2018 Fixed Income Asset Class Review

Jason Weiner, Director
Germán Gaymer, Analyst
Jacob Bowland, Analyst
Amy Hsiang, RVK

December 6–7, 2018

TMRS
Texas Municipal Retirement System
Agenda

I. Fixed Income Program: A Year in Review
II. Fixed Income Performance, Portfolio and Compliance
III. Fixed Income Market Review
IV. Forward Looking Plans
V. Conclusion
Section I

FIXED INCOME PROGRAM: A YEAR IN REVIEW
Comprehensive Annual Review Process

Why do we conduct annual reviews?

Per the TMRS IPS, comprehensive reviews are to be conducted and documented at least annually.

The Review Process Includes:

- Annual due diligence questionnaire, ADV and compliance, as appropriate, are reviewed
- Includes firm changes, personnel, investment strategy, style, process, and philosophy
- Compliance, operations, risk management, and performance
- Both quantitative and qualitative factors
- The review includes an onsite due diligence visit to the Manager’s office

The Annual Review process holds TMRS Staff accountable for its portfolio management process in order to preempt manager specific, strategic, or other potential problems.
Fixed Income Initiatives Accomplished: Annual Review

- Establish a due-diligence process to identify “best in class” manager opportunities
  - Sourcing, investment and operational due diligence, and leveraging Staff and consultant relationships were key factors enabling the identification of opportunities

- Initiate & execute on manager selection, negotiation, and funding while maintaining consideration of portfolio construction and diversification looking forward 5 years
  - Recommendations and approval of selected manager investments and funding are executed on a dynamic timeline taking into account anticipated portfolio diversification and market regimes

- Progress Non-Core Fixed Income Portfolio towards a target NAV while managing commitment levels, portfolio construction and access to best in class managers
  - Commitment levels, portfolio construction, and access to best in class managers have been successful, but deployment – somewhat outside of our control – has been a bit slower than expected

- Construct and maintain the NCFI portfolio to accomplish TMRS’ investment objectives as a return driver and diversifier of risk
  - $3.15 billion of non-core fixed income capital committed since Dec. 2015. $5.115 billion in total for new mandates plus existing portfolio improvements. The risk/return profile of the invested portfolio achieves TMRS investment objectives

- Monitor existing portfolio. Source, research, and pursue new strategies and co-invest opportunities
  - Additional strategies, including international exposure and co-investments may be used to further optimize the portfolio as well as blend down fees with existing funds

Status:

- ✓
- ✓
- ✓
- ✓
- ✓
Strong planning, execution & portfolio management has put TMRS on the path to achieving strategic investment objectives.
**FI Team Experience**

**Jason Weiner**
- 25 years of experience
- CFA
- Asset Management/Senior Portfolio Manager, Corporate and Structured Credit Analyst, Pension experience

**Germán Gaymer**
- 12 years of experience
- Asset Management, Insurance & Pension experience
- Credit Analyst, Fixed Income Analyst, Portfolio Manager

**Jacob Bowland**
- 12 years experience
- MBA, CFA
- Pension & Consulting experience
- Research Analyst, Performance Analyst, Investment Officer

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**CIO**

**TJ Carlson**

**Risk Management**
- Dimitry Shishkoff
- Melissa Jerkins
- Ryan Conner

**Admin. Support**
- Cindy Morse
- Debbie Farahmandi

**Compliance**
- Kurt Cressotti

**Public Equity**
- Kristin Qualls
- Carol Leung

**Private Equity**
- Chris Schelling
- Peter Teneriello

**Absolute Return**
- Mark Leavitt
- Kevin Notaro

**Real Assets**
- Tom Masthay
- Eddie Schultz
- Yvonne Huang

**Operations**
- Sally Case
- Geldon Vlluha
- Susan Jaques

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**FI Program Review – Accountability in Action**

**FI Staff Resources**

<table>
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<tr>
<th>Manager Meetings</th>
<th>2016</th>
<th>2017</th>
<th>2018*</th>
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<td>198</td>
<td>220</td>
<td>165</td>
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* As of 9/30/18
Manager & Consultant Scorecard Summary:
All 26 manager relationships were assessed and are in satisfactory standing.

