						161
	\$2,849,884	\$2,801,922	\$73,380						\$5,725,186
25-29	165	353	65	0					583
	\$6,879,660	\$15,604,905	\$3,310,646	\$0					\$25,795,211
30-34	166	369	201	50					786
	\$7,810,585	\$18,234,364	\$10,737,310	\$2,959,678					\$39,741,937
35-39	124	296	210	157	30	4			821
	\$5,716,094	\$15,908,958	\$12,748,779	\$10,029,673	\$2,045,043	\$261,773			\$46,710,320
40-44	118	278	197	171	90	59	1		914
	\$5,886,426	\$15,779,853	\$12,297,592	\$10,833,785	\$6,413,293	\$3,904,144	\$54,485		\$55,169,578
45-49	93	243	173	158	128	168	54	1	1,018
	\$4,285,543	\$13,202,222	\$11,095,547	\$9,986,786	\$8,177,526	\$11,347,728	\$3,778,037	\$102,420	\$61,975,809
50-54	88	233	167	183	147	186	88	20	1,112
	\$4,296,923	\$12,892,287	\$9,440,982	\$11,971,392	\$10,449,642	\$13,374,124	\$6,301,224	\$1,475,778	\$70,202,352
55-59	58	197	154	220	162	169	39	46	1,045
	\$2,786,560	\$11,189,742	\$8,798,023	\$13,167,752	\$10,520,389	\$11,488,765	\$3,032,084	\$3,779,556	\$64,762,871
60-64	33	109	111	140	89	97	44	42	665
	\$1,807,222	\$5,999,567	\$6,784,405	\$8,771,980	\$5,777,913	\$6,588,005	\$3,256,067	\$3,576,112	\$42,561,271
65&Over	8	35	51	71	47	56	18	36	322
	\$388,926	\$2,153,435	\$2,924,287	\$4,718,790	\$3,296,824	\$3,564,028	\$1,329,005	\$2,869,929	\$21,245,224
Totals	939	2,186	1,331	1,150	693	739	244	145	7,427
	\$42,707,823	\$113,767,255	\$78,210,951	\$72,439,836	\$46,680,630	\$50,528,567	\$17,750,902	\$11,803,795	\$433,889,759



**Distribution of Benefit Recipients
as of December 31, 2019**

Age	Number	Annual Benefit*	Annual Average Benefit*
Under 50	45	\$ 741,627	\$ 16,481
50-54	197	8,598,939	43,649
55-59	657	30,317,521	46,145
60-64	1,303	50,806,210	38,992
65-69	1,724	64,763,938	37,566
70-74	1,523	58,046,066	38,113
75-79	886	27,848,855	31,432
80-84	547	15,658,193	28,626
85-89	316	7,801,810	24,689
90 & Over	207	4,679,946	22,608
Total	7,405	\$ 269,263,106	\$ 36,362

* Does not include Health Benefit Supplement.

Schedule of Active Member Valuation Data

Year Ending December 31,	Active Participants	Percent Change	Covered Payroll	Percent Change	Average Salary	Percent Change
2007	8,117	-	\$ 359,369,000	-	\$ 44,274	-
2008	8,371	3.1%	378,021,000	5.2%	45,158	2.0%
2009	7,654	-8.6%	364,237,000	-3.6%	47,588	5.4%
2010	7,034	-8.1%	322,374,000	-11.5%	45,831	-3.7%
2011	6,745	-4.1%	309,682,000	-3.9%	45,913	0.2%
2012	6,864	1.8%	330,536,000	6.7%	48,155	4.9%
2013	6,993	1.9%	342,219,000	3.5%	48,937	1.6%
2014	7,180	2.7%	363,109,000	6.1%	50,572	3.3%
2015	7,477	4.1%	393,186,000	8.3%	52,586	4.0%
2016	7,619	1.9%	409,433,000	4.1%	53,738	2.2%
2017	7,838	2.9%	421,269,000	2.9%	53,747	0.0%
2018	7,584	-3.2%	423,723,000	0.6%	55,871	4.0%
2019	7,427	-2.1%	433,890,000	2.4%	58,421	4.6%



Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

Year Ending December 31,	Added to Rolls		Removed from Rolls		Rolls-End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2007	239	\$ 7,250,468	205	\$ 4,551,742	5,304	\$142,267,609	-	\$ 26,823
2008	383	8,905,680	211	4,684,964	5,476	154,692,846	8.7%	28,249
2009	446	9,268,740	216	4,795,982	5,706	165,826,328	7.2%	29,062
2010	508	12,798,268	221	4,907,000	5,993	179,730,384	8.4%	29,990
2011	404	10,012,165	198	4,396,317	6,199	193,851,170	7.9%	31,271
2012	325	9,795,464	204	4,529,539	6,320	202,120,582	4.3%	31,981
2013	324	11,246,955	197	4,327,990	6,447	210,027,512	3.9%	32,578
2014	370	12,415,771	219	4,821,713	6,598	219,150,070	4.3%	33,215
2015	476	13,777,204	318	6,847,464	6,756	226,019,290	3.1%	33,455
2016	384	12,746,549	237	5,562,549	6,903	237,992,528	5.3%	34,477
2017	383	9,893,931	244	6,375,641	7,042	244,768,143	2.8%	34,758
2018	402	14,905,595	220	5,976,286	7,224	258,085,328	5.4%	35,726
2019	478	17,715,050	297	8,368,302	7,405	269,263,106	10.0%	36,362



Solvency Test (\$ in 000s)

Valuation Date	Aggregated Accrued Liabilities for			Reported Assets	Portions of Accrued Liabilities Covered by Reported Assets		
	Active and Inactive Members Contributions	Retirees and Beneficiaries	Active and Inactive Members (Employer Financed Portion)		(5)/(2)	[(5)-(2)]/3	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
December 31, 2007	\$ 206,090	\$ 1,591,731	\$ 1,117,343	\$ 3,183,260	100.0%	100.0%	100.0%
December 31, 2008	221,667	1,707,599	1,146,119	2,957,506	100.0%	100.0%	89.7%
December 31, 2009	228,666	1,834,491	1,128,963	3,031,652	100.0%	100.0%	85.8%
December 31, 2010	232,727	2,041,322	1,008,077	3,027,439	100.0%	100.0%	74.7%
December 31, 2011	240,821	2,181,731	969,100	2,916,746	100.0%	100.0%	51.0%
December 31, 2012	257,716	2,250,533	1,010,107	2,846,124	100.0%	100.0%	33.4%
December 31, 2013	278,892	2,319,424	1,012,529	3,074,284	100.0%	100.0%	47.0%
December 31, 2014	301,567	2,578,071	1,124,417	3,241,053	100.0%	100.0%	32.1%
December 31, 2015	325,607	2,650,638	1,152,888	3,320,387	100.0%	100.0%	29.9%
December 31, 2016	350,646	2,770,533	1,170,623	3,451,463	100.0%	100.0%	28.2%
December 31, 2017	373,193	2,854,818	1,149,833	3,601,612	100.0%	100.0%	32.5%
December 31, 2018	392,004	2,989,597	1,145,395	3,620,319	100.0%	100.0%	20.8%
December 31, 2019	408,984	3,228,576	1,225,766	3,682,959	100.0%	100.0%	3.7%



EXPERIENCE TABLES

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**Pay Experience for Employees who are Active at
Beginning and End of Year
Valuation Pay Analysis
Analyzed by Years of Service**

Service Beginning of Year	Experience for 2019			
	Number	Expected Pay	Actual Pay	Ratio A/E
Under 5	1,947	\$ 98,967,990	\$ 101,463,637	102.52%
5-9	1,486	84,069,981	85,411,055	101.60%
10-14	1,108	68,206,392	69,882,938	102.46%
15-19	701	46,217,700	47,290,563	102.32%
20-24	777	50,700,220	52,514,418	103.58%
25-29	273	18,992,878	19,612,917	103.26%
30 & Over	165	13,023,614	13,313,549	102.23%
Total	6,457	\$ 380,178,775	\$ 389,489,077	102.45%
Over 10 Years	3,024	\$ 197,140,804	\$ 202,614,385	102.78%

Service Beginning of Year	Experience for 2015-2019			
	Number	Expected Pay	Actual Pay	Ratio A/E
Under 5	10,109	\$ 480,328,582	\$ 488,026,238	101.60%
5-9	6,752	370,185,321	372,968,512	100.75%
10-14	5,930	347,219,232	349,453,654	100.64%
15-19	4,407	263,721,804	265,996,461	100.86%
20-24	3,519	223,059,586	225,920,091	101.28%
25-29	1,444	100,584,035	101,596,476	101.01%
30 & Over	978	72,436,290	72,892,156	100.63%
Total	33,139	\$ 1,857,534,850	\$ 1,876,853,588	101.04%
Over 10 Years	16,278	\$ 1,007,020,947	\$ 1,015,858,838	100.88%

Analysis of Retirement Experience
Each Age

Age	2019 Retirement			2015-2019 Retirement		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
46	-	-	N/A	-	-	N/A
47	-	-	N/A	-	-	N/A
48	-	-	N/A	1	0.90	111.11%
49	-	0.10	0.00%	4	2.90	137.93%
50	5	6.20	80.65%	45	49.80	90.36%
51	10	8.65	115.61%	42	51.25	81.95%
52	7	10.32	67.83%	44	57.32	76.76%
53	9	7.90	113.92%	53	58.55	90.52%
54	6	8.50	70.59%	47	52.52	89.49%
55	18	13.20	136.36%	55	59.86	91.88%
56	8	13.07	61.21%	52	70.31	73.96%
57	23	18.62	123.52%	70	79.43	88.13%
58	12	15.37	78.07%	51	76.11	67.01%
59	21	20.74	101.25%	60	87.52	68.56%
60	22	25.31	86.92%	114	132.88	85.79%
61	17	23.83	71.34%	76	116.82	65.06%
62	24	21.30	112.68%	86	104.45	82.34%
63	9	19.65	45.80%	60	95.40	62.89%
64	16	17.00	94.12%	61	72.70	83.91%
65	22	16.90	130.18%	79	83.68	94.41%
66	20	14.40	138.89%	79	73.10	108.07%
67	21	14.00	150.00%	54	55.35	97.56%
68	8	6.45	124.03%	36	36.20	99.45%
69	8	6.85	116.79%	28	28.55	98.07%
70 & Over	21	90.00	23.33%	68	381.00	17.85%
Total	307	378.36	81.14%	1,265	1,826.60	69.25%
Total Under 70	286	288.36	99.18%	1,197	1,445.60	82.80%



Analysis of Retirement Experience

Age Groups

Age Group	2019 Retirements			2015-2019 Retirements		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
Under 55	37	41.67	88.79%	236	273.24	86.37%
55-59	82	81.00	101.23%	288	373.23	77.16%
60-64	88	107.09	82.17%	397	522.25	76.02%
65-69	79	58.60	134.81%	276	276.88	99.68%
70 & Over	21	90.00	23.33%	68	381.00	17.85%
Total	307	378.36	81.14%	1,265	1,826.60	69.25%
Total Under 70	286	288.36	99.18%	1,197	1,445.60	82.80%

Analysis of Turnover Experience

Years of Service	2019 Quits			2015-2019 Quits		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
0-4	530	356.72	148.58%	2,175	1,797.26	121.02%
5-9	180	103.67	173.64%	598	440.33	135.81%
10-14	57	37.09	153.66%	260	205.55	126.49%
15-19	17	15.76	107.85%	90	92.42	97.38%
20-24	19	9.10	208.84%	48	42.00	114.30%
25-29	2	0.74	269.54%	4	3.12	128.12%
Total	805	523.08	153.90%	3,175	2,580.68	123.03%

Analysis of Active Mortality Experience

Age	2019 Deaths			2015-2019 Deaths*		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
20-24	-	0.05	0.00%	1	0.22	445.21%
25-29	-	0.21	0.00%	1	1.01	99.19%
30-34	-	0.42	0.00%	1	1.99	50.31%
35-39	-	0.64	0.00%	3	3.21	93.32%
40-44	-	1.11	0.00%	7	5.39	129.94%
45-49	-	1.68	0.00%	3	9.29	32.29%
50-54	2	3.04	65.77%	14	16.56	84.53%
55-59	-	4.78	0.00%	10	23.27	42.97%
60 and Over	6	8.19	73.23%	26	37.45	69.43%
Total	8	20.11	39.77%	66	98.39	67.08%

Analysis of Disability Experience

Age	2019 Disabilities			2015-2019 Disabilities		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
20-24	-	0.02	0.00%	-	0.11	0.00%
25-29	-	0.14	0.00%	-	0.67	0.00%
30-34	-	0.26	0.00%	-	1.21	0.00%
35-39	-	0.39	0.00%	-	1.93	0.00%
40-44	1	0.78	128.30%	3	3.84	78.15%
45-49	-	1.68	0.00%	2	9.06	22.07%
50-54	-	3.27	0.00%	10	17.35	57.64%
55-59	3	4.09	73.31%	7	20.07	34.88%
60 and Over	1	1.54	64.75%	5	6.55	76.39%
Total	5	12.18	41.05%	27	60.78	44.43%

Analysis of Retiree Mortality Experience*

Age	2019 Experience			2015-2019 Experience		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
Under 60	20	2.90	690.51%	42	15.78	266.10%
60-64	18	9.03	199.33%	61	47.74	127.77%
65-69	26	20.52	126.69%	109	105.07	103.74%
70-74	40	29.22	136.91%	134	121.47	110.31%
75-79	23	26.71	86.11%	117	118.86	98.43%
80-84	27	24.37	110.78%	119	113.37	104.97%
85-89	25	21.61	115.69%	122	114.32	106.72%
90 & over	35	22.89	152.89%	127	103.06	123.22%
Total	214	157.25	136.09%	831	739.68	112.35%

**This analysis does not include beneficiary, QDRO, or disabled deaths.*

ACTUARIAL METHODS AND ASSUMPTIONS

The most recent experience study was completed in conjunction with the December 31, 2019 actuarial valuation. Please see our experience study, dated June 2020, to see more detail of the rationale for the current assumptions. As authorized under Sec. 40A-9 of Chapter 40A, the actuarial assumptions and methods are established set by the Board of Trustees based upon recommendations from the Fund's actuary.

Entry Age Normal Method

The Entry Age Normal actuarial cost method is the actuarial valuation method used for all purposes under ERF. The concept of this method is that funding of benefits for each member should be affected as a, theoretically, level contribution (as a level percentage of pay) from entry into ERF to termination of active status.

The Normal Cost (NC) for a fiscal year under this method is determined as described in the prior paragraph for each member. The ERF NC for the year is the total of individual normal costs determined for each active member. The Actuarial Accrued Liability (AAL) under this method is the theoretical asset balance of the normal costs that would have accumulated to date based upon current actuarial assumptions. To the extent that the assets of the fund are insufficient to cover the AAL, an Unfunded Actuarial Accrued Liability (UAAL) develops.

Actuarially Determined Contribution

The actuarially determined contribution rate is developed using an open group projection. The total contribution rate (member plus City) is the level percentage of pay needed to fund the Normal Cost for each year and pay off the UAAL over 30 years.

In the open group projection, the demographic assumptions are applied to the current active employees and any employees that are assumed to leave employment are replaced one for one with a new employee. Over time this results in the change of the employee group from mostly Tier A members to Tier B members. The projection is built to assume no gains or losses on the actuarial accrued liability or the actuarial value of assets.

In the projection, new members' pay is assumed to increase at 3.00% year over year (i.e. a new employee in 2020 is assumed to be hired at a salary that is 3.00% greater than a new employee hired in 2019). The 3.00% growth rate is equal to our wage inflation assumption of 3.00% (ultimate salary increase



ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

assumption). Note that this is not an assumption that payroll will grow at 3.00% per year. Payroll could grow more slowly in the near-term due to membership demographics.

New Entrant Profile

For the purposes of determining the funding period, an open group projection is used which replaces on a one-to-one basis each active member who leaves employment with an average new hire. The average new hire is determined based on a new entrant profile, which is created from the valuation data by determining the entry age and entry pay for anyone with eight or less years of service as of the valuation date, with salaries normalized to the valuation date. A summary of the new entrant profile is shown in the table below, with 25.9% of the population being male. The salaries below would be applicable for the year preceding the valuation date. Future cohorts of new hires have starting salaries that are assumed to grow at the General Wage Inflation of 3.00% over the salaries of the previous year.

New Entrant Profile		
Entry Age	# of Employees	Average Salary
15-19	3	39,150
20-24	127	37,261
25-29	201	43,196
30-34	193	46,921
35-39	160	51,724
40-44	141	55,026
45-49	120	56,755
50-54	105	56,915
55-59	73	51,121
60-64	36	61,036
65-69	4	56,905
Total	1,163	49,498

Actuarial Value of Asset Method

The method for determining the actuarial value of assets in future years is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected actuarial value of assets each year, and recognizes the cumulative excess return (or shortfall) at a minimum rate of 20% per year. Each year, a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases, then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base.

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Annual Rate of Investment Return: For all purposes under the Fund, the rate of investment return is assumed to be 7.25% per annum, net of investment expenses. This rate includes an annual assumed rate of inflation of 2.50%. In addition, annual cost-of-living adjustments are assumed to occur on average at the rate of 2.50% per annum for Tier A members and 2.20% for Tier B members (due to the lower maximum on cost-of-living-adjustments).

Annual Compensation Increases: Each member's compensation is assumed to increase in accordance with a table based on actual ERF experience. Sample rates follow:

Years of Service	Merit, Promotion, Longevity		General		Total	
0	5.25	%	3.00	%	8.25	%
1	4.25		3.00		7.25	
2	3.25		3.00		6.25	
3	2.50		3.00		5.50	
4	2.00		3.00		5.00	
5	1.75		3.00		4.75	
6	1.75		3.00		4.75	
7	1.25		3.00		4.25	
8	1.25		3.00		4.25	
9	1.00		3.00		4.00	
10	1.00		3.00		4.00	
11	1.00		3.00		4.00	
12	0.75		3.00		3.75	
13	0.75		3.00		3.75	
14	0.75		3.00		3.75	
15	0.75		3.00		3.75	
16	0.75		3.00		3.75	
17	0.75		3.00		3.75	
18	0.50		3.00		3.50	
19 & Over	0.00		3.00		3.00	

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Mortality:

Disabled Lives: The gender-distinct 2019 Texas Municipal Retirees Mortality Table for males and females respectively, set forward 4 years for males and 3 years for females. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.

Sample rates as of 2019 follow (rate per 1,000):

Age	Disability Mortality Rate	
	Male	Female
20	35	30
30	35	30
40	35	30
50	35	30
60	35	30
70	35	30
80	84	51
90	240	164

Other Benefit Recipients:

The gender-distinct 2019 Texas Municipal Retirees Mortality Tables are used for males and females respectively. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.

Sample rates as of 2019 follow (rate per 1,000), with projected mortality applied:

Age	Mortality Rate	
	Male	Female
30	0.4	0.1
40	0.8	0.4
50	2.8	1.2
60	7.5	3.6
70	20.2	11.3
80	55.9	35.8
90	157.2	114.2

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Mortality:

Active Members: The PUB(10) Mortality Table for General Employees tables are used for males and females respectively. The rates are projected on a fully generational basis using Scale UMP.

Sample rates follow (rate per 1,000):

Age	Mortality Rate	
	Male	Female
30	0.3	0.1
40	0.6	0.3
50	1.4	0.8
60	2.9	1.7
70	6.4	4.5
80	15.8	12.2
90	134.9	105.6

10% of active deaths are assumed to be service related.

Disability: A client-specific table of disability incidence with sample rates follows (rate per 1,000):

Age	Disability Rate
30	0.1
40	0.5
50	1.2
60	2.2

20% of disabilities are assumed to be service related. There is a 0% assumption of disability for members who have over 10 years of service and are eligible for retirement.

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Retirement: Upon eligibility, active members are assumed to retire as follows (rate per 1,000):

Tier A:

Age	Male		Female	
	<u>First Year Eligible</u>	<u>Thereafter</u>	<u>First Year Eligible</u>	<u>Thereafter</u>
48-49	100	100	100	100
50	550	550	450	350
51	500	450	400	350
52	500	300	400	300
53	400	300	350	300
54	350	250	350	200
55	300	250	350	250
56	300	250	350	250
57	300	250	350	250
58-59	300	250	250	200
	<u>Service < 18 yrs.</u>	<u>Service 18 yrs.+</u>	<u>Service < 18 yrs.</u>	<u>Service 18 yrs. +</u>
60	80	230	90	200
61	90	230	90	180
62	100	230	90	200
63	100	230	150	150
64	150	230	120	130
65	150	230	120	300
66	200	230	150	300
67	200	230	250	300
68	200	230	150	300
69	200	230	150	300
70	1,000	1,000	1,000	300

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Retirement, Continued:

Upon eligibility, active members are assumed to retire as follows (rate per 1,000):

Tier B:

Age	Male		Female	
	Service < 40 yrs.	Service 40 yrs. +	Service < 40 yrs.	Service 40 yrs. +
<55	10	350	10	350
55-56	20	350	20	350
57-58	30	350	30	350
59-60	40	350	40	350
61-62	50	350	50	350
63-64	60	350	60	350
65	180	600	200	450
66	200	250	250	250
67	200	250	250	250
68	200	250	150	250
69	200	250	150	250
70	1,000	1,000	1,000	1,000

*For service < 40 yrs, rates shown are for those who met the rule of 80.

Retirement of Deferred Vested Members:

All deferred vested members are assumed to commence payment at their normal retirement age, which is age 60 for Tier A members and age 65 for Tier B members.

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

General Turnover: A table of termination rates based on ERF experience as shown below.

Years of Service	Terminations (per 1,000)	
	Male	Female
0	228	200
1	180	165
2	144	150
3	110	120
4	90	95
5	75	90
6	67	80
7	60	65
8	51	48
9	43	48
10	33	45
11	33	32
12	30	30
13	30	30
14	22	20
15	22	14
16	19	14
17	19	14
18	19	14
19	19	14
20	12	14
21	12	14
22	12	6
23	12	6
24	12	6
25	12	6
26 & Over	5	6

There is 0% assumption of termination for members eligible for retirement.

Mortality Improvement: Scale UMP is used to project mortality improvements for retirees on a fully generational basis.

Refunds of Contributions: Members are assumed to choose the most valuable termination benefit.



ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Operational Expenses: The amount of estimated administrative expenses expected in the next year is assumed to be equal to the prior year's expenses and is incorporated in the Normal Cost.

Marital Status: 75% of active male members and 50% of active female employees are assumed to be married.

Vacation Leave Conversions: Members with 20 or more years of service are assumed to convert unused vacation leave to 1.5 months of service. Other members are assumed to convert unused vacation leave to 1 month of service. No vacation leave conversion is assumed for disability retirement.

Spouse Age: The female spouse is assumed to be 3 years younger than the male spouse.

Payroll Growth Rate: Used to estimate projected payroll for the following fiscal year. Assumed to be equal to the inflation rate of 2.50%.

Member's Pay: In determining the member's valuation salary, the greater of the prior calendar year's gross pay and the member's rate of compensation is used.

Form of Payment: For Tier A it is assumed that 60% of married active male members and 84% of married active female employees will elect a Joint & 50% Survivor form of payment. Taking into consideration the marriage assumption and the inherent subsidy in the System's Joint & 100% Survivor factors, the male employees are valued with Joint and 28.0% Survivor annuities and the female employees are valued with Joint and 19.5% Survivor annuities. It is also assumed that 100% of Tier B employees will elect the normal form of payment under Tier B.

Data Adjustments: Certain records are missing spousal information. For these records we use the marital status assumption and spousal age difference assumption to value these records. No other adjustments are made to the data.

Actuarial Equivalence Assumptions: for form of payment conversion and Tier B early retirement factors are based on the following assumptions:

- a. Interest Rate of 8.00%.
- b. Mortality: Unisex blend (60% male and 40% female) of the following assumptions for males and females. 109% of the RP-2000 Combined Healthy Table for males with Blue Collar adjustment projected to 2026 using improvement scale BB for males. 103% of the RP-2000 Combined Healthy Table for females with Blue Collar adjustment projected to 2026 using improvement scale BB for females.
- c. Cost-of-living-adjustments (COLA): a 3.0% COLA assumption for Tier A members and a 2.50% COLA assumption for Tier B members.

Changes in Assumptions and Methods Since Prior Valuation: Changes were made to salary, mortality, retirement, and turnover rates. The discount rate, payroll growth rate, and form of payment assumptions have also been updated. Please see the experience study report dated June 2020 for more information.



SUMMARY OF BENEFIT PROVISIONS

Employees' Retirement Fund of the City of Dallas As of December 31, 2019

Membership

An employee becomes a member upon permanent employment and contributes to the Fund.

Tier A

A person who was employed by the City prior to January 1, 2017, or who was re-employed by the City on or after January 1, 2017 and whose pre January 1, 2017 credited service was not cancelled by withdrawal or forfeiture or was reinstated.

Tier B

A person who was employed by the City on or after January 1, 2017, or who was re-employed by the City on or after January 1, 2017 and whose pre January 1, 2017 credited service has been cancelled by withdrawal or forfeiture.

Contributions

Member: 37% of the current adjusted total obligation rate. New rates effective October 1 after the valuation date.

City: 63% of the current adjusted total obligation rate. New rates effective October 1 after the valuation date.

Definitions

Final Average Salary:

Tier A

Average monthly salary over the member's highest three years (or 36 months) of service.

Tier B

Average monthly salary over the member's highest five years (or 60 months) of service.

Credited Service: Length of time as an employee of the City of Dallas and while making contributions to the Fund.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Retirement Pension

Eligibility:

Tier A

- a. Attainment of age 60; or
- b. Attainment of age 55 (if credited service began before May 9, 1972); or
- c. At any age after completion of 30 years of credited service with a reduced benefit before age 50; or
- d. Attainment of age 50, if the sum of an active member's age and credited service is at least equal to 78.

Tier B

- a. Attainment of age 65 and 5 years of service; or
- b. At any age after completion of 40 years of credited service; or
- c. At any age if the sum of an active member's age and credited service is at least equal to 80 (under this eligibility the member's pension will be actuarially reduced for each year prior to the age of 65 that the member retires).

Retirement Benefits:

Tier A

The retirement benefit equals 2-3/4% multiplied by average monthly earnings multiplied by credited service limited to a maximum of 36.3636 years plus a monthly \$125 health supplement (prorated for service less than 5 years).

Tier B

The retirement benefit equals 2-1/2% multiplied by average monthly earnings multiplied by credited service limited to a maximum of 40 years (no monthly health supplement).

Form of Payment:

Tier A

An unreduced pension benefit under a joint and one-half survivor option with 10 years guaranteed or a ten-year certain and life option. An actuarially equivalent joint and full survivor option is also available.

Tier B

An unreduced pension payable for life with 10 years guaranteed. Actuarially equivalent joint and survivor options (50% and 100%) are also available.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Early Retirement Factors:

Tier A

For members retiring prior to age 50 with 30 or more years of service the pension shall be multiplied by the following percentage:

<u>Age</u>	<u>Percentage</u>
49	93.3
48	87.2
47	81.5
46	76.3
45	71.5
44	67.0

Tier B

For members retiring prior to age 65 with less than 40 years of service, the pension shall be multiplied by the following percentage:

<u>Age</u>	<u>Percentage</u>	<u>Age</u>	<u>Percentage</u>
64	89.72	56	40.03
63	80.66	55	36.41
62	72.64	54	33.15
61	65.53	53	30.22
60	59.21	52	27.57
59	53.58	51	25.18
58	48.56	50	23.01
57	44.06	49	21.05

Deferred Retirement

Eligibility: Deferred retirement pension benefit commencing at age 60 for Tier A members or at age 65 for Tier B members, with at least five (5) years of credited service, and accumulated contributions are left on deposit with the Fund.

Monthly Benefit: The deferred retirement benefit is equal to the retirement pension based on earnings and credited service at the time of termination.

SUMMARY OF BENEFIT PROVISIONS (cont.)

Disability Retirement Pension

Non-Service Disability:

1. Eligibility: Five (5) years of service and totally and permanently incapacitated for duty.
2. Monthly Benefit: Computed based on average monthly earnings and credited service at time of disability but not less than 10 times the percentage multiplier multiplied by the average monthly earnings.

Service Disability:

1. Eligibility: Totally and permanently incapacitated from the further performance of duty as a result of injury while in the course of employment for the City.
2. Monthly Benefit: Calculated as a non-service disability pension but not less than \$1,000 per month.

Death Benefits

Eligibility: active or inactive members who die prior to retirement

Benefit: For members with less than 2 years of service or inactive member with less than 5 years of service: refund of the members contributions.

Benefit: For members with more than 2 years of service but less than 15 years of service: an unreduced pension to designated beneficiary for 120 months or a one-half survivor option for life with 120 payments guaranteed.

Benefit: For members eligible for retirement or members and inactive members with more than 15 years of service: an unreduced pension to designated beneficiary for 120 months or a Full Survivor option for life with 120 payments guaranteed.

Form: Benefit paid in accordance with the option on file, or the eligible option, or if no eligible beneficiary, a lump sum equivalent of 10 years of benefit payments to the member's estate.

Minimum Benefit for Service Death: For job-related death a minimum of 10 years of service used in calculation of benefit. Benefit will not be less than \$1,000 per month.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Return of Accumulated Contributions

A member at the time of termination is entitled to be paid accumulated contributions without interest.

Cost-of-Living Adjustments

An annual cost-of-living adjustment to the base pension benefit shall be made based on the greater of:

Tier A

- a. The percentage of change in the price index for October of the current year over October of the previous year, up to 5%, or
- b. The percentage of annual average change in the price index for the 12-month period ending with the effective date of the adjustment, up to 5%.

Tier B

- c. The percentage of change in the price index for October of the current year over October of the previous year, up to 3%, or
- d. The percentage of annual average change in the price index for the 12-month period ending with the effective date of the adjustment, up to 3%.

The Employees' Retirement Fund of the City of Dallas Investment Practices and Performance Review



April 2020

Prepared by Randy Mitchell and Charles Hodge



Purpose & Scope

- Purpose: **Independent Review** of the Investment Practices and Performance of the Employees' Retirement Fund of the City of Dallas (the “ERF” or the “Fund”).
- Scope:
 - Identify and review existing investment policies, procedures, and practices.
 - Investment Policy Statement,
 - any informal procedures and practices,
 - not necessary to review past policies, procedures, and practices that are no longer applicable.
 - Compare the existing policies and procedures to industry best practices.
 - Generally, assess whether the ERF Board of Trustees (the “Board”), internal Staff, and external consultants are adhering to the established policies.
 - Identify the strengths and weaknesses of the current policies, procedures, and practices and make recommendations for improvement.
 - Include a detailed description of the criteria considered and methodology used to perform the evaluation, including an explanation of any metrics used and associated calculations.

Introduction



- The Texas Pension Review Board has provided guidance on the different areas required by statute to be reviewed by independent consulting firms. Evaluations will vary based on specific characteristics of each system's size, governance, and investments.
- Milliman's evaluation identified and reviewed the existing policies and procedures of the ERF as it relates to the oversight and management of the Fund's investments. Our examination included a review of the ERF's Investment Policy Statement and other documents related to the investment of plan assets as well as formal and informal procedures adopted by the ERF management and Staff. We compared the ERF's policies and procedures to industry best practices and assessed the likelihood the Board, internal Staff and external consultants are adhering to the established policies.
- Our evaluation also identified strengths and potential weaknesses of the current policies and procedures and where appropriate we provided recommendations for improvements of any deficiencies we identified.

Milliman – Independent Firm Disclosure



Milliman Inc. is a consulting, actuarial and outsourcing firm with 3,800 employees and offices in 59 principal cities across the U.S. and worldwide.

- Milliman is privately owned and managed by our employees. Milliman was established 1947.
- Milliman Advisors, LLC is an Investment Advisor with consulting relationships with over 200 institutional clients, \$40 billion in assets under consultation, 120+ investment professionals, average experience 25+ years.
- Milliman Advisors, LLC has no hidden broker/dealer, trust, or money management conflicts and is not involved in directly or indirectly managing investments of the ERF.
- Milliman Advisors, LLC does not receive any remuneration by any firm used by the ERF or from sources other than the ERF directly.

Components of Evaluation

Accountability



- The Board and Staff operate under the authority of **Dallas City Code Chapter 40A** (“Chapter 40A”) which addresses the creation of the Board, powers and duties of the Board, administration of the Fund, and contributions.
- The Fund has engaged an Investment Consultant, who is also a fiduciary, to review asset allocations, investment policies, and make recommendations to Staff and the Board. The Fund has also engaged outside legal counsel to review investment contracts. The Board makes all decisions with detailed and comprehensive input from Staff, Investment Consultant, and Legal Counsel.
- The ERF’s Investment Consultant is independent of the investment managers and trading platforms.
- The ERF conducts a Strategic Plan each year to set goals for key issues like investments, communications, customer service, and operational management. Staff then reports to the Board each year on their progress toward these goals.
- The ERF’s current governance structure strikes a good balance between risk and efficiency and is consistent with best practices.

Components of Evaluation

Investment Policy Statement (IPS)

The **Investment Policy Statement** is a manifestation of a disciplined process for selecting and monitoring the components in an investment program. It forms a foundation for a fund's investment strategy, formally establishes the governance structure and asset class representation, and defines the processes for investment manager selection and monitoring.

- The ERF has a written IPS for the overall plan as well as sub-asset classes, clearly customized for the ERF.
- It is reviewed annually and the files demonstrate the evolution of targets and expectations.
- The ERF has a formal funding policy, developed with input from Legal Counsel.

Components of Evaluation

Investment Policy Statement - cont.

- The IPS is written clearly so existing as well as newly appointed or elected Trustees will find it helpful as an ongoing tool for evaluating the Fund's investment program, consistent with best practices.
- The Manager Guidelines contain specific, measurable objectives for the managers, net of fees, over “a full market cycle” expected to be 3-5 years.
- “Discussion Sheets” in the Board materials provide an example of the Fund following its IPS.
- We found the ERF's IPS is consistent with other plans and best practices.

Components of Evaluation

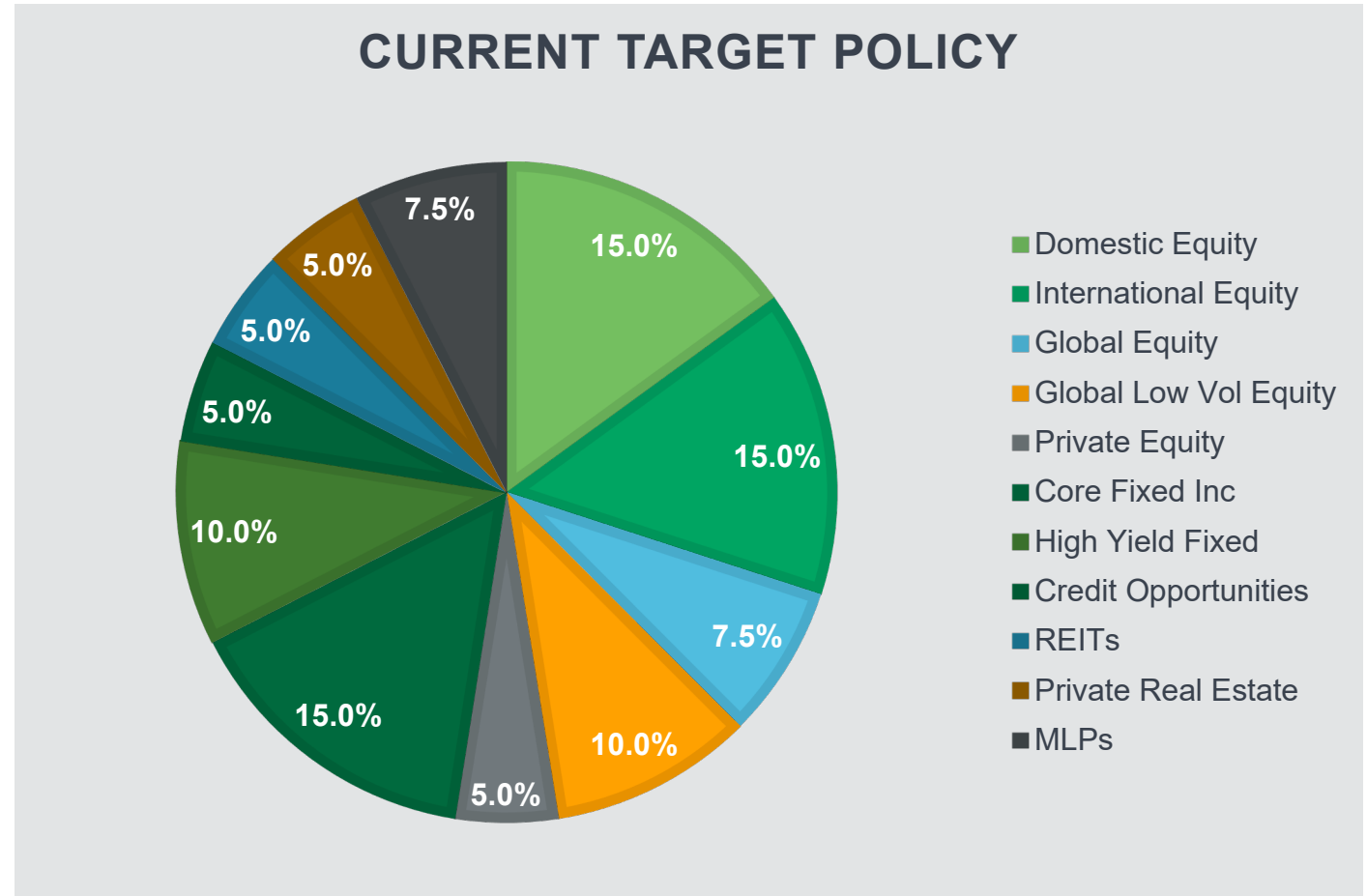
Asset Allocation

- The ERF has a formal **asset allocation policy** defined within the IPS. It is specific in terms of asset classes used, ranges around target allocations, and evaluation criteria.
- The Staff, working with the Investment Consultant, makes recommendations to the Board for approval. They examine the asset allocation monthly and will rebalance to targets based on defined ranges.
- An asset allocation study is conducted annually, incorporating current capital market assumptions and the Investment Consultant's current views on the market. We found these assumptions to be in-line with peers.
- In the asset allocation study, the ERF will consider new asset classes and their contribution to increasing or stabilizing return and its impact on the ERF's overall risk and standard deviation.
- The ERF's Investment Consultant and Actuary communicate regularly on the expected returns for the ERF. The Actuary examines the Investment Consultant's expectations and compares them to a survey of other capital market expectations from other sources.

Components of Evaluation

Asset Allocation – Target Allocation

- The changes in the assumed rate of return are reflected in the Actuary's modeling each year when the actuarial valuation is updated.
- The ERF maintains a strategic asset allocation that is monitored and rebalanced as needed.
- The ERF does not implement any tactical asset allocation component but does recognize and attribute its managers' returns by their invested sectors and geographical positioning.
- The ERF's asset allocation is appropriate for a plan their size and is consistent with best practices.



As of 09/30/2019

Components of Evaluation

Asset Allocation – Expected Risk and Return

- The ERF has a target strategic allocation of 70% Equity and 30% Fixed Income.
- Each sub-asset class has its own expected risk and return.
- The ERF's expectations for risk examines standard deviation and opportunities for diversification.
- The ERF is implementing its strategy using both active and passive management.
- The ERF's return and risk expectations used in the asset allocation process are stress tested under different scenarios as well as 5th and 95th percentile measurements.

