2018 Real Return Asset Class Review

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TMR S
Texas Municipal Retirement System
Agenda

I. Introduction
II. **WHAT** we are Invested in
III. **DEMYSTIFYING** Performance Management
IV. **DEFINING** Portfolio Management
Section I

INTRODUCTION
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 goal is to formally review managers’ performance, current investment strategy or style relative to that which was communicated, and other issues related to the managers’ organization, personnel, or investment philosophy. The annual review process is part of the IPS manager retention framework.

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

-- Slide first appeared in conjunction with 2017 Real Estate Annual Review
Transparency
Focusing on the RIGHT Information

WHAT we are Invested In
We invest in public & private securities across Infrastructure, Energy, Mining, Agriculture, Commodities, and Inflation Linked Bond Markets, amongst others.

DEMYSTIFYING Performance Management
There are many ways to measure performance.

DEFINING Portfolio Management
What Investment Staff does on a daily basis.
Section II

WHAT WE ARE INVESTED IN
TMRS Real Return Portfolio

What we are Invested In

*Photos courtesy Brookfield & I Squared Annual 2017 Annual Reports, Orion 2017 Annual Meeting
Real Return Opportunity Set

The Real Return Opportunity Set is categorized principally by:

**Public Securities**
Listed Infra, Listed RE, Nat. Resource Equities, Commodities, Preferred Securities, Credit, etc.

and

**Private Opportunities**
Infrastructure, Energy, Agriculture, Mining, Royalties, etc.
Real Return Portfolio Assessment
Pacing Plan vs. Actual Capital Deployment

2015
- Pacing Plan: $600mm*
- Deployed: $800mm

2016
- Pacing Plan: $800mm
- Deployed: $800mm

2017
- Pacing Plan: $600–1,000mm
- Deployed: $895mm

2018
- Pacing Plan: $400–800mm
- Deployed: $400mm+ (est.)

2015 Beg. Market Value (%): $994mm (4.21%)
2015 Beg. Private MV (%): $0 (0%)
2015 End (BOY) Vehicles: 16 (1)

2017 Beg. Market Value (%): $2,302mm (9.17%)
2017 End Market Value (%): $2,912mm (10.24%)
2017 Beg. Private MV: $154mm (0.61%)
2017 End Private MV (%): $311mm (1.10%)
2017 End (BOY) Vehicles: 15 (7)

2017 Beg. Private MV (%): $154mm (0.61%)
2017 End Private MV (%): $311mm (1.10%)
2017 End (BOY) Vehicles: 15 (7)

2018
- Pacing Plan: $800mm
- Deployed: $800mm

2018 6/30 Market Value: $2,943mm (10.31%)
2018 6/30 Private MV (%): $354mm (1.24%)
2018 6/30 (2015 BOY) Veh.: 16 (1)

*Pacing plan as established at beginning of year/ # of vehicles measure ‘as approved’ / Market Values per State Street
Portfolio Implementation
Ex-Ante Risk Return Expectations: The Traditional Model

Higher (E)Return

The private real return opportunity set typically has return profiles that sit between public markets strategies and private equity.
TMRS is well diversified across public markets and private allocations are growing as commitments are drawn.

All charts presented on an adjusted committed basis.

Portfolio Exposure by Manager
Public Markets Detail as of 6/30/18

Current Private vs. Public Assets
Market Value as of 6/30/18

Projected Private vs. Public Assets
based on current commitments as of 6/30/18
Private investment strategy commitments will begin to draw down real return public markets exposure going forward.

All charts presented on an adjusted committed basis.
Recent recommendations have enhanced TMRS’ diversification within the infrastructure, mining and agricultural sectors.

All charts presented on an adjusted committed basis.
TMRS Real Return Portfolio

What we are Invested In

Portfolio Exposure by Geography
as of 6/30/18

Real Return is a global opportunity set. TMRS continues a path of portfolio level conservatism.

TMRS has pursued a conservative real return portfolio capital structure.

Real Return Capital Structure
as of 6/30/18

All charts presented on an adjusted committed basis.
1. Real Return range includes 0–30% limit on Inflation Linked Bonds to align with the IPS’s Asset Class Goal of CPI+4%
IPS Compliance Review

**Vehicle Concentration Guideline** – TMRS is within guideline limits that no more than 35% of the total net assets of the real return portfolio may be invested in any one Registered Investment Vehicle.

**Closed or Open-end Vehicle Concentration Limit** – TMRS is within guideline limits that no more than 15% of total net assets may be invested in a single Private investment Vehicle.

**Commingled Open-End Concentration Limit** – TMRS is within guideline limits that TMRS can not represent more than 20% of total net assets of a commingled investment vehicle.

**Percentage of Manager AUM Limit** – TMRS does not account for more than 25% of total AUM of any contracted manager’s total AUM.
For the past 12–months, US CPI increased sharply in part due to energy price increases.

* Data Source: Bloomberg; U.S Bureau of Labor Statistics
Historically USD is negatively correlated to all others while Commodity, Oil and Gold are positively correlated to each other. However, recently Oil prices raised a lot while Gold is dropping.

Data Source: Bloomberg
Breakevens provide a snapshot of what the fixed income market is currently predicting for inflation.