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<th>Excellent</th>
<th>In Good Standing</th>
<th>Fair (working with manager)</th>
<th>Unsatisfactory (remedial action being taken)</th>
<th>Comprehensive Review</th>
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Contractual Compliance:
All managers, as appropriate, have certified compliance with relationship governing documents, including:
- Valuation policies
- Regulatory actions
- Code of Ethics compliance
- LPA/side letter compliance

Monitoring and Review Summary:
Quarterly monitoring, annual reviews (including annual onsite, due-diligence), ad-hoc reviews, capital calls reviews, LPAC meetings

Manager Reporting: DDQ, ADV, Annual Audited Financials, Quarterly Capital Account Statements, Investment Commentary, Investor Letters, and fee disclosures

RVK Reports: Investment Due Diligence, Manager Summaries and Market Reviews

IPS Compliance and Monitoring at the Portfolio Level
Section II

FIXED INCOME
PERFORMANCE, PORTFOLIO & COMPLIANCE
Fixed Income Portfolio

- Core fixed income continues to fund NCFI and other asset classes.
- NCFI represents 17.2% on an invested basis and 21.2% on a commitment basis of the overall TMRS portfolio.
In addition to expected return and volatility, investment staff is constantly evaluating additional factors such as:

- Liquidity
- Fund structure
- Strategy
- Market and Economic Conditions
Implementation Risk Ranges Implied by IPS Asset Class Guidelines
September 2018

Based on current as-invested strategy allocations and Investment Department long-term assumptions regarding each strategy.

Maximum risk implied by IPS

Minimum risk implied by IPS

- - - Risk range implied by IPS Rebalancing Policy

Current TMRS Risk Estimate

RVK Long-Term Assumption

0.0% 5.0% 10.0% 15.0% 20.0% 25.0%
Investment Staff’s objective is to construct the NCFI portfolio to increase expected return while minimizing overall risk given market conditions.
Core Fixed Income Asset Class Objectives

IPS Stated Objective for the Core Fixed Income Portfolio:
“The core fixed income asset class diversifies the risk of the overall investment portfolio with a secondary goal of capital preservation. The overall objective is to exceed its benchmark performance net of fees over rolling five year periods.”

A primary goal of the annual review presentation is to discuss the Fixed Income portfolio and its construction relative to IPS stated performance goals & implementation objectives:

Performance Goals:

- Exceed the Bloomberg Barclays US Aggregate Bond Index net of fees over rolling five year periods.
Core Fixed Income

Teams strategically allocate between the three alpha sources: top-down sector allocation, bottom-up security selection, and macro duration/yield curve positioning.

- **Core Sectors**
  - US Treasuries
  - US Agencies
  - US Mortgages
  - Investment Grade Corporates
  - US Municipals
  - ABS
  - CMBS

- **Unbiased Approach**

- **Sector Allocation**
  - Active rotation across benchmark and out of benchmark sectors

- **Security Selection**
  - Strong bottom-up research dedicated to identifying well supported credits

- **Duration, Yield Curve, Macro**
  - Strategies designed to manage duration, yield curve positioning and risk

- **“Plus” Sectors**
  - US TIPS
  - Global Inflation Linkers
  - HY Corporates
  - Bank Loans
  - Non-US Credit
  - Non-Agency RMBS
  - CLOs
  - Emerging Markets

Source: BlackRock
## Performance

### Core Fixed Income Performance

**Period Ending September 30, 2018 (Net All)**

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<tr>
<th>Fund</th>
<th>MKT VAL</th>
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<td>NGROA03 – TMRS – TOTAL CORE FIXED INCOME</td>
<td>4,129,792,189</td>
<td>14.17</td>
<td>−0.64</td>
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### Performance Goals:

- Exceed the Bloomberg Barclays US Aggregate Bond Index net of fees over rolling five year periods.

*Source: State Street Investment Analytics*
Non-Core Fixed Income Asset Class Objectives

IPS Stated Objective for the Non-Core Fixed Income (NCFI) Portfolio:
“The NCFI asset class diversifies the risk of the overall investment program and is designed to provide both income and capital appreciation. The overall objective is to exceed its benchmark performance net of fees over rolling five year periods.”