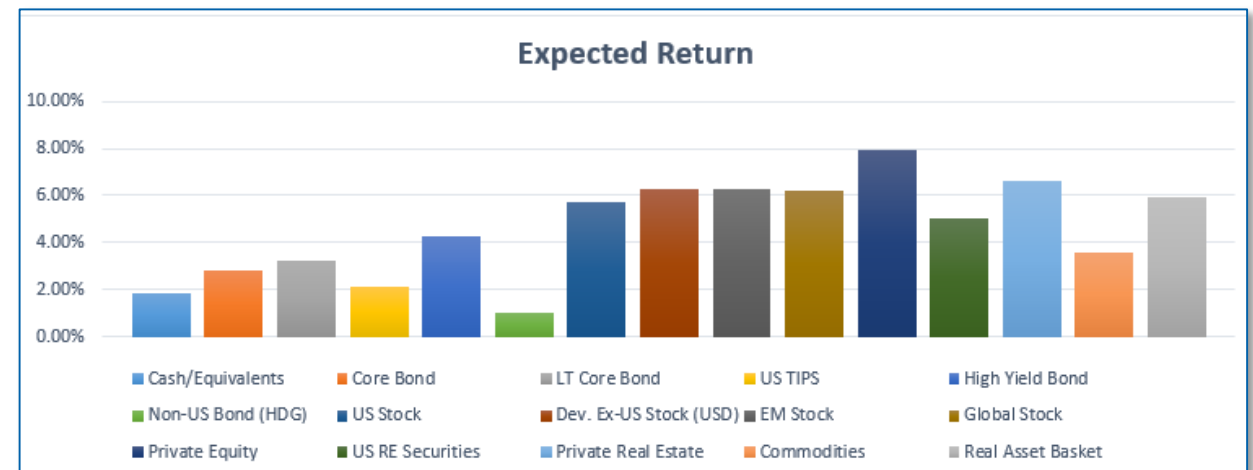
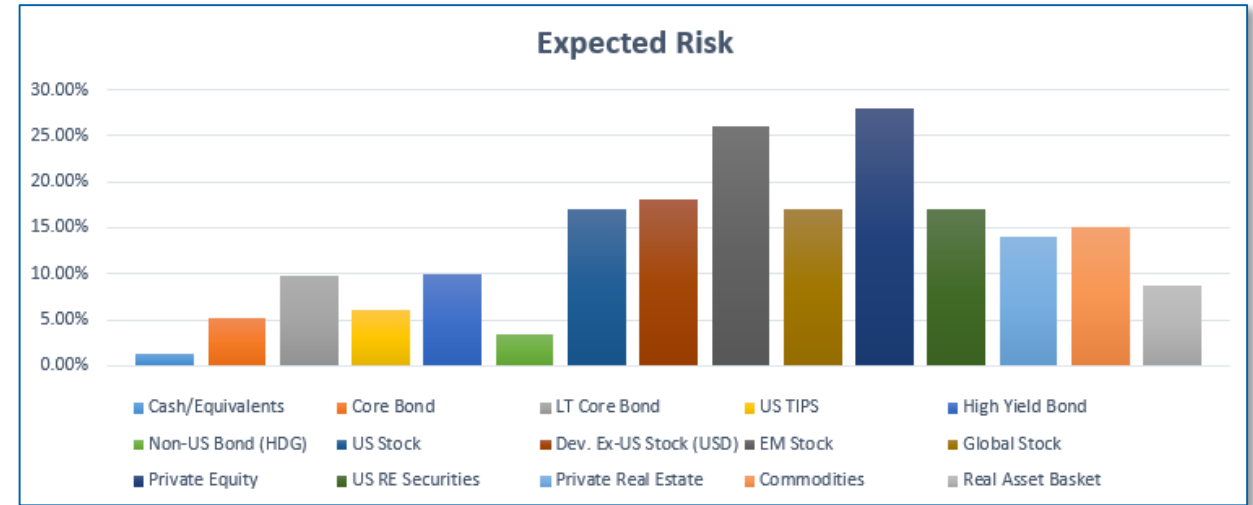
Components of Evaluation

Asset Allocation – Expected Risk and Return – cont.

- The Investment Consultant develops return expectations using an Income Growth Valuation Model, Dividend Discount Model, and Cyclically Adjusted P/E Model.
- The inputs for the asset allocation modeling are reasonable and the approach used by the system to develop the expected returns and asset mix is disciplined and reviewed regularly. It is consistent with best practices, and results in a well-diversified portfolio appropriate for the plan’s size.
- The ERF’s frequent evaluation of expected returns is an example of a Fund procedure that exceeds best practices.



Employees' Retirement Fund
of the City of DALLAS®



Components of Evaluation

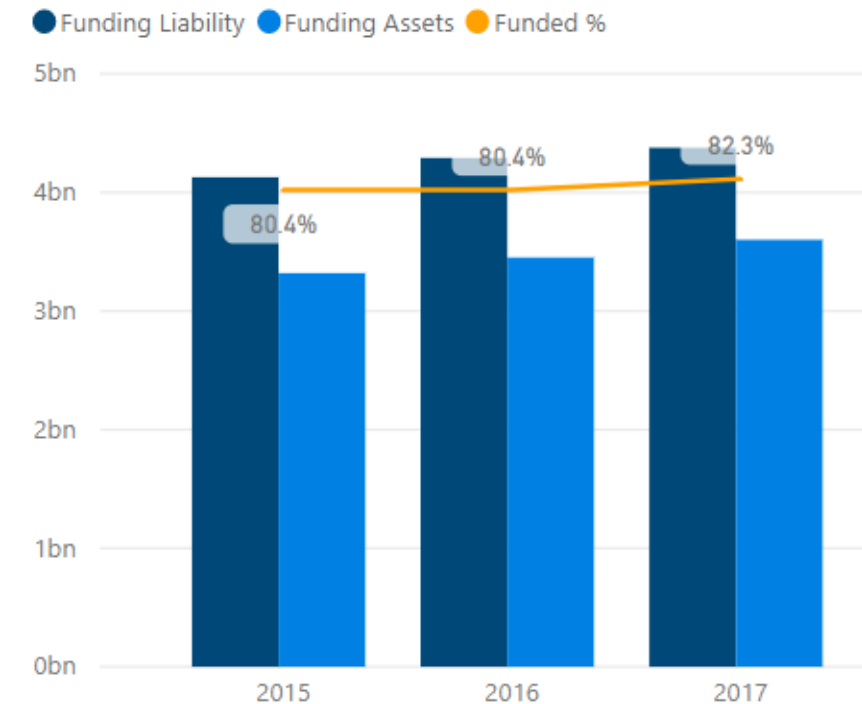
Asset Allocation – Appropriateness of Alternatives and Illiquid Assets

- The IPS outlines the specific types of **alternatives assets** allowed including ranges and maximum allocations. The ERF's long-term time horizon provides the context for properly setting and measuring performance of these assets as well as defining their target allocations.
- The IPS along with Staff procedures and manager selection help mitigate the implied risk of these asset classes. For example, Private Equity investments are managed in a fund-of-fund structure with multiple managers utilizing two layers of audit and valuation (pricing).
- The targets defined in the IPS are consistent with industry norms. The ERF's target allocations for alternatives are (as of 9-30-2019):
 - Private Real Estate (5.0% target)
 - Private Equity (5.0% target)
- The ERF's Staff has extensive experience with alternative asset investing, both with ERF and prior to joining the ERF. The Staff is actively engaged in monitoring the alternatives and makes a concentrated effort to stay current with industry trends, products, and strategies.
- The ERF's alternative investments are appropriate given its size and level of investment expertise.

Components of Evaluation

Asset Allocation – Future Cash Flow and Liquidity Needs

- An **Asset Liability Study** is conducted annually, reflecting the current population and expected cash flow needs.
- Though the Fund is currently experiencing negative net cash flow due to larger benefit payments vs. current contributions, it does not offer lump-sums and the population is very stable and predictable. This in turn provides predictable, stable cash requirements.
- The Asset Liability Study includes stress testing the portfolio in different market environments. The ERF does not expect any stresses applied to the portfolio in these tests to negatively impact the ERF's cash flow or liquidity requirements.
- The Funded Ratio is in line with long-term expectations.

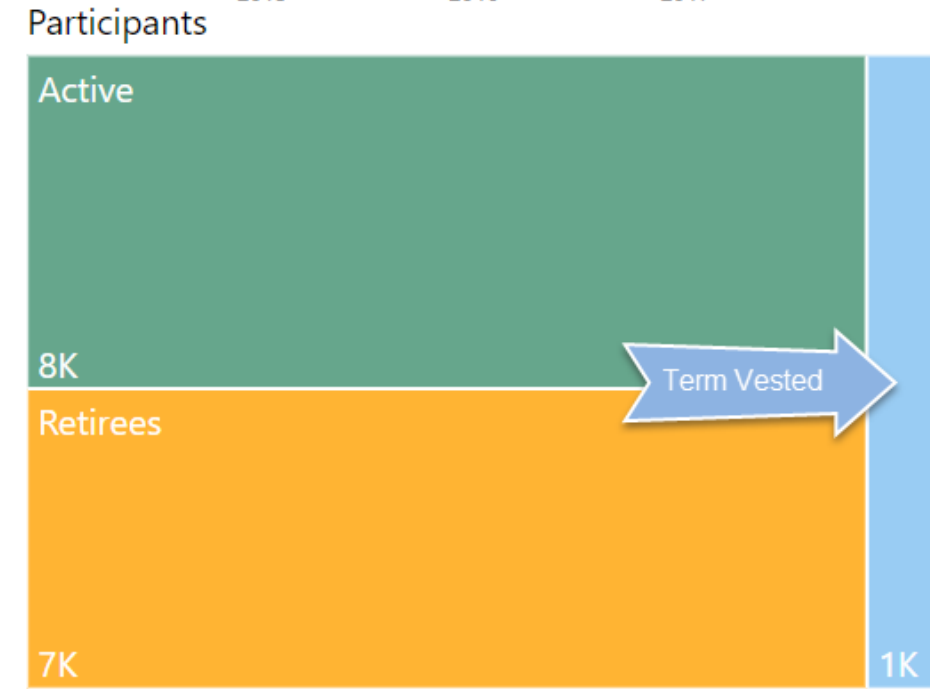


Components of Evaluation

Asset Allocation – Future Cash Flow and Liquidity Needs – cont.



- The ERF has a formal cash management policy to manage the benefit payments and expenses which includes a process for systematically raising cash from investment managers and rebalancing as needed.
- The ERF examines expected cash flows each year and models the plan's cash timing needs in light of contributions, expected income, and dividends. The ERF's policy for future cash flow and liquidity needs is adequate for the plan's size and consistent with best practices.
- The plan has about the same number of retirees and non-retirees.
- The ERF's annual Asset Liability Study is an example of a Fund procedure that exceeds best practices.



Components of Evaluation

Appropriateness of Investment Fees and Commissions

- The ERF has a disciplined and detailed evaluation procedure to **measure, reconcile, and benchmark fees.**
- The ERF's custodian provides reporting on securities trading, brokerage fees, and other risk measures, such as sector weights, country weights, cash levels, etc.
- All fees are transparent and reconciled with service agreements. The ERF does not use commission recapture or directed trades.
- Manager fees as well as trading and commissions are reported monthly and evaluated formally each quarter.
- Staff monitors the utilization of brokers by the managers, noting both new brokers and long-tenured providers.
- Fees deemed to be outside of acceptable variances are flagged, questioned, and reconciled.
- The ERF's discipline around fees is very thorough and we consider these Fund procedures to be beyond what we see with best practices.

Components of Evaluation

Governance Related to Investment Activities and Transparency

- The ERF and the Board are organized under Chapter 40A.
- The ERF has Investment Policies related to all asset classes (e.g. International Equity, REITs, Private Equity, Real Asset, etc.) as well as a Manager Selection and Monitoring Policy.
- The ERF's Code of Ethics (this "Code") covers the Board and Staff and addresses topics such as travel, gifts, prohibited transactions, and conflicts of interests.
- This Code also covers the ERF's consultants, advisors, vendors, employees, and other fiduciaries of the ERF.
- This Code is read and enforced **together** with the code of ethics found in Chapter 12A of the Dallas City Code and the travel policy adopted by the Board for itself and its Staff.
- Meeting agendas, minutes, and report materials are easily available to the Board and the public online.
- The ERF's governance policy and transparency of practices is adequate for a plan its size and is consistent with best practices.

Components of Evaluation

Investment Knowledge/Expertise

- The Board members are required to complete the **PRB Trustee education** with the ERF filing annual disclosure statements.
- Many members come to the Board with prior professional investment experience.
- The Board members and Staff attend educational training and conferences and are required to report back on what they learn.
- The Board and Staff also frequently attend their Investment Consultant's Client Conference covering investment and fiduciary topics.
- The ERF issues RFPs for their Investment Consultant typically every 5 years.

Components of Evaluation

Manager Selection and Monitoring Process

- Managers are selected by issuing an RFP for each asset class. Working with the Investment Consultant, Staff will recommend candidates for due diligence visits for Board approval. After conducting due diligence, Staff then recommends finalist candidates to present to the Board.
- Once hired, managers are required to meet with the Board as needed, typically once every two years.
- The ERF reviews performance monthly, examining both gross and net returns compared to index benchmarks and alpha-adjusted benchmarks.
- Quarterly, the ERF examines managers compared to peer groups, net of fees, attributing returns to sector, timing, and manager skill.
- Managers can be placed on “watch” for different periods of time depending on the market environment for that manager’s asset class. The Board is provided special information related to watch manager evaluation criteria and the expectations on timing and conditions for improvement.
- The manager selection and monitoring process is consistent with the IPS and in-line with industry standards. The use of net-of-alpha benchmarks in the IPS and monitor reports are an example of the ERF’s processes being above standard best practices.

SB 322 Evaluation Summary

Investment Practices and Performance Review

- The ERF's current governance structure **strikes a good balance between risk and efficiency.**
- It is consistent with best practices and is ample for a plan of its size.
- We found the **ERF Investment Policy Statement is consistent with other plans and best practices**, and their asset allocation is appropriate for a plan their size and is consistent with best practices.
- The **Capital Market Assumptions are reasonable** and consistent with best practices, and results in a well-diversified portfolio appropriate for the plan's size.
- The **ERF's alternative investments are appropriate** given its size and level of investment expertise.

SB 322 Evaluation Summary

Investment Practices and Performance Review – cont.

- **The manager selection and monitoring process is consistent with the Investment Policy Statement** and in-line with industry standards.
- **The ERF's discipline around fees is very thorough and consistent** with best practices.
- **The ERF confirms the services and fees provided by its independent Investment Consultant by periodically soliciting open bids through a RFP process.**
- In our review of the ERF's processes, procedures and documentation, **we found no clear deviances from industry standards or prescribed norms** for similar funds. The ERF's management and Staff maintain a well defined set of policies and procedures designed to oversee, manage, and report the performance and current status of the ERF.

SB 322 Evaluation Summary

Investment Practices and Performance Review – cont.

Recommendations:

- Maintain current rigorous reviews of the ERF's performance, providers, and consultants.
- Maintain a focus on transparency.
- Adjust training and education requirements as needed to stay abreast of evolving investment strategies in a very dynamic and global environment.



Thank you

Evaluation Footnotes

- The Pension Review Board has provided guidance on the different areas required by statute to be reviewed by independent consulting firms. The PRB recognizes that evaluations should and will vary significantly based on the specific characteristics of each system's size, governance structure, and investment program.
- This evaluation of the Employees' Retirement Fund of the City of Dallas was conducted independently by Milliman Advisors, LLC based on guidelines provided by the Pension Review Board and legislation enacted in the State of Texas under Senate Bill 322 (86R).
- SB 322 requires systems with assets of at least \$100 million must complete an evaluation once every 3 years.
- Information for this review was found in public filings of Board agendas, meeting minutes and other supporting documentation including meetings with Staff, and transcripts of Board meetings.

Caveats and Disclaimers

The analysis in this report was prepared utilizing data from third parties and other sources including but not limited to internal computer software and databases, including among others mpi Stylus Pro® , software designed by Markov Processes International. Reasonable care has been taken to assure the accuracy of the data contained herein, and comments are objectively stated and are based on facts gathered in good faith. These reports do not constitute investment advice with respect to the sale or disposition of individual securities. Milliman disclaims responsibility, financial or otherwise, for the accuracy or completeness of this report.

Milliman's work product was prepared exclusively for the ERF for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning the ERF's operations, and uses the ERF's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

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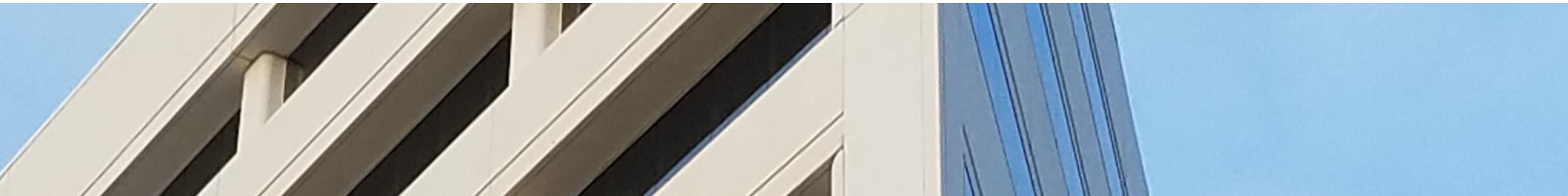
Milliman provides a copy of its SEC Form ADV Part II to clients without charge upon request.

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WILSHIRE ASSOCIATES

Wilshire Consulting



Numbers in Context

MARKET COMMENTARY

U.S. Equity

The U.S. stock market was down -20.7% for the first quarter, the worst quarter since the Global Financial Crisis. Uncertainty and a declining outlook were the driving forces behind the sell-off as the COVID-19 pandemic worsened, resulting in significant limitations on global commerce. Government action so far has included cutting short-term rates to near zero and the passage of a \$2 trillion stimulus bill.

The world of investing has been introduced to an unprecedented set of conditions in 2020. As the COVID-19 virus spreads globally, the response has been to separate people and close nonessential businesses, with others working remotely. The economic expectations are that the unemployment rate will rise into the teens and U.S. GDP will fall by one-third. Investors are facing challenges reminiscent of the Global Financial Crisis.

Non-U.S. Equity

Economic growth in the U.K. was already nonexistent during the fourth quarter, before the country had to deal with the virus in earnest. Across continental Europe, quarantine efforts are starting to bear fruit as cases in Italy and Spain appear to be approaching a peak. China has recently been relaxing severe travel restrictions while the official Purchasing Manager's Index for China indicates that manufacturing in the country expanded during March after a dramatic slowdown.

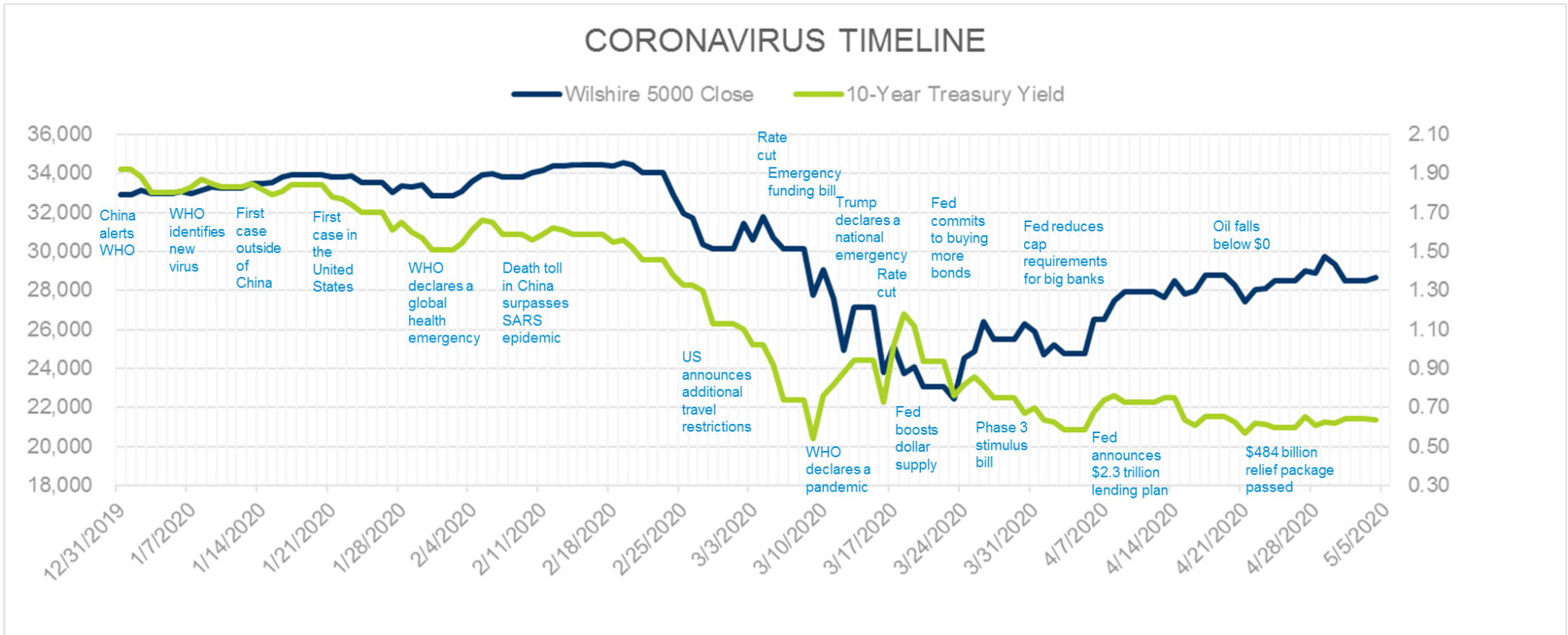
Fixed Income

The U.S. Treasury yield curve fell dramatically during the quarter. The 10-year Treasury yield ended the quarter at 0.70%, down 122 basis points. The FOMC decreased its overnight rate by a total of 1.50% during two unscheduled meetings in March. The Fed also announced quantitative easing measures totaling at least \$700 billion over the coming months.

CORONAVIRUS TIMELINE

AS OF MAY 4

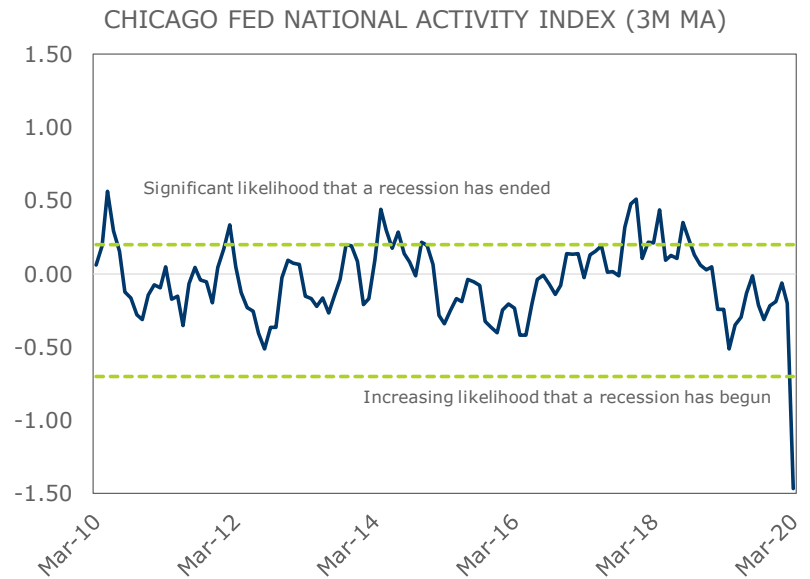
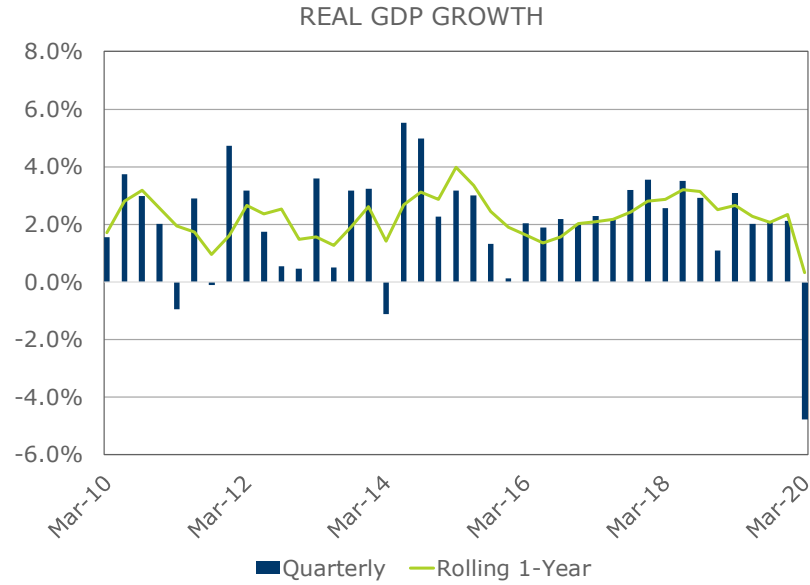
<https://wilshire.com/covid19-timeline>



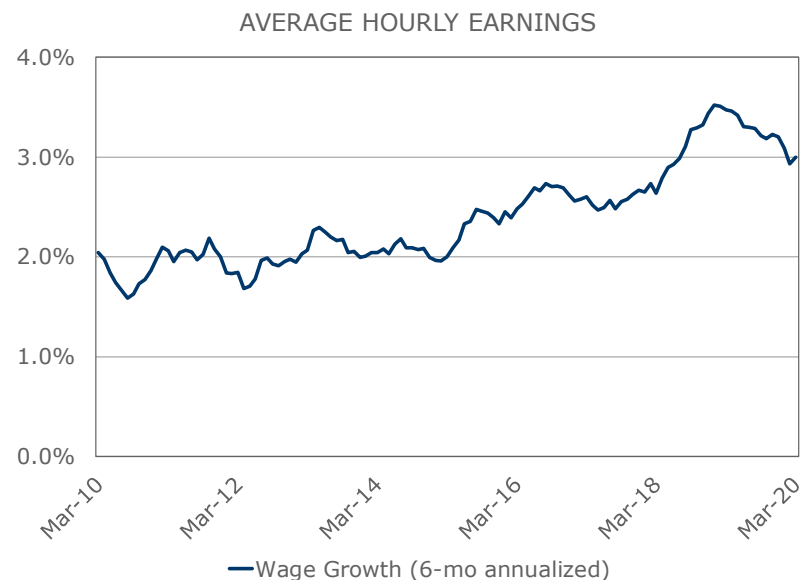
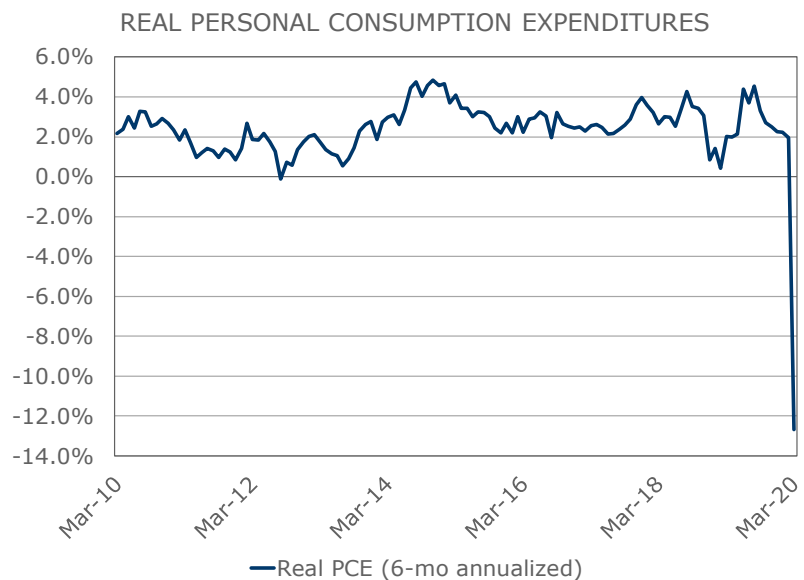
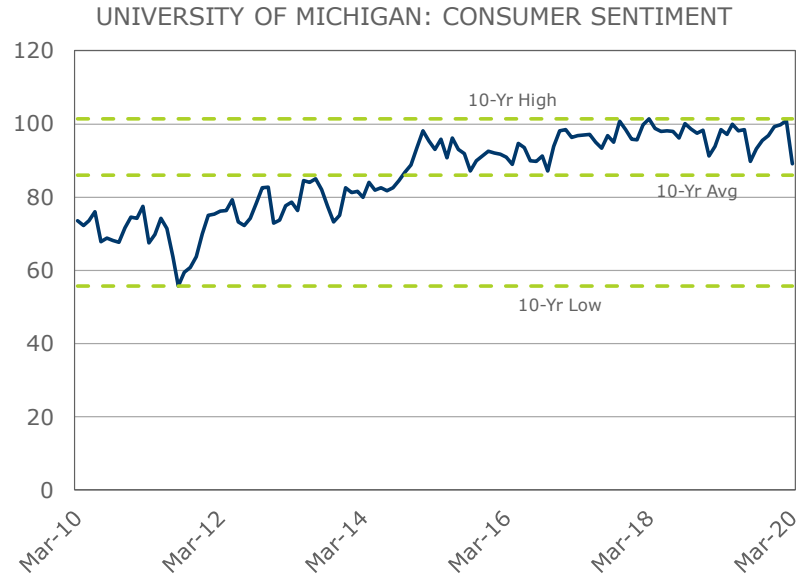
MARCH 2020 ASSET CLASS ASSUMPTIONS

	EQUITY						FIXED INCOME						REAL ASSETS					
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Dev ex-US Bond (Hdg)	Real Estate			Cmnty	Real Assets	US CPI
		US RES	Global RES	Private RE	US RES	Global RES			Private RE									
COMPOUND RETURN (%)	6.75	7.25	7.25	7.50	7.20	8.40	0.70	1.80	2.70	0.70	5.40	0.80	5.60	5.80	7.00	1.85	5.65	1.15
ARITHMETIC RETURN (%)	8.05	8.70	10.20	9.10	8.50	11.75	0.70	1.95	3.15	0.90	5.85	0.85	6.95	6.95	7.90	2.95	6.00	1.15
EXPECTED RISK (%)	17.00	18.00	26.00	18.95	17.10	28.00	1.25	5.15	9.85	6.00	10.00	3.50	17.00	15.80	14.00	15.00	8.75	1.75
CASH YIELD (%)	2.25	3.75	3.00	3.55	2.80	0.00	0.70	1.90	2.65	1.15	7.40	1.10	4.75	4.75	2.95	0.70	2.50	0.00
CORRELATIONS																		
US Stock	1.00																	
Dev ex-US Stock (USD)	0.81	1.00																
Emerging Mkt Stock	0.74	0.74	1.00															
Global ex-US Stock	0.83	0.96	0.87	1.00														
Global Stock	0.95	0.92	0.83	0.94	1.00													
Private Equity	0.74	0.64	0.62	0.67	0.74	1.00												
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
Core Bond	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT Core Bond	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.93	1.00									
TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.60	0.47	1.00								
High Yield Bond	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.18	0.18	0.26	0.10	0.67	0.66	0.39	0.26	1.00						
US RE Securities	0.59	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
Global RE Securities	0.65	0.59	0.56	0.62	0.66	0.58	-0.05	0.17	0.22	0.11	0.62	0.03	0.94	1.00				
Private Real Estate	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.78	0.76	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.42	0.43	0.50	0.48	0.47	0.43	0.01	0.24	0.25	0.41	0.53	0.06	0.65	0.69	0.69	0.59	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	-0.08	0.05	0.03	0.05	0.44	0.26	1.00

ECONOMIC GROWTH

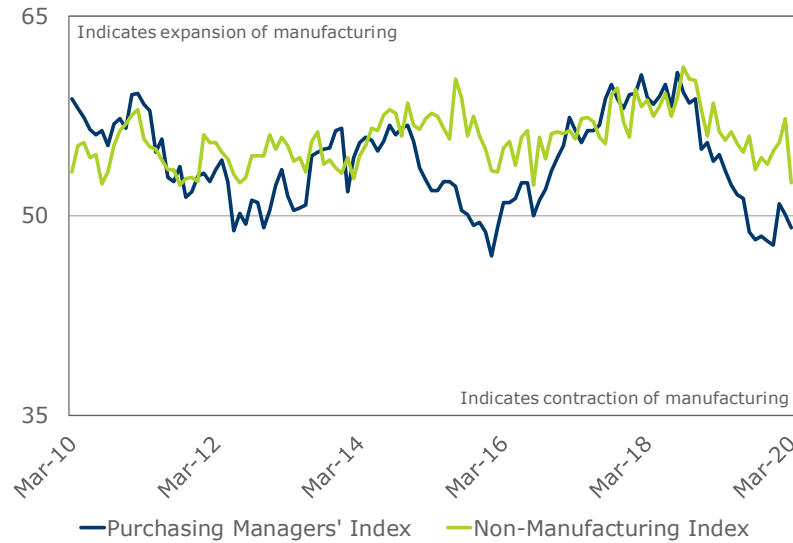


CONSUMER ACTIVITY

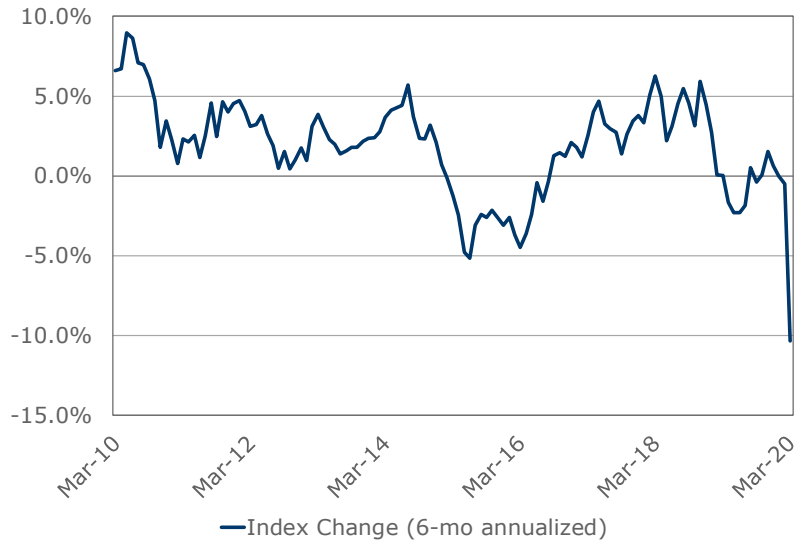


BUSINESS ACTIVITY

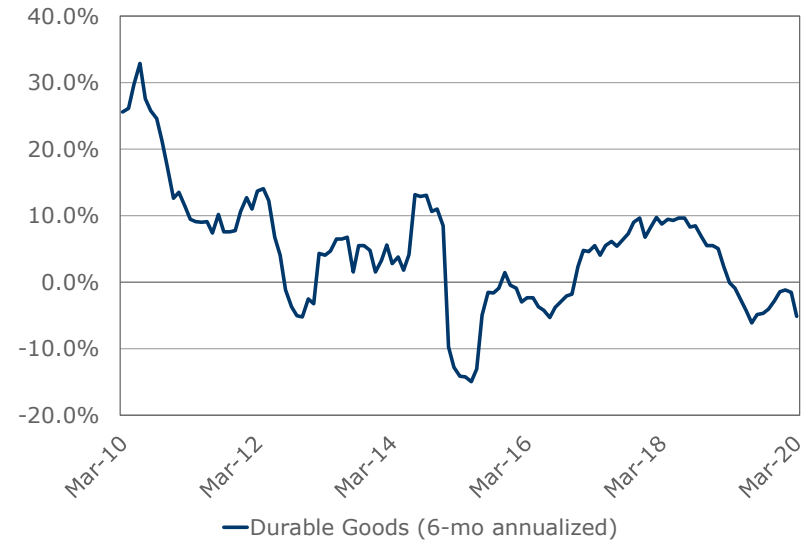
ISM REPORT ON BUSINESS



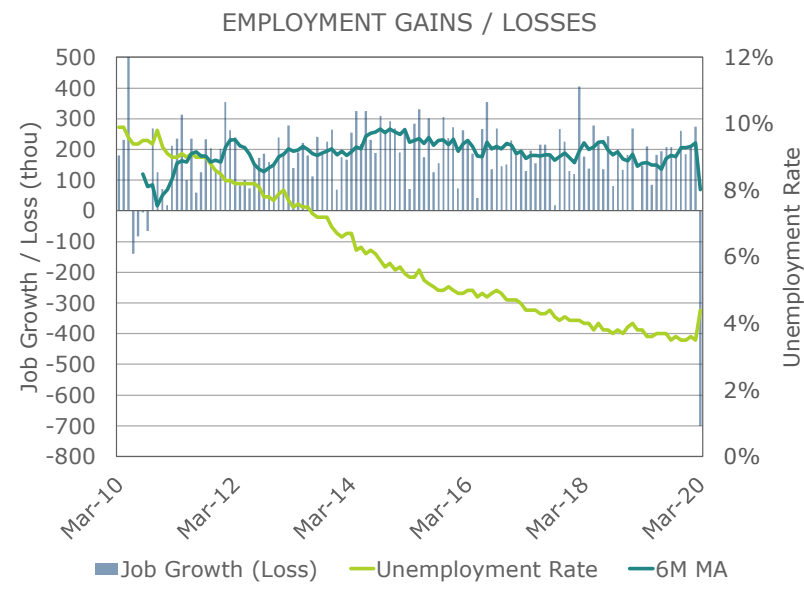
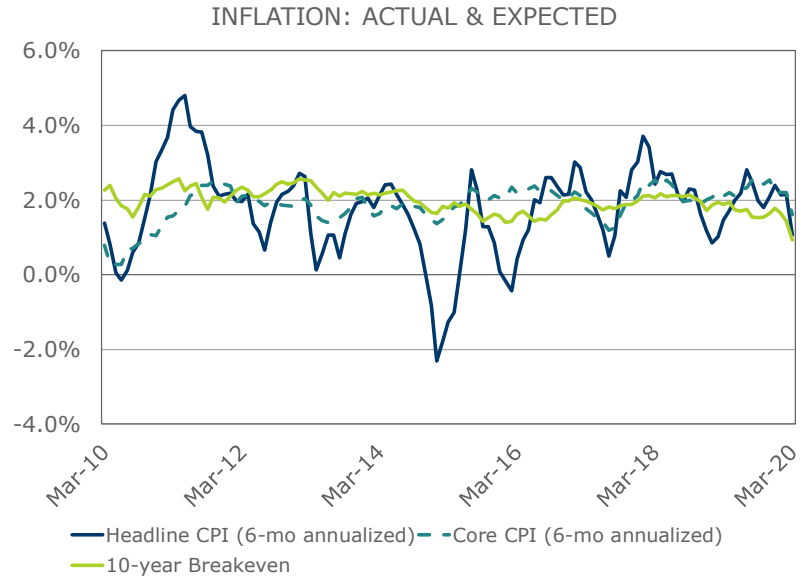
INDUSTRIAL PRODUCTION INDEX



DURABLE GOODS NEW ORDERS



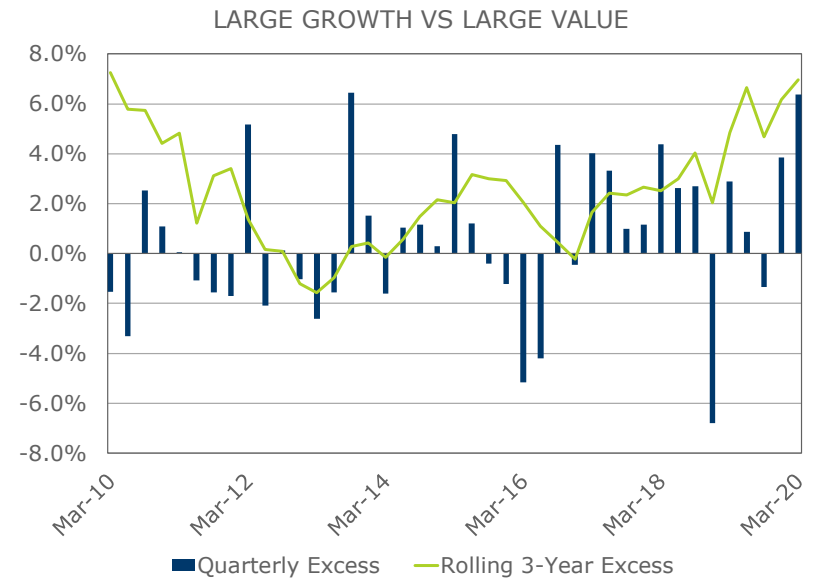
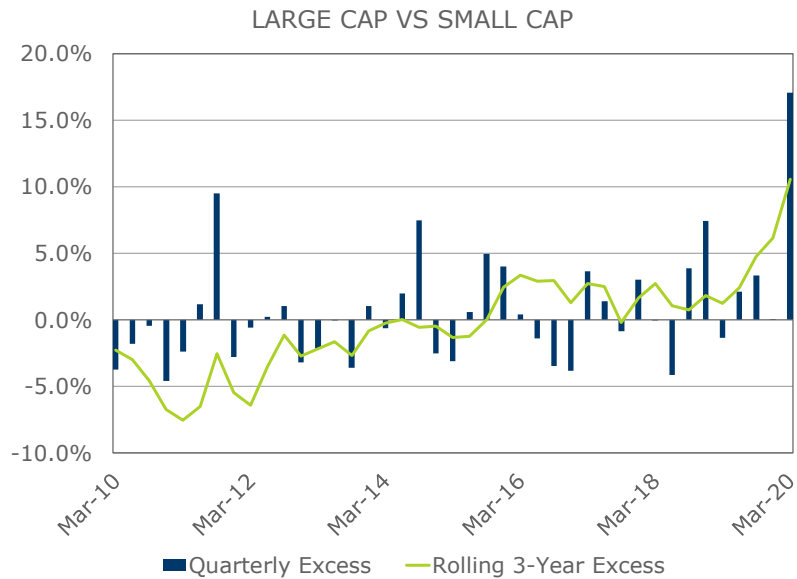
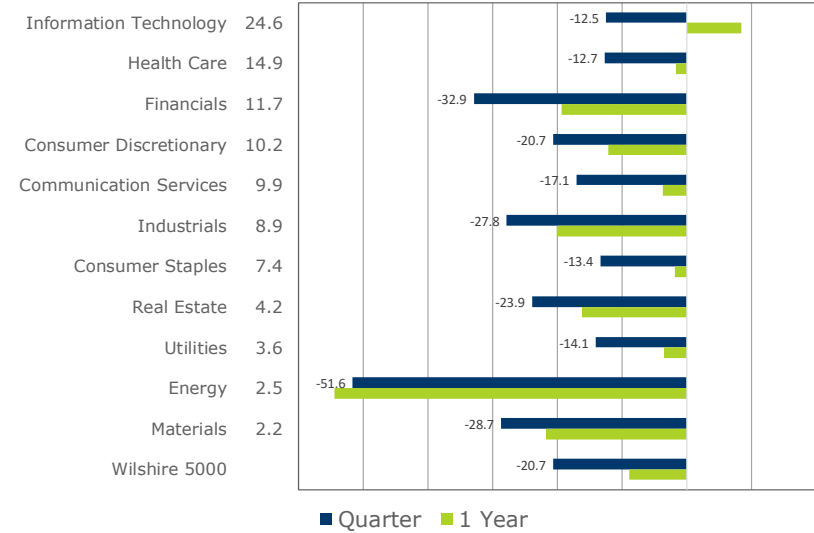
INFLATION AND EMPLOYMENT