A primary goal of the annual review presentation is to discuss the Non-Core Fixed Income portfolio and its construction relative to IPS stated performance goals & implementation objectives:

Performance Goals:

- Exceed its benchmark performance net of fees over rolling five year periods.
- For periods less than 5 years, reported performance is significantly more difficult to benchmark.
- Measures of success are portfolio construction: identify best in class managers, balance concentration and diversification, ensure sufficient strategy diversification, etc.
The Opportunity Spectrum of Credit

Source: BlackRock
Non-Core Fixed Income Portfolio Construction

NCFI Portfolio (as of 9/30/18)

- **Structured Credit (18%)**
  - Ellington
  - Voya
  - Waterfall*

- **Direct Lending (21%)**
  - Adams Street**
  - Angelo Gordon**
  - Golub***
  - H.I.G. WhiteHorse**
  - TCW**
  - White Oak**

- **BL/CLO (15%)**
  - GSO
  - Octagon

- **EMD (11%)**
  - Alliance Bernstein
  - Bain
  - ECO
  - COF II
  - Varde
  - Ellington
  - Waterfall

- **High Yield (10%)**
  - Columbia
  - Neuberger Berman

- **Opportunistic Credit (25%)**
  - Bain
  - Beach Point
  - BlackRock GCO**
  - GoldenTree
  - Marathon SPS**
  - Marathon ECO**
  - Marathon CLO RR**
  - PIMCO COF II**
  - Värde**

*Opportunistic Mandate
**Partially funded
*** Investment Period terminated, on run-off mode
Non-Core Fixed Income Portfolio Construction

NCFI Portfolio (as of 9/30/18)

- Private 37%
- Public 60%
- Private & Public 3%

Structured Credit (18%)
- Ellington
- Voya
- Waterfall

BL/CLO (15%)
- GSO
- Octagon

Direct Lending (21%)
- Adams Street
- Angelo Gordon
- Golub
- H.I.G. WhiteHorse
- TCW
- White Oak

HY (10%)
- Columbia
- Neuberger Berman

EMD (11%)
- Alliance Bernstein
- BlueBay

Opportunistic Credit (25%)
- Bain
- Beach Point
- BlackRock GCO
- GoldenTree
- Marathon SPS
- Marathon ECO
- Marathon CLO RR
- PIMCO COF II
- Värde

*Opportunistic Mandate
**Partially funded
*** Investment Period terminated, on run-off mode
Non-Core Fixed Income Portfolio

The NCFI portfolio has the following sector concentration limitations:

- Global High Yield Debt: 0%-55%
- Loans: 0%-50%
- Emerging Markets Debt: 0%-20%
- Opportunistic Fixed Income: 0%-50%
- Structured Credit: 0%-40%

<table>
<thead>
<tr>
<th>IPS</th>
<th>Max</th>
<th>Actual</th>
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</thead>
<tbody>
<tr>
<td>Global High Yield</td>
<td>55.00%</td>
<td>10.23%</td>
</tr>
<tr>
<td>Loans</td>
<td>50.00%</td>
<td>35.30%</td>
</tr>
<tr>
<td>EMD</td>
<td>20.00%</td>
<td>11.43%</td>
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<tr>
<td>Opportunistic FI</td>
<td>50.00%</td>
<td>24.85%</td>
</tr>
<tr>
<td>Structured Credit</td>
<td>40.00%</td>
<td>18.19%</td>
</tr>
</tbody>
</table>
Performance

Non-Core Fixed Income Performance
Period Ending September 30, 2018 (Net All)

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<tr>
<th></th>
<th>MKT VAL</th>
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<th>Incept Date</th>
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<tbody>
<tr>
<td>NGR0A11 – TOTAL NON-CORE FIXED INCOME</td>
<td>5,007,396,745</td>
<td>17.18</td>
<td>0.1</td>
<td>0.86</td>
<td>2.26</td>
<td>3.37</td>
<td>5.15</td>
<td>4.57</td>
<td>10-01-14</td>
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<tr>
<td>TOTAL NON-CORE FI WEIGHTED INDEX</td>
<td>0.08</td>
<td>0.99</td>
<td>2.42</td>
<td>3.43</td>
<td>4.43</td>
<td>3.710-01-14</td>
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<tr>
<td>Excess</td>
<td>0.02</td>
<td>-0.13</td>
<td>-0.15</td>
<td>-0.06</td>
<td>0.73</td>
<td>0.87</td>
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Performance Goals:

- Exceed its benchmark performance net of fees over rolling five year periods. ✔
- For periods less than 5 years, reported performance is significantly more difficult to benchmark. ✔
- Measures of success are portfolio construction: identify best in class managers, balance concentration and diversification, ensure sufficient strategy diversification, etc. ✔
Section III

FIXED INCOME MARKET REVIEW
Market Review

**Short-Term Interest Rates**

Fed Funds Target Rate – Upper Bound

3 Mo. LIBOR

**Interest Rate Trends**

Higher growth expectations caused interest rates to rise over the quarter.

**Yield Curve Slope**

Yield curves slightly flattened over the quarter as short-term yields rose more than intermediate and long-term yields.

Source: Western Asset, Bloomberg, U.S. Department of Treasury
Market Review

US GDP exhibiting moderate growth, picking up recently

Confidence measures and PMIs remain near post-crisis highs

Unemployment declining further and LFPR levelling off despite demographic pressure downward

Broad measures of inflation have trended higher in recent months

Source: BlackRock, Bloomberg
Data as of Sep. 30, 2018
Market Review

An expanding universe
Growth in global credit markets

$16tn

0tn

2001 2005 2009 2013 2017

IG  Loans  HY  Securitized  Emerging mkt. corp.

Sources: Standard and Poor’s LCD, JP Morgan, and Barclays, June 2017. IG and HY totals based on Barclays Global Corporate Agg Index and Barclays Global HY Index. Loan totals based on S&P/LSTA Leverage Loans Index and S&P European All Loans Index. Securitized total based on Barclays Global Securitized - CMBS Index, Barclays Global Securitized - ABS Index, and JP Morgan CLO Issuance data. EM corporate total based on Barclays EM USD Aggregate Index.

Source: BlackRock
Market Review

Both IG and HY credit spreads have widened off their cyclical tights

Source: BlackRock & Bloomberg
Data as of Sep. 30, 2018
## Market Review

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<td>8.26%</td>
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<td>28.7%</td>
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<td>17.13%</td>
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### Annual Dispersion

| Source: BBg Barclays, Bloomberg and J.P. Morgan, as of 10/31/18. U.S. High Yield = BBg Barclays US HY 2% Issuer Cap. European High Yield = BBg Barclays Pan-European High Yield USD hedged. U.S. Loan = S&P/LSTA Leveraged Loan. U.S. Investment Grade = BBg Barclays US Corp IG. European Investment Grade = BBg Barclays Pan-Euro Corporate USD hedged. EM bonds = JP Morgan EMBI Global. EUR Loans = S&P/LSTA European Leveraged Loan Index. Asian Credit = JPMorgan Asian Credit Index (JACI). Index performance is shown for illustrative purposes only. It is not possible to invest directly in an index. Past performance is not a reliable indicator of current or future results. Source: BlackRock |
Market Review

YTD Fixed Income Returns (%)\(^2\)

- US Loans: 4.03%
- US High Yield: 2.57%
- US MBS: -1.07%
- US Agg: -1.60%
- US Treasuries: -1.67%
- EM USD Agg: -2.28%
- US IG Corporate: -2.33%

U.S. Loan Returns by Quality\(^3\)

- BBB: 10.0%
- BB: 8.3%
- B: 4.3%
- CCC: 3.2%

U.S. High Yield Returns by Quality\(^3\)

- BB: 9.0%
- B: 8.2%
- CCC/Split CCC: 3.3%


\(^3\) Source: S&P/LSTA Leveraged Loan Index, as of September 30, 2018 and Credit Suisse High Yield Index, as of September 30, 2018.
Market Review

Resilience in rising-rate environments
Performance of treasuries, IG, HY and bank loans in periods of rising rates

Source: BlackRock
Market Review

Emerging Markets Indices (Dec. 29, 2017 =100)