U.S. EQUITY MARKET

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
WILSHIRE 5000 INDEX	-20.7	-20.7	-8.9	4.1	6.0	10.2
WILSHIRE U.S. LARGE CAP	-19.7	-19.7	-7.3	5.0	6.7	10.5
WILSHIRE U.S. SMALL CAP	-31.4	-31.4	-25.0	-5.0	-0.5	7.4
WILSHIRE U.S. LARGE GROWTH	-17.1	-17.1	-2.7	8.6	8.5	11.9
WILSHIRE U.S. LARGE VALUE	-22.1	-22.1	-11.5	1.5	4.7	9.1
WILSHIRE U.S. SMALL GROWTH	-28.2	-28.2	-20.0	-1.1	1.0	8.8
WILSHIRE U.S. SMALL VALUE	-34.5	-34.5	-29.6	-8.9	-2.1	6.0
WILSHIRE REIT INDEX	-25.6	-25.6	-19.4	-2.5	-0.2	7.7
MSCI USA MIN. VOL. INDEX	-17.1	-17.1	-5.9	6.6	7.9	11.8
FTSE RAFI U.S. 1000 INDEX	-26.4	-26.4	-16.1	-0.9	2.8	8.6

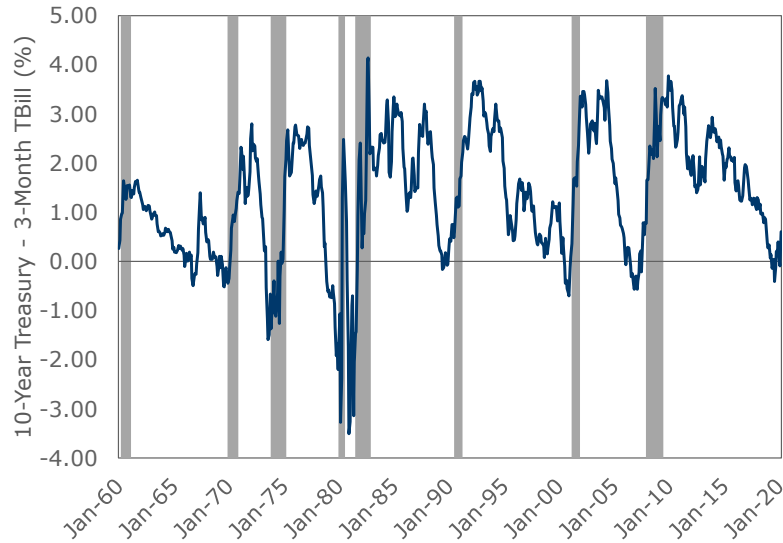
U.S. SECTOR WEIGHT AND RETURN (%)



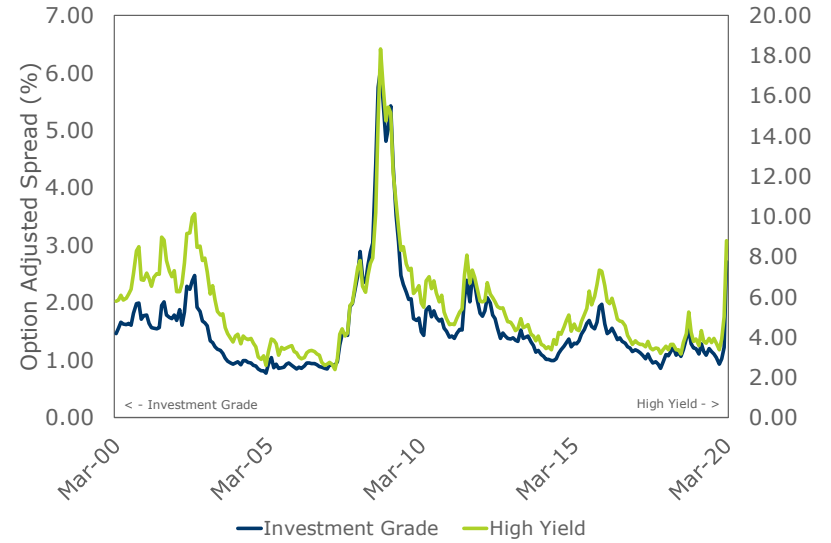
Data sources: Wilshire Compass, Wilshire Atlas

RISK MONITOR

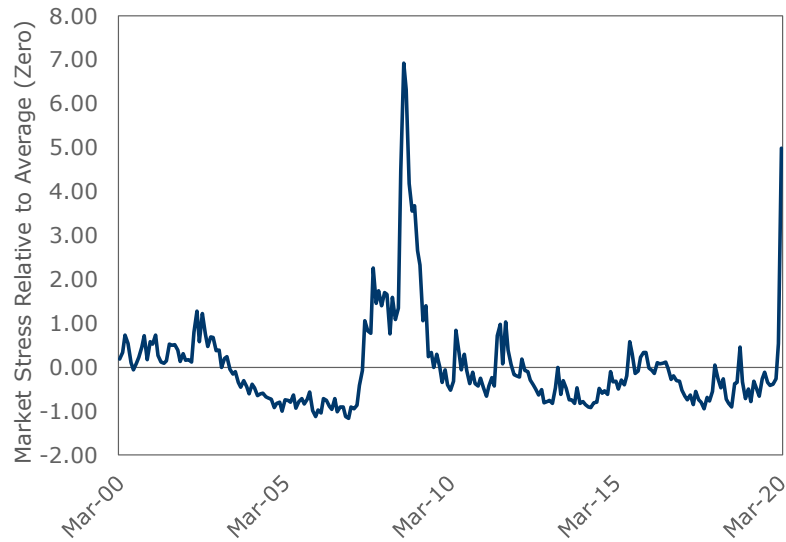
YIELD CURVE SLOPE VS RECESSIONS (IN GRAY)



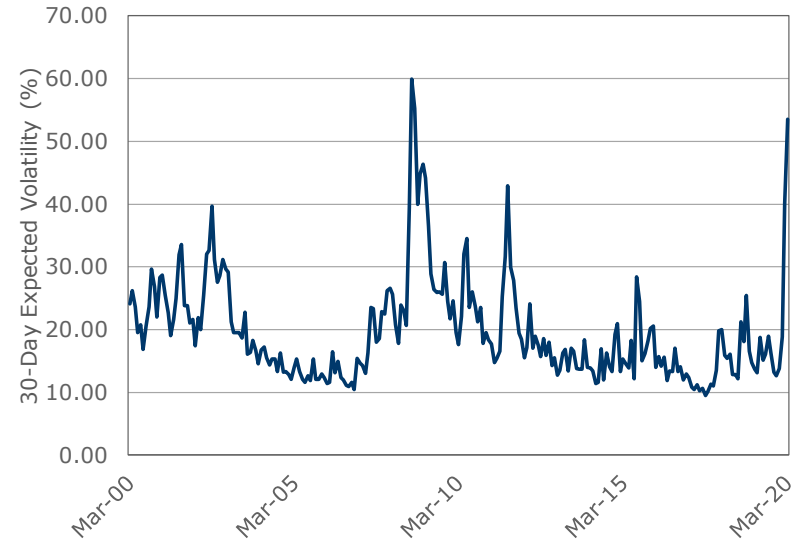
BLOOMBERG BARCLAYS CREDIT INDEXES



ST. LOUIS FED FINANCIAL STRESS INDEX



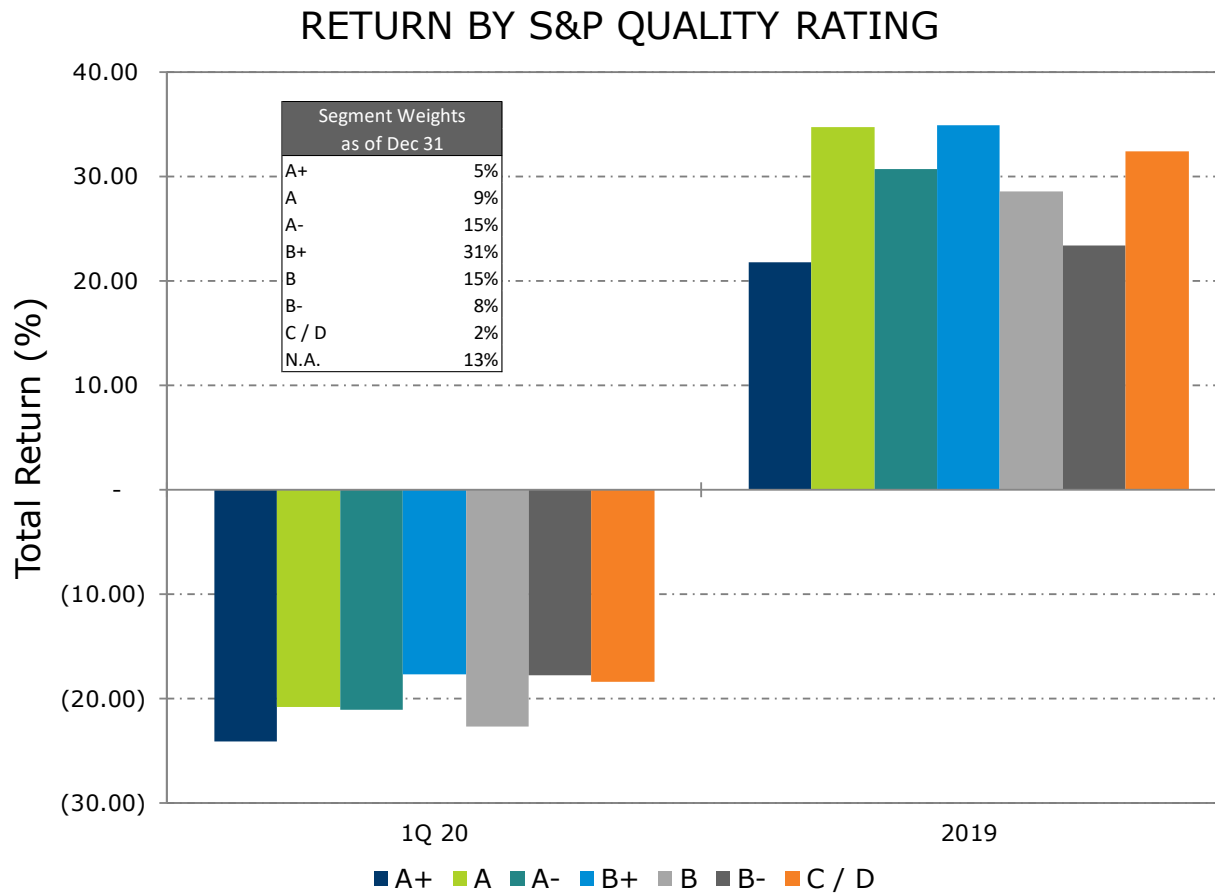
CBOE VOLATILITY INDEX



Data sources: Federal Reserve, Bloomberg Barclays

RETURNS BY QUALITY SEGMENT

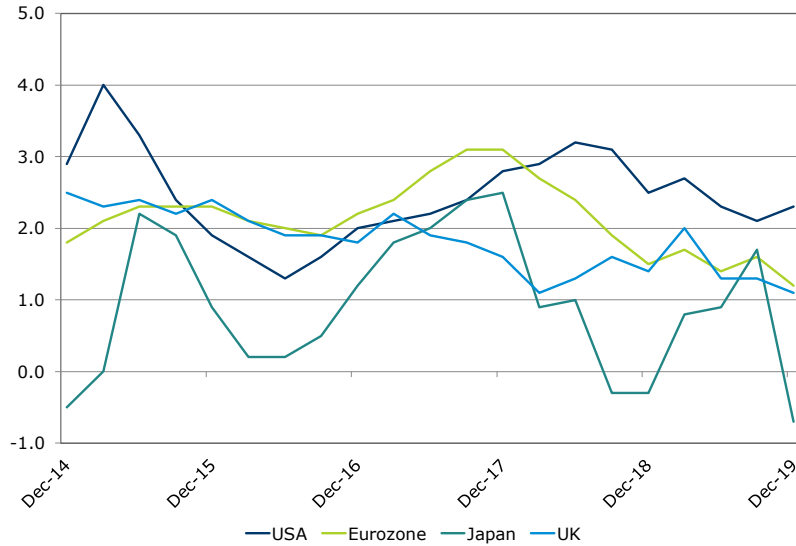
Higher quality names trailed, somewhat, although losses were generally broad based



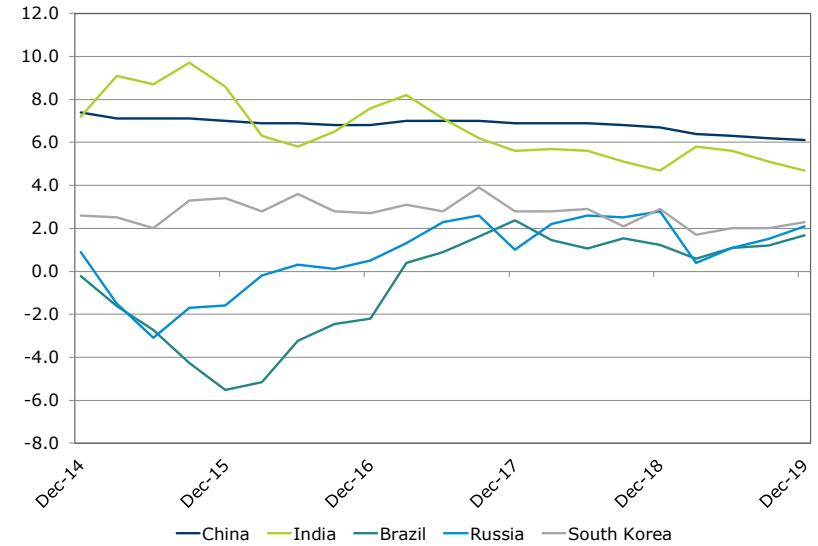
Data sources: Wilshire Atlas

NON-U.S. GROWTH AND INFLATION

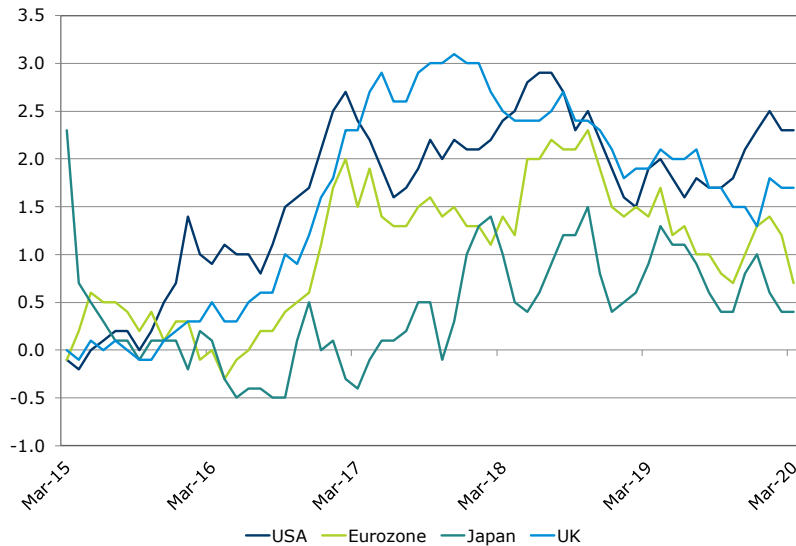
DEVELOPED MARKETS REAL GDP GROWTH YoY (%)



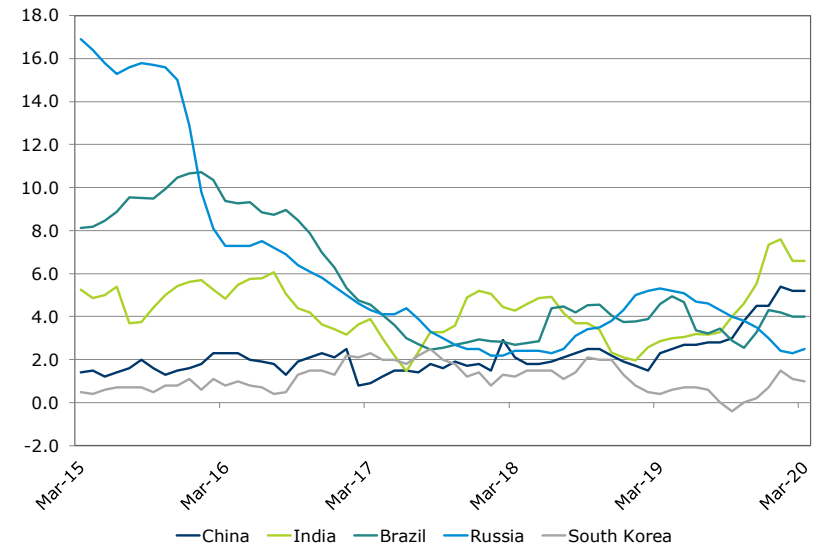
EMERGING MARKETS REAL GDP GROWTH YoY (%)



DEVELOPED MARKETS CPI GROWTH YoY (%)



EMERGING MARKETS CPI GROWTH YoY (%)



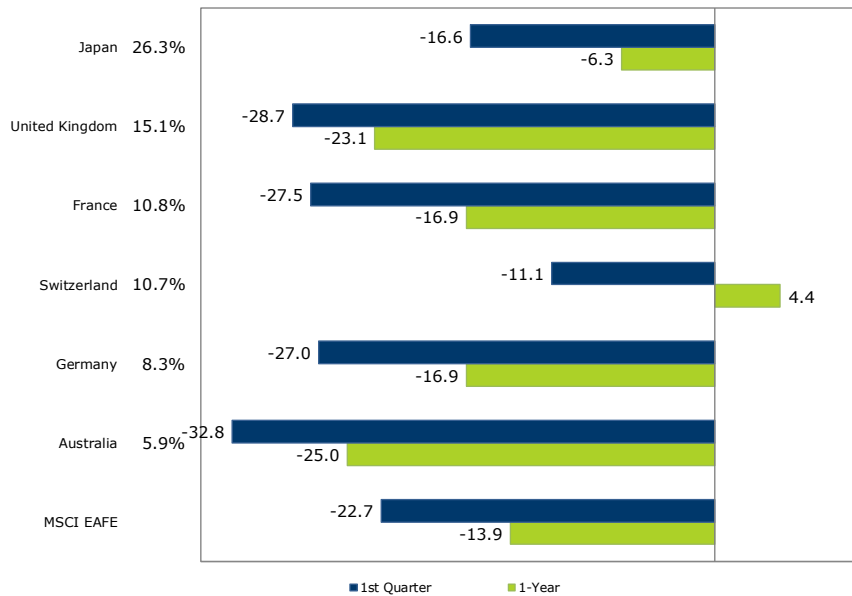
Data sources: Bloomberg

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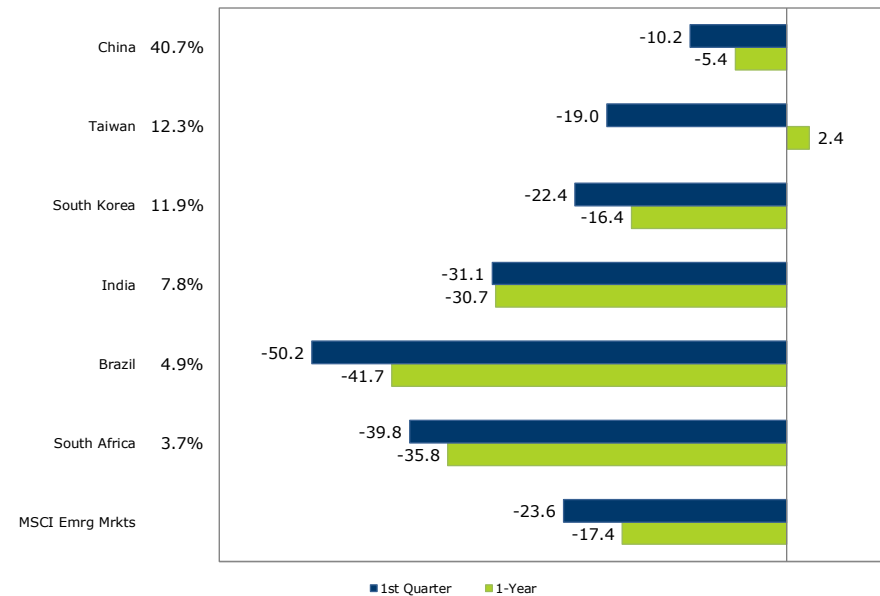
NON-U.S. EQUITY MARKET

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI EX-US (\$G)	-23.3	-23.3	-15.1	-1.5	-0.2	2.5
MSCI EAFE (\$G)	-22.7	-22.7	-13.9	-1.3	-0.1	3.2
MSCI EMERGING MARKETS (\$G)	-23.6	-23.6	-17.4	-1.3	0.0	1.0
MSCI FRONTIER MARKETS (\$G)	-26.6	-26.6	-18.7	-4.0	-2.5	1.4
MSCI ACWI EX-US GROWTH (\$G)	-18.2	-18.2	-6.9	2.9	2.5	4.3
MSCI ACWI EX-US VALUE (\$G)	-28.5	-28.5	-23.2	-5.9	-2.9	0.7
MSCI ACWI EX-US SMALL (\$G)	-28.9	-28.9	-20.8	-4.5	-0.3	3.2
MSCI ACWI MINIMUM VOLATILITY	-15.9	-15.9	-7.0	4.3	5.3	8.7
MSCI EAFE MINIMUM VOLATILITY	-16.3	-16.3	-9.0	2.1	2.7	6.1
FTSE RAFI DEVELOPED EX-US	-27.6	-27.6	-20.8	-4.7	-1.8	1.8
MSCI EAFE LC (G)	-20.4	-20.4	-12.1	-1.3	0.3	4.9

MSCI EAFE: LARGEST COUNTRIES & RETURN (USD)



MSCI EM: LARGEST COUNTRIES & RETURN (USD)



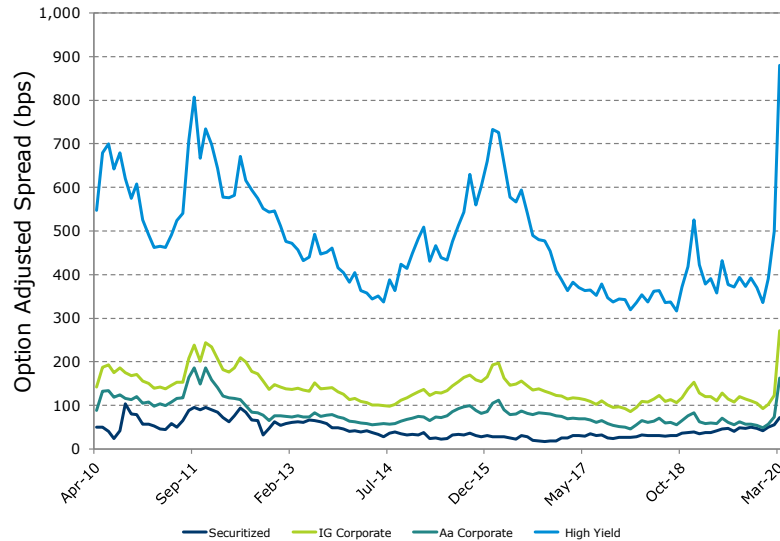
Data sources: Wilshire Compass

U.S. FIXED INCOME

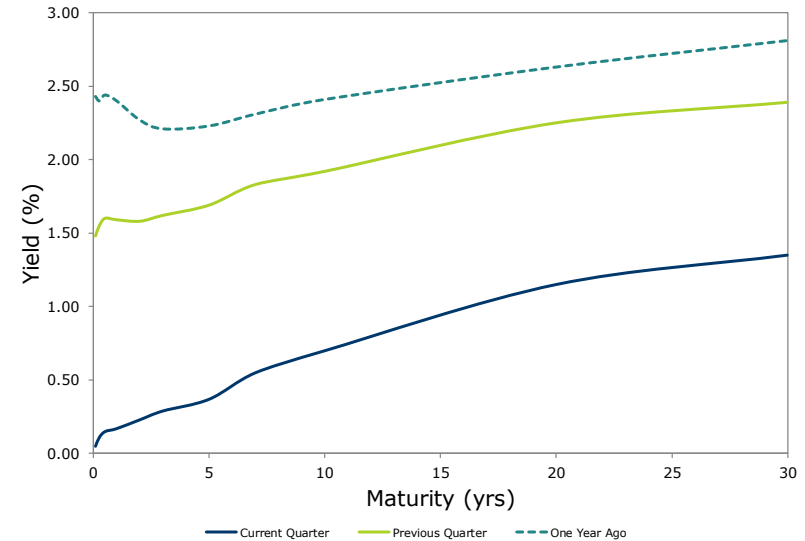
AS OF 3/31/2020	YTM	DURATION	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS AGGREGATE	1.6	5.7	3.2	3.2	8.9	4.8	3.4	3.9
BLOOMBERG BARCLAYS TREASURY	0.6	7.0	8.2	8.2	13.2	5.8	3.6	3.8
BLOOMBERG BARCLAYS GOV'T-REL.	2.0	5.6	0.5	0.5	6.2	4.1	2.9	3.4
BLOOMBERG BARCLAYS SECURITIZED	1.4	1.9	2.7	2.7	6.9	4.0	2.9	3.4
BLOOMBERG BARCLAYS CORPORATE	3.4	8.0	-3.6	-3.6	5.0	4.2	3.4	4.9
BLOOMBERG BARCLAYS LT G/C	2.7	16.4	6.2	6.2	19.3	9.7	6.0	8.1
BLOOMBERG BARCLAYS LT TREASURY	1.3	19.2	20.9	20.9	32.6	13.4	7.3	9.0
BLOOMBERG BARCLAYS LT GOV't-REL.	3.9	12.6	-3.6	-3.6	7.3	6.3	4.3	7.0
BLOOMBERG BARCLAYS LT CORP.	3.9	14.5	-4.5	-4.5	9.6	6.7	4.7	7.3
BLOOMBERG BARCLAYS U.S. TIPS *	0.7	7.8	1.7	1.7	6.8	3.5	2.7	3.5
BLOOMBERG BARCLAYS HIGH YIELD	9.5	4.1	-12.7	-12.7	-6.9	0.8	2.8	5.6
TREASURY BILLS	0.1	0.25	0.6	0.6	2.2	1.8	1.2	0.6

* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

BLOOMBERG BARCLAYS FIXED INCOME INDEXES



TREASURY YIELD CURVE

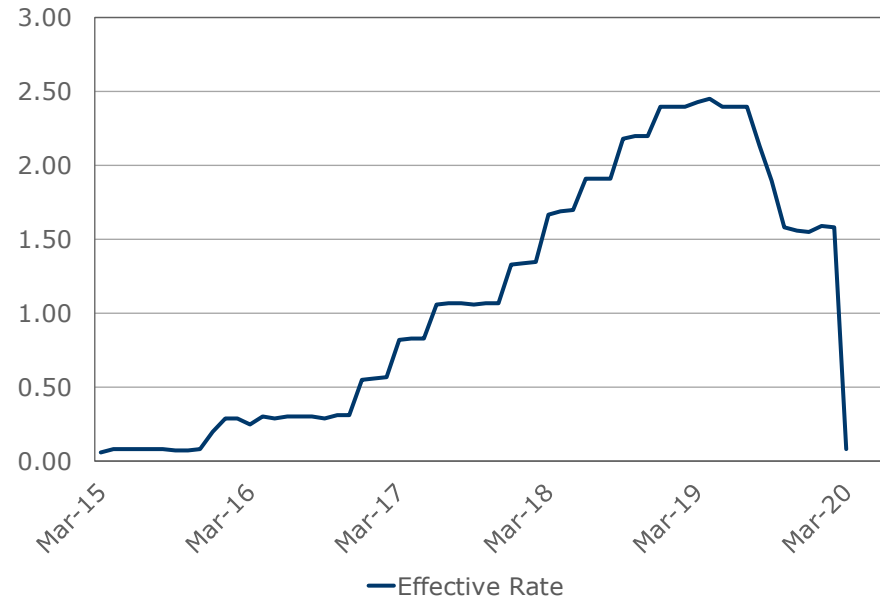


Data sources: Wilshire Compass, Bloomberg Barclays, U.S. Treasury

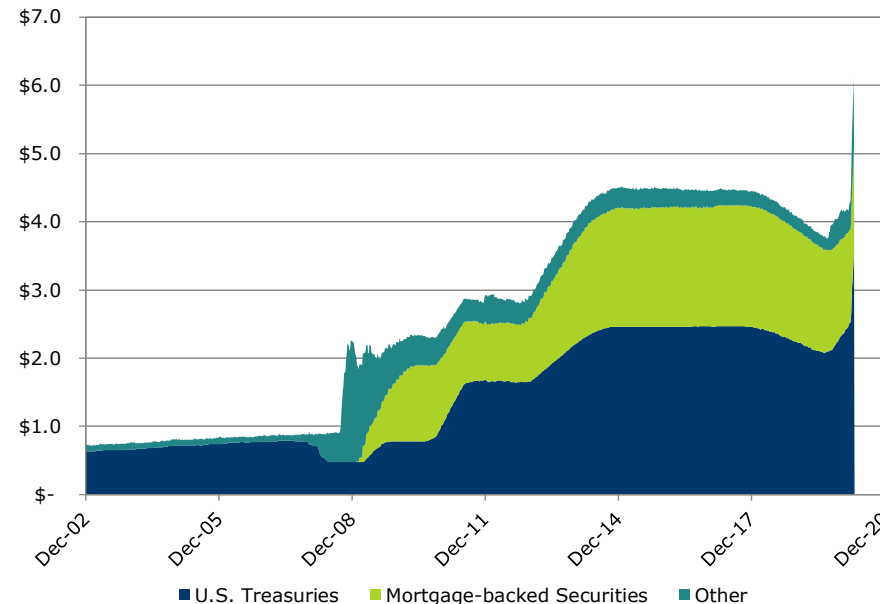
FEDERAL RESERVE

- Restarted unlimited asset purchase programs
- Reduced reserve requirements for the banking sector
- Restarted Term asset backed securities loan facility (TALF), expanding to include CMBS
- Launched a Primary (PMCCF) and Secondary Corporate Credit Facility (SMCCF)
- Allowed municipal debt to be eligible as collateral in Money Market Fund Liquidity Facility (MMLF) and Commercial Paper Funding Facility (CPFF)
- Total stimulus – FOMC plus U.S. government – in excess of \$3.75 T as of first week of April

FEDERAL FUNDS RATE (%)



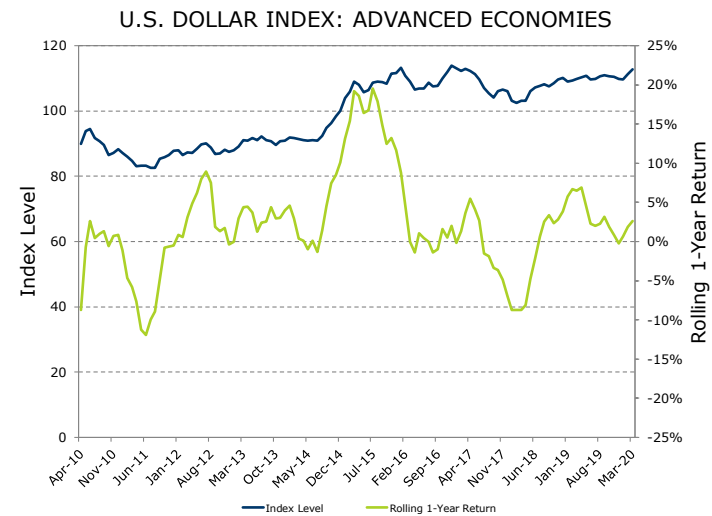
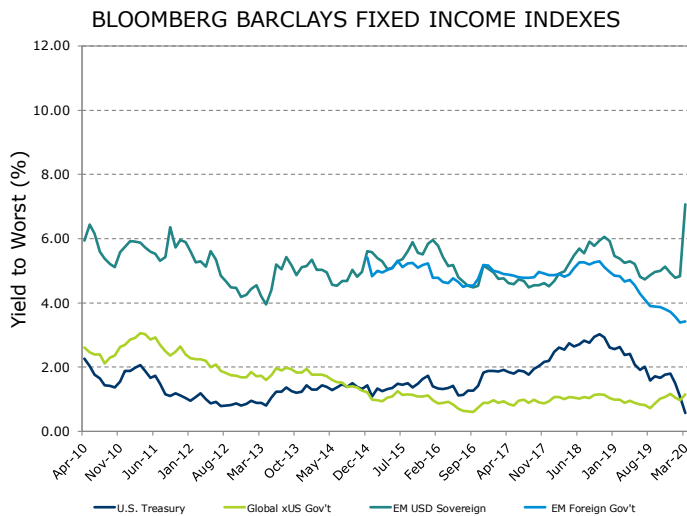
FEDERAL RESERVE: BALANCE SHEET FORECAST (\$T)



NON-U.S. FIXED INCOME

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DEVELOPED MARKETS						
BLMBRG BRCLYS GLBL AGGREGATE xUS	-2.7	-2.7	0.7	2.6	2.0	1.4
BLMBRG BRCLYS GLBL AGGREGATE xUS *	0.5	0.5	5.0	4.5	3.6	4.2
BLMBRG BRCLYS GLOBAL INF LNKD xUS	-5.9	-5.9	-2.8	2.0	1.3	2.9
BLMBRG BRCLYS GLOBAL INF LNKD xUS *	-0.7	-0.7	2.8	3.9	4.4	5.5
EMERGING MARKETS (HARD CURRENCY)						
BLMBRG BRCLYS EM USD AGGREGATE	-9.5	-9.5	-2.9	1.5	3.3	5.1
EMERGING MARKETS (FOREIGN CURRENCY)						
BLMBRG BRCLYS EM LOCAL CURR. GOV'T	-7.6	-7.6	-1.1	1.5	1.7	2.1
BLMBRG BRCLYS EM LOCAL CURR. GOV'T *	0.7	0.7	6.9	4.6	3.5	3.6
EURO vs. DOLLAR						
EURO vs. DOLLAR	-2.2	-2.2	-2.3	0.9	0.4	-2.1
YEN vs. DOLLAR						
YEN vs. DOLLAR	0.7	0.7	2.5	1.1	2.1	-1.4
POUND vs. DOLLAR						
POUND vs. DOLLAR	-6.4	-6.4	-4.8	-0.3	-3.5	-2.0

* Returns are reported in terms of local market investors, which removes currency effects.

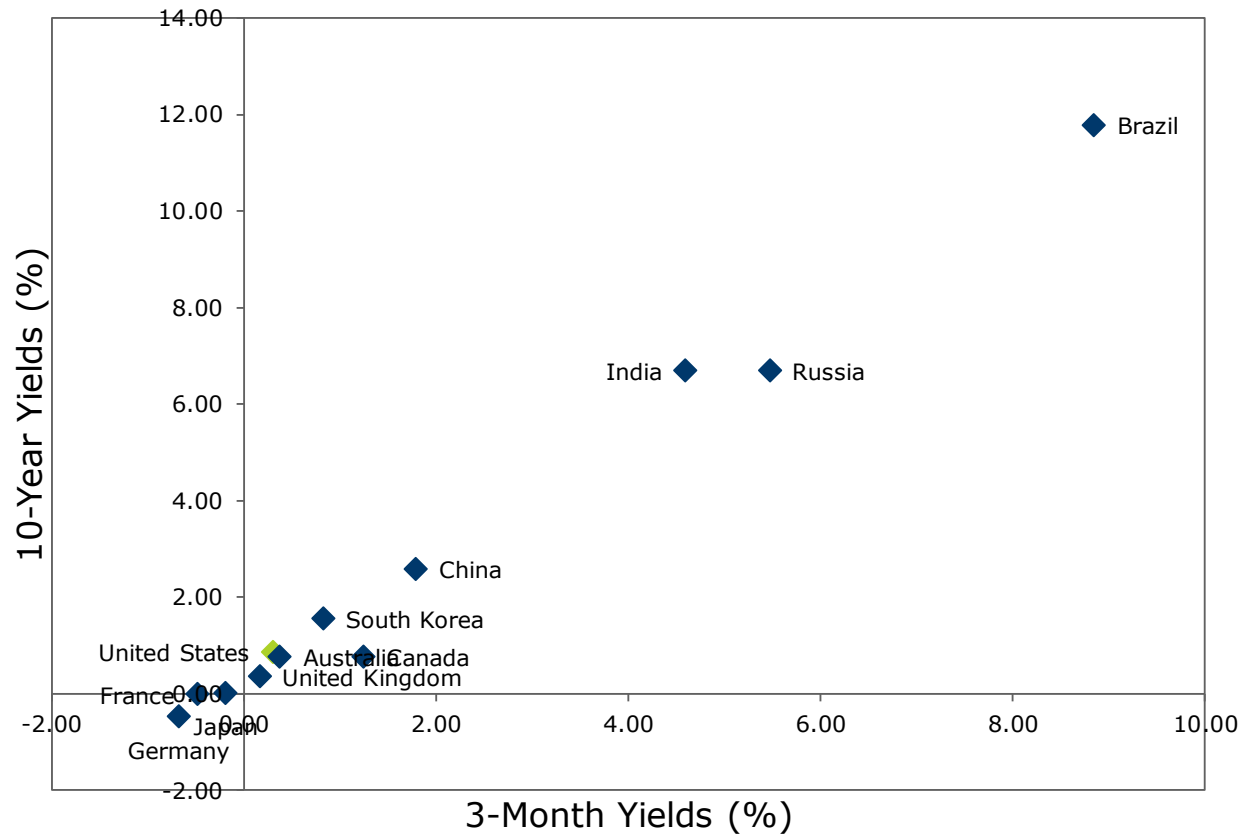


Data sources: Wilshire Compass, Bloomberg Barclays, Federal Reserve Bank of St. Louis

GLOBAL INTEREST RATES

Negative rates found in Germany and France; low but positive rates, and at similar levels, in the U.S., Australia and U.K.

GOVERNMENT BOND YIELDS

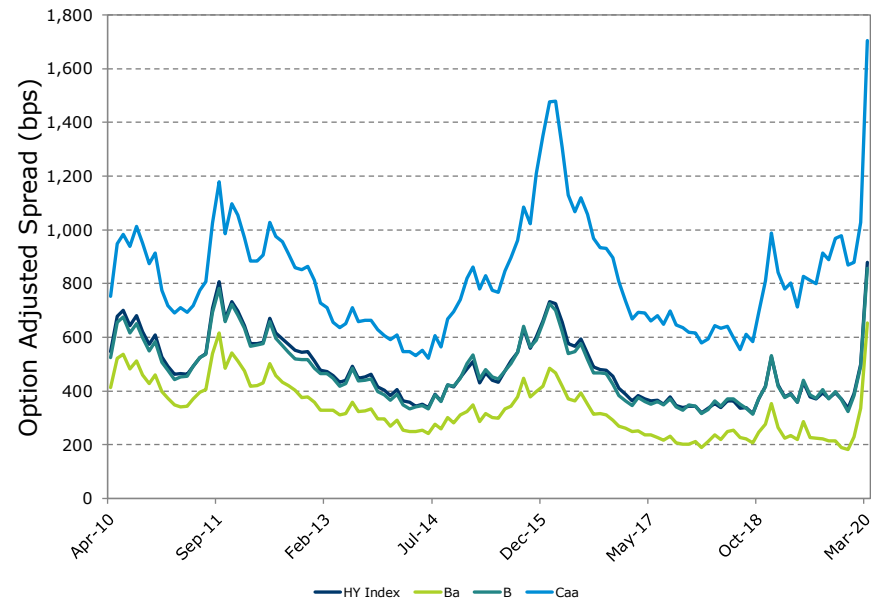


Data sources: Bloomberg

HIGH YIELD BOND MARKET

AS OF 3/31/2020		YTW	QTR	YTD	1 YR	3 YR	5 YR
BLOOMBERG BARCLAYS HIGH YIELD		9.4	-12.7	-12.7	-6.9	0.8	2.8
S&P LSTA LEVERAGE LOAN INDEX		7.3	-9.9	-9.9	-5.1	0.5	1.6
HIGH YIELD QUALITY DISTRIBUTION	WEIGHT						
Ba U.S. HIGH YIELD	52.3%	7.2	-10.2	-10.2	-3.2	2.1	3.4
B U.S. HIGH YIELD	34.8%	9.2	-13.0	-13.0	-6.8	0.8	2.5
Caa U.S. HIGH YIELD	11.9%	17.5	-20.6	-20.6	-18.8	-4.1	0.9
Ca to D U.S. HIGH YIELD	0.8%	44.2	-29.7	-29.7	-40.3	-10.2	-8.2
Non-Rated U.S. HIGH YIELD	0.3%	11.8	-11.9	-11.9	-9.6	-0.6	-1.8

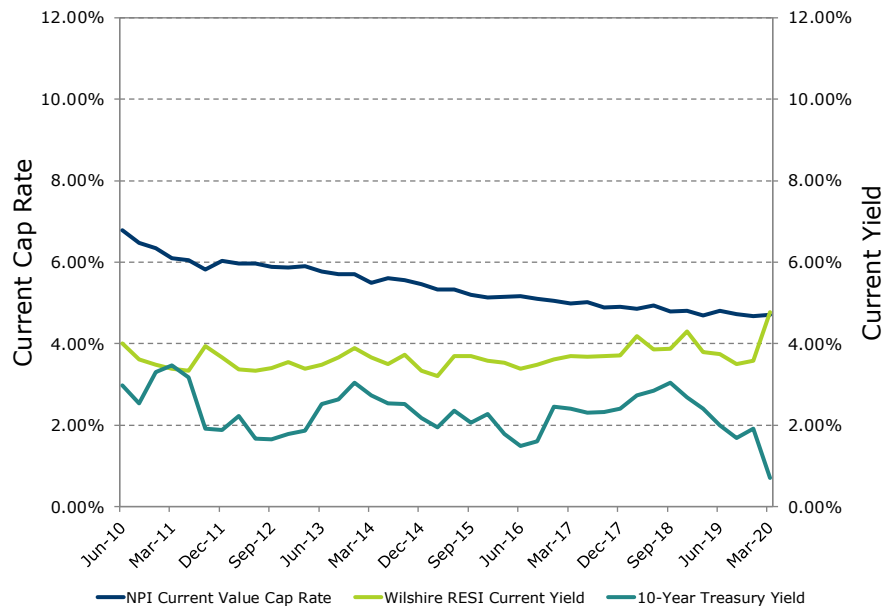
BLOOMBERG BARCLAYS HIGH YIELD INDEXES



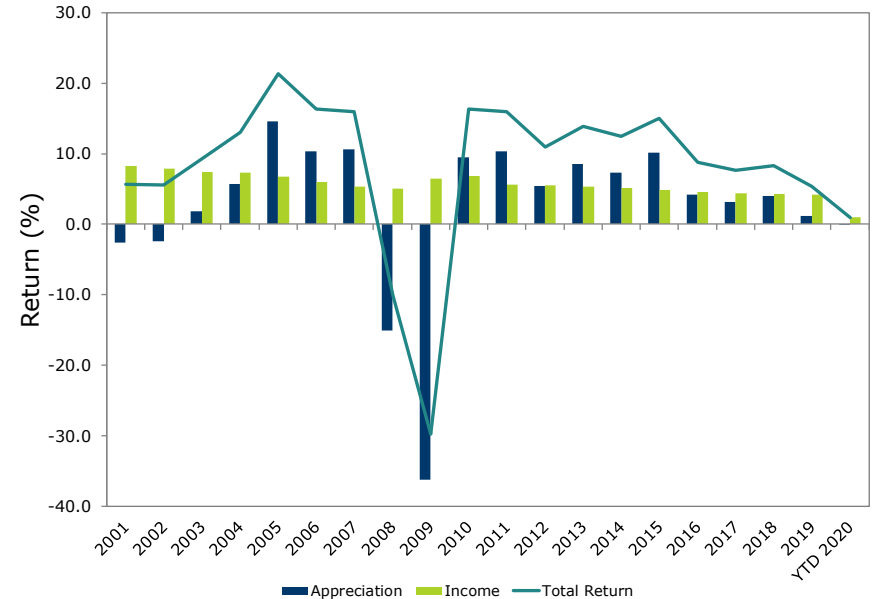
Data sources: Wilshire Compass, Bloomberg Barclays

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
BLOOMBERG BARCLAYS U.S. TIPS	1.7	1.7	6.8	3.5	2.7	3.5
BLOOMBERG COMMODITY INDEX	-23.3	-23.3	-22.3	-8.6	-7.8	-6.7
WILSHIRE GLOBAL RESI INDEX	-27.2	-27.2	-21.4	-2.7	-0.7	6.5
NCREIF ODCE FUND INDEX	1.0	1.0	4.9	6.8	8.5	11.4
NCREIF TIMBERLAND INDEX	0.1	0.1	1.3	2.5	2.8	4.5
ALERIAN MLP INDEX (OIL & GAS)	-57.2	-57.2	-61.0	-28.9	-20.7	-5.0

REAL ESTATE VALUATION



NCREIF ODCE FUND INDEX RETURN



Data sources: Wilshire Compass, National Council of Real Estate Investment Fiduciaries

ASSET CLASS PERFORMANCE

ASSET CLASS RETURNS - BEST TO WORST						ANNUALIZED 5-YEAR AS OF 3/2020
2015	2016	2017	2018	2019	2020 YTD	
REITs 4.2%	MLPs 18.3%	Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 31.0%	Core Bond 3.2%	U.S. Equity 6.0%
U.S. Equity 0.7%	High Yield 17.1%	Developed 25.6%	Core Bond 0.0%	REITs 25.8%	U.S. TIPS 1.7%	Core Bond 3.4%
Core Bond 0.6%	U.S. Equity 13.4%	U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 22.7%	T-Bills 0.6%	High Yield 2.8%
T-Bills 0.1%	Commodities 11.8%	High Yield 7.5%	High Yield -2.1%	Emrg Mrkts 18.9%	High Yield -12.7%	U.S. TIPS 2.7%
Developed -0.4%	Emrg Mrkts 11.6%	REITs 4.2%	REITs -4.8%	High Yield 14.3%	U.S. Equity -20.7%	T-Bills 1.2%
U.S. TIPS -1.4%	REITs 7.2%	Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.7%	Developed -22.7%	Emrg Mrkts 0.0%
High Yield -4.5%	U.S. TIPS 4.7%	U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 8.4%	Commodities -23.3%	Developed -0.1%
Emrg Mrkts -14.6%	Core Bond 2.6%	Commodities 1.7%	MLPs -12.4%	Commodities 7.7%	Emrg Mrkts -23.6%	REITs -0.2%
Commodities -24.7%	Developed 1.5%	T-Bills 0.8%	Developed -13.4%	MLPs 6.6%	REITs -25.6%	Commodities -7.8%
MLPs -32.6%	T-Bills 0.3%	MLPs -6.5%	Emrg Mrkts -14.2%	T-Bills 2.3%	MLPs -57.2%	MLPs -20.7%

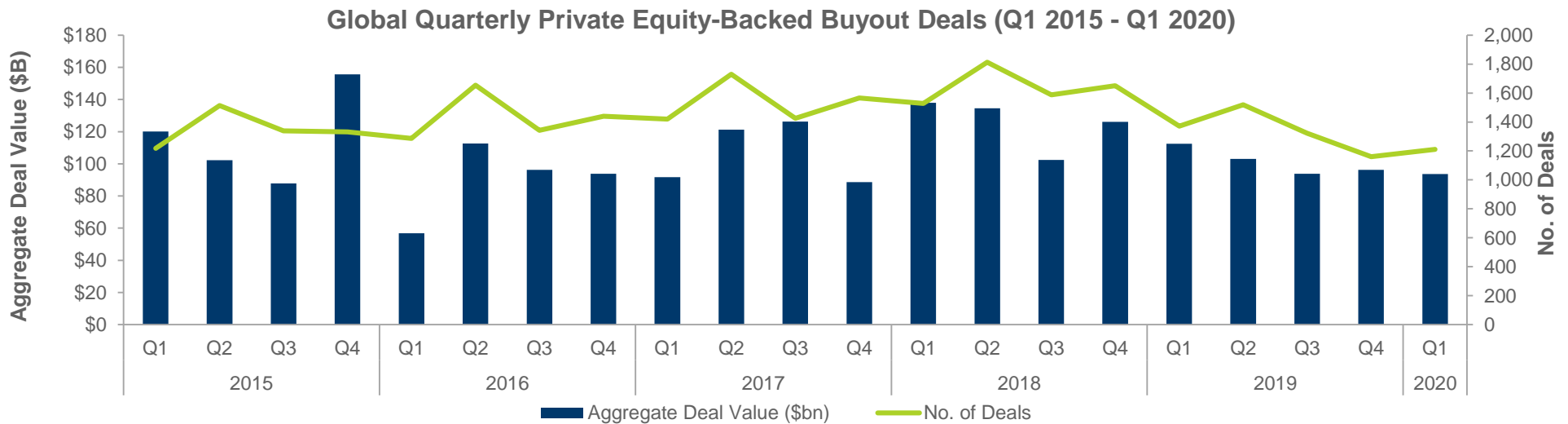
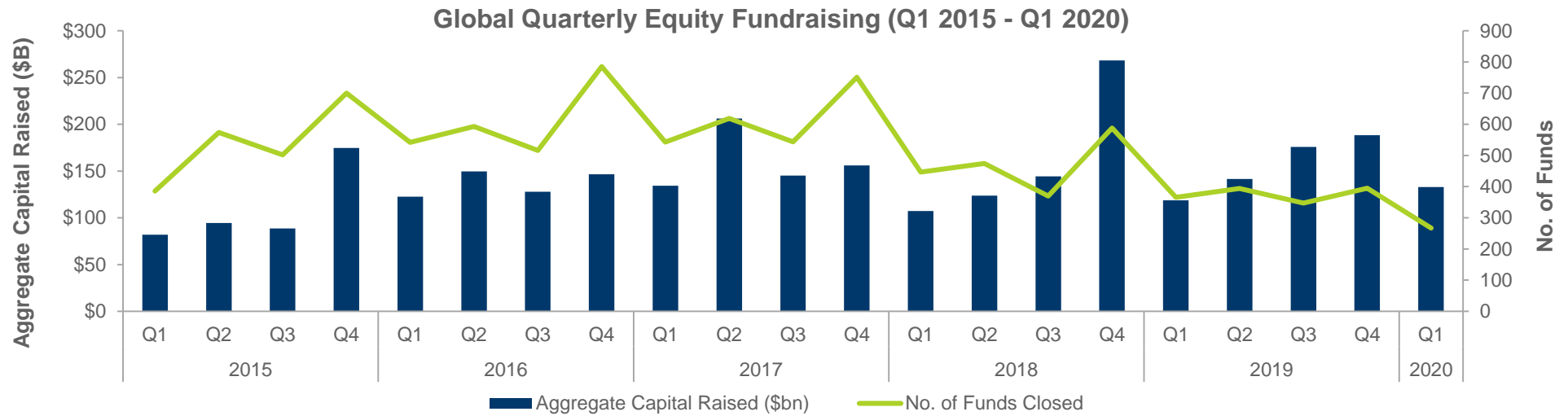
Data sources: Wilshire Compass

Note: Developed asset class is developed equity markets ex-U.S., ex-Canada



APPENDIX: PRIVATE MARKETS UPDATE

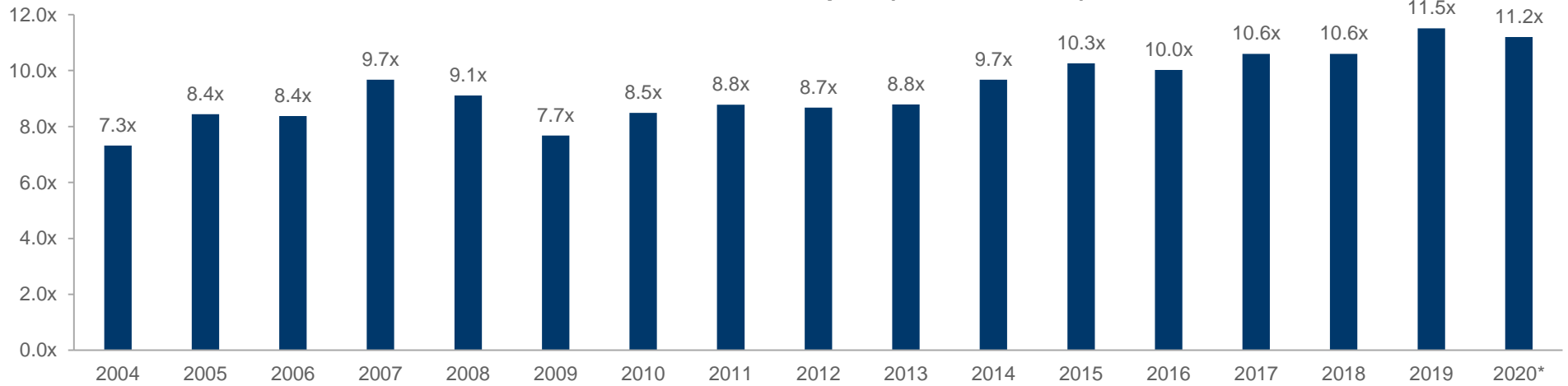
PRIVATE EQUITY – FUNDRAISING & INVESTMENT ACTIVITY



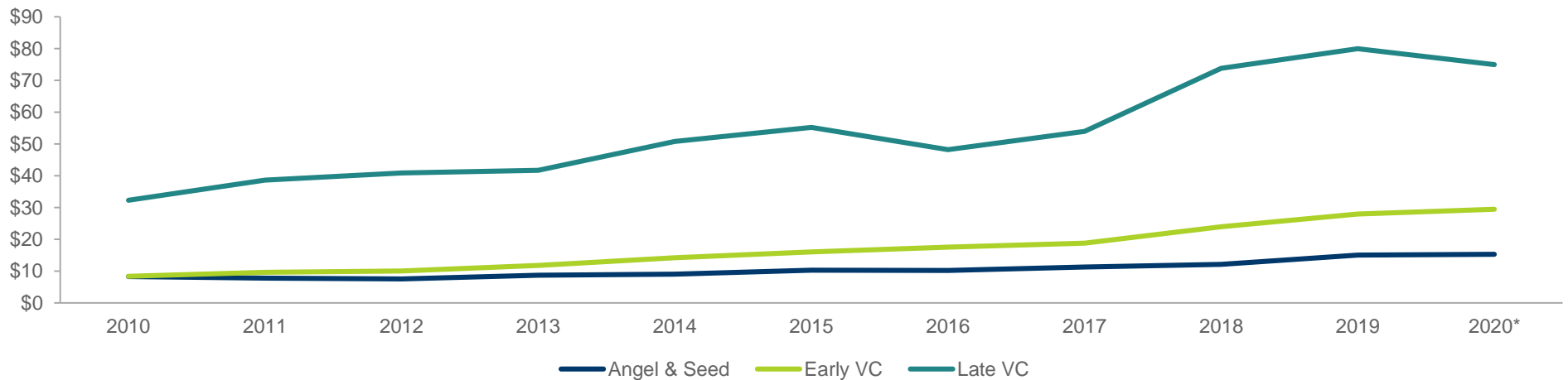
Source: Preqin, as of March 31, 2020.

PRIVATE EQUITY – PRICING & VALUATIONS

LBO Purchase Price Multiples (2004 - Q1 2020)



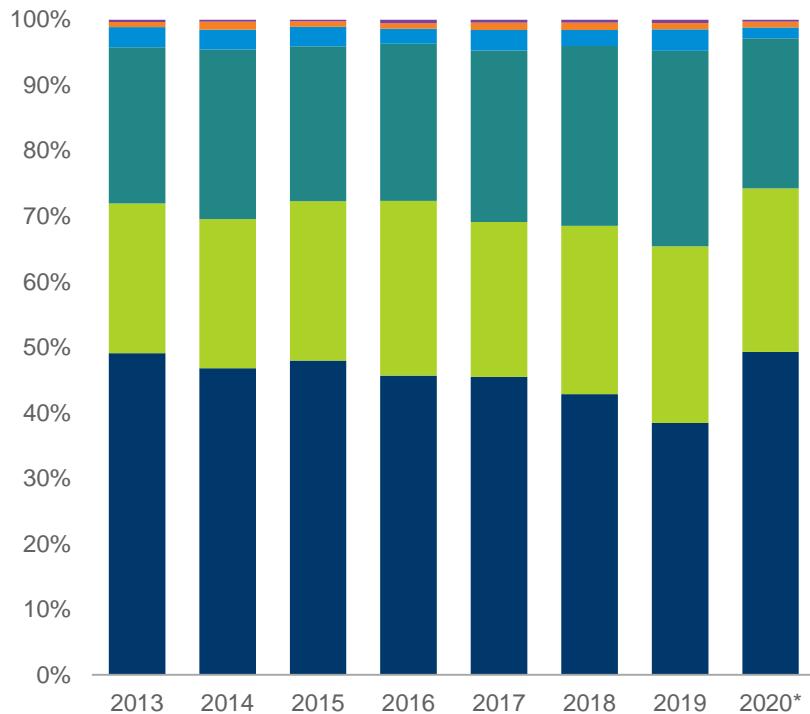
Venture Capital Pre-Money Valuations (\$M) (2010 - Q1 2020)



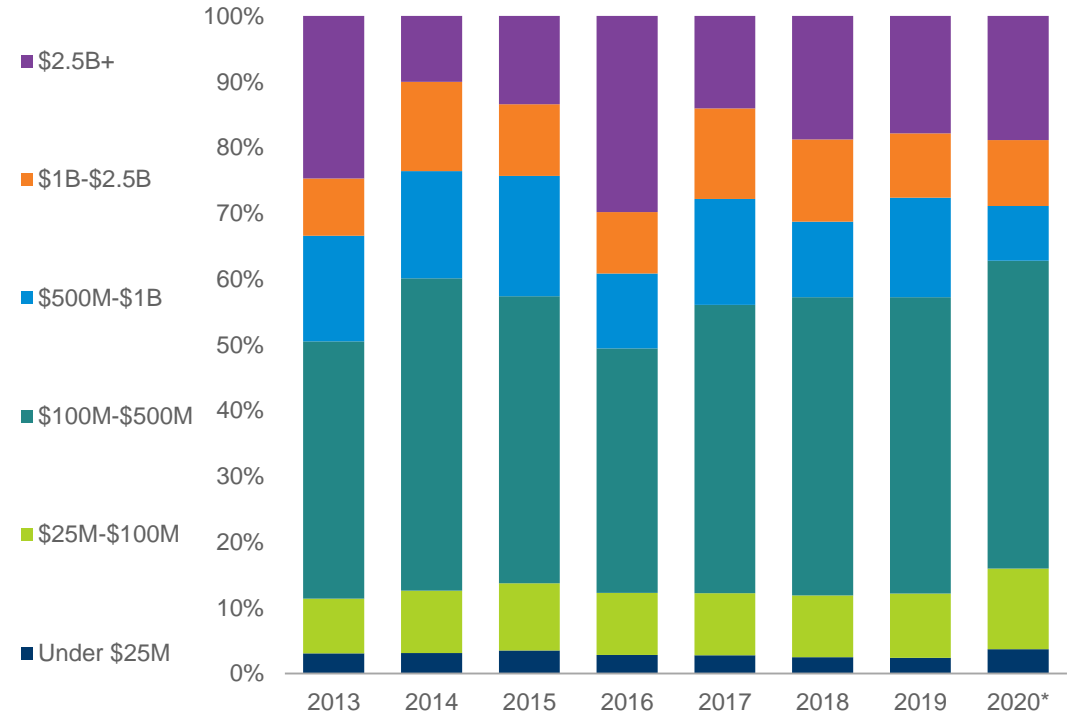
Source: S&P LBO; PitchBook, *as of March 31, 2020.

U.S. INVESTMENT ACTIVITY BY DEAL SIZE

Percentage of Deal Volume by Deal Size (by Count)*



Percentage of Deal Volume by Deal Size (by Dollars)*

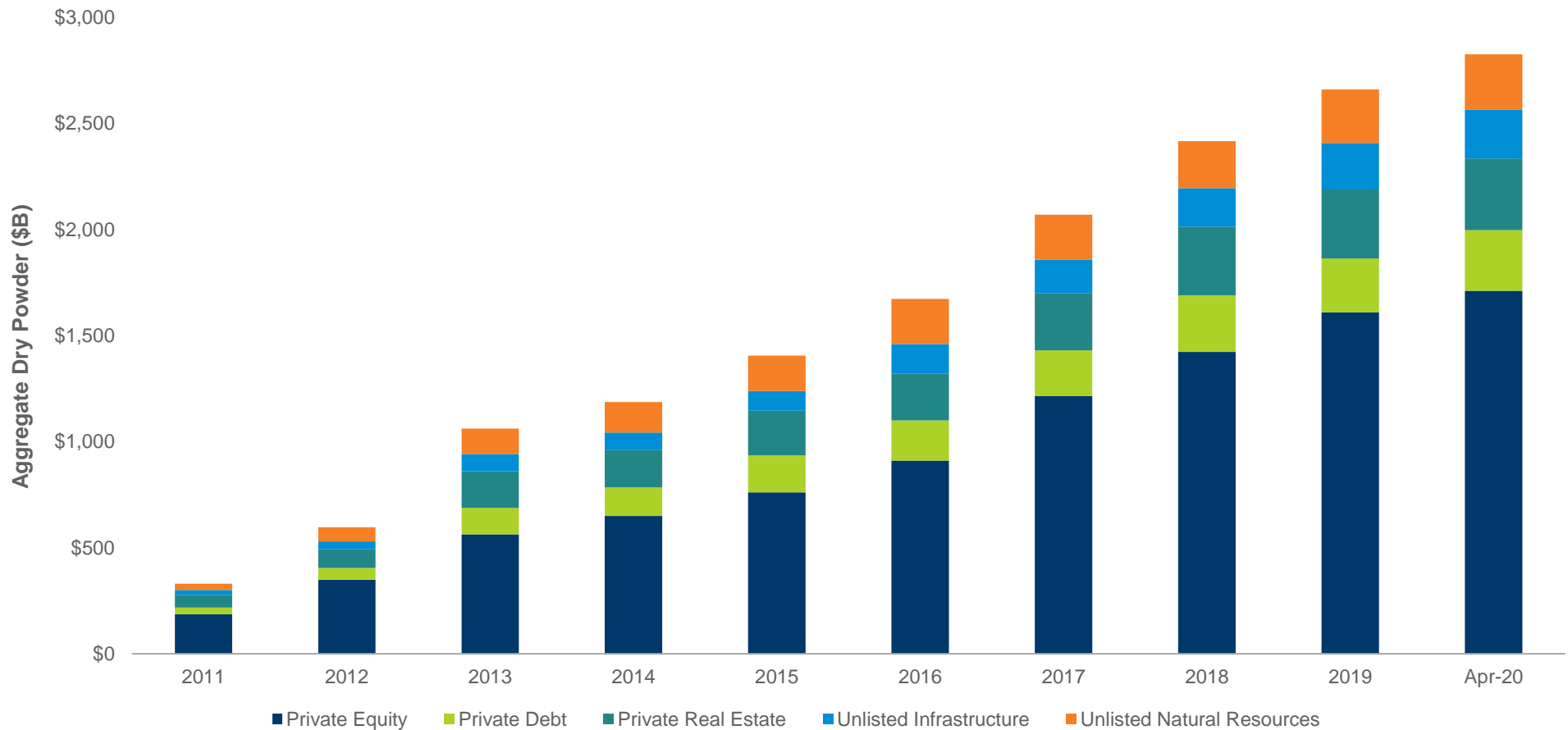


- Deal volume continues to be dominated by lower middle market deals with investment sizes below \$100 million through the first quarter of 2020
- However, deals with below \$100 million check sizes comprised only 16% of all deal volume by amount of capital invested in the first quarter of 2020

Source: PitchBook, *as of March 31, 2020.

PRIVATE CAPITAL DRY POWDER

Private Capital Dry Powder by Fund Type (2011 – April 2020)



- Global private capital dry powder continues to increase, topping \$2.8 trillion across all fund types
- Private equity comprises just over 60% of total dry powder in the market as of April 2020

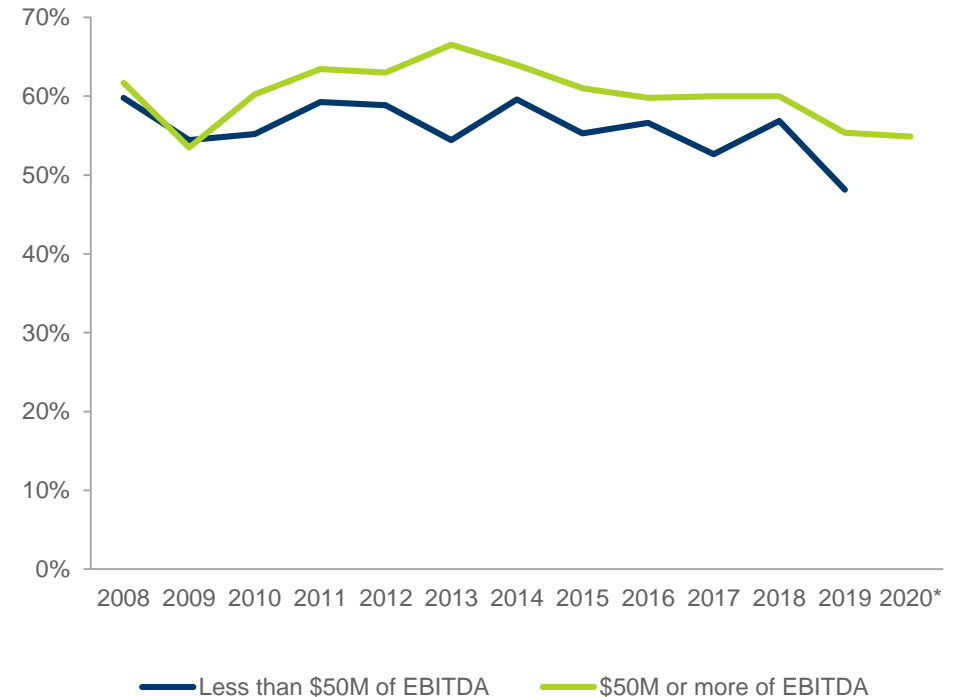
Source: Preqin, as of April 20, 2020.

PRIVATE EQUITY - U.S. DEBT MARKETS

Total U.S. LBO Loan Volume (\$B) (2005 - Q1 2020)



Percentage of Debt Used in LBOs (2008 - Q1 2020)

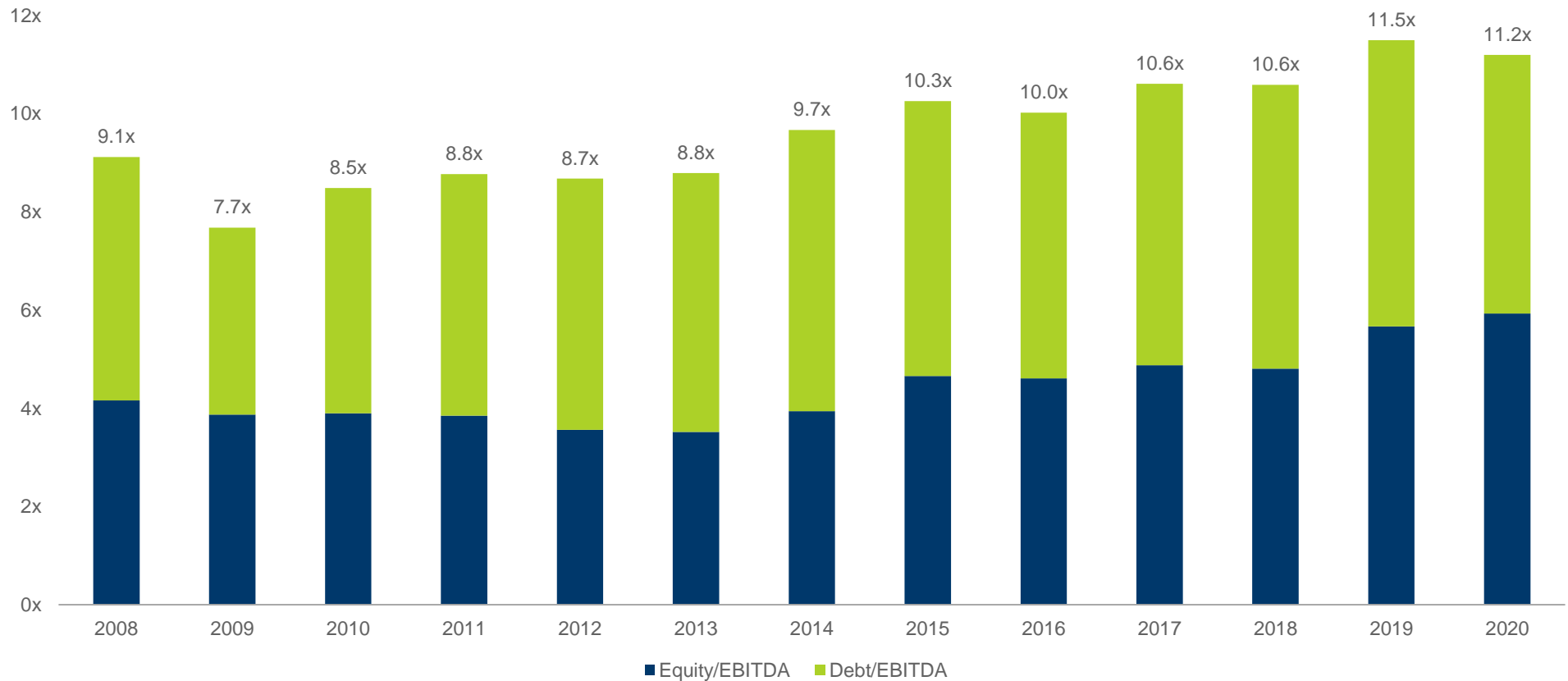


- 2020 has generated approximately \$23 billion in loan volume so far and is on pace to see a slight decrease in loan volume from 2019
- As debt multiples continue to increase, the percentage of debt used to finance leveraged buyouts through the first quarter of 2020 has dropped from 2019 marks

Source: S&P LBO, *as of March 31, 2020. "Less than \$50M of EBITDA" data for 2020 not yet available

PRIVATE EQUITY - U.S. LBO PURCHASE PRICE MULTIPLES

Purchase Price Multiples of U.S. LBO Transactions (2008 - Q1 2020)

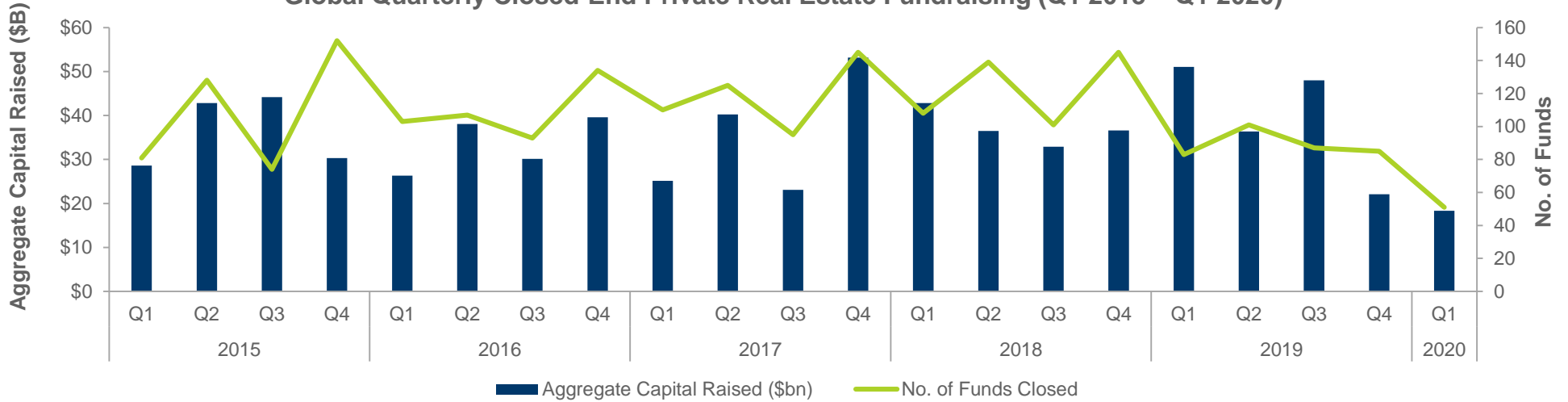


- Purchase price multiples for U.S. LBOs have slightly decreased through Q1 2020, relative to 2019 levels

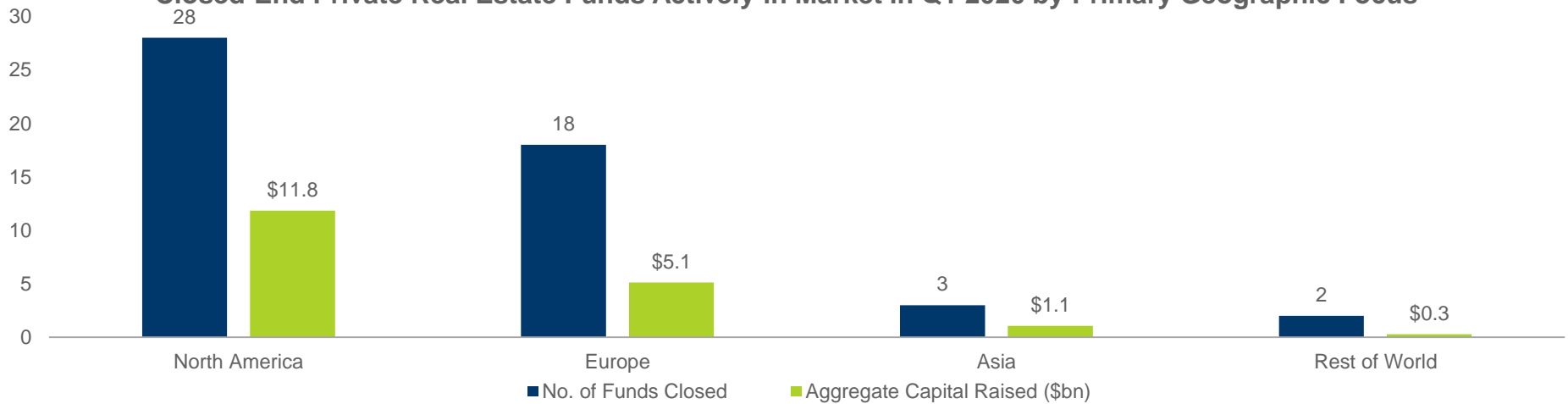
Source: S&P LBO, *as of March 31, 2020.

PRIVATE REAL ESTATE – FUNDRAISING ACTIVITY

Global Quarterly Closed-End Private Real Estate Fundraising (Q1 2015 – Q1 2020)



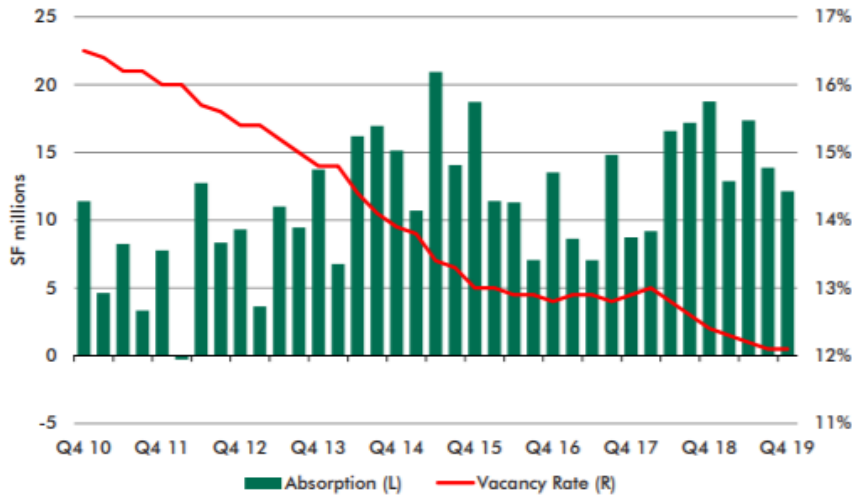
Closed-End Private Real Estate Funds Actively in Market in Q1 2020 by Primary Geographic Focus



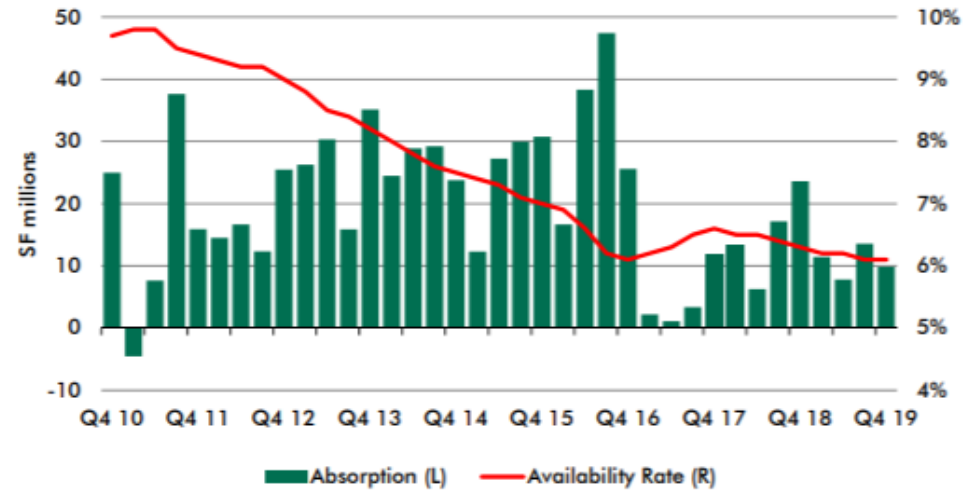
Source: Preqin, as of March 31, 2020.