<table>
<thead>
<tr>
<th>Index Type</th>
<th>2018 YTD Return (as of 11/9/18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBI (Sovereign Hard Currency)</td>
<td>-4.8%</td>
</tr>
<tr>
<td>GBI (Sovereign Local Currency)</td>
<td>-8.7%</td>
</tr>
<tr>
<td>CEMBI (Corporate Hard Currency)</td>
<td>-1.8%</td>
</tr>
</tbody>
</table>

Source: Bloomberg, JP Morgan & BlueBay
Market Review

The interest cost of US debt is now estimated to be $550 billion per year. The U.S. government has estimated revenues to be $3.33 trillion in 2018, which means almost 17% of federal tax revenue will go towards paying interest on debt.
Market Review

You're right! Maybe I should hibernate.
2018 Summary

- Inflation has picked up in 2018, mainly driven by an increase in energy prices. Future expectations of inflation remain muted contributing to a flat yield curve.
  Staff 2017: Interest rates have moved higher as investors have adjusted their inflation expectations.

- As of Sep. 2018, the NCFI portfolio returned 2.26% YTD compared to −1.37% for the core fixed income portfolio and −1.6% for the core fixed income benchmark.
  Staff 2017: Investors continue to diversify into other asset classes to mitigate rising interest rate risk and capture attractive yields.

- The Fed Funds Rate reached 0.75% by the end of 2016. The Fed increased rates 3 times in 2017 reaching 1.50%.
  Staff 2017: The Fed raised rates in December and suggested they could increase short term interest rates three times in 2017.

- Recent tax cuts have boosted GDP and allowed the Fed to continue raising rates at a measured pace. The Fed has increased rates 3 times to 2.25% in 2018 with one additional hike expected in December. The Fed continues to be hawkish by signaling 3 additional rate hikes in 2019.
  Staff 2017: Effective fiscal policy could have a significant impact on the future level of interest rates.
Section IV

FORWARD LOOKING PLANS
Fixed Income Agenda

• NCFI portfolio is fully allocated on a committed basis.

• Conduct manager searches in 2019 to reinvest returns of capital from previous private credit investments (or other reasons) if needed.

• Refine our manager due diligence process to improve the total return and risk profile of the Core and NCFI portfolios.

• Continue to assess and potentially implement more Strategic and Direct Investor mandates to drive down costs and improve net returns.
Fixed Income Agenda

More Expensive

Direct Investor
Highly Sophisticated Institutions
Asset Managers

Strategic Capital
Sophisticated Institutions
Separate Accounts, Co-Invest, etc.

Direct Fund
Sophisticated Institutions
Resourced Institutions

Fund of Funds
Subscale Institutions
Resource Constrained

More Specialized Expertise

 Alliance Bernstein
 Bain
 BlackRock
 BlueBay
 Columbia
 Ellington
 GoldenTree
 GSO
 H.I.G. WhiteHorse
 Neuberger Berman
 Octagon
 PIMCO
 TCW
 Voya

 Adams Street
 Angelo Gordon
 Beach Point
 BlackRock GCO
 Golub
 Marathon (SPS, ECO & CLO)
 PIMCO COF II
 Värde
 Waterfall
 White Oak
Section V

CONCLUSION
Conclusion

- TMRS has made substantial progress towards its strategic fixed income objectives, although deployment has been slower than expected.
- Fixed Income Staff continues to work to develop deeper relationships with managers and become a strategic partner.
- The overall fixed income portfolio has performed according to expectations.
- The NCFI portfolio has generated positive returns from diversified/differentiated sources as intended. These returns are able to help mitigate some of the more acute risks within the Core portfolio, namely interest rate risk.
- The markets are experiencing heightened volatility as interest rates continue to move higher.
- Select private credit strategies remain attractive but caution is warranted given the substantial capital raised in this market segment.
DISCLOSURES

TMRS periodically discloses public information that is not excepted from disclosure under Section 552.0225(b) of the Texas Public Information Act. Information provided by a manager, a Managing General Partner (GP), any of its Associates or other data provider to TMRS or a TMRS service provider, and contained in these materials (i) may have been independently produced or modified by TMRS or the TMRS service provider; (ii) has not been reviewed or approved by the manager, Managing GP or any of its Associates; and (iii) may not reflect the historical performance or asset value reflected in the manager’s, Managing GP’s or any of its Associates’ records and, therefore, should not be used for comparative purposes.