COMMERCIAL PROPERTY

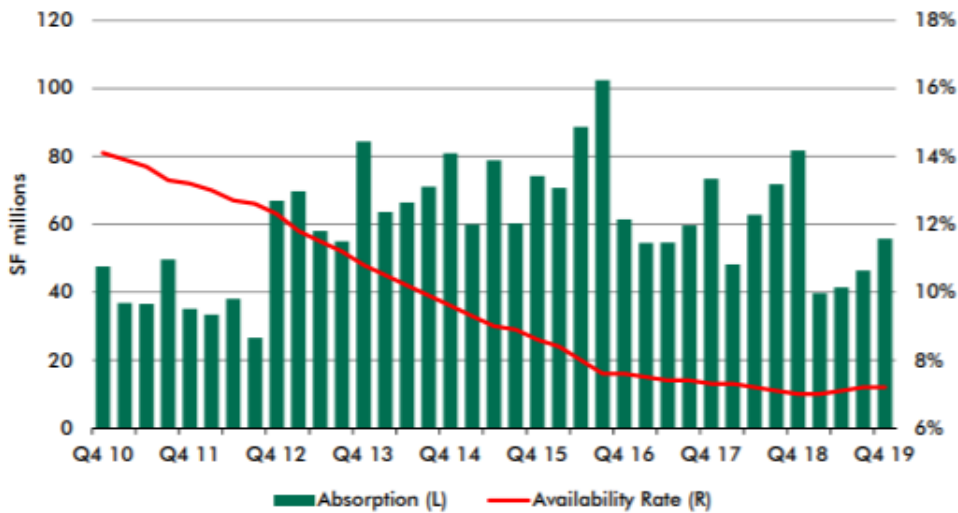
OFFICE



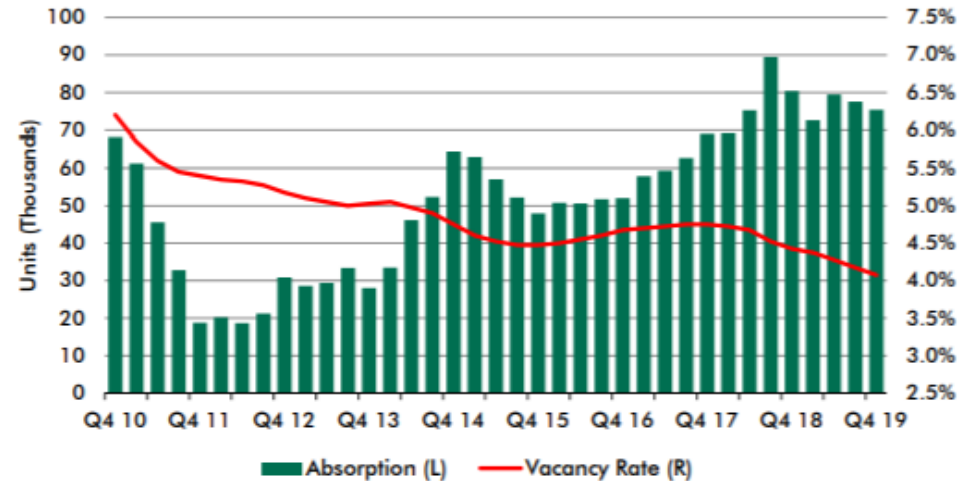
RETAIL



INDUSTRIAL



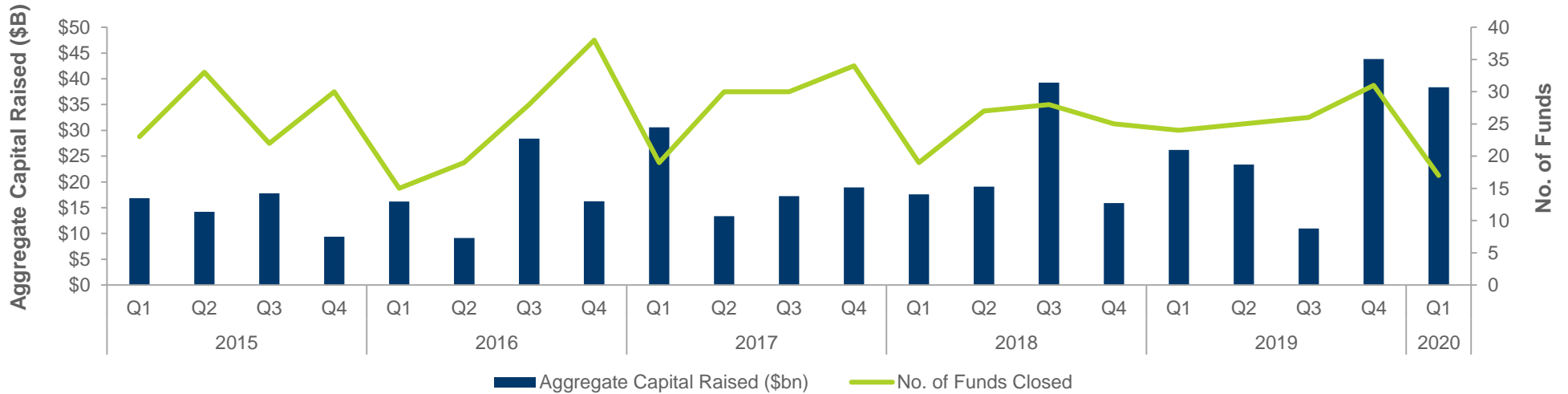
APARTMENTS



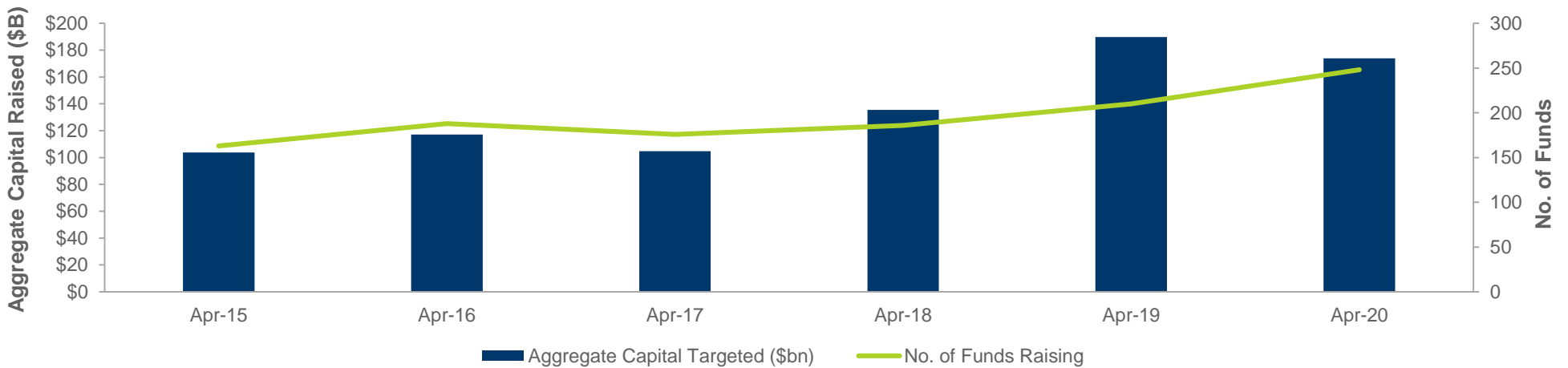
Data sources: CB Richard Ellis

UNLISTED INFRASTRUCTURE – FUNDRAISING & INVESTMENT ACTIVITY

Global Quarterly Unlisted Infrastructure Fundraising (Q1 2015 - Q1 2020)

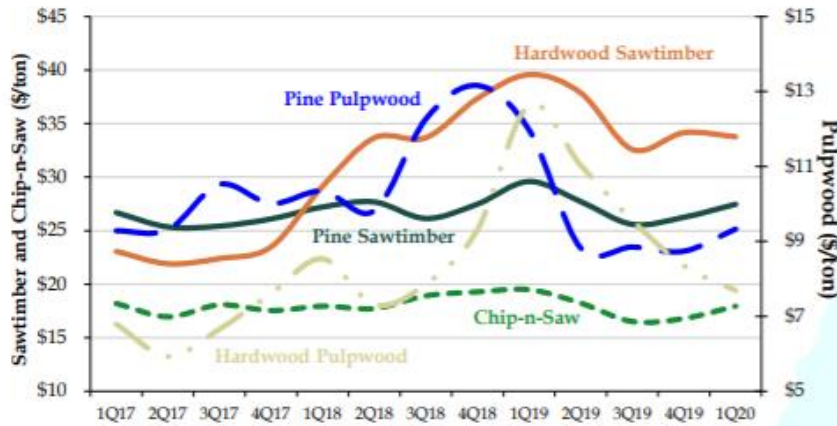


Unlisted Infrastructure Funds in Market over Time (April 2015 - April 2020)



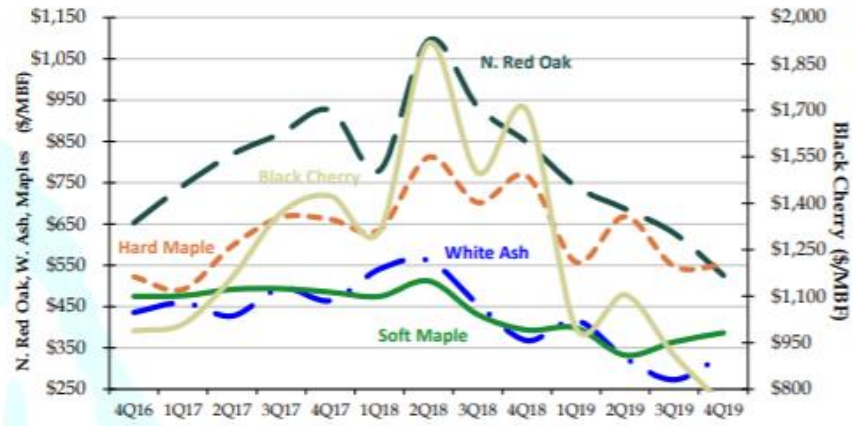
Source: Preqin, as of March 31, 2020.

Southeastern Timber Prices



Source: Forest2Market®

Northeastern Hardwood Timber Prices



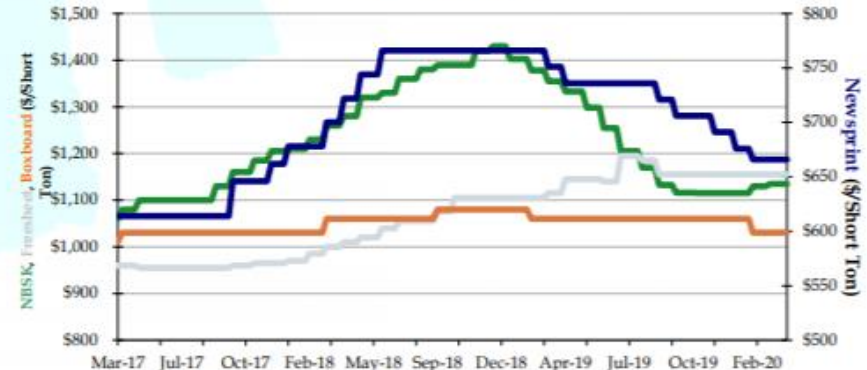
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

Pacific Northwest Timber Prices



Source: Fastmarkets RISI - Log Lines®

Pulp and Paper



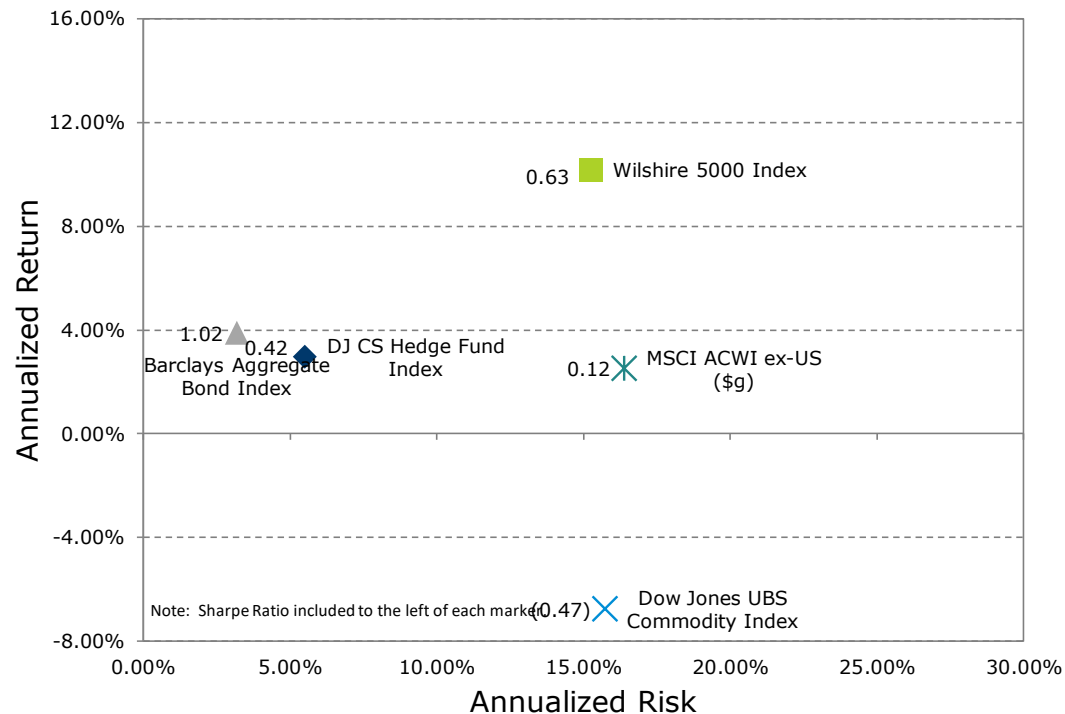
Source: Fastmarkets RISI

Data sources: Forest Investment Associates

HEDGE FUND PERFORMANCE

AS OF 3/31/2020	QTR	YTD	1 YR	3 YR	5 YR	10 YR
DJ CS HEDGE FUND INDEX	-9.0	-9.0	-4.3	0.4	0.2	3.0
EVENT DRIVEN	-15.8	-15.8	-13.2	-3.2	-2.5	1.3
GLOBAL MACRO	-8.1	-8.1	-1.1	1.1	0.6	3.6
LONG/SHORT EQUITY	-11.2	-11.2	-5.4	1.4	1.1	3.6
MULTI-STRATEGY	-6.5	-6.5	-2.6	1.1	2.2	5.0
WILSHIRE 5000	-20.7	-20.7	-8.9	4.1	6.0	10.2
MSCI ACWI EX-US (\$G)	-23.3	-23.3	-15.1	-1.5	-0.2	2.5
BLOOMBERG BARCLAYS AGGREGATE	3.2	3.2	8.9	4.8	3.4	3.9
DOW JONES UBS COMMODITY	-23.3	-23.3	-22.3	-8.6	-7.8	-6.7

HEDGE FUND 10-YEAR RISK/RETURN



Data sources: Wilshire Compass



WILSHIRE ASSOCIATES

Wilshire Consulting



Employees' Retirement Fund of the City of Dallas
Executive Summary of Performance
First Quarter 2020

*Wilshire Associates Incorporated
1299 Ocean Avenue, Suite 700
Santa Monica, CA 90401
Phone: 310-451-3051
contactconsulting@wilshire.com*

Capital Market Overview

U.S. Equity Market

The U.S. stock market, represented by the Wilshire 5000 Total Market Index, was down -20.70% for the first quarter of 2020, the worst quarter since the Global Financial Crisis. Uncertainty and a declining outlook were the driving forces behind the sell-off as the COVID-19 pandemic worsened, resulting in significant limitations on global commerce. The fluidity of conditions means that the U.S. is facing at least one more month of travel restrictions and social distancing. Government action so far has included cutting short-term rates to near zero and the passage of a \$2 trillion stimulus bill.

Large capitalization stocks outperformed small caps by a wide margin for the quarter as the Wilshire Large-Cap Index was down -19.68% versus -31.40% for the Wilshire US Small-Cap Index. The Wilshire US Micro-Cap IndexSM was down -33.84% for the quarter and -32.34% for the one-year. Growth stocks led value during the first quarter and have outperformed during the past twelve months.

All eleven major sectors were in negative territory during the first quarter. The best performing sectors, Information Technology (-12.5%) and Health Care (-12.7%), were still down by double-digits. The worst performing sector, by far, was Energy (-51.6%) as oil fell -66.5% on a downward shock to demand.

Fixed Income Market

The U.S. Treasury yield curve fell dramatically during the quarter across the maturity spectrum. While the largest decreases occurred in the short end, yields across the curve all fell in excess of 100 basis points. The 10-year Treasury yield ended the quarter at 0.70%, down 122 basis points from December. The Federal Open Market Committee decreased its overnight rate by a total of 1.50% during two unscheduled meetings in March. The Fed also announced quantitative easing measures, committing to Treasury purchases of at least \$500 billion and mortgage-backed securities of at least \$200 billion over the coming months. Credit spreads were up big during the quarter within both the investment grade and high yield markets.

Non-U.S. Markets

Equity markets outside of the U.S. sold off during the quarter as the COVID-19 virus was officially categorized as a global pandemic. Economic growth in the U.K. was already nonexistent during the fourth quarter, before the country had to deal with the virus in earnest. Prime Minister Boris Johnson became the first world leader to announce that he was infected with the respiratory disease. Across continental Europe, quarantine efforts are starting to bear fruit as cases in Italy, one of the worst afflicted countries, and Spain appear to be approaching a peak. Clear news out of China, where the virus originated, can be difficult to obtain but there are some recent events that provide signs of hope. China has recently been relaxing severe travel restrictions and the lockdown of Wuhan, and its population of 11 million, is set to be lifted in early April. The official Purchasing Manager's Index for China indicates that manufacturing in the country expanded during March after a dramatic slowdown.

Real Assets Markets

Real estate securities were down during the first quarter in both the U.S. and abroad. Falling prices in this segment were a bit worse than the broad equity market. Commodity results were negative for the quarter as crude oil fell -66.5% to \$20.48 per barrel, the lowest level since the end of the 2001 recession. Natural gas prices were down -25.1%, ending the quarter at \$1.64 per million BTUs. MLPs were among the worst performing market segments, down -57.2% for the quarter. Finally, gold prices were up and finished at approximately \$1,597 per troy ounce, up +4.8% from last quarter.

Summary of Index Returns For Periods Ended March 31, 2020

	<u>Quarter</u>	<u>One Year</u>	<u>Three Years</u>	<u>Five Years</u>	<u>Ten Years</u>
Domestic Equity					
		-			
Standard & Poor's 500	-19.60%	6.98%	5.11%	6.73%	10.53%
Wilshire 5000	-20.70	-8.94	4.09	5.99	10.19
Wilshire 4500	-27.91	28.06	10.93	9.51	13.09
Wilshire Large Cap	-19.68	-7.31	5.01	6.66	10.47
Wilshire Small Cap	-31.40	-25.04	-5.03	-0.48	7.40
Wilshire Micro Cap	-33.84	-32.34	-9.28	-3.82	4.85
Domestic Equity					
Wilshire Large Value	-22.10%	-11.52%	1.54%	4.71%	9.10%
Wilshire Large Growth	-11.13	-2.73	8.62	8.54	11.85
Wilshire Mid Value	-34.45	-28.79	-6.81	-0.85	6.90
Wilshire Mid Growth	-25.05	-17.08	0.84	1.95	8.89
Wilshire Small Value	-34.46	-29.63	-8.90	-2.10	5.95
Wilshire Small Growth	-28.15	-20.04	-1.05	1.03	8.76
International Equity					
MSCI All World ex U.S. (USD)	-22.35%	-15.57%	-1.96%	-0.64%	2.05%
MSCI EAFE	-22.83	-14.38	-1.82	-0.62	2.71
MSCI Europe	-24.33	-15.50	-2.34	-1.31	2.46
MSCI Pacific	-20.30	-12.42	-0.85	0.76	3.31
MSCI Emerging Markets Index	-23.60	-17.69	-1.62	-0.37	0.68
Domestic Fixed Income					
Barclays Aggregate Bond	3.15%	8.93%	4.82%	3.36%	3.88%
Barclays Treasury	8.20	13.23	5.82	3.64	3.83
Barclays Mortgage	2.82	7.03	4.04	2.94	3.28
Barclays Credit	-3.14	5.10	4.19	3.28	4.75
Citigroup High Yield Cash Pay	-13.08	-7.65	0.45	2.43	5.33
Barclays US TIPS	1.69	6.85	3.46	2.67	3.48
91-Day Treasury Bill	0.58	2.26	1.83	1.19	0.64
Currency*					
Euro vs. \$	-2.25%	-2.28%	0.86%	0.43%	-2.07%
Yen vs. \$	0.67	2.53	1.06	2.13	-1.43
Pound vs. \$	-6.40	-4.84	-0.28	-3.54	-2.00
Real Estate					
Wilshire REIT Index	-25.63%	-19.38%	-2.49%	-0.19%	7.67%
Wilshire RESI	-25.73	-19.47	-2.47	0.08	7.76

*Positive values indicate dollar depreciation.

Total Fund Overview

Asset Class Performance

	Assets		Performance (%)					
	(\$Mil)	(%)	QTR	YTD	1-year	3-year	5-year	10-year
U.S. Equity	370.0	12.2	-24.93	-24.93	-14.61	0.65	3.66	8.85
International Equity	334.2	11.0	-24.74	-24.74	-17.23	-3.06	-0.42	3.21
Global Equity	210.9	6.9	-17.30	-17.30	-9.56	2.20	2.89	
Global Low Volatility	358.9	11.8	-18.89	-18.89	-9.67	2.24		
Real Estate	351.4	11.6	-9.96	-9.96	-3.31	3.47	4.36	13.63
Global Fixed Income	517.0	17.0	-0.51	-0.51	4.99	3.68	2.93	4.17
High Yield	321.3	10.6	-12.08	-12.08	-6.22	0.46	2.35	5.20
Credit Opportunities	152.6	5.0	-15.15	-15.15	-10.29	-0.31		
MLPs	102.5	3.4	-48.13	-48.13	-51.83	-22.52	-16.25	
Private Equity	270.0	8.9	2.69	2.69	14.46	14.16	11.85	12.02
Cash Equivalents	45.7	1.5	0.58	0.58	2.26	1.83	1.19	0.64
Total Fund	3,034.4	100.0	-15.94	-15.94	-9.20	0.93	2.34	6.20
Asset Allocation Policy			-17.68	-17.68	-10.63	0.13	1.77	5.76
<i>Value Added vs Policy</i>			<i>1.74</i>	<i>1.74</i>	<i>1.43</i>	<i>0.80</i>	<i>0.57</i>	<i>0.44</i>
Actuarial Rate			1.94	3.92	8.00	8.00	8.02	8.14
Wilshire 5000 Index			-20.70	-20.70	-8.94	4.09	5.99	10.18
S&P 500 Index			-19.60	-19.60	-6.98	5.10	6.73	10.53
MSCI ACWI x-U.S. IMI Index			-24.11	-24.11	-16.32	-2.34	-0.66	2.14
MSCI EAFE Index			-22.83	-22.83	-14.38	-1.82	-0.62	2.72
Bloomberg Aggregate Bond Index			3.15	3.15	8.93	4.82	3.36	3.88
Citigroup High Yield Cash Pay			-13.08	-13.08	-7.65	0.45	2.43	5.33
Wilshire RE Securities Index			-25.73	-25.73	-19.47	-2.47	0.08	7.76
91-Day Treasury Bill			0.58	0.58	2.25	1.83	1.17	0.62

Total Fund Asset Growth

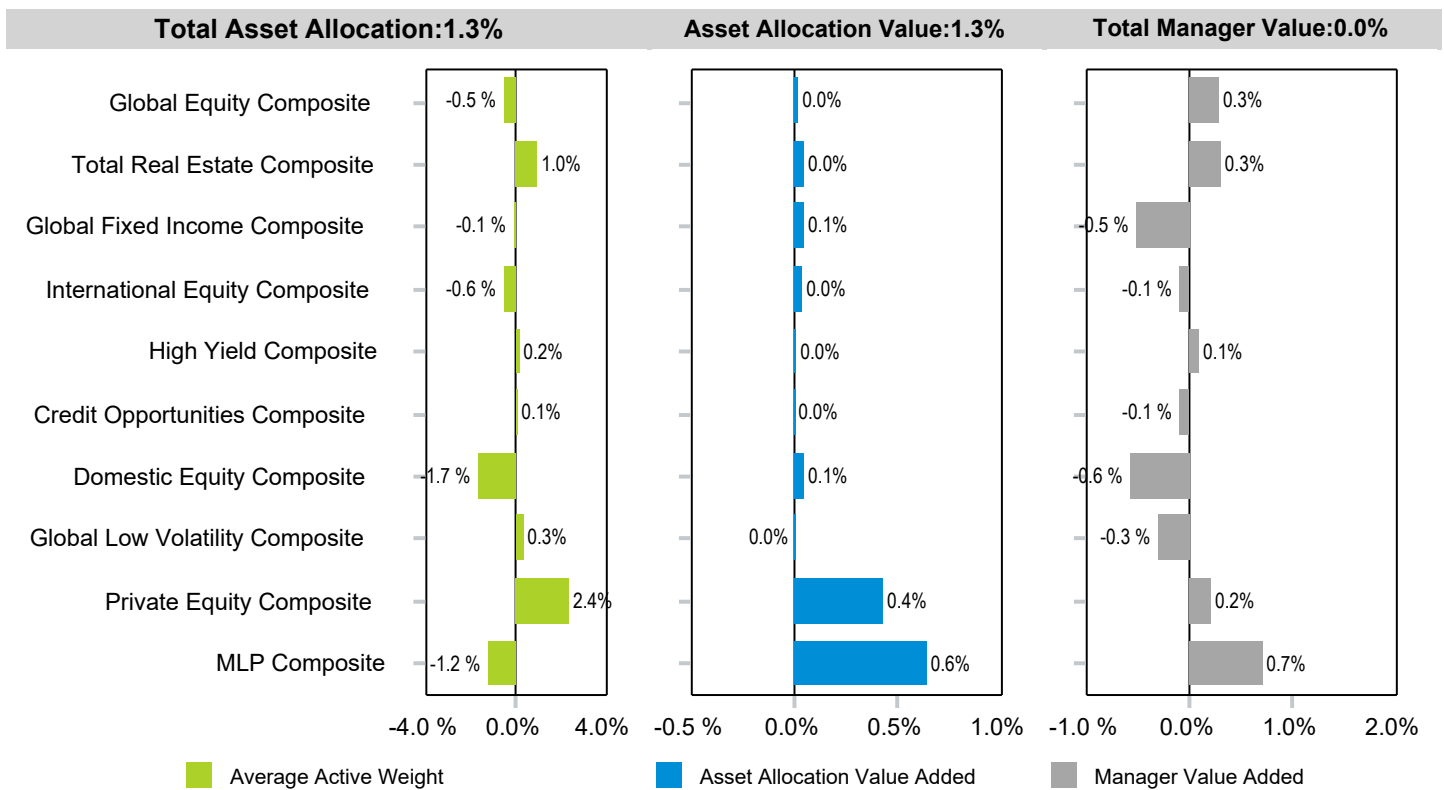
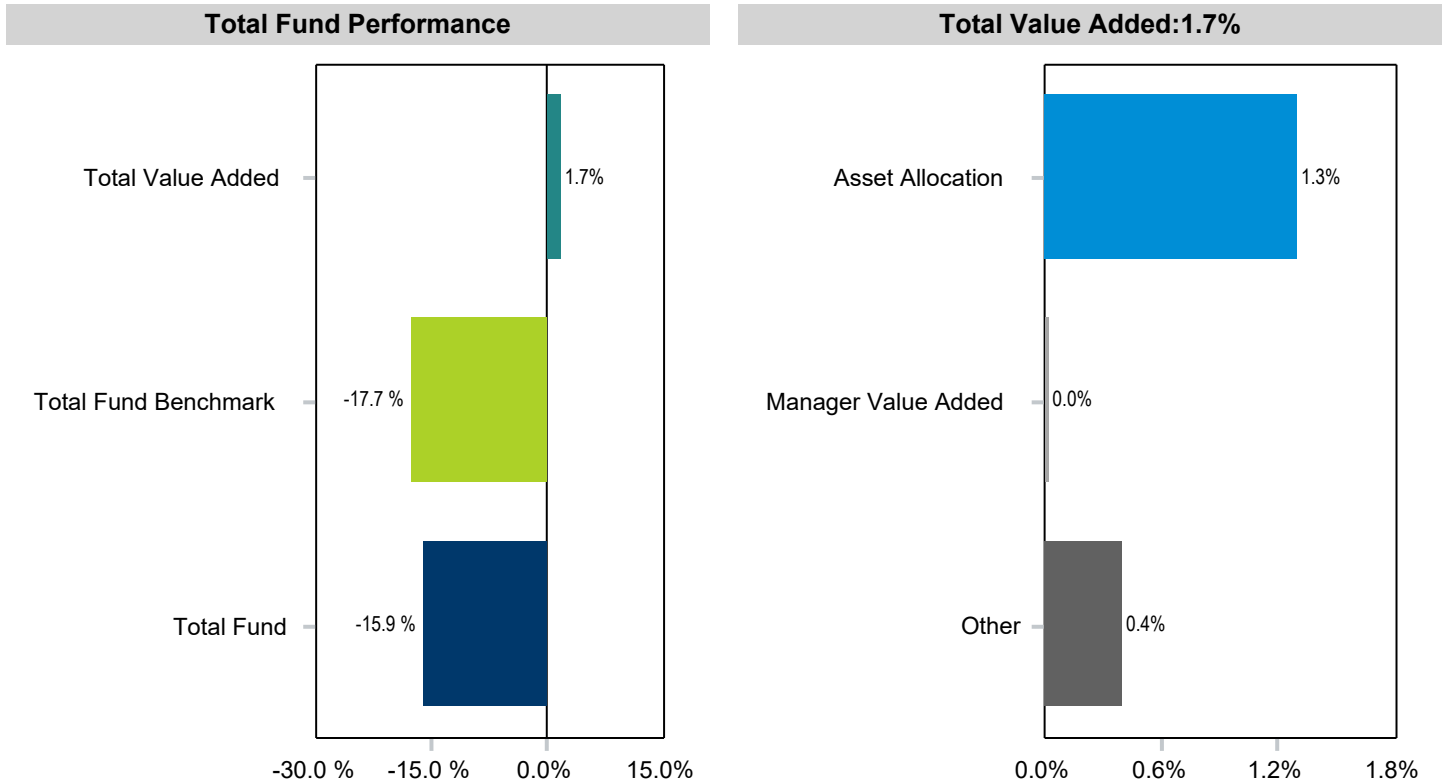
	Beg. Mkt (\$Millions)	Net Value	Net Contrib.	Net Distrib.	Investment Fees	Investment Gain/Loss	End Mkt Value	Total Return
1Q16	3,199.2	89.0	127.7	3.0	40.9	3,198.3	1.28%	
2Q16	3,198.3	70.8	105.2	2.8	116.2	3,277.3	3.54%	
3Q16	3,277.3	32.9	67.4	2.9	117.3	3,357.2	3.48%	
4Q16	3,357.2	28.1	66.0	3.0	21.4	3,337.8	0.62%	
1Q17	3,337.8	36.2	74.6	2.6	140.0	3,436.7	4.15%	
2Q17	3,436.7	24.9	68.7	3.2	86.6	3,476.4	2.46%	
3Q17	3,476.4	47.8	84.0	3.5	110.0	3,546.6	3.10%	
4Q17	3,546.6	31.1	74.1	3.3	107.5	3,607.8	3.02%	
1Q18	3,607.8	31.9	74.7	3.1	(37.9)	3,524.0	-1.09%	
2Q18	3,524.0	27.2	71.0	3.6	68.0	3,544.4	1.83%	
3Q18	3,544.4	31.6	75.1	3.3	101.0	3,598.8	2.74%	
4Q18	3,598.8	27.5	73.9	3.5	(274.6)	3,274.3	-7.66%	
1Q19	3,274.3	32.4	71.8	3.2	292.5	3,524.2	8.90%	
2Q19	3,524.2	27.7	76.6	3.4	108.0	3,579.9	3.04%	
3Q19	3,579.9	32.8	76.2	3.2	20.4	3,553.7	0.49%	
4Q19	3,553.7	27.7	79.8	3.6	154.3	3,653.6	4.28%	
1Q20	3,653.6	32.7	75.8	3.8	(572.3)	3,034.4	-15.94%	

- At the end of the first quarter of 2020, the Fund's market value was \$3,034.4 million, which represented a decrease of \$619.2 million in total net asset value over the previous quarter. The change in the Fund's value was driven by \$32.7 million in net contributions, \$572.3 million investment loss, \$75.8 million in net distributions and \$3.8 million in investment management fees.

Total Fund Attribution

Dallas Total Fund

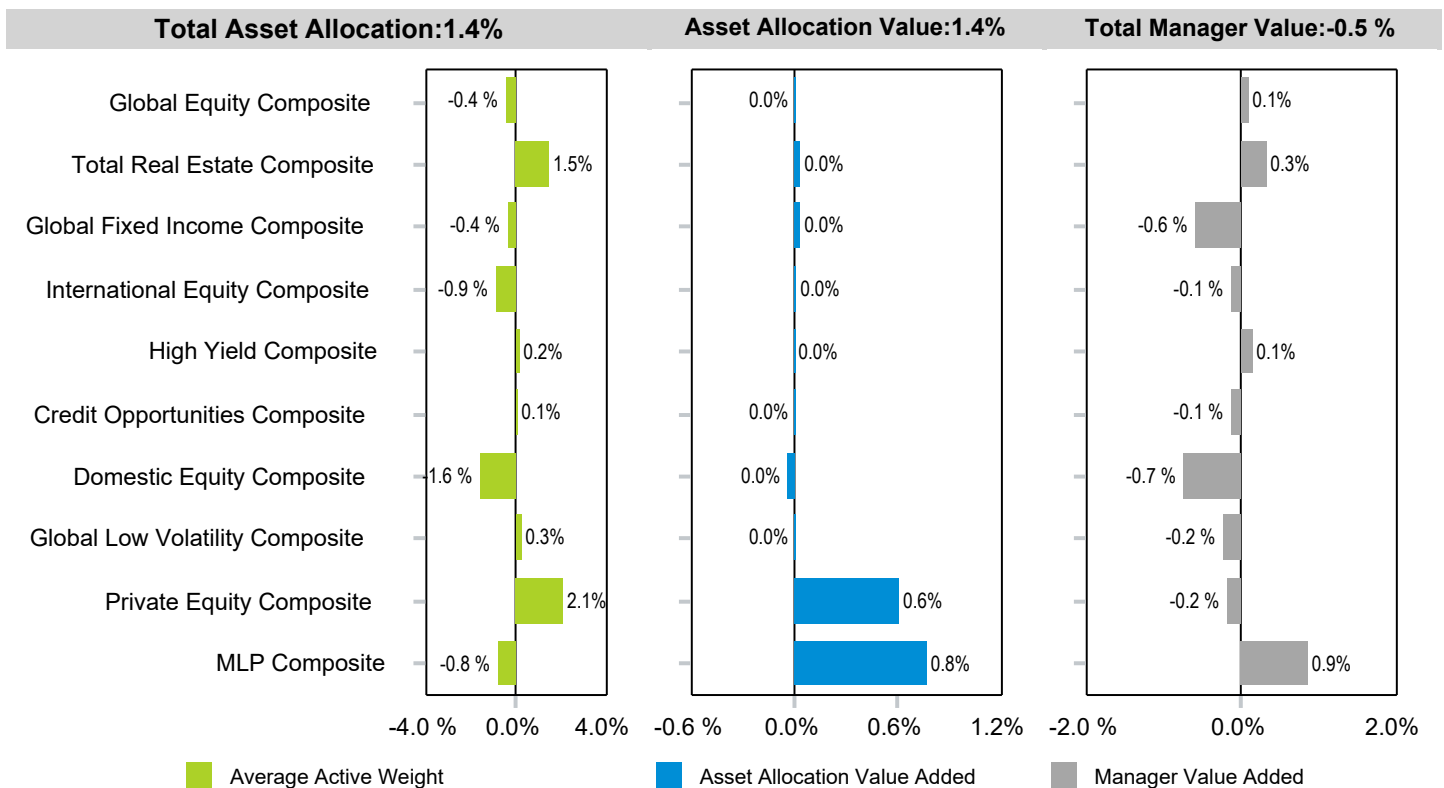
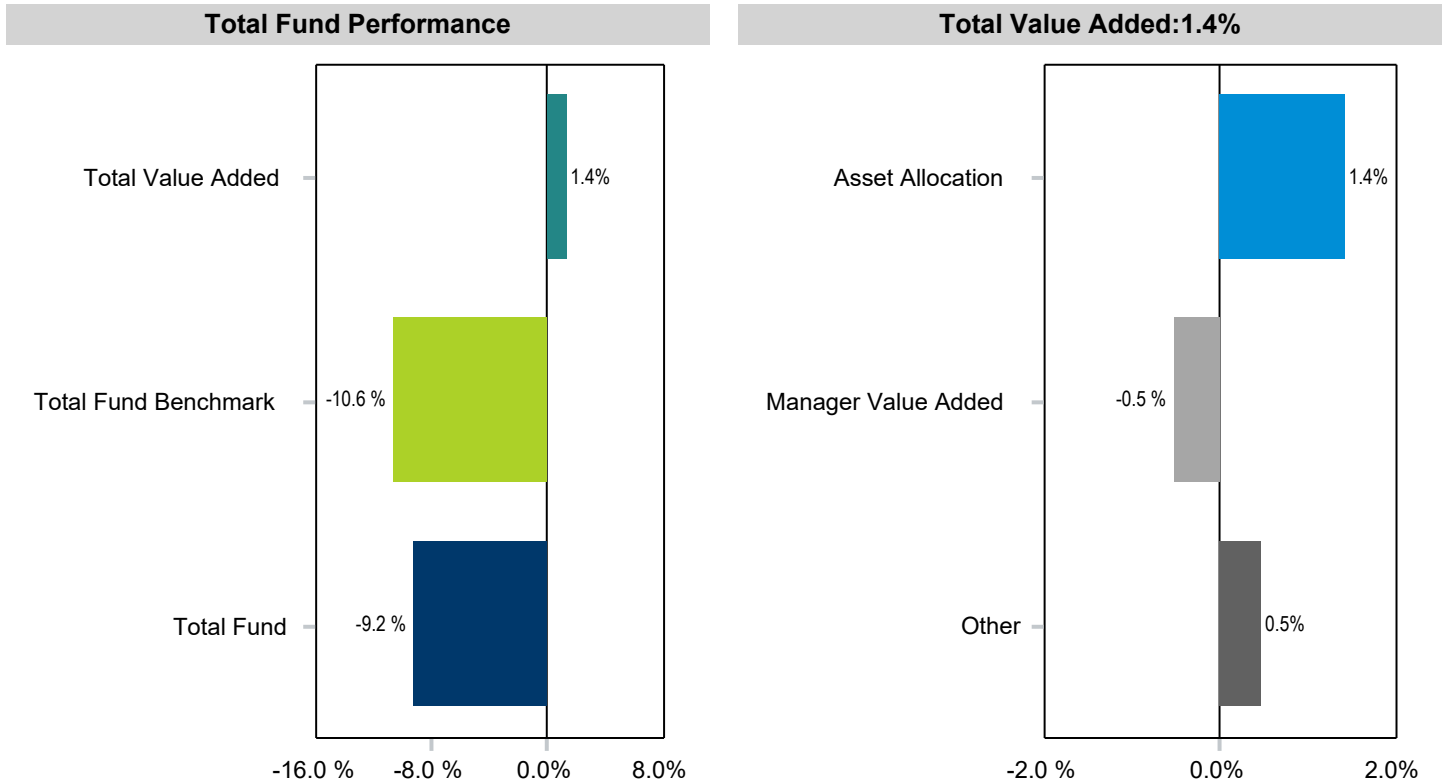
Periods Ended 1 Quarter Ending March 31, 2020



Total Fund Attribution

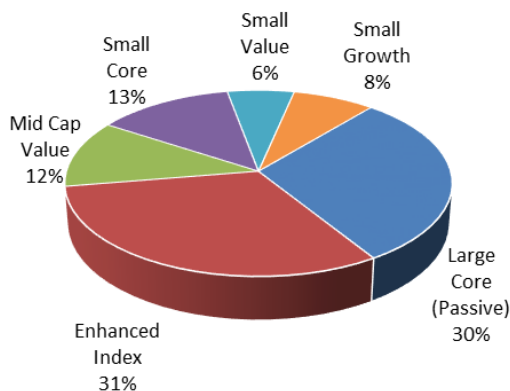
Dallas Total Fund

Periods Ended 1 Year Ending March 31, 2020

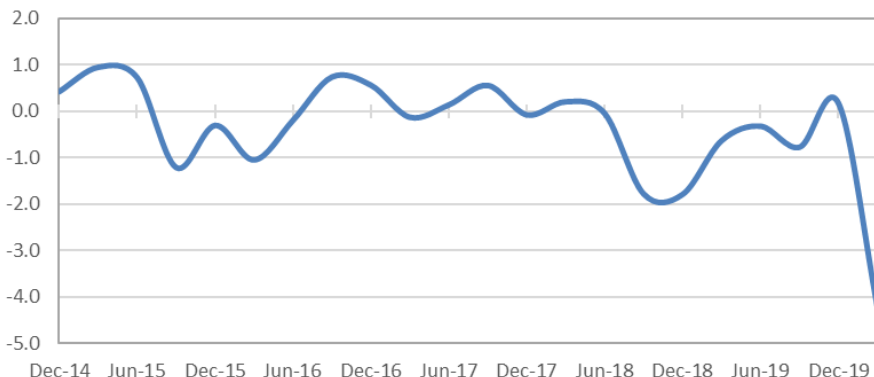


U.S. Equity Overview

U.S. Equity Structure



U.S. Equity Composite
 Quarterly Excess Return



Composite

	Assets		Performance				
	(Millions)	QTR	YTD	1-year	3-year	5-year	10-year
Total U.S. Equity (Gross)	\$ 370.0	-24.85	-24.85	-14.25	1.04	4.04	9.24
Total U.S. Equity (Net)		-24.93	-24.93	-14.61	0.65	3.66	8.85
Custom Benchmark ¹		-20.70	-20.70	-8.94	4.09	5.99	10.18
<i>Net of Fee Value Added vs Benchmark</i>		-4.23	-4.23	-5.67	-3.44	-2.33	-1.33
Small Cap Composite	\$ 99.8	-28.49	-28.49	-22.52	-5.15	-0.05	6.91
Wilshire 5000 Index		-20.70	-20.70	-8.94	4.09	5.99	10.18
S&P 500 Index		-19.60	-19.60	-6.98	5.10	6.73	10.53
Russell 2000 Index		-30.61	-30.61	-23.99	-4.64	-0.25	6.90

U.S. Equity Managers

	Assets		Performance (%)				Since Inception	Inception Date
	(Millions)	QTR	YTD	1-year	3-year	5-year		
Large Core - Passive								
Northern Trust S&P 500 (Gross)	\$ 110.7	-19.59	-19.59	-6.95	5.13	6.77	9.24	Dec-94
Northern Trust S&P 500 (Net)		-19.59	-19.59	-6.95	5.13	6.76	9.21	Dec-94
S&P 500 Index		-19.60	-19.60	-6.98	5.10	6.73	9.16	Dec-94
<i>Net of Fee Value Added vs Benchmark</i>		0.01	0.01	0.03	0.03	0.03	0.05	
Enhanced Index								
T. Rowe Price (Gross)	\$ 116.1	-19.62	-19.62	-6.67	6.14	7.67	8.14	Mar-06
T. Rowe Price (Net)		-19.68	-19.68	-6.95	5.82	7.33	7.82	Mar-06
S&P 500 Index		-19.60	-19.60	-6.98	5.10	6.73	7.29	Mar-06
<i>Net of Fee Value Added vs Benchmark</i>		-0.08	-0.08	0.03	0.72	0.60	0.53	
Information Ratio				0.03	0.67	0.50		
Sharpe Ratio				-0.45	0.25	0.44		

¹ Domestic Equity Custom Benchmark: Wilshire 5000 Index (3q99 – Present); S&P 500 Index (1q90 – 2q99).

U.S. Equity Overview (Continued)

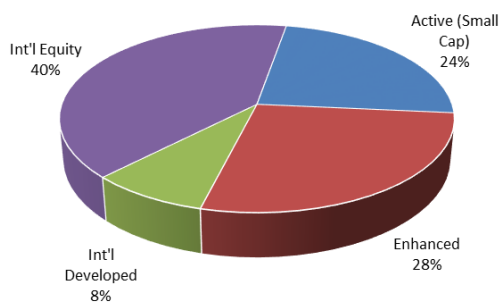
U.S. Equity Managers

	Assets (Millions)	QTR	Performance (%)			5-year	Since Inception	Inception Date
			YTD	1-year	3-year			
Small Core - Active								
Systematic Financial (Gross)	\$ 47.9	-32.33	-32.33	-23.64	-4.44	2.01	8.98	Jun-03
Systematic Financial (Net)		-32.47	-32.47	-24.28	-5.24	1.15	8.17	Jun-03
Russell 2000 Index		-30.61	-30.61	-23.99	-4.64	-0.25	6.87	Jun-03
<i>Net of Fee Value Added vs Benchmark</i>		-1.86	-1.86	-0.29	-0.60	1.40	1.30	
Information Ratio				-0.09	-0.15	0.35		
Sharpe Ratio				-0.90	-0.33	0.00		
Small Value - Active								
Channing Capital Management (Gross) *	\$ 23.3	-33.66	-33.66	-27.55	-9.23	-2.56	-0.01	Oct-13
Channing Capital Management (Net) *		-33.82	-33.82	-28.23	-10.09	-3.48	-0.93	Oct-13
Russell 2000 Value Index		-35.66	-35.66	-29.64	-9.51	-2.42	-0.68	Oct-13
<i>Net of Fee Value Added vs Benchmark</i>		1.84	1.84	1.41	-0.58	-1.06	-0.25	
Information Ratio				0.42	-0.12	-0.23		
Sharpe Ratio				-1.00	-0.51	-0.22		
Small Growth - Active								
Redwood Investments (Gross) *	\$ 28.7	-14.32	-14.32	-12.98	0.26		1.84	Sep-16
Redwood Investments (Net) *		-14.47	-14.47	-13.58	-0.44		1.23	Sep-16
Russell 2000 Growth Index		-25.76	-25.76	-18.58	0.10		2.61	
<i>Net of Fee Value Added vs Benchmark</i>		11.29	11.29	5.00	-0.54		-1.38	
Information Ratio				0.44	-0.06	--		
Sharpe Ratio				-0.81	-0.12	--		
Mid Cap Value - Active								
Smith Graham Mid Cap Value (Gross) *	\$ 43.4	-38.83	-38.83	-28.89			-15.75	Dec-17
Smith Graham Mid Cap Value (Net) *		-38.95	-38.95	-29.41			-16.33	Dec-17
Russell Midcap Index		-27.07	-27.07	-18.31			-6.20	
<i>Net of Fee Value Added vs Benchmark</i>		-11.88	-11.88	-11.10			-10.13	
Information Ratio				-0.90	--	--		
Sharpe Ratio				-0.83	--	--		

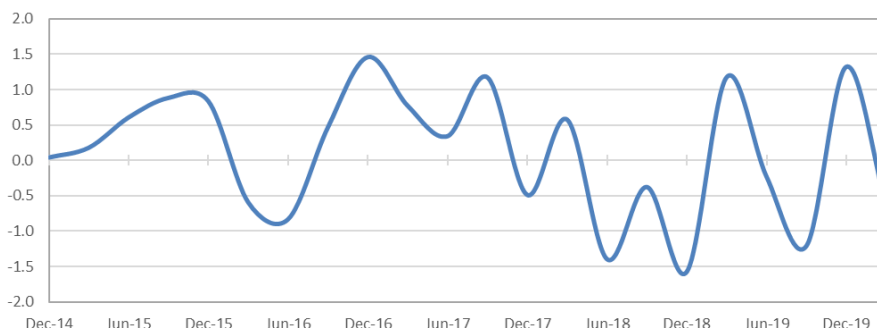
- ◆ The Fund's domestic equity composite generated a return of -24.93% (net of fees) during the first quarter of 2020, trailing the Wilshire 5000 Total Market Index, which returned -20.70%. Relative performance was negative during the quarter for T. Rowe Price, Systematic, and Smith Graham, while positive for Channing Capital and Redwood. Following this quarter's results, the domestic equity composite is trailing its benchmark over the one-, three-, five- and ten-year periods.

International Equity Overview

International Equity Structure



International Equity Composite
 Quarterly Excess Return



International Equity Composite

	Assets	Performance					
	(Millions)	QTR	YTD	1-year	3-year	5-year	10-year
Total International Equity (Gross)	\$ 334.2	-24.63	-24.63	-16.85	-2.62	0.03	3.66
Total International Equity (Net)		-24.74	-24.74	-17.23	-3.06	-0.42	3.21
Custom Benchmark ¹		-24.11	-24.11	-16.32	-2.34	-0.66	2.12
<i>Net of Fee Value Added vs Benchmark</i>		<i>-0.63</i>	<i>-0.63</i>	<i>-0.91</i>	<i>-0.72</i>	<i>0.24</i>	<i>1.09</i>
MSCI ACWI x-US IMI (Net)		-24.11	-24.11	-16.32	-2.34	-0.66	2.14
MSCI ACWI x-US (Net)		-23.36	-23.36	-15.57	-1.96	-0.64	2.05
MSCI EAFE (Net)		-22.83	-22.83	-14.38	-1.82	-0.62	2.72
MSCI Emerging Markets		-23.60	-23.60	-17.69	-1.62	-0.37	0.69

International Equity Managers

	Assets	Performance (%)					Since	Inception
	(Millions)	QTR	YTD	1-year	3-year	5-year	Inception	Date
Int'l Small Cap - Active								
Acadian International (Gross)	\$ 79.1	-27.53	-27.53	-20.82	-3.84	1.41	7.64	Mar-89
Acadian International (Net)		-27.63	-27.63	-21.26	-4.42	0.84	7.19	Mar-89
Custom Benchmark		-29.01	-29.01	-21.18	-4.89	-0.81	4.78	Mar-89
<i>Net of Fee Value Added vs Benchmark</i>		<i>1.38</i>	<i>1.38</i>	<i>-0.08</i>	<i>0.47</i>	<i>1.65</i>	<i>2.41</i>	
Information Ratio				-0.02	0.12	0.43		
Sharpe Ratio				-1.00	-0.34	-0.02		

² International Equity Custom Benchmark: MSCI ACWI x-US IMI (2q10 – Present); MSCI ACWI x-US (1q99 – 1q10); Wilshire Non-US/Non-SA (2q96 – 4q98); MSCI EAFE (4q89 – 1q96)

³ Acadian Custom Benchmark: MSCI ACWI x-US Small Cap (3q09 – Present); MSCI EAFE Small Cap (4q99 – 2q09); S&P/Citigroup Eur/Pac EMI Index (2q96 – 3q99); MSCI EAFE (2q89 – 1q96). Performance Objective: Custom Benchmark +2% (1q05 – Present); +1% (2q89 – 4q04).

International Equity Overview (Continued)

International Equity Managers

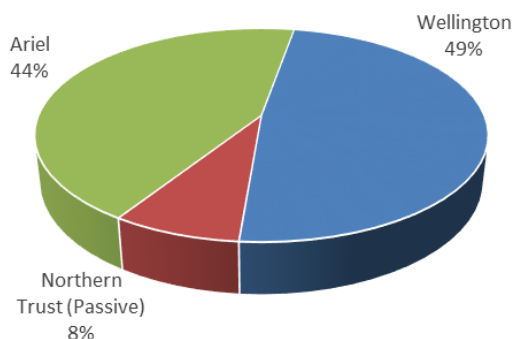
	Assets (Millions)	Performance (%)					Since Inception	Inception Date
		QTR	YTD	1-year	3-year	5-year		
Int'l Enhanced Index								
AQR Capital Management (Gross)	\$ 91.9	-22.62	-22.62	-16.51	-3.04	-0.05	2.06	Mar-06
AQR Capital Management (Net)		-22.73	-22.73	-16.86	-3.55	-0.60	1.55	Mar-06
Custom Benchmark		-23.36	-23.36	-15.57	-1.96	-0.64	1.21	Mar-06
<i>Net of Fee Value Added vs Benchmark</i>		0.63	0.63	-1.29	-1.59	0.04	0.34	
Information Ratio				-0.59	-0.63	0.02		
Sharpe Ratio				-0.92	-0.33	-0.12		
Int'l Developed								
Ativo International Developed (Gross) *	\$ 28.2	-25.55	-25.55	-16.70			-9.13	Dec-17
Ativo International Developed (Net) *		-25.66	-25.66	-17.19			-9.66	Dec-17
MSCI EAFE Index		-22.83	-22.83	-14.38			-8.85	
<i>Net of Fee Value Added vs Benchmark</i>		-2.83	-2.83	-2.81			-0.81	
Information Ratio				-0.55	--	--		
Sharpe Ratio				-0.86	--	--		
Int'l Equity (Active)								
Baillie Gifford (Gross)	\$ 73.1	-20.41	-20.41	-6.72			-6.72	Mar-19
Baillie Gifford (Net)		-20.51	-20.51	-7.00			-7.00	Mar-19
MSCI ACWI x-US (Net)		-23.36	-23.36	-15.57			-15.57	
<i>Net of Fee Value Added vs Benchmark</i>		2.85	2.85	8.57			8.57	
Information Ratio				--	--	--		
Sharpe Ratio				--	--	--		
Int'l Equity (Active)								
Earnest Partners (Gross) *	\$ 61.8	-28.41	-28.41	-21.17			-21.17	Mar-19
Earnest Partners (Net) *		-28.52	-28.52	-21.55			-21.55	Mar-19
MSCI ACWI x-US (Net)		-23.36	-23.36	-15.57			-15.57	
<i>Net of Fee Value Added vs Benchmark</i>		-5.16	-5.16	-5.98			-5.98	
Information Ratio				--	--	--		
Sharpe Ratio				--	--	--		

- ◆ The Fund's international equity composite returned -24.74% (net of fees) during the first quarter of 2020, trailing the MSCI ACWI x-US Investable Market Index (IMI) which returned -24.11%. Active management was mixed for the Fund's international equity program with three managers outperforming their respective benchmarks and two trailing their benchmarks. The program's long-standing small cap international equity mandate managed by Acadian succeeded in the first quarter, outperforming its benchmark by a significant margin although not being able to lead to composite outperformance for the quarter. The recently funded Earnest Partners portfolio significantly underperformed its benchmark during the period, creating a drag on relative composite performance. The international equity composite is currently outperforming against its benchmark for the five-year period.

⁵ AQR Custom Benchmark: MSCI ACWI x-US (2q10 – Present); MSCI EAFE (1q06 – 1q10); Performance Objective: Custom Benchmark + 1.5%.

Global Equity Overview

Global Equity Structure



Global Equity Composite

	Assets		Performance				
	(Millions)	QTR	YTD	1-year	3-year	5-year	10-year
Total Global Equity (Gross)	\$ 210.9	-17.19	-17.19	-9.06	2.70	3.38	
Total Global Equity (Net)		-17.30	-17.30	-9.56	2.20	2.89	
MSCI ACWI (Net)		-21.37	-21.37	-11.26	1.50	2.85	
<i>Net of Fee Value Added vs Index</i>		4.07	4.07	1.70	0.70	0.04	
MSCI ACWI IMI (Net)		-22.44	-22.44	-12.73	0.76	2.45	5.80
MSCI ACWI (Net)		-21.37	-21.37	-11.26	1.50	2.85	5.88
MSCI World (Net)		-21.05	-21.05	-10.39	1.92	3.25	6.57

Global Equity Managers

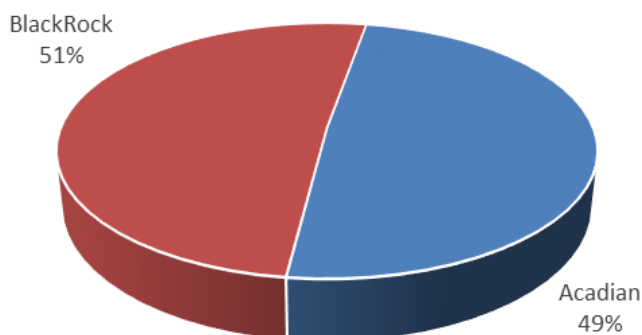
	Assets (Millions)	Performance (%)					Since Inception	Inception Date
		QTR	YTD	1-year	3-year	5-year		
Global Equity - Active								
Wellington (Gross)	\$ 102.3	-19.18	-19.18	-10.45	1.76	3.16	8.85	Jan-00
Wellington (Net)		-19.30	-19.30	-10.97	1.17	2.55	8.25	Aug-12
MSCI ACWI (Net)		-21.37	-21.37	-11.26	1.50	2.85	6.38	Aug-12
<i>Net of Fee Value Added vs Benchmark</i>		2.07	2.07	0.29	-0.33	-0.30	1.87	
Information Ratio				0.11	-0.10	-0.09		
Sharpe Ratio				-0.65	-0.04	0.09		
Global Equity - Active								
Ariel (Gross) *	\$ 92.1	-13.83	-13.83	-6.86			-1.35	Dec-17
Ariel (Net) *		-13.96	-13.96	-7.43			-1.91	Dec-17
MSCI ACWI (Net)		-21.37	-21.37	-11.26			-4.49	
<i>Net of Fee Value Added vs Benchmark</i>		7.41	7.41	3.83			2.58	
Information Ratio				0.57	--	--		
Sharpe Ratio				-0.63	--	--		
Global Equity - Passive								
Northern Trust (Gross)	\$ 16.4	-22.25	-22.25	-12.01	1.31		5.48	Oct-15
Northern Trust (Net)		-22.25	-22.25	-12.01	1.27		5.43	Oct-15
MSCI ACWI IMI (Net)		-22.44	-22.44	-12.73	0.76		4.93	Oct-15
<i>Net of Fee Value Added vs Benchmark</i>		0.19	0.19	0.72	0.51		0.50	

Global Equity Overview (Continued)

- ◆ The global equity composite is comprised of an actively-managed strategy (with a U.S. bias relative to the benchmark) managed by Wellington. This strategy is complemented by a passively-managed strategy provided by Northern Trust. The composite also recently added an exposure to the Ariel Global Product strategy which has recently completed its first two years of performance. The new structure favors active management (currently 92% active/8% passive) versus the previous 50%/50% allocation between active and passively managed funds within the composite. During the first quarter the two actively managed strategies both outperformed their respective benchmarks while the passive Northern Trust strategy was in line with its benchmark. The global equity composite is currently outperforming its benchmark across all time periods including since inception (9/12).

Global Low Volatility Equity Overview

Global Low Volatility Structure



Global Low Volatility Composite

	Assets (Millions)	Performance					
		QTR	YTD	1-year	3-year	5-year	10-year
Total Global Low Volatility (Gross)	\$ 358.9	-18.85	-18.85	-9.47	2.43		
Total Global Low Volatility (Net)		-18.89	-18.89	-9.67	2.24		
MSCI ACWI Minimum Volatility (Net)		-16.00	-16.00	-7.52	3.72		
<i>Net of Fee Value Added vs Index</i>		-2.89	-2.89	-2.15	-1.48		
MSCI ACWI Minimum Volatility (Net)		-16.00	-16.00	-7.52	3.72	4.62	8.11
MSCI World x-US Minimum Volatility (Net)		-16.46	-16.46	-10.56	1.48	1.91	5.64
MSCI ACWI (Net)		-21.37	-21.37	-11.26	1.50	2.85	5.88

Global Equity Managers

	Assets (Millions)	Performance (%)				Since Inception	Inception Date
		QTR	YTD	1-year	3-year		
Global Low Volatility - Active							
Acadian Global Low Vol (Gross)	\$ 176.7	-20.72	-20.72	-10.65	1.08	3.94	Jun-15
Acadian Global Low Vol (Net)		-20.79	-20.79	-11.01	0.74	3.60	Jun-15
MSCI ACWI (Net)		-21.37	-21.37	-11.26	1.50	2.93	Jun-15
<i>Net of Fee Value Added vs MSCI ACWI</i>		0.58	0.58	0.25	-0.76	0.67	
MSCI ACWI Min Vol (Net)		-16.00	-16.00	-7.52	3.72	5.25	Jun-15
<i>Net of Fee Value Added vs MSCI ACWI Min Vol</i>		-4.79	-4.79	-3.49	-2.98	-1.65	
Information Ratio				0.04	-0.16	--	
Sharpe Ratio				-0.73	-0.08	--	
Global Low Volatility - Passive							
BlackRock Global Low Vol (Gross)	\$ 182.2	-16.94	-16.94	-8.27	3.77	5.49	Jun-15
BlackRock Global Low Vol (Net)		-16.94	-16.94	-8.30	3.74	5.47	Jun-15
MSCI ACWI Min Vol (Net)		-16.00	-16.00	-7.52	3.72	5.25	Jun-15
<i>Net of Fee Value Added vs Benchmark</i>		-0.94	-0.94	-0.78	0.02	0.22	

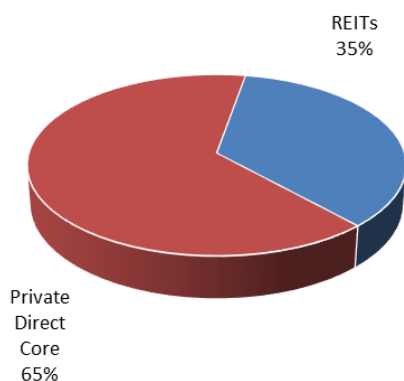
*Acadian Info Ratio/Sharpe Ratio statistics based on MSCI ACWI Min Vol benchmark.

Global Low Volatility Equity Overview (Continued)

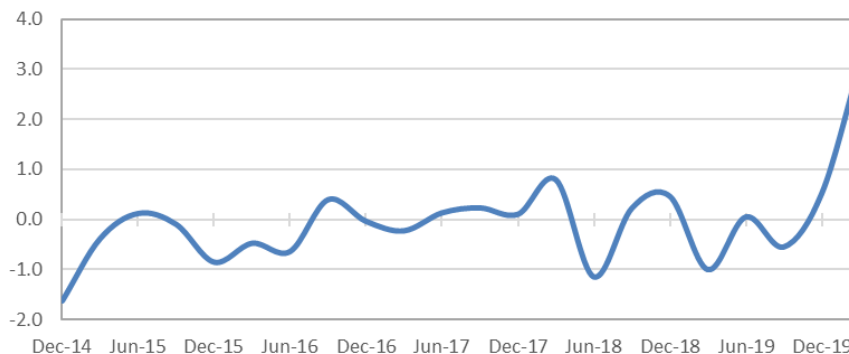
- ◆ In 2015, the Board elected to transfer assets from existing strategies elsewhere in the Fund into two new global low volatility equity portfolios. The first portfolio is actively-managed and run by Acadian. Its primary mandate is to provide the Fund with a better risk/return profile relative to the broad MSCI ACWI, its primary benchmark (the Acadian portfolio's performance is also measured against the MSCI ACWI Minimum Volatility as a secondary benchmark). The second portfolio is a passively-managed index fund provided through BlackRock. Taken together, both funds will add diversification benefits to the existing suite of public equity managers. The global low volatility equity composite trails the MSCI ACWI Minimum Volatility Index across all time periods except since inception where it's slightly ahead.

Real Estate Overview

Real Estate Structure



Total Real Estate Composite
 Quarterly Excess Return



Real Estate Composite

	Assets		Performance				
	(Millions)	QTR	YTD	1-year	3-year	5-year	10-year
Total Real Estate (Gross)	\$ 351.4	-9.82	-9.82	-2.73	4.07	5.01	14.40
Total Real Estate (Net)		-9.96	-9.96	-3.31	3.47	4.36	13.63
Custom Benchmark ¹		-13.04	-13.04	-6.62	2.28	3.67	13.52
<i>Net of Fee Value Added vs Benchmark</i>		3.08	3.08	3.31	1.19	0.69	0.11
REIT Strategies	\$ 124.4	-24.09	-24.09	-17.47	-1.24	0.00	12.05
Private Core Real Estate	\$ 226.9	0.25	0.25	6.71	6.40	7.11	
Wilshire Real Estate Securities Index		-25.73	-25.73	-19.47	-2.47	0.08	7.76
NCREIF Open Diversified Core Equity (Net)		0.75	0.75	3.93	5.85	7.48	

Real Estate Managers

	Assets		Performance (%)				Since Inception	Inception Date
	(Millions)	QTR	YTD	1-year	3-year	5-year		
Real Estate Securities - Public								
Adelante Capital Management (Gross)	\$ 62.4	-23.46	-23.46	-16.57	-0.11	0.70	9.02	Sep-01
Adelante Capital Management (Net)		-23.58	-23.58	-17.05	-0.68	0.12	8.44	Sep-01
Wilshire Real Estate Securities		-25.73	-25.73	-19.47	-2.47	0.08	8.61	Sep-01
<i>Net of Fee Value Added vs Index</i>		2.15	2.15	2.42	1.79	0.04	-0.17	
Information Ratio				1.18	0.90	0.02		
Sharpe Ratio				-0.92	-0.15	-0.07		
CenterSquare (Gross)	\$ 62.0	-24.48	-24.48	-17.48			-2.91	May-18
CenterSquare (Net)		-24.59	-24.59	-17.88			-3.33	May-18
Wilshire Real Estate Securities		-25.73	-25.73	-19.47			-4.78	May-18
<i>Net of Fee Value Added vs Index</i>		1.14	1.14	1.59			1.45	
Information Ratio				1.46	--	--		
Sharpe Ratio				-0.89	--	--		

⁶ Real Estate Custom Benchmark: 50% Wilshire RESI / 39% NCREIF ODCE NOF/11% Invesco Custom Benchmark (4q13 – Present); Wilshire RESI (4q89 – 4q10).

Real Estate Overview (Continued)

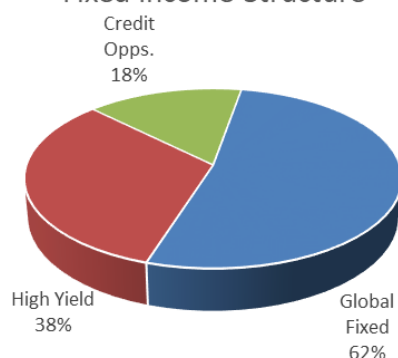
Real Estate Managers

	Assets (Millions)	QTR	Performance (%)				Since Inception	Inception Date
			YTD	1-year	3-year	5-year		
Direct Core Real Estate - Private								
Heitman America Real Estate Trust (Gross)	\$ 84.0	-1.85	-1.85	-1.20	4.41	7.30	10.77	Aug-10
Heitman America Real Estate Trust (Net)		-2.07	-2.07	-2.08	3.49	6.35	9.74	Aug-10
NCREIF Open-End Diversified Core (Net)		0.75	0.75	3.93	5.85	7.48	10.12	Aug-10
<i>Net of Fee Value Added vs Index</i>		-2.82	-2.82	-6.01	-2.36	-1.13	-0.38	
Invesco Core Real Estate USA (Gross)	\$ 73.3	1.87	1.87	8.13	8.75	10.24	11.91	Aug-10
Invesco Core Real Estate USA (Net)		1.65	1.65	7.20	7.83	9.29	10.94	Aug-10
NCREIF Open-End Diversified Core (Net)		0.75	0.75	3.93	5.85	7.48	10.12	Aug-10
<i>Net of Fee Value Added vs Index</i>		0.90	0.90	3.27	1.98	1.81	0.82	
Invesco II	\$ 69.7	1.67	1.67	18.40	8.56	3.69	2.44	Oct-13

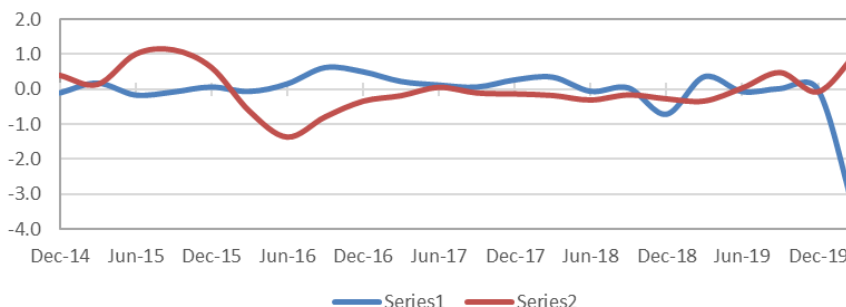
- ◆ The Fund's total real estate composite is comprised of both public market real estate securities (REITs) and private investment in direct core real estate. The total segment returned -9.96% (net of fees) during the first quarter, outperforming its benchmark (split 50% Wilshire Real Estate Securities Index, 39% NCREIF Open-End Diversified Core Index and 11% Invesco II Custom Benchmark) which returned -13.04%. On the public side, both REIT exposures outperformed the Wilshire Real Estate Securities Index. On the private side, Invesco led the NCREIF ODCE Index while Heitman trailed. Currently, the Fund's total real estate composite outperforms its benchmark across all time periods, not including since inception (12/89)

Fixed Income Overview

Fixed Income Structure



Global Fixed Income and High Yield
 Quarterly Excess Return



Fixed Income Composites

	Assets (Millions)	Performance					
		QTR	YTD	1-year	3-year	5-year	10-year
Global Fixed Income (Gross)	\$ 517.0	-0.46	-0.46	5.21	3.90	3.14	4.37
Global Fixed Income (Net)		-0.51	-0.51	4.99	3.68	2.93	4.17
Bloomberg Aggregate Bond Index		3.15	3.15	8.93	4.82	3.36	3.88
<i>Net of Fee Value Added vs Benchmark</i>		-3.66	-3.66	-3.94	-1.14	-0.43	0.29
High Yield (Gross)	\$ 321.3	-11.93	-11.93	-5.72	0.98	2.84	5.70
High Yield (Net)		-12.08	-12.08	-6.22	0.46	2.35	5.20
Custom Benchmark ¹		-13.08	-13.08	-7.65	0.45	2.43	5.33
<i>Net of Fee Value Added vs Benchmark</i>		1.00	1.00	1.43	0.01	-0.08	-0.13
Bloomberg Aggregate		3.15	3.15	8.93	4.82	3.36	3.88
Citigroup High Yield Cash Pay		-13.08	-13.08	-7.65	0.45	2.43	5.33
BofA ML High Yield Master II		-13.12	-13.12	-7.45	0.55	2.67	5.50

Global Fixed Income Managers

	Assets (Millions)	Performance (%)					Since Inception	Inception Date
		QTR	YTD	1-year	3-year	5-year	Inception	Date
Global Fixed Income								
Securian Asset Mgmt. (Gross)	\$ 219.2	-2.65	-2.65	3.03	3.40	3.04	4.61	May-07
Securian Asset Mgmt. (Net)		-2.69	-2.69	2.85	3.22	2.85	4.44	May-07
Bloomberg Aggregate		3.15	3.15	8.93	4.82	3.36	4.53	May-07
<i>Net of Fee Value Added vs Benchmark</i>		-5.84	-5.84	-6.08	-1.60	-0.51	-0.09	
Information Ratio				-1.02	-0.47	-0.19		
Sharpe Ratio				0.08	0.29	0.41		
Aberdeen (Gross)	\$ 227.1	1.22	1.22	7.17	4.36	3.29	4.97	Apr-07
Aberdeen (Net)		1.16	1.16	6.93	4.11	3.07	4.76	Apr-07
Bloomberg Aggregate		3.15	3.15	8.93	4.82	3.36	4.39	Apr-07
<i>Net of Fee Value Added vs Benchmark</i>		-1.99	-1.99	-2.00	-0.71	-0.29	0.37	
Information Ratio				-0.83	-0.45	-0.21		
Sharpe Ratio				0.90	0.61	0.55		

⁷ High Yield Custom Benchmark: Citigroup High Yield Cash Pay (4q99 – Present); Citigroup High Yield Composite Index (1q97 – 3q99).

Fixed Income Overview (Continued)

Global Fixed Income Managers

	Assets (Millions)	Performance (%)					Since Inception	Inception Date
		QTR	YTD	1-year	3-year	5-year		
Global Fixed Income								
Garcia Hamilton (Gross)	\$ 70.7	1.19	1.19	5.98	4.07	3.04	3.87	Oct-13
Garcia Hamilton (Net)		1.13	1.13	5.71	3.80	2.78	3.62	Oct-13
Bloomberg Aggregate		3.15	3.15	8.93	4.82	3.36	3.64	Oct-13
<i>Net of Fee Value Added vs Benchmark</i>		<i>-2.02</i>	<i>-2.02</i>	<i>-3.22</i>	<i>-1.02</i>	<i>-0.58</i>	<i>-0.02</i>	
Information Ratio				-2.30	-0.81	-0.48		
Sharpe Ratio				0.87	0.71	0.55		

- ◆ The Fund's global fixed income segment returned -0.51% (net of fees) during the first quarter of 2020, trailing the Bloomberg Aggregate Bond Index, which returned 3.15%. The segment is comprised of three actively managed strategies: (1) Securian Asset Management (previously Advantus Capital Management), (2) Aberdeen Asset Management, and (3) Garcia Hamilton. During the period, all three actively managed portfolios trailed the Bloomberg Aggregate Index. Securian and Aberdeen (both with early 2007 inception dates) manage roughly the same level of assets for the Fund while the Garcia Hamilton portfolio has a smaller mandate. Therefore, quarter to quarter performance is largely driven by the results of the Securian and Aberdeen accounts while the Garcia Hamilton account does not have the ability to move the needle as much, so to speak, on account of its smaller size. Following this period's results, the global fixed income composite now trails the Bloomberg Aggregate over the one-, three-, and five-year period, although does lead over the ten-year period.

Fixed Income Overview (Continued)

High Yield/Credit Opportunities Managers

	Assets (Millions)	Performance (%)					Since Inception	Inception Date
		QTR	YTD	1-year	3-year	5-year		
High Yield								
Oaktree Capital Management (Gross)	\$ 159.8	-12.58	-12.58	-7.13	0.16	2.13	6.55	Dec-96
Oaktree Capital Management (Net)		-12.69	-12.69	-7.58	-0.33	1.62	6.03	Dec-96
Custom Benchmark		-13.32	-13.32	-7.92	0.33	2.33		Dec-96
Net of Fee Value Added vs Benchmark		0.63	0.63	0.34	-0.66	-0.71		
Information Ratio				0.05	-0.71	-0.80		
Sharpe Ratio				-0.84	-0.28	0.06		
BlackRock High Yield (Gross)								
BlackRock High Yield (Gross)	\$ 161.5	-11.27	-11.27	-4.29	1.80	3.11	5.95	Sep-06
BlackRock High Yield (Net)		-11.48	-11.48	-4.84	1.26	2.61	5.47	Sep-06
Citigroup High Yield Cash Pay		-13.08	-13.08	-7.65	0.45	2.43	5.80	Sep-06
Net of Fee Value Added vs Benchmark		1.60	1.60	2.81	0.81	0.18	-0.33	
Information Ratio				1.71	0.70	0.10		
Sharpe Ratio				-0.62	-0.08	0.21		
Credit Opportunities								
Neuberger Berman (Gross)	\$ 152.6	-15.10	-15.10	-10.03	-0.01		3.20	Jan-16
Neuberger Berman (Net)		-15.15	-15.15	-10.29	-0.31		2.93	Jan-16
Custom Benchmark		-13.18	-13.18	-7.80	0.09		3.78	Jan-16
Net of Fee Value Added vs Benchmark		-1.97	-1.97	-2.49	-0.40		-0.85	
Information Ratio				-1.19	-0.24	--		
Sharpe Ratio				-0.80	-0.22	--		

- ◆ The high yield composite returned -12.08% (net of fees) during the first quarter, leading the Citigroup High Yield Cash Pay Index, which returned -13.08%. The composite is currently split equally between the two actively-managed strategies. During the period, both BlackRock and Oaktree outperformed the benchmark. The high yield composite is currently underperforming its benchmark over extended time periods greater than three-year including since inception (03/97).

⁸ Oaktree Capital Management Performance Objective: Citigroup High Yield Cash Pay + 1% (4q99 – Present); Citigroup High Yield Composite Index + 1% (2q97 – Present).

Private Equity Overview

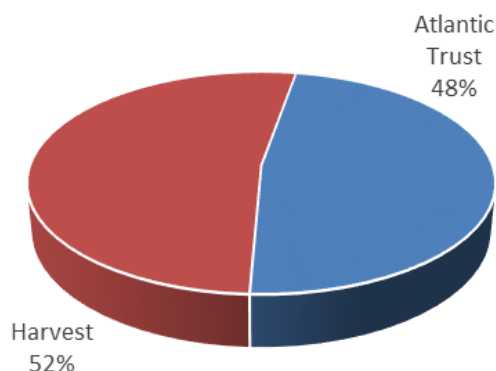
Private Equity Composite

	Total Commitment	Cumulative Capital Called		Cumulative Distributions	Capital Balance	Multiple	Calculated IRR
Hamilton Lane Fund VII LP (Series A)	30,000,000	25,297,247	84.3%	26,051,961	13,522,908	1.56	9.8%
Hamilton Lane Fund VII LP (Series B)	20,000,000	17,695,467	88.5%	9,066,469	9,753,041	1.06	1.2%
<i>Hamilton Lane Fund VII LP (Total)</i>	<i>50,000,000</i>	<i>42,992,714</i>	<i>86.0%</i>	<i>35,118,430</i>	<i>23,275,949</i>	<i>1.36</i>	<i>6.4%</i>
Hamilton Lane Secondary Fund II LP	25,000,000	22,848,181	91.4%	27,078,689	1,324,190	1.24	8.4%
Hamilton Lane Secondary Fund III LP	30,000,000	17,764,658	59.2%	18,603,871	10,511,062	1.64	18.7%
Hamilton Lane Secondary Fund IV LP	30,000,000	18,667,963	62.2%	3,099,866	22,020,513	1.35	23.9%
Hamilton Lane Fund VIII LP (Global)	30,000,000	16,412,837	54.7%	4,425,140	21,524,925	1.58	10.6%
GCM Grosvenor - Partnership, L.P.	75,000,000	81,752,229	109.0%	86,497,244	47,598,903	1.64	14.8%
GCM Grosvenor - Partnership II, L.P. (2014)	60,000,000	59,234,526	98.7%	19,096,084	55,618,332	1.26	13.1%
GCM Grosvenor - Partnership II, L.P. (2015)	20,000,000	29,470,171	147.4%	3,512,059	38,059,107	1.41	18.2%
GCM Grosvenor - Partnership II, L.P. (2017)	30,000,000	10,939,984	36.5%	105,389	10,637,953	0.98	0.1%
Fairview Capital III *	40,000,000	36,477,216	91.2%	3,663,353	39,383,343	1.18	9.5%
Total Private Equity Program	390,000,000	336,560,480	86.3%	201,200,125	269,954,277	1.40	12.9%

- Multiple calculation = (market value + distributions) / capital called
- Internal Rate of Return shown here is calculated by Wilshire based on cumulative cash flows and annualized since inception.

MLP Overview

MLP Structure



MLP Composite

	Assets		Performance				
	(Millions)	QTR	YTD	1-year	3-year	5-year	10-year
Total MLPs (Gross)	\$ 102.5	-48.04	-48.04	-51.51	-22.01	-15.70	
Total MLPs (Net)		-48.13	-48.13	-51.83	-22.52	-16.25	
Alerian MLP Index		-57.19	-57.19	-60.95	-28.91	-20.66	
<i>Net of Fee Value Added vs Index</i>		9.06	9.06	9.12	6.39	4.41	
Alerian MLP Index		-57.19	-57.19	-60.95	-28.91	-20.66	-5.04
S&P MLP Index		-56.86	-56.86	-62.51	-32.47	-25.77	-10.13
Bloomberg Commodities Index		-23.29	-23.29	-22.31	-8.61	-7.76	-6.74

Managers

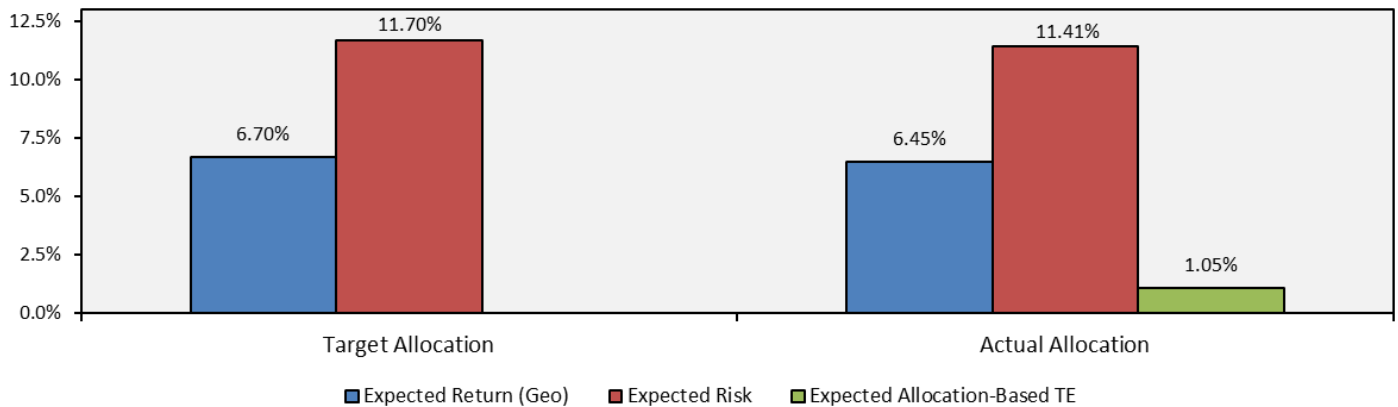
MLPs	Assets		Performance (%)				Since	Inception
	(Millions)	QTR	YTD	1-year	3-year	5-year	Inception	Date
Harvest Fund Advisors (Gross)	\$ 53.4	-46.38	-46.38	-49.17	-20.61	-14.98	-2.89	
Harvest Fund Advisors (Net)		-46.48	-46.48	-49.55	-21.21	-15.61	-3.57	Dec-11
Alerian MLP Index		-57.19	-57.19	-60.95	-28.91	-20.66	-10.05	Dec-11
<i>Net of Fee Value Added vs Benchmark</i>		10.71	10.71	11.40	7.70	5.05	6.48	
Information Ratio				1.70	1.03	0.73		
Sharpe Ratio				-1.28	-0.77	-0.62		
Atlantic Trust CIBC (Gross)	\$ 49.1	-49.76	-49.76	-53.84	-23.49	-16.49	-3.35	
Atlantic Trust CIBC (Net)		-49.84	-49.84	-54.10	-23.93	-16.96	-3.88	Dec-11
Alerian MLP Index		-57.19	-57.19	-60.95	-28.91	-20.66	-10.05	Dec-11
<i>Net of Fee Value Added vs Benchmark</i>		7.35	7.35	6.85	4.98	3.70	6.17	
Information Ratio				1.47	0.96	0.73		
Sharpe Ratio				-1.29	-0.83	-0.64		

MLP Overview (Continued)

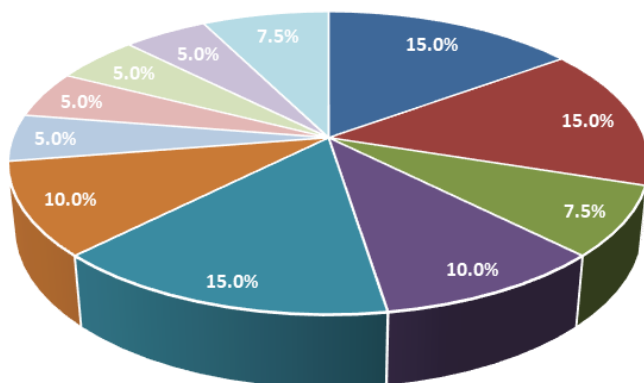
- ◆ The Fund's Master Limited Partnership (MLP) program is comprised of two individual managers, Harvest Fund Advisors and Atlantic Trust (formerly Invesco), with the mandates essentially split evenly between the two. Commodity results were negative for the quarter as crude oil fell -66.5% to \$20.48 per barrel, the lowest level since the end of the 2001 recession. Natural gas prices were down -25.1%, ending the quarter at \$1.64 per million BTUs. MLPs were among the worst performing market segments, down -57.19% for the quarter. The additional headwind of the crude oil price war that stemmed from Russia and Saudi Arabia's inability to come to an agreement on production cuts led to a broad energy decline with S&P Energy Select Sector Index returning -50.70% during the quarter.

Appendix: Risk Analysis & Performance Objectives

Expected Return and Risk

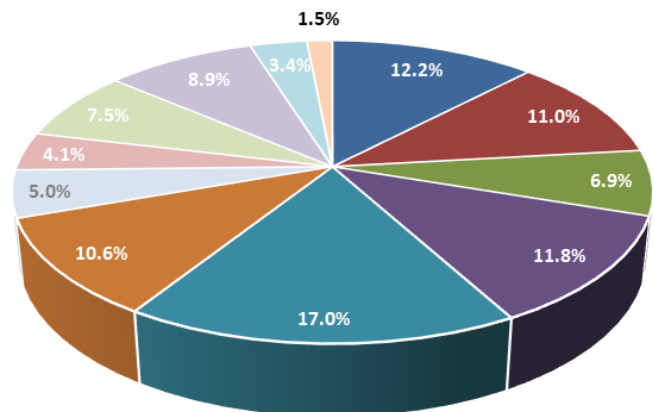


Target Asset Allocation



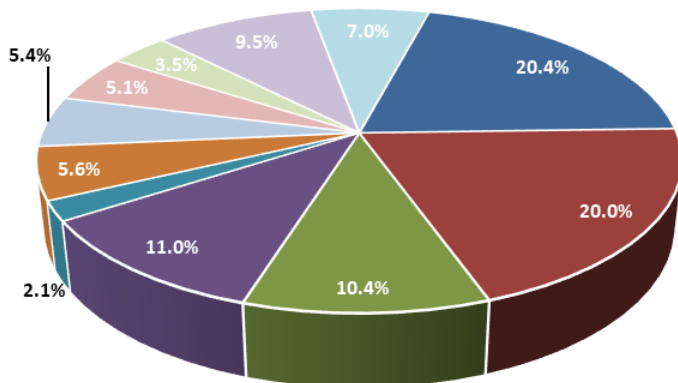
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Actual Asset Allocation



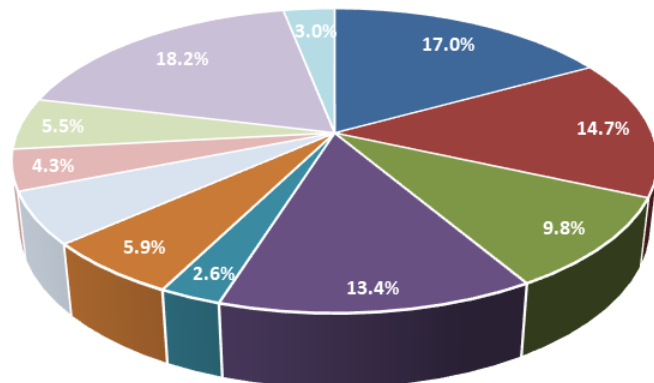
Global Low Vol, Global Fixed Income, High Yield, Private Equity, MLPs, Cash, Opp Credit, Public REITs, Private Real Est.

Contribution to Total Risk - Target Allocation



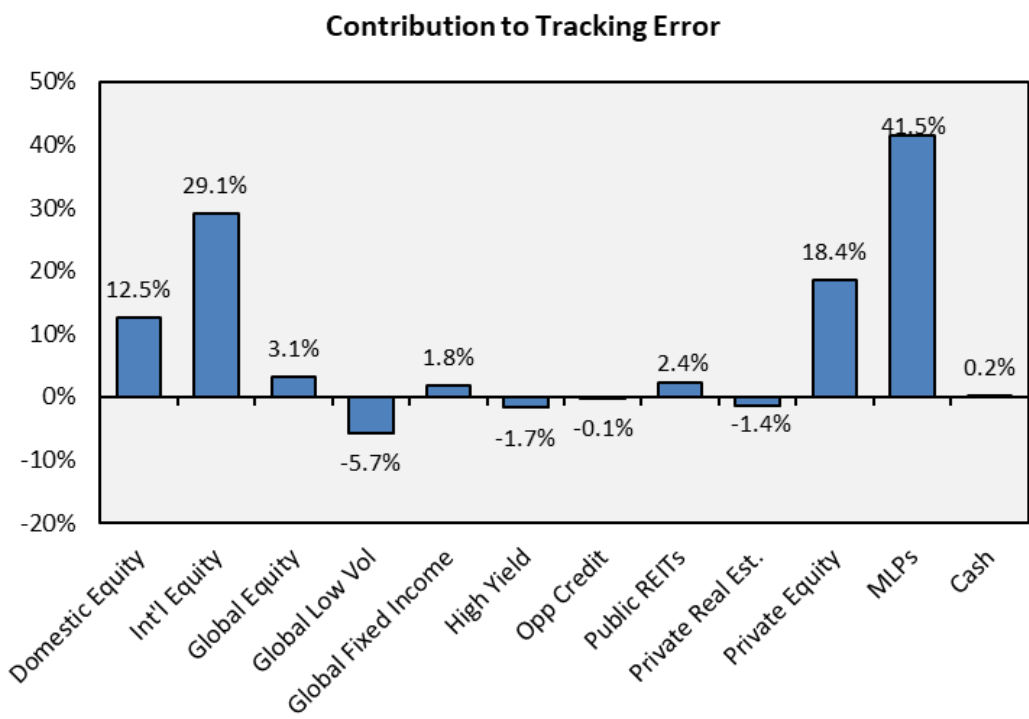
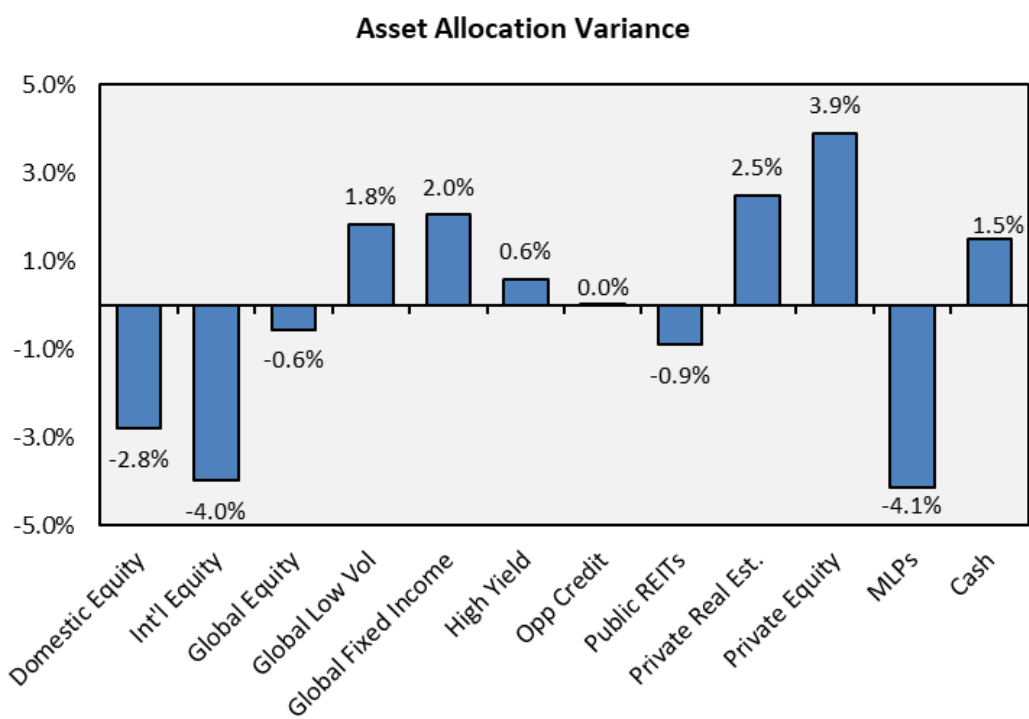
Domestic Equity, Int'l Equity, Global Equity, Global Low Vol, Global Fixed Income, High Yield, Private Equity, MLPs, Cash, Opp Credit, Public REITs, Private Real Est.

Contribution to Total Risk - Actual Allocation



Global Low Vol, Global Fixed Income, High Yield, Private Equity, MLPs, Cash, Opp Credit, Public REITs, Private Real Est.

Expected Return and Tracking Error based on Wilshire's Asset Assumptions



◆ The variance between the Fund's actual asset allocation and the target allocation is a source of tracking error for the Fund. This "asset allocation tracking error" is currently forecasted to be 1.05% (for the one-year period) at quarter-end. MLP's and international equity provided the largest contributions to tracking error at the total fund level.

Manager Risk Statistics

U.S. Equity					Non-U.S. Equity				
<u>T. Rowe Price (Enhanced Index)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>Acadian (Int'l Small Cap)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>
Standard Deviation	20.14	15.54	13.94	13.54	Standard Deviation	23.00	17.82	16.25	16.81
Standard Deviation (Index)	19.80	15.21	13.65	13.30	Standard Deviation (Index)	24.28	17.24	15.77	16.30
Sharpe Ratio	-0.45	0.25	0.44	0.74	Sharpe Ratio	-1.00	-0.34	-0.02	0.29
Sharpe Ratio (Index)	-0.46	0.21	0.40	0.74	Sharpe Ratio (Index)	-0.94	-0.38	-0.13	0.13
Excess Risk	0.89	1.03	1.13	1.01	Excess Risk	-0.11	0.49	1.66	2.64
Information Ratio	0.03	0.67	0.50	0.18	Information Ratio	-0.02	0.12	0.43	0.74
Systematic (Small Core)					AQR (Int'l Equity)				
Standard Deviation	28.73	21.15	18.73	18.57	Standard Deviation	20.36	16.03	14.72	16.15
Standard Deviation (Index)	27.46	21.20	19.15	18.49	Standard Deviation (Index)	20.43	15.15	14.52	15.37
Sharpe Ratio	-0.90	-0.33	0.00	0.38	Sharpe Ratio	-0.92	-0.33	-0.12	0.14
Sharpe Ratio (Index)	-0.93	-0.30	-0.07	0.34	Sharpe Ratio (Index)	-0.85	-0.25	-0.12	0.09
Excess Risk	4.36	4.21	3.95	3.60	Excess Risk	2.59	2.56	2.51	2.47
Information Ratio	-0.09	-0.15	0.35	0.21	Information Ratio	-0.59	-0.63	0.02	0.36
Channing Capital (Small Value)					Ativo (Int'l Developed)				
Standard Deviation	29.89	22.74	20.79	n/a	Standard Deviation	22.04	n/a	n/a	n/a
Standard Deviation (Index)	30.65	22.39	19.95	n/a	Standard Deviation (Index)	19.72	n/a	n/a	n/a
Sharpe Ratio	-1.00	-0.51	-0.22	n/a	Sharpe Ratio	-0.86	n/a	n/a	n/a
Sharpe Ratio (Index)	-1.02	-0.50	-0.18	0.22	Sharpe Ratio (Index)	-0.83	n/a	n/a	n/a
Excess Risk	4.82	5.29	4.73	n/a	Excess Risk	5.97	n/a	n/a	n/a
Information Ratio	0.42	-0.12	-0.23	n/a	Information Ratio	-0.55	n/a	n/a	n/a
Redwood (Small Growth)					Global Equity				
Standard Deviation	19.11	18.46	n/a	n/a	<u>Wellington (Global Equity)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>
Standard Deviation (Index)	25.27	20.74	n/a	n/a	Standard Deviation	19.92	15.90	14.61	n/a
Sharpe Ratio	-0.81	-0.12	n/a	n/a	Standard Deviation (Index)	19.98	14.89	13.69	n/a
Sharpe Ratio (Index)	-0.81	-0.08	n/a	n/a	Sharpe Ratio	-0.65	-0.04	0.09	n/a
Excess Risk	6.13	-0.54	n/a	n/a	Sharpe Ratio (Index)	-0.66	-0.02	0.12	n/a
Information Ratio	0.44	-0.06	n/a	n/a	Excess Risk	2.95	3.22	3.20	n/a
Smith Graham (Mid-Cap)					Global Low Volatility				
Standard Deviation	37.26	n/a	n/a	n/a	<u>Wellington (Global Equity)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>
Standard Deviation (Index)	24.81	n/a	n/a	n/a	Standard Deviation	14.69	n/a	n/a	n/a
Sharpe Ratio	-0.83	n/a	n/a	n/a	Standard Deviation (Index)	19.98	n/a	n/a	n/a
Sharpe Ratio (Index)	-0.81	n/a	n/a	n/a	Sharpe Ratio	-0.63	n/a	n/a	n/a
Excess Risk	15.19	n/a	n/a	n/a	Sharpe Ratio (Index)	-0.66	n/a	n/a	n/a
Information Ratio	-0.90	n/a	n/a	n/a	Excess Risk	8.18	n/a	n/a	n/a
Real Estate Investment Trusts					Global Low Volatility				
<u>Adelante (REIT)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>Acadian (Global Low Volatility)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>
Standard Deviation	20.55	16.33	15.58	15.58	Standard Deviation	17.72	12.73	n/a	n/a
Standard Deviation (Index)	22.41	1.43	16.48	16.47	Standard Deviation (Index)	19.98	14.89	n/a	n/a
Sharpe Ratio	-0.92	-0.15	-0.07	0.48	Sharpe Ratio	-0.73	-0.08	n/a	n/a
Sharpe Ratio (Index)	-0.95	-0.24	-0.07	0.43	Sharpe Ratio (Index)	-0.66	-0.02	n/a	n/a
Excess Risk	2.55	2.04	2.00	1.88	Excess Risk	6.63	4.75	n/a	n/a
Information Ratio	1.18	0.90	0.02	0.22	Information Ratio	0.04	-0.16	n/a	n/a
Real Estate Investment Trusts					Fixed Income (Core)				
<u>Centersquare (REIT)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>Securian (Core Fixed Income)</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>
Standard Deviation	22.06	n/a	n/a	n/a	Standard Deviation	7.56	4.70	4.00	3.47
Standard Deviation (Index)	22.41	n/a	n/a	n/a	Standard Deviation (Index)	3.76	3.20	3.09	2.94
Sharpe Ratio	-0.89	n/a	n/a	n/a	Sharpe Ratio	0.08	0.29	0.41	1.05
Sharpe Ratio (Index)	-0.95	n/a	n/a	n/a	Sharpe Ratio (Index)	1.74	0.92	0.69	1.10
Excess Risk	1.35	n/a	n/a	n/a	Excess Risk	5.49	3.24	2.54	1.87
Information Ratio	1.46	n/a	n/a	n/a	Information Ratio	-1.02	-0.47	-0.19	0.21

Manager Risk Statistics

High Yield Fixed Income				
BlackRock (High Yield)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	11.17	7.30	6.68	6.24
Standard Deviation (Index)	12.64	8.14	7.69	6.95
Sharpe Ratio	-0.62	-0.08	0.21	0.76
Sharpe Ratio (Index)	-0.77	-0.17	0.16	0.67
Excess Risk	1.78	1.14	1.86	1.42
Information Ratio	1.71	0.70	0.10	0.06

Fixed Income (Core)				
Aberdeen (Core Fixed Income)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	5.06	3.65	3.41	3.23
Standard Deviation (Index)	3.76	3.20	3.09	2.94
Sharpe Ratio	0.90	0.61	0.55	1.04
Sharpe Ratio (Index)	1.74	0.92	0.69	1.10
Excess Risk	2.20	1.49	1.30	1.32
Information Ratio	-0.83	-0.45	-0.21	0.09

Oaktree (High Yield)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	11.49	7.61	7.17	6.50
Standard Deviation (Index)	12.64	8.14	7.69	6.95
Sharpe Ratio	-0.84	-0.28	0.06	0.63
Sharpe Ratio (Index)	-0.77	-0.17	0.16	0.67
Excess Risk	1.71	1.09	0.99	1.12
Information Ratio	0.05	-0.71	-0.80	-0.51

Garcia Hamilton (Core Fixed Income)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	3.89	2.74	2.86	n/a
Standard Deviation (Index)	3.76	3.20	3.09	n/a
Sharpe Ratio	0.87	0.71	0.55	n/a
Sharpe Ratio (Index)	1.74	0.92	0.69	1.09
Excess Risk	1.28	1.20	1.17	n/a
Information Ratio	-2.30	-0.81	-0.48	n/a

Neuberger Berman (Credit Opps)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	15.30	9.39	n/a	n/a
Standard Deviation (Index)	13.54	8.30	n/a	n/a
Sharpe Ratio	-0.80	-0.22	n/a	n/a
Sharpe Ratio (Index)	-0.73	-0.21	n/a	n/a
Excess Risk	2.26	1.67	n/a	n/a
Information Ratio	-1.19	-0.24	n/a	n/a

Master Limited Partnerships				
Harvest (MLP)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	39.68	29.30	26.79	n/a
Standard Deviation (Index)	48.70	33.12	29.33	n/a
Sharpe Ratio	-1.28	-0.77	-0.62	n/a
Sharpe Ratio (Index)	-1.27	-0.91	-0.74	n/a
Excess Risk	17.18	10.56	8.67	n/a
Information Ratio	1.7	1.03	0.73	n/a

Atlantic Trust CIBC (MLP)	1 Yr	3 Yr	5 Yr	10 Yr
Standard Deviation	42.74	30.48	28.07	24
Standard Deviation (Index)	48.70	33.12	29.33	23.34
Sharpe Ratio	-1.29	-0.83	-0.64	-0.12
Sharpe Ratio (Index)	-1.27	-0.91	-0.74	-0.24
Excess Risk	11.90	7.31	6.42	9.19
Information Ratio	1.47	0.96	0.73	0.32

Manager Performance Objectives

Domestic Equity	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	<u>Inception Date</u>
<u>Enhanced Index</u>				
T. Rowe Price (Net)	5.82	7.33	7.82	Mar-06
S&P 500 Index + 1%	6.16	7.79	8.41	Mar-06
<i>Net of Fee Value Added vs Objective</i>	-0.34	-0.46	-0.59	
S&P 500 Index	5.10	6.73	7.29	Mar-06
<i>Net of Fee Value Added vs Benchmark</i>	0.72	0.60	0.53	
<u>Small Core - Active</u>				
Systematic Financial (Net)	-5.24	1.15	8.17	Jun-03
Russell 2000 Index + 1.25%	-3.43	1.01	8.21	Jun-03
<i>Net of Fee Value Added vs Objective</i>	-1.81	0.14	-0.04	
Russell 2000 Index	-4.64	-0.25	6.87	Jun-03
<i>Net of Fee Value Added vs Benchmark</i>	-0.60	1.40	1.30	
<u>Small Value - Active</u>				
Channing Capital Management (Net) *	-10.09	-3.48	-0.93	Oct-13
Russell 2000 Value Index + 1.25%	-8.36	-1.19	0.57	Oct-13
<i>Net of Fee Value Added vs Objective</i>	-1.73	-2.29	-1.50	
Russell 2000 Value Index	-9.51	-2.42	-0.68	Oct-13
<i>Net of Fee Value Added vs Benchmark</i>	-0.58	-1.06	-0.25	
<u>Small Growth - Active</u>				
Redwood Investments (Net) *	-0.44		1.23	Sep-16
Russell 2000 Growth Index + 1.50%	1.62		4.52	Sep-16
<i>Net of Fee Value Added vs Objective</i>	-2.06		-3.29	
Russell 2000 Growth Index	0.10		2.61	
<i>Net of Fee Value Added vs Benchmark</i>	-0.54		-1.38	
<u>Mid Cap Value - Active</u>				
Smith Graham Mid Cap Value (Net) *	--	--	-16.33	Dec-17
Russell Midcap Index + 2%	--	--	-4.30	Dec-17
<i>Net of Fee Value Added vs Objective</i>			-12.03	
Russell Midcap Index	--	--	-6.20	
<i>Net of Fee Value Added vs Benchmark</i>			-10.13	

Manager Performance Objectives

International Equity	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	
<u>Int'l Small Cap - Active</u>				
Acadian International (Net)	-4.42	0.84	7.19	Mar-89
Custom Benchmark + 2%	-2.95	1.19	6.89	Mar-89
<i>Net of Fee Value Added vs Objective</i>	-1.47	-0.35	0.30	
Custom Benchmark	-4.89	-0.81	4.78	Mar-89
<i>Net of Fee Value Added vs Benchmark</i>	0.47	1.65	2.41	
<u>Int'l Enhanced Index</u>				
AQR Capital Management (Net)	-3.55	-0.60	1.55	Mar-06
Custom Benchmark + 1.5%	-0.50	0.85	2.73	Mar-06
<i>Net of Fee Value Added vs Objective</i>	-3.05	-1.45	-1.18	
Custom Benchmark	-1.96	-0.64	1.21	Mar-06
<i>Net of Fee Value Added vs Benchmark</i>	-1.59	0.04	0.34	
<u>Int'l Developed</u>				
Ativo International Developed (Net) *	--	--	-9.66	Dec-17
MSCI EAFE Index + 2%	--	--	-6.05	
<i>Net of Fee Value Added vs Objective</i>			-3.61	
MSCI EAFE Index	--	--	-8.85	
<i>Net of Fee Value Added vs Benchmark</i>			-0.81	
<u>Int'l Equity (Active)</u>				
Baillie Gifford (Net)	--	--	-7.00	Mar-19
MSCI ACWI x-US (Net) + 2%	--	--	-12.23	
<i>Net of Fee Value Added vs Objective</i>			5.23	
MSCI ACWI x-US (Net)	--	--	-15.57	
<i>Net of Fee Value Added vs Benchmark</i>			8.57	
<u>Int'l Equity (Active)</u>				
Earnest Partners (Net) *	--	--	-21.55	Mar-19
MSCI ACWI x-US (Net) + 2%	--	--	-12.23	
<i>Net of Fee Value Added vs Objective</i>			-9.32	
MSCI ACWI x-US (Net)	--	--	-15.57	
<i>Net of Fee Value Added vs Benchmark</i>			-5.98	

Manager Performance Objectives

Global Equity	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	<u>Inception Date</u>
<u>Global Equity - Active</u>				
Wellington (Net)	1.17	2.55	8.25	Aug-12
MSCI ACWI (Net) + 2%	3.55	4.92	8.52	Aug-12
<i>Net of Fee Value Added vs Objective</i>	<i>-2.38</i>	<i>-2.37</i>	<i>-0.27</i>	
MSCI ACWI (Net)	1.50	2.85	6.38	Aug-12
<i>Net of Fee Value Added vs Benchmark</i>	<i>-0.33</i>	<i>-0.30</i>	<i>1.87</i>	
<u>Global Equity - Active</u>				
Ariel (Net) *	--	--	-1.91	Dec-17
MSCI ACWI (Net) + 1.5%	--	--	-3.04	
<i>Net of Fee Value Added vs Objective</i>			<i>1.13</i>	
MSCI ACWI (Net)	--	--	-4.49	
<i>Net of Fee Value Added vs Benchmark</i>			<i>2.58</i>	
<u>Global Low Volatility - Active</u>				
Acadian Global Low Vol (Net)	0.74		3.60	Jun-15
MSCI ACWI (Net) + 2%	3.55		4.43	Jun-15
<i>Net of Fee Value Added vs Objective</i>	<i>-2.81</i>		<i>-0.83</i>	
MSCI ACWI (Net)	1.50		2.93	Jun-15
<i>Net of Fee Value Added vs MSCI ACWI</i>	<i>-0.76</i>		<i>0.67</i>	
MSCI ACWI Min Vol (Net)	3.72		5.25	Jun-15
<i>Net of Fee Value Added vs MSCI ACWI Min Vol</i>	<i>-2.98</i>		<i>-1.65</i>	

Manager Performance Objectives

Real Estate	<u>3-year</u>	<u>5-year</u>	<u>Since</u> <u>Inception</u>	<u>Inception</u> <u>Date</u>
Real Estate Securities - Public				
Adelante Capital Management (Net)	-0.68	0.12	8.44	Sep-01
Wilshire Real Estate Securities + 1%	-1.49	1.09	9.69	Sep-01
<i>Net of Fee Value Added vs Objective</i>	0.81	-0.97	-1.25	
Wilshire Real Estate Securities	-2.47	0.08	8.61	Sep-01
<i>Net of Fee Value Added vs Index</i>	1.79	0.04	-0.17	
<hr/>				
CenterSquare (Net)	--	--	-3.33	May-18
Wilshire Real Estate Securities + 1%	--	--	-3.83	May-18
<i>Net of Fee Value Added vs Objective</i>			0.50	
Wilshire Real Estate Securities	--	--	-4.78	May-18
<i>Net of Fee Value Added vs Index</i>			1.45	

Manager Performance Objectives

Fixed Income	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	<u>Inception Date</u>
<u>Global Fixed Income</u>				
Securian Asset Mgmt. (Net)	3.22	2.85	4.44	May-07
Bloomberg Aggregate + 0.5%	5.35	3.88	5.00	May-07
<i>Net of Fee Value Added vs Objective</i>	-2.13	-1.03	-0.56	
Bloomberg Aggregate	4.82	3.36	4.53	May-07
<i>Net of Fee Value Added vs Benchmark</i>	-1.60	-0.51	-0.09	
<hr/>				
Aberdeen (Net)	4.11	3.07	4.76	Apr-07
Bloomberg Aggregate + 0.5%	5.35	3.88	4.91	Apr-07
<i>Net of Fee Value Added vs Objective</i>	-1.24	-0.81	-0.15	
Bloomberg Aggregate	4.82	3.36	4.39	Apr-07
<i>Net of Fee Value Added vs Benchmark</i>	-0.71	-0.29	0.37	
<hr/>				
Garcia Hamilton (Net)	3.80	2.78	3.62	Oct-13
Bloomberg Aggregate + 0.5%	5.35	3.88	4.16	Oct-13
<i>Net of Fee Value Added vs Objective</i>	-1.55	-1.10	-0.54	
Bloomberg Aggregate	4.82	3.36	3.64	Oct-13
<i>Net of Fee Value Added vs Benchmark</i>	-1.02	-0.58	-0.02	
<hr/>				
	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	<u>Inception Date</u>
<u>High Yield</u>				
Oaktree Capital Management (Net)	-0.33	1.62	6.03	Dec-96
Performance Objective	1.46	3.46	7.30	Dec-96
<i>Net of Fee Value Added vs Objective</i>	-1.79	-1.84	-1.27	
Custom Benchmark	0.33	2.33		Dec-96
<i>Net of Fee Value Added vs Benchmark</i>	-0.66	-0.71		
<hr/>				
BlackRock High Yield (Net)	1.26	2.61	5.47	Sep-06
Citigroup High Yield Cash Pay + 1%	1.46	3.46	6.86	Sep-06
<i>Net of Fee Value Added vs Objective</i>	-0.20	-0.85	-1.39	
Citigroup High Yield Cash Pay	0.45	2.43	5.80	Sep-06
<i>Net of Fee Value Added vs Benchmark</i>	0.81	0.18	-0.33	
<hr/>				
<u>Credit Opportunities</u>				
Neuberger Berman (Net)	-0.31		2.93	Jan-16
Custom Benchmark + 1%	1.09		4.82	Jan-16
<i>Net of Fee Value Added vs Objective</i>	-1.40		-1.89	
Custom Benchmark	0.09		3.78	Jan-16
<i>Net of Fee Value Added vs Benchmark</i>	-0.40		-0.85	

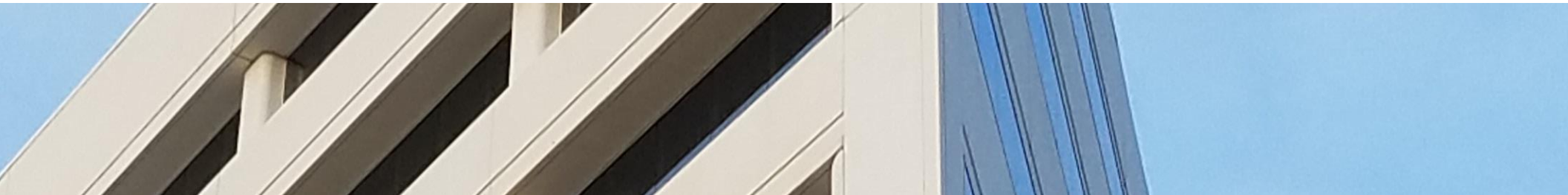
Manager Performance Objectives

MLP's	<u>3-year</u>	<u>5-year</u>	<u>Since Inception</u>	<u>Inception Date</u>
MLPs				
Harvest Fund Advisors (Net)	-21.21	-15.61	-3.57	Dec-11
Alerian MLP Index + 1.5%	-27.79	-19.44	-7.96	Dec-11
<i>Net of Fee Value Added vs Objective</i>	6.58	3.83	4.39	
Alerian MLP Index	-28.91	-20.66	-10.05	Dec-11
<i>Net of Fee Value Added vs Benchmark</i>	7.70	5.05	6.48	
Atlantic Trust CIBC (Net)	-23.93	-16.96	-3.88	Dec-11
Alerian MLP Index + 1.5%	-27.79	-19.44	-7.96	Dec-11
<i>Net of Fee Value Added vs Objective</i>	3.86	2.48	4.08	
Alerian MLP Index	-28.91	-20.66	-10.05	Dec-11
<i>Net of Fee Value Added vs Benchmark</i>	4.98	3.70	6.17	



WILSHIRE ASSOCIATES

Wilshire Consulting



144A Securities - Education

Thomas Toth, CFA, Managing Director

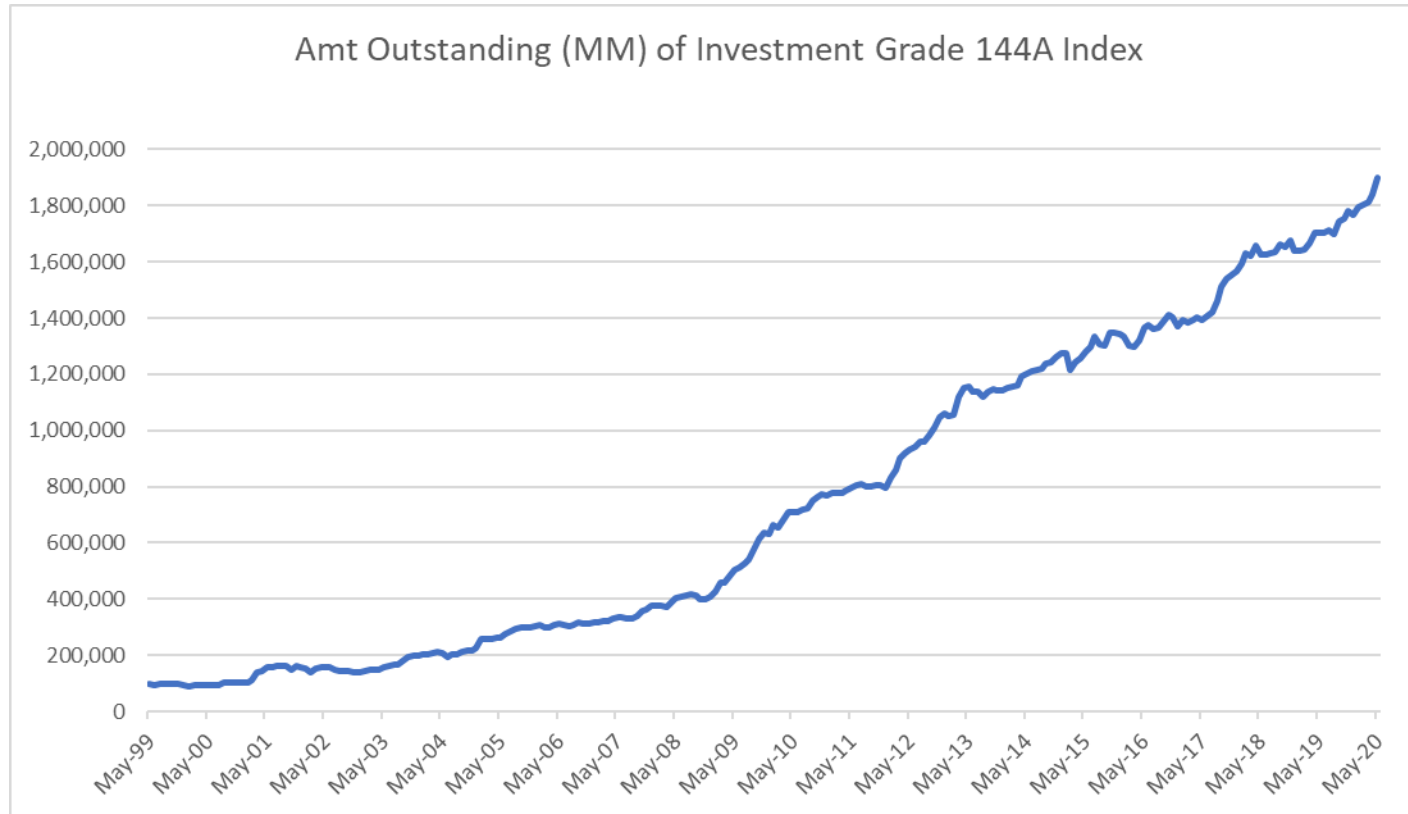
Ali Kazemi, Managing Director

June 2020

What Are 144A Securities?

- 144A securities are private placement or restricted securities that are not registered with the SEC
 - In order to avoid registration, these securities must comply with the standards of the SEC's Rule 144A
 - Rule 144A is an exemption from the registration requirements of Section 5 of the Securities Act of 1933, allowing for "private resales of securities to institutions"
 - Although a resale exemption, 144A is most frequently used for institutional private placements of debt and asset-backed securities
- The purchaser of 144A securities must be a Qualified Institutional Buyer ("QIB")
 - A QIB must have a minimum of \$100 million in assets to be an eligible purchaser
 - Institutional investors who are QIBs can trade the 144A securities amongst themselves, but retail investors (the public) are not permitted to purchase them

Growing Popularity 144A Issuance



As Of: 05/29/2020	Count	Market Value [%]	Market Value
Total	1975	100.00	2,070,828,836
Government-Related	559	38.21	791,205,299
Agency	405	20.55	425,531,381
Local Authority	15	0.76	15,661,745
Sovereign	126	16.21	335,684,221
Supranational	13	0.69	14,327,952
Corporate	1416	61.79	1,279,623,538
Industrial	743	34.69	718,473,005
Utility	129	4.39	90,856,651
Financial Institutions	544	22.71	470,293,881

Growing Popularity 144A Issuance

The makeup of the high yield universe has morphed to one with a much higher percentage of 144A issuance.

The majority of new issuances in the high yield fixed income market have been in the form of 144A securities

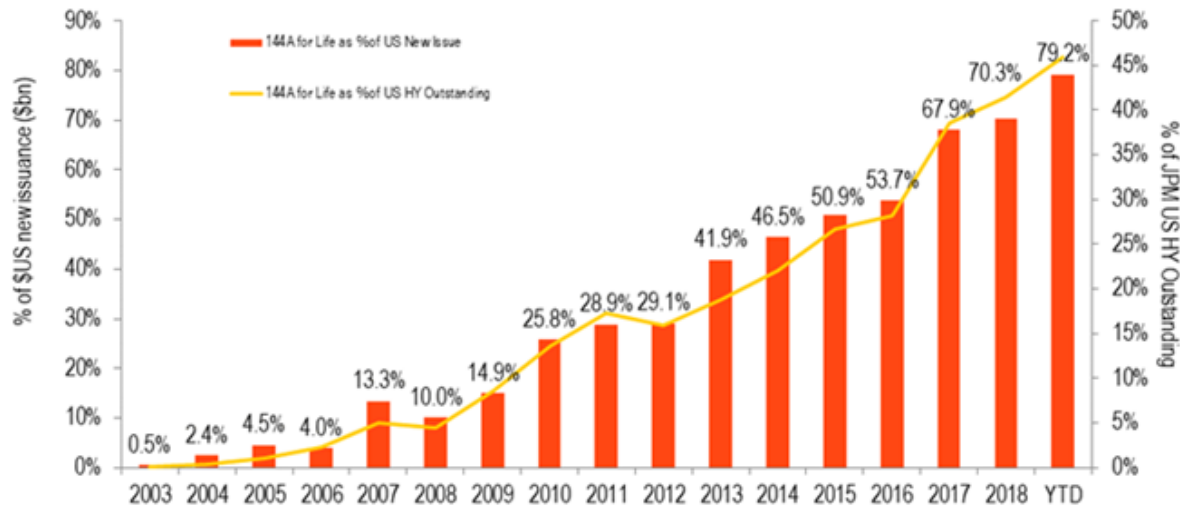
- As a result, the current percentage of 144A securities represented in the high yield market has grown to approximately 45% in 2019 up from 15% in 2010

Advantages for issuers:

- Allow issuers to issue debt quickly when rates become attractive

Increasing number of “144A for life” issues without registration rights

- Market has been accepting of the issuance
- Potential yield disadvantage to issuer trades off well against costly and lengthy registration process



Wilshire Consulting

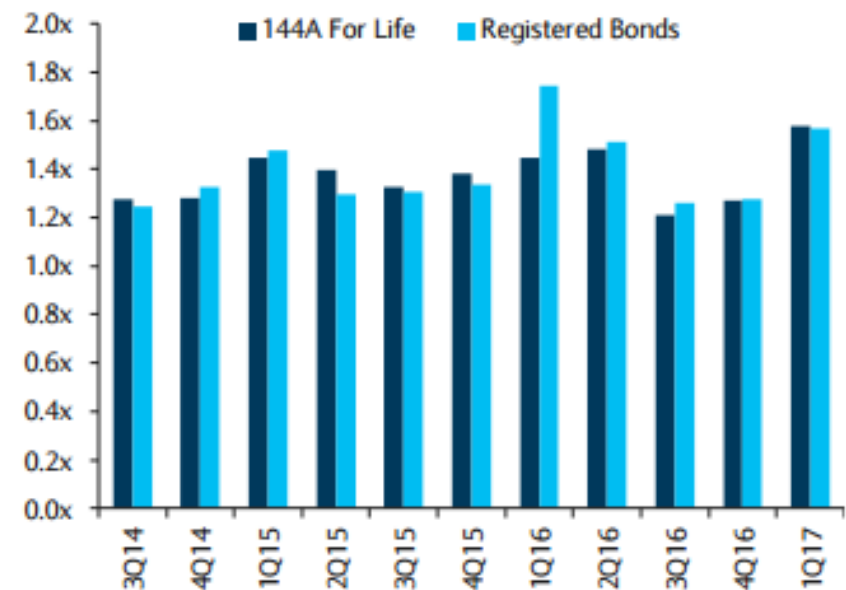
Liquidity

Since its adoption, Rule 144A has greatly increased the liquidity of the securities affected. This is because the institutions can now trade these formerly restricted securities amongst themselves, thereby eliminating the restrictions that are imposed to protect the public.

Historically, limits on the weight of 144A holdings were driven by concerns over liquidity. Concern in this regard has abated as the turnover for 144A securities essentially equals that of registered bonds.

Generally no difference in bid-ask spreads and liquidity for 144A's versus comparable corporate bonds. However, this applies to 144A's with registration rights; 144A's without registration rights do tend to trade with a 10-15bp liquidity premium

FIGURE 4
Turnover for 144A-for-Life Securities Now Matches That of Registered Bonds



Source: Bloomberg Barclays Indices, MarketAxess

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DISCUSSION SHEET

Employees' Retirement Fund Board of Trustees Meeting

Friday, June 9th, 2020

- Issue:** Aberdeen Guideline Changes
- Attachments:** Redlined Aberdeen Standard Investments Fixed Income Guidelines
- Discussion:** Aberdeen is requesting two changes in manager guidelines:
- 1) To allow out of benchmark purchases of up to 5% of the market value of the portfolio;
 - 2) To allow the Manager to invest in 144A securities up to a maximum of 25% of the market value of the portfolio.
- Recommendation:** Suggested motion for the approval is as follows: Move to approve the requested guideline changes as noted and authorize the Board Chair to sign.

Exhibit 2
Aberdeen Asset Management Inc.
Total Return Bond Strategy Portfolio Guidelines

for the

Employees' Retirement Fund of the City of Dallas

I. Investment Philosophy, Policy & Process
Active Domestic and Non-dollar Fixed Income Management

Aberdeen Asset Management believes an investment-grade fixed income portfolio can consistently deliver a source of superior risk-adjusted returns when enhanced through multiple sources of alpha, including:

- Effective duration budgeting
- Expanding the opportunity set to include foreign sovereign debt in both local and hard currency
- Yield curve positioning across global markets
- Sector-oriented credit analysis

The Aberdeen Asset Management process is centered on global fundamental analysis of macroeconomic variables, country-specific monetary and fiscal policies, and trade and current account balances around the world. Aberdeen Asset Management breaks down the universe into six distinct segments – Core, Major, Satellites, Convergence, Low Correlation, and Commodity, applying different tactics for different segments. Aberdeen Asset Management believes that this approach allows the firm to use its macro economic analysis to strategically deliver alpha. The five steps that we follow to execute the process of managing the strategy include market segmentation, macro fundamental analysis and screening, internal ratings assignment, target portfolio construction, and risk distribution examination of target portfolio.

II. Portfolio Characteristics

A. Permitted Markets

Individual markets must meet certain minimum standards prior to their approval by Investment Manager for investment. The criteria considered in this process relate to the degree of political, currency, legal, regulatory, liquidity and settlement risk exhibited by each market. Investment in non-dollar debt is allowed in countries in the Citibank Non-US Government Bond Index or in emerging market countries in the Emerging Local Markets Index Plus (ELMI+) provided that the countries are rated investment grade by Moody's or S&P's. [Countries of similar qualities that are not in either indices can also be purchased](#)

but limited to a total of 5% of market value, provided that the countries are rated investment grade by Moody's or S&P's (revised 05/20).

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B. Permitted Instruments

1. Non-U.S. Instruments

Eurobonds
Local Currency Markets
Government Bonds
Government Agency Bonds
Corporate Bonds
Supranationals
Asset Backed Securities, Mortgage Backed Securities, and Pfand Briefs

2. U.S. Instruments

Units of the Master Custodian STIF
U.S. Treasury Bonds
U.S. Government, Agency and Whole-Loan -Backed Mortgages
(Pass Throughs, TBAs and CMOs, note restriction below)
Federal Agency and Supranational Bonds
Corporate Bonds and Hybrids
Asset-Backed and Commercial Mortgage-Backed Securities
Yankee Bonds

C. Restricted Instruments

The manager may not invest in the following securities without prior written approval:

Emerging Market securities that are below investment grade

(revised 12/16)

Leveraged/Residual CMOs

Structured Notes

D. Portfolio Restrictions.

Maximum non-dollar bonds or foreign currency exposure	30%, based on market value
Maximum corporate bond exposure	50%, based on market value
Maximum structured bond (CMO, ABS, etc.) exposure	50% based on market value <small>(revised 10/8/13)</small> .
Non-US Issues	5% per issuer, based on market value

Non-US Government Sovereign Issues	10% per issuer, based on market value
Duration range relative to stated benchmark	Maximum of plus one year to the index (with no minimum) (revised 10/8/13)
Average Credit Quality	A or A2 (revised 12/16)
Minimum Credit Rating Per Issue	BBB- or Baa3
Maximum holdings in BB+ or Ba1 or lower	5% based on market value (added 12/16)
Maximum holding period for individual securities rated BB+ or Ba1 or lower	270 days from date of downgrade (added 12/16)
Maximum allocation to 144A Private Placements without Registration Rights	25 40% based on market value (added 12/16, revised 05/20)

No single currency can have a net negative exposure

E. Maximum Allocation to Derivatives

1. Maximum net allocation to derivatives is 10% of the entire account on a market value basis, excluding currency forward contract positions and options.
2. Maximum allocation to currency forward contracts and options is 100% of the non-dollar allocation.

III. General Investment Manager Guidelines and Requirements

- A. Investment Manager shall take note of and operate under the “Fixed Income Asset Class Policy for the Employees’ Retirement Fund of the City of Dallas”, which specifies the strategic role its portfolio is to fulfill in the overall investment structure of the Fund, a copy of which is appended to, and is a part of, these guidelines and objectives.
- B. Purchases and sales, security selection, and portfolio implementation of investment strategies are delegated to the discretion of the investment manager.
- C. The following transactions are prohibited: purchase of non-negotiable securities, short sales, except for hedging purposes, stock and bond transactions on margin, straddles, options, leverage, or letter stock.
- D. Derivatives.
Notwithstanding any other language in Aberdeen Asset Management Inc’s. investment management agreement with the Employees’ Retirement Fund of the City of Dallas effective April 26, 2007 and as thereafter amended, which may relate to Aberdeen Asset Management’s investment authority in and use of derivatives of any type, the provisions of:

- a. the Employees' Retirement Fund General Investment Policy, dated December 13, 2016, at Paragraph G.7 found as Exhibit 2-A, and
- b. The Employees' Retirement Fund Fixed Income Asset Class Investment Policy,

as may later be amended, which are both attached hereto and made a part hereof and a part of the April 26, 2007 investment management agreement as if fully set forth in both, shall control (revised 12/16).

- E. Transactions that involve a broker acting as a "principal" where such broker is also the investment manager who is making the transaction is prohibited.
- F. Transactions shall be executed at a reasonable cost, taking into consideration prevailing market conditions and services and research provided by the executing broker.
- G. Each investment manager shall have full responsibility for the exercise of all rights appurtenant to any securities under its management, including responsibility to vote proxies, except to the extent otherwise directed by the Trustees. Investment managers shall maintain records of proxy votes and make them available for inspection upon reasonable request.
- H. Performance objectives are to be met on a net of fees basis.
- I. Any investment or action with respect to an investment not expressly allowed is prohibited, unless presented to and approved prospectively by the Trustees of the Dallas Employees' Retirement Fund. All guidelines must be adhered to by the manager. If from time to time an exception to the guidelines shall be deemed appropriate by a manager, it must seek review and approval by the Trustees prior to making such an exception. However, if a guideline is violated due to market events, actions, or conditions, the manager must immediately inform the Administrator to determine a course of action. This course of action will be based upon the best judgement recommendation of the manager and the Administrator's discussion with the investment consultant and Board members. Correction of the violation may be postponed if it is deemed to be in the best interest of the Fund.
- J. Should any temporary or permanent change regarding a manager occur, the manager shall notify the Trustees immediately via phone. A letter, detailing the circumstances of the change and the possible impact to the portfolio management, will be faxed immediately to the Trustees. Changes include, but are not limited to: a) a significant change in investment philosophy, b) a loss of one or more key management personnel, c) a new portfolio manager on the account, d) a change in ownership structure of the firm, or e) any occurrence which might potentially impact the management, professionalism, integrity or financial position of the investment manager.

K. For purposes of the guidelines, (a) all percentages apply on a market value basis immediately after a purchase or initial investment and (b) any subsequent change in any applicable percentage resulting from market fluctuations or other changes in total assets does not require immediate elimination of any security from the Portfolio.

V. Performance Objective

Exceed the return of the Barclay's Aggregate Bond Index by 50 basis points annually net of the base fee over a 5-year period.

Acknowledged: Aberdeen Asset Management Inc.

By: _____ Date: _____

Employees' Retirement Fund of the City of Dallas

By: _____ Date: _____

Approved by Board: April 10, 2007

Last Amended: ~~June 9th, 2020~~ December 13, _____

2016

Formatted: Superscript

DISCUSSION SHEET

Employees' Retirement Fund Board of Trustees Meeting

Tuesday, June 9th, 2020

- Issue:** Ariel Investments, LLC Guideline Changes
- Attachments:** Redlined Ariel Investments Global Equity Guidelines
- Discussion:** Ariel is requesting two changes in manager guidelines:
1) To increase maximum sector weighting from 25% to 35% of the market value of the portfolio;
2) To change calculation methodology in monitoring guidelines from "time of purchase" to "current market value".
- Recommendation:** Suggested motion for the approval is as follows: Move to approve the requested guideline changes as noted and authorize the Board Chair to sign.

ARIEL GLOBAL EQUITY GUIDELINES
for the
Employees' Retirement Fund of the City of Dallas

Investment Approach

The investment philosophy seeks to invest in undervalued franchise-quality companies that are believed to be mispriced by the market. The goal is to deliver attractive absolute and relative risk-adjusted returns over a full market cycle.

Typical Portfolio Characteristics

Number of holdings	50-150 in total
Maximum allocation to a single issue	10.0%
Maximum cash allocation	5%
Average Turnover	25 - 35%
Sector exposure around benchmark weight	the greater of 23 5% or 1.5x the benchmark
Tracking Error	3% - 5%
Information Ratio	.3 - .5
Out of Benchmark Countries (MSCI ACWI)	Limit 1-3%

The characteristics above are representative of a portfolio with your firm's designated investment specialization. The characteristics are not intended to hinder the manager or inhibit its ability to implement its investment process and disciplines. The portfolio will be monitored to identify any significant deviations that may indicate a material change in investment approach. The manager acknowledges that the client's objective with this portfolio is to gain exposure to global securities in regions throughout the world within both the developed and emerging markets, primarily outside of, but also including, the U.S.

Guidelines/ Authorized Investments

1. Common stocks
2. Preferred stocks
3. Master Custodian Short-term Investment Fund (STIF)
4. Non-US currency of permitted markets
5. Derivatives are to be used for risk control, except for market access products which are permitted to provide synthetic exposure to the equity of an underlying company for purposes other than risk control. Derivative classes permitted (other than market access products) are futures contracts; options on futures; warrants; options; currency forward contracts; swaps; and structured notes in long or short positions for the purpose of managing currency risk and where no collateral is required to be posted with a third party non-custodian bank. Currency speculation is prohibited. Market access products permitted are zero-strike options, warrants, and synthetic notes. Market access products prohibited are total-return swaps. The use of market access products should generally be limited to emerging market companies only.

6. For the purposes of obtaining efficient investment exposure, such as equitizing cash, the Portfolio is permitted to invest up to 7% of the market value of the Account in ETFs.
7. Depository Receipts
8. Diversified by country, industry and market capitalization

Permitted Markets

The manager will invest in those countries included in the Morgan Stanley Capital All Countries World Index, and may invest up to the greater of 20% or 1.5X the index weighting of the portfolio in emerging markets countries. Investments in Russia are limited to ADRs (American Depository Receipts, receipts on shares of a foreign-domiciled corporation, held by a U.S. bank) and GDRs (Global Depository Receipts, receipts on shares of a foreign-domiciled corporation, issued in more than one country), that trade on the Hong Kong, London, or U.S. exchanges.

General Investment Manager Guidelines and Requirements

1. Investment Manager shall take note of and operate under the “International and Global Equity Asset Class Policy for Employees’ Retirement Fund of the City of Dallas”, which specifies the strategic roles the portfolio is to fulfill in the overall investment structure of the Fund, a copy of which is appended to, and is part of these guidelines and objectives.
2. Purchases and sales, security selection, and portfolio implementation of investment strategies are delegated to the discretion of the investment manager.
3. The following transactions are prohibited: purchase of non-negotiable securities, short sales, stock and bond transactions on margin, straddles, options, leverage or letter stock.
4. Transactions that involve a broker acting as a “principal” where such broker is also the investment manager who is making the transaction is prohibited.
5. Transactions shall be executed at a reasonable cost, taking into consideration prevailing market conditions and services and research provided by the executing broker. At the discretion of the Board, the manager will prepare a report detailing all transaction costs.
6. Each investment manager shall have full responsibility for the exercise of all rights appurtenant to any securities under its management, including responsibility to vote proxies, except to the extent otherwise directed by the Trustees. Investment managers shall maintain records of proxy votes and make them available for inspection upon reasonable request.
7. Performance objectives are to be met on a net of fee basis.

8. Any investment or action with respect to an investment not expressly allowed is prohibited, unless presented to and approved prospectively by the Trustees. All guidelines must be adhered to by the external money managers; however, if from time to time an exception to the guidelines shall be deemed appropriate by a manager, it may seek review and approval by the Trustees to make such an exception. However, if a guideline is violated due to market events, actions, or conditions, the manager must immediately inform the Administrator to determine a course of action. This course of action will be based upon the best judgement recommendation of the manager and the Administrator's discussion with the investment consultant and Board members. Correction of the violation may be postponed if it is deemed to be in the best interest of the Fund.
9. Should any temporary or permanent change regarding a manager occur, the manager shall notify the Administrator immediately by phone. A letter, detailing the circumstances of the change and the possible impact to the portfolio management, will be faxed immediately to the Administrator. Changes include but are not limited to: a.) a significant change in investment philosophy, b.) a loss of one or more key management personnel, c.) a new portfolio manager on the account, d.) a change in ownership structure of the firm, or e.) any occurrence which may potentially impact the management, professionalism, integrity, or financial position of the investment manager.
10. For purposes of the guidelines, (a) all percentages apply on a market value basis ~~immediately after a purchase or initial investment~~ and (b) any subsequent change in any applicable percentage resulting from market fluctuations or other changes in total assets does not require immediate elimination of any security from the Portfolio.

Performance Objectives

Exceed the return of the Morgan Stanley Capital International All Countries World Index annually by 1.5% net of fees, over a full market cycle (normally three to five years).

Acknowledged: Ariel Investments, LLC

By: _____ Date: _____

Employees' Retirement Fund of the City of Dallas

By: _____ Date: _____

Date last revised: ~~June~~, ~~2020~~~~November 20, 2017~~

ASSET ALLOCATION COMPARISON

May 31, 2020

	Market Value	% of Total Fund	Allocation Policy	% Difference from Allocation	Prior Period Market Value	Prior Period % of Total Fund
EQUITY						
CHANNING CAPITAL	28,503,620.69	0.86			26,592,557.73	0.82
REDWOOD- SL	34,873,203.77	1.05			31,387,876.19	0.97
SYSTEMATIC	55,022,203.54	1.66			53,276,243.85	1.65
<i>Total Small Cap</i>	118,399,028.00	3.58			111,256,677.77	3.45
SMITH GRAHAM	52,713,858.82	1.59			49,958,530.39	1.55
T. ROWE PRICE	137,145,039.64	4.14			130,597,399.86	4.04
<i>Total Domestic/Enhanced equity</i>	189,858,898.46	5.73			180,555,930.25	5.59
NTGI S&P 500 EQUITY INDEX	130,898,847.13	3.95			124,947,275.05	3.87
<i>Total Index</i>	130,898,847.13	3.95			124,947,275.05	3.87
<i>Total Domestic</i>	439,156,773.59	13.26	12.50	0.76	416,759,883.07	12.91
ADELANTE CAPITAL	67,287,764.94	2.03			67,156,177.22	2.08
CENTERSQUARE-SL	67,389,241.23	2.04			66,756,415.16	2.07
<i>Total REITS</i>	134,677,006.17	4.07	2.50	1.57	133,912,592.38	4.15
HEITMAN	83,362,106.55	2.52			83,362,106.55	2.58
INVESCO	73,287,915.10	2.21			73,287,915.10	2.27
INVESCO - SA	70,857,392.00	2.14			69,665,216.00	2.16
VALUE ADD REAL ESTATE	-	0.00			-	-
<i>Total Real Estate</i>	227,507,413.65	6.87	7.50	-0.63	226,315,237.65	7.01
FAIRVIEW CAPITAL	40,578,460.00	1.23			40,578,460.00	1.26
GROSVENOR GCM - CFG	149,467,182.00	4.51			153,542,631.00	4.76
HAMILTON LANE	84,804,060.00	2.56			78,656,639.00	2.44
<i>Total Private Equity</i>	274,849,702.00	8.30	7.50	0.80	272,777,730.00	8.45
ACADIAN	93,681,733.03	2.83			88,129,382.47	2.73
AQR CAPITAL	103,323,695.89	3.12			100,371,943.15	3.11
ATIVO	31,844,036.05	0.96			30,436,006.14	0.94
BAILLIE GIFFORD	85,268,608.24	2.58			79,747,020.60	2.47
BLACKROCK ACW-EXUS-SL	1,486.31	0.00			1,486.31	0.00
EARNEST PARTNERS	69,091,277.29	2.09			67,424,597.42	2.09
GLOBAL TRANSITION ACCOUNT	939.77	0.00			939.46	0.00
<i>Total International</i>	383,211,776.58	11.57	12.50	-0.93	366,111,375.55	11.34
ARIEL	100,942,111.40	3.05			100,122,302.02	3.10
NORTHERN TRUST INTL EQ ACWI INDEX	19,113,725.07	0.58			18,210,507.54	0.56
WELLINGTON MGMT	121,163,259.97	3.66			114,143,817.61	3.54
<i>Total Global Equity</i>	241,219,096.44	7.29	7.50	-0.21	232,476,627.17	7.20
ACADIAN-LVG	195,309,988.91	5.90			191,549,915.78	5.93
BLACKROCK	200,441,218.91	6.05			195,780,522.25	6.06
<i>Total Global Low Volatility Equity</i>	395,751,207.82	11.95	12.50	-0.55	387,330,438.03	12.00
ATLANTIC TRUST	72,934,741.64	2.20			67,983,430.30	2.11
HARVEST FUND	73,486,670.57	2.22			69,985,478.11	2.17
GLOBAL LISTED INFRASTRUCTURE	-	0.00			-	-
<i>Total Global Listed Infrastructure</i>	146,421,412.21	4.42	5.00	-0.58	137,968,908.41	4.27
<i>Total Marketable Alternatives</i>	-	0.00	2.50	-2.50	-	-
TOTAL EQUITY	2,242,794,388.46	67.74	70.00	-2.26	2,173,652,792.26	67.32
FIXED INCOME						
ABERDEEN ASSET MGMT	213,944,203.99	6.46			234,463,036.76	7.26
GARCIA HAMILTON	66,142,587.57	2.00			72,380,701.77	2.24
SECURIAN ASSET MANAGEMENT	213,177,198.15	6.44			226,363,641.78	7.01
<i>Total Investment Grade</i>	493,263,989.71	14.90	15.00	-0.10	533,207,380.31	16.51
NEUBERGER BERMAN	168,412,741.46	5.09			159,058,454.13	4.93
<i>Total Opportunistic Credit</i>	168,412,741.46	5.09	5.00	0.09	159,058,454.13	4.93
BLACKROCK-HY	167,110,358.43	5.05			168,189,859.68	5.21
OAKTREE	167,441,027.04	5.06			165,811,342.21	5.14
<i>Total High Yield</i>	334,551,385.47	10.11	10.00	0.11	334,001,201.89	10.34
CASH ACCOUNT	71,668,959.99	2.16			28,872,607.70	0.89
<i>Total Short Term</i>	71,668,959.99	2.16	0.00	2.16	28,872,607.70	0.89
TOTAL FIXED INCOME	1,067,897,076.63	32.26	30.00	2.26	1,055,139,644.03	32.68

TOTAL FUND \$ 3,310,691,465.09

\$ 3,228,792,436.29

Market Value YE 2019 \$ 3,650,917,064.60

Market Value Variance

Change from YE 2019: \$ (340,225,599.51)

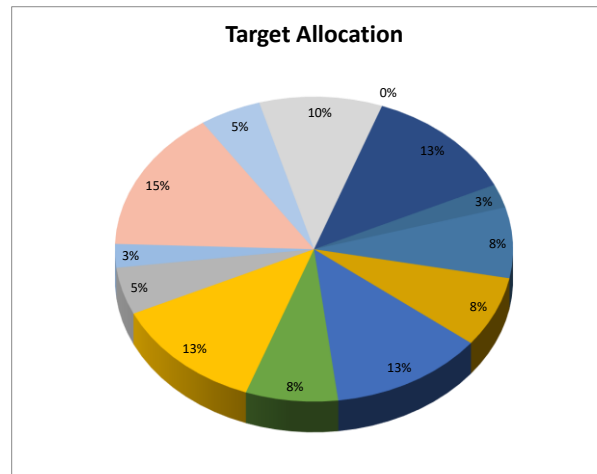
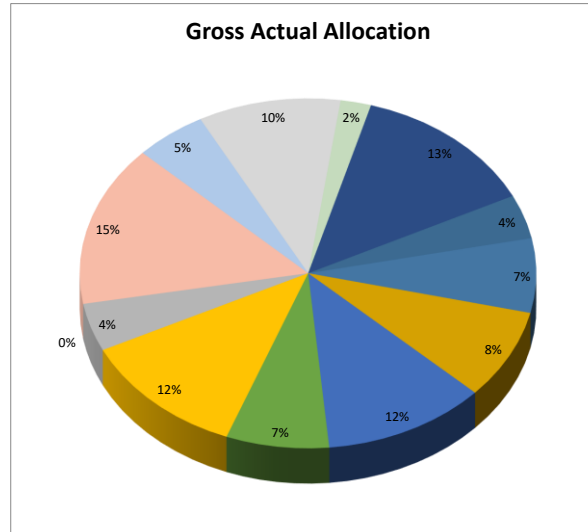
Change from prior month: \$ 81,899,028.80

Asset Allocation: Actual vs. Target

May 31, 2020

	Market Value	Gross Actual Allocation	Target Allocation	% Difference from Allocation
EQUITY				
CHANNING CAPITAL	28,503,620.69	0.86		
REDWOOD- SL	34,873,203.77	1.05		
SYSTEMATIC	55,022,203.54	1.66		
<i>Total Small Cap</i>	118,399,028.00	3.58		
SMITH GRAHAM	52,713,858.82	1.59		
T. ROWE PRICE	137,145,039.64	4.14		
<i>Total Domestic/Enhanced equity</i>	189,858,898.46	5.73		
NTGI S&P 500 EQUITY INDEX	130,898,847.13	3.95		
<i>Total Index</i>	130,898,847.13	3.95		
<i>Total Domestic</i>	439,156,773.59	13.26	12.50	0.76
ADELANTE CAPITAL	67,287,764.94	2.03		
CENTERSQUARE-SL	67,389,241.23	2.04		
<i>Total REITS</i>	134,677,006.17	4.07	2.50	1.57
HEITMAN	83,362,106.55	2.52		
INVESCO	73,287,915.10	2.21		
INVESCO - SA	70,857,392.00	2.14		
VALUE ADD REAL ESTATE				
<i>Total Real Estate</i>	227,507,413.65	6.87	7.50	-0.63
FAIRVIEW CAPITAL	40,578,460.00	1.23		
GROSVENOR GCM - CFGI	149,467,182.00	4.51		
HAMILTON LANE	84,804,060.00	2.56		
<i>Total Private Equity</i>	274,849,702.00	8.30	7.50	0.80
ACADIAN	93,681,733.03	2.83		
AQR CAPITAL	103,323,695.89	3.12		
ATIVO	31,844,036.05	0.96		
BAILLIE GIFFORD	85,268,608.24	2.58		
BLACKROCK ACW-EXUS-SL	1,486.31	0.00		
EARNEST PARTNERS	69,091,277.29	2.09		
GLOBAL TRANSITION ACCOUNT	939.77	0.00		
<i>Total International</i>	383,211,776.58	11.57	12.50	-0.93
ARIEL	100,942,111.40	3.05		
NORTHERN TRUST INTL EQ ACWI INDEX	19,113,725.07	0.58		
WELLINGTON MGMT	121,163,259.97	3.66		
<i>Total Global Equity</i>	241,219,096.44	7.29	7.50	-0.21
ACADIAN-LVG	195,309,988.91	5.90		
BLACKROCK	200,441,218.91	6.05		
<i>Total Global Low Volatility Equity</i>	395,751,207.82	11.95	12.50	-0.55
ATLANTIC TRUST	72,934,741.64	2.20		
HARVEST FUND	73,486,670.57	2.22		
GLOBAL LISTED INFRASTRUCTURE				
<i>Total Global Listed Infrastructure</i>	146,421,412.21	4.42	5.00	-0.58
<i>Total Marketable Alternatives</i>		0.00	2.50	-2.50
TOTAL EQUITY	2,242,794,388.46	67.74	70.00	-2.26
FIXED INCOME				
ABERDEEN ASSET MGMT	213,944,203.99	6.46		
GARCIA HAMILTON	66,142,587.57	2.00		
SECURIAN ASSET MANAGEMENT	213,177,198.15	6.44		
<i>Total Investment Grade</i>	493,263,989.71	14.90	15.00	-0.10
NEUBERGER BERMAN	168,412,741.46	5.09		
<i>Total Opportunistic Credit</i>	168,412,741.46	5.09	5.00	0.09
BLACKROCK-HY	167,110,358.43	5.05		
OAKTREE	167,441,027.04	5.06		
<i>Total High Yield</i>	334,551,385.47	10.11	10.00	0.11
CASH ACCOUNT	71,668,959.99	2.16		
<i>Total Short Term</i>	71,668,959.99	2.16	0.00	2.16
TOTAL FIXED INCOME	1,067,897,076.63	32.26	30.00	2.26

TOTAL FUND \$ 3,310,691,465.09





WILSHIRE ASSOCIATES

Wilshire Consulting



Employees' Retirement Fund of the City of Dallas

Monthly Investment Summary

May 31, 2020

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Global Equity Composite	3.76	1.72	-5.40	7.20	5.46	5.19	7.99	9/1/2012	241,219,096	7.29
Global Low Volatility Composite	2.17	-3.19	-10.56	-0.35	4.24		6.48	7/1/2015	395,751,208	11.96
Domestic Equity Composite	5.37	-0.80	-10.91	5.26	5.77	6.95	9.63	1/1/1990	439,156,774	13.27
International Equity Composite	4.70	-3.16	-13.60	-1.76	-0.29	1.59	5.01	1/1/1990	383,211,777	11.58
Global Fixed Income Composite	1.15	0.13	3.78	7.53	4.62	3.95	5.14	10/1/1995	493,263,990	14.90
High Yield Composite	4.37	1.96	-0.24	6.35	4.09	4.66	6.41	1/1/1997	334,551,385	10.11
Credit Opportunities Composite	5.88	-5.59	-6.33	-1.46	2.19		5.19	2/1/2016	168,412,741	5.09
Total Real Estate Composite	0.21	-4.50	-6.84	-0.97	4.28	5.58	6.38	1/1/1990	361,691,185	10.93

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
MLP Composite	6.13	-14.16	-25.91	-28.29	-10.68	-10.58	0.70	1/1/2012	146,421,412	4.42
Private Equity Composite	-0.24	0.16	2.89	10.95	13.45	11.42	13.23	6/1/2009	274,849,702	8.30
Managed Short Term Composite	0.00	0.30	0.59	1.84	1.79	1.19	2.91	1/1/1990	71,668,960	2.17
Dallas Total Fund	2.94	-2.14	-6.97	1.25	3.72	4.14	8.76	1/1/1985	3,310,198,230	100.00
Policy Index	3.11	-1.19	-6.66	1.89	3.75	4.03	9.36			

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Systematic Financial	3.28	-9.62	-22.36	-9.08	-1.28	3.91	8.99	8/1/2003	55,022,204	12.53
Russell 2000 Index	6.51	-5.18	-15.95	-3.44	1.98	3.72	8.03			
Redwood Investments *	11.10	9.70	4.04	9.23	5.93		6.72	10/1/2016	34,873,204	7.94
Russell 2000 Growth Index	9.45	1.74	-6.65	7.32	7.72		9.10			
Channing Capital *	7.19	-5.34	-19.06	-7.79	-3.12	0.95	2.21	12/1/2013	28,503,621	6.49
Russell 2000 Value Index	2.87	-12.95	-25.65	-14.69	-4.16	0.71	1.57			
Domestic Equity Small Cap Composite	6.42	-3.57	-15.19	-4.02	0.22	3.42	8.14	6/1/2003	118,399,028	26.96

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Smith Graham * Russell Midcap Index	5.52 7.03	-12.55 -1.45	-25.86 -10.73	-7.27 2.63			-8.20 2.43	1/1/2018	52,713,859	12.00
T. Rowe Price S&P 500	5.01 4.76	2.89 3.59	-5.09 -4.97	12.67 12.84	10.53 10.23	10.41 9.86	9.00 8.47	4/1/2006	137,145,040	31.23
Northern Trust S&P 500 (Lending) S&P 500	4.76 4.76	3.60 3.59	-4.95 -4.97	12.87 12.84	10.25 10.23	9.90 9.86	9.87 9.82	1/1/1995	130,898,847	29.81
Domestic Equity Composite Custom Benchmark	5.37 5.20	-0.80 2.92	-10.91 -5.51	5.26 11.59	5.77 9.60	6.95 9.37	9.63 9.93	1/1/1990	439,156,774	100.00

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Adelante Capital Management	0.20	-11.66	-17.63	-10.70	1.68	2.86	8.80	10/1/2001	67,287,765	18.60
Wilshire U.S. Real Estate Securities Index	-0.32	-13.58	-19.72	-13.12	0.16	2.82	8.98			
CenterSquare	0.95	-12.46	-18.06	-11.09			1.05	6/1/2018	67,389,241	18.63
Wilshire U.S. Real Estate Securities Index	-0.32	-13.58	-19.72	-13.12			-0.60			
REIT Composite	0.57	-12.06	-17.84	-10.90	1.51	2.81	8.89	10/1/2001	134,677,006	37.24
Wilshire U.S. Real Estate Securities Index	-0.32	-13.58	-19.72	-13.12	0.16	2.82	8.98			
Heitman America Real Estate Trust, LP	0.00	-2.07	-2.07	-2.08	3.49	6.35	9.57	12/1/2010	83,362,320	23.05
NCREIF ODCE NOF	0.00	0.75	0.75	3.93	5.85	7.48	9.94			
Invesco Core Real Estate USA, LLC	0.00	1.65	1.65	7.20	7.83	9.29	10.74	12/1/2010	72,794,467	20.13
NCREIF ODCE NOF	0.00	0.75	0.75	3.93	5.85	7.48	9.94			
Private Core Real Estate Composite	0.00	0.59	1.11	5.90	5.97	7.25	9.58	10/1/2010	227,014,179	62.76
Custom Benchmark	0.00	1.20	1.57	6.45	6.15	6.75	8.98			
Total Real Estate Composite	0.21	-4.50	-6.84	-0.97	4.28	5.58	6.38	1/1/1990	361,691,185	100.00
Custom Benchmark	-0.16	-5.75	-8.92	-2.93	3.61	5.17	8.27			

Employees' Retirement Fund of the City of Dallas
Private Equity & Direct Private Real Estate Monthly Performance and Market Value Summary



Periods Ended 05/31/20

	Month-End Market Value	Commitment Value	Drawn Down Capital	Cash Distributions	Inception Date	IRR Since Inception	Multiple ³
Invesco II	70,857,392	65,188,333	65,188,333	6,418,420	Jan-14	4.5%	1.2
Total Direct Private Real Estate	70,857,392	65,188,333	65,188,333	6,418,420	Jan-14	4.5%	1.2

	Month-End Market Value	Commitment Value	Drawn Down Capital	Cash Distributions	Inception Date	IRR Since Inception	Multiple ³
Hamilton Lane Secondary Fund II	1,324,190	25,000,000	22,848,181	27,078,689	Jul-09	8.4%	1.2
Hamilton Lane Secondary Fund III	10,375,762	30,000,000	17,764,658	18,739,171	Nov-12	18.4%	1.6
Hamilton Lane Secondary Fund IV	23,103,234	30,000,000	19,880,195	3,099,866	Mar-17	21.0%	1.3
Hamilton Lane Secondary Fund V	6,000,000	40,000,000	6,019,890	-	Mar-20	-0.7%	1.0
Hamilton Lane Fund VII Composite	23,275,949	50,000,000	42,992,714	35,118,430	Jan-10	6.4%	1.4
Hamilton Lane Fund VIII (Global)	21,524,925	30,000,000	16,412,837	4,425,140	Nov-12	10.3%	1.6
Hamilton Lane Cash	-	-	-	-	Aug-09	--	--
GCM Grosvenor - Partnership, L.P.	45,137,171	75,000,000	81,752,229	88,397,643	Jun-11	15.2%	1.6
GCM Grosvenor - Partnership II, L.P. (2014)	54,032,951	60,000,000	59,335,350	20,465,813	Jul-14	12.1%	1.3
GCM Grosvenor - Partnership II, L.P. (2015)	38,059,107	20,000,000	29,537,819	3,724,621	Dec-15	17.7%	1.4
GCM Grosvenor - Partnership II, L.P. (2017)	11,437,953	30,000,000	11,796,234	351,228	Jan-18	-1.9%	1.0
GCM Grosvenor Cash	-	-	-	-	Jun-11	--	--
Fairview Capital III *	40,578,460	40,000,000	36,477,216	3,663,353	Aug-15	10.2%	1.2
Total Private Equity Composite	274,849,702	430,000,000	344,817,324	205,063,954	Jul-09	12.7%	1.4

Public Market Equivalent (PME) ²

329,650,776

15.5%

* Next Generation Manager

¹ Total Value to Paid-in Capital ("TVPI") multiple calculation = (market value + distributions) / capital called

² The Public Market Equivalent (PME) approach creates a hypothetical investment vehicle that mimics the private equity composite cash flows. The performance difference between the PME vehicle and the private equity portfolio is determined by their net asset value (NAV) at the end of the benchmarking period. The performance of the "public market" is simulated using the monthly S&P 500 index returns, plus a 300 BPs annual hurdle rate.

³ Private Equity cash account

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Acadian International Custom Benchmark	6.30 6.06	-1.36 -4.00	-14.30 -15.55	-4.79 -3.27	-0.80 -1.10	3.20 1.39	7.73 5.34	4/1/1989	93,681,733	24.45
Ativo International * MSCI EAFE Index (Net)	4.63 4.35	-7.28 -3.73	-16.18 -14.26	-5.62 -2.81			-4.39 -4.18	1/1/2018	31,844,036	8.31
AQR Capital Management Custom Benchmark	3.04 3.27	-2.72 -4.99	-12.84 -14.85	-1.09 -3.43	-1.31 -0.24	1.23 0.79	2.39 1.95	4/1/2006	103,323,696	26.96
Baillie Gifford MSCI AC World ex USA (Net)	6.93 3.27	1.43 -4.99	-7.22 -14.85	9.57 -3.43			7.29 -5.34	4/1/2019	85,268,608	22.25
Earnest Partners MSCI AC World ex USA (Net)	2.47 3.27	-9.58 -4.99	-20.09 -14.85	-9.28 -3.43			-10.64 -5.34	4/1/2019	69,091,277	18.03
BlackRock ACWI Ex U.S.									1,486	0.00
International Equity Composite Custom Benchmark	4.70 3.63	-3.16 -4.86	-13.60 -14.94	-1.76 -3.41	-0.29 -0.36	1.59 0.87	5.01 4.06	1/1/1990	383,211,777	100.00

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees							Allocation		
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Ariel Global * MSCI AC World Index (Net)	0.82 4.35	1.47 -0.07	-5.69 -9.16	5.96 5.43			2.03 1.71	1/1/2018	100,942,111	41.85
Wellington MSCI AC World Index (Net)	6.15 4.35	2.30 -0.07	-4.45 -9.16	8.62 5.43	5.46 5.19	5.43 5.29	10.45 8.23	9/1/2012	121,163,260	50.23
Northern Trust Global Equity MSCI AC World IMI (Net)	4.99 4.60	-0.56 -0.59	-9.58 -9.94	5.22 4.34	5.22 4.65		8.70 8.16	10/1/2015	19,113,725	7.92
Global Equity Composite MSCI AC World Index (Net)	3.76 4.35	1.72 -0.07	-5.40 -9.16	7.20 5.43	5.46 5.19	5.19 5.29	7.99 8.23	9/1/2012	241,219,096	100.00

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Acadian Global Low Vol.	1.96	-3.98	-12.46	-1.75	2.81		5.61	7/1/2015	195,309,989	49.35
MSCI AC World Index (Net)	4.35	-0.07	-9.16	5.43	5.19		5.89			
MSCI ACWI Minimum Volatility Index (Net)	2.21	-1.44	-7.74	1.79	5.61		7.09			
BlackRock Global Low Vol.	2.38	-2.40	-8.63	1.07	5.67		7.34	7/1/2015	200,441,219	50.65
MSCI ACWI Minimum Volatility Index (Net)	2.21	-1.44	-7.74	1.79	5.61		7.09			
Global Low Volatility Composite	2.17	-3.19	-10.56	-0.35	4.24		6.48	7/1/2015	395,751,208	100.00
MSCI ACWI Minimum Volatility Index (Net)	2.21	-1.44	-7.74	1.79	5.61		7.09			

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Atlantic Trust CIBC	7.28	-13.31	-25.48	-28.53	-11.17	-10.63	0.83	1/1/2012	72,934,742	49.81
Alerian MLP Index	8.95	-13.98	-30.21	-34.74	-14.67	-12.93	-4.47			
Harvest Fund Advisors MLP	5.00	-15.02	-26.35	-28.07	-10.27	-10.57	0.23	1/1/2012	73,486,671	50.19
Alerian MLP Index	8.95	-13.98	-30.21	-34.74	-14.67	-12.93	-4.47			
MLP Composite	6.13	-14.16	-25.91	-28.29	-10.68	-10.58	0.70	1/1/2012	146,421,412	100.00
Alerian MLP Index	8.95	-13.98	-30.21	-34.74	-14.67	-12.93	-4.47			

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Securian Asset Management Blmbg. Barc. U.S. Aggregate	1.25 0.47	-1.76 1.65	1.73 5.47	5.57 9.42	4.20 5.07	3.86 3.94	4.74 4.65	7/1/2007	213,177,198	43.22
Aberdeen Global Fixed Income Blmbg. Barc. U.S. Aggregate	1.08 0.47	1.55 1.65	5.58 5.47	9.42 9.42	5.06 5.07	4.12 3.94	5.04 4.51	5/1/2007	213,944,204	43.37
Garcia Hamilton * Blmbg. Barc. U.S. Aggregate	1.07 0.47	1.66 1.65	4.63 5.47	7.76 9.42	4.58 5.07	3.76 3.94	4.06 3.90	11/1/2013	66,142,588	13.41
Global Fixed Income Composite Blmbg. Barc. U.S. Aggregate	1.15 0.47	0.13 1.65	3.78 5.47	7.53 9.42	4.62 5.07	3.95 3.94	5.14 5.32	10/1/1995	493,263,990	100.00

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Neuberger Berman	5.88	-5.59	-6.33	-1.46	2.19		5.19	2/1/2016	168,412,741	
Custom Benchmark	4.80	-5.25	-5.81	-0.71	2.25		5.60			

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees							Allocation		
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Oaktree Capital Management	4.61	6.30	3.52	9.75	4.72	4.84	6.76	2/1/1997	167,441,027	50.05
FTSE High Yield Cash Pay	4.88	-3.97	-5.61	0.31	2.58	3.78	6.52			
BlackRock	4.14	-2.33	-4.00	2.91	3.41	3.97	6.03	10/1/2006	167,110,358	49.95
FTSE High Yield Cash Pay	4.88	-3.97	-5.61	0.31	2.58	3.78	6.37			
High Yield Composite	4.37	1.96	-0.24	6.35	4.09	4.66	6.41	1/1/1997	334,551,385	100.00
FTSE High Yield Cash Pay	4.88	-3.97	-5.61	0.31	2.58	3.78	6.53			

Asset Allocation & Performance

Dallas Total Fund

Periods Ended May 31, 2020

	Performance (%) net of fees								Allocation	
	1 Month	1 Quarter	YTD	1 Year	3 Years	5 Years	Since Inception	Inception Date	Market Value \$	%
Cash Account	0.00	0.30	0.59	1.84	1.79	1.19	3.27	1/1/1988	71,668,960	100.00
Managed Short Term Composite	0.00	0.30	0.59	1.84	1.79	1.19	2.91	1/1/1990	71,668,960	100.00

At A Glance

For period ended May 31, 2020

	2019		2020	
	This Month	YTD	This Month	YTD
Retirements				
Age	25	114	15	77
Service	1	9	4	15
Rule of 78	9	49	7	37
QDRO	0	2	0	2
<i>Total</i>	35	174	26	131
Disability Retirements				
Service	2	2	0	0
Non-service	0	0	0	3
<i>Total</i>	2	2	0	3
Benefits Paid	\$ 23,093,555.24	\$ 113,912,679.16	\$ 23,740,597.74	\$ 117,935,848.49
Refunds	\$ 1,110,106.67	\$ 4,344,640.32	\$ 359,318.01	\$ 2,992,910.41
Number of refunds	63	313	22	210
*Contributions	\$ 9,061,340.21	\$ 50,291,918.77	\$ 9,031,716.08	\$ 50,629,413.81

Members on record at month end			
	Retirees & beneficiaries	Disabilities	Actives
Jan	7,400	161	7,438
Feb	7,414	161	7,441
Mar	7,445	156	7,461
April	7,446	156	7,495
May	7,446	156	7,541
June			
July			
Aug			
Sep			
Oct			
Nov			
Dec			