Data Source: Bloomberg

Note: Breakevens are the difference in the yield between a nominal and inflation protected bond of similar maturity and grade.
Section III

DEMYSTIFYING PERFORMANCE MEASUREMENT

*Performance data is as of 12/31/17 unless otherwise disclosed
PERFORMANCE MEASUREMENT

THREE PILLARS

Absolute Return

Relative to Benchmark

Relative to Peers

N/M – Market Beta Driven

TMRS: Was short term positioning good? Was it intentional?

Manager: If valid benchmark, good positioning? Intentional?

N/M – Too many variables, more valid questions pertain to benchmark selection

Short Term

Longer Term

TMRS: Is asset class meeting asset allocation objective? Is Benchmark (BM) choice appropriate?

Manager: Is manager/strategy meeting a priori expectations?

TMRS: Given BM choice, has program been successfully implemented?

Manager: If valid benchmark, has strategy been implemented well?

TMRS: Has our program design been different from consensus? Have our choices been better or worse?

Manager: Do you deserve to be invested with still?
## Absolute Return

An absolute return objective of CPI + 400bps is established as the long term objective of the real return portfolio.

Over the last three years, TMRS has made allocations objectively to increase the probability of meeting its long term absolute return goal.

Private Markets Returns should increasingly contribute positively to returns through time.

### Performance Measurement

<table>
<thead>
<tr>
<th></th>
<th>1 Yr.</th>
<th>Met Objective</th>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>9.13%</td>
<td>✓ / n/m</td>
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<tr>
<td>Private Mkts. Return</td>
<td>-2.75%</td>
<td>X / n/m</td>
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<tr>
<td>Total RR Return</td>
<td>7.93%</td>
<td>✓ / n/m</td>
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<table>
<thead>
<tr>
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<th>3 Yr.</th>
<th>Met Objective</th>
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</thead>
<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>2.96%</td>
<td>X</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>2.87%</td>
<td>X</td>
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<table>
<thead>
<tr>
<th></th>
<th>5 Yr.</th>
<th>Met Objective</th>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>1.74%</td>
<td>X</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>1.68%</td>
<td>X</td>
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</table>
Recent real return public markets trading activity has improved TMRS performance and brought returns above 3 and 5 year benchmark returns.

### Performance Measurement

### Relative to Benchmark

<table>
<thead>
<tr>
<th></th>
<th>1 Yr.</th>
<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
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</thead>
<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>9.13%</td>
<td>8.51% (GILBs)</td>
<td>✓</td>
<td>64bps</td>
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<tr>
<td>Private Mkts. Return</td>
<td>-2.75%</td>
<td>n/m</td>
<td>n/m</td>
<td>n/a</td>
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<tr>
<td>Total RR Return</td>
<td>7.93%</td>
<td>8.51% (GILBs)</td>
<td>X</td>
<td>(59bps)</td>
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<table>
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<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
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<tr>
<td>Public Mkts. Return</td>
<td>2.96%</td>
<td>2.46% (GILBs)</td>
<td>✓</td>
<td>50bps p.a.</td>
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<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>Total RR Return</td>
<td>2.87%</td>
<td>2.46% (GILBs)</td>
<td>✓</td>
<td>41bps p.a.</td>
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<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
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</thead>
<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>1.74%</td>
<td>1.28% (GILBs)</td>
<td>✓</td>
<td>46 bps p.a.</td>
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<tr>
<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>Total RR Return</td>
<td>1.68%</td>
<td>1.28% (GILBs)</td>
<td>✓</td>
<td>40bps p.a.</td>
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</table>
Relative to Peers, analysis at the Plan Sponsor level would typically compare TMRS performance to other public pension plans. There is insufficient data to perform this analysis currently for multiple reasons:

1) There is no reported peer universe for Real Return
2) The asset class is still institutionally nascent
3) Real Return program design is highly heterogeneous

Comparison to Peers at the Plan Sponsor level may remain difficult for an extended period of time.
Relative to Peers, analysis at the manager level would typically compare performance to other similar strategies. There is insufficient data to perform this analysis currently for multiple reasons:

1) Private Real Return – Funds are too early in life cycle to analyze properly

2) Public Real Return – Strategies in TMRS portfolio are market distinct with few, if any, direct comparables, with the exception of the MLP mandate which is only 8 months since the inception of the account

3) Public Real Return – Short account life cycles mean absolute return, relative to benchmark, and relative to funding asset returns, are more meaningful at this juncture.

Comparison to Peers at the Manager level will become increasingly possible and meaningful as TMRS’ portfolio matures.
## Additional Performance Data

### Dollarized Public Markets Relative Performance, 2018 YTD

<table>
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<th>Public Markets Dollar Value Trade Assessment (2016-2018)</th>
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<tr>
<td><strong>Manager (Strategy)</strong></td>
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<tr>
<td>------------------------</td>
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<tr>
<td>Nuveen (Income Screened REITS &amp; Infra)</td>
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<tr>
<td>Cohen &amp; Steers (Diversified Inflation Linked)</td>
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<tr>
<td>Nuveen &amp; Cohen &amp; Steers</td>
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<tr>
<td>Chickasaw (Master Limited Partnerships)</td>
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**Total Trade Value to TMRS**

(data through May 31, 2018) $164 million

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### State Street Performance

(though 7/23/18 daily figures)

- **TMRS Total RR:** 0.28%
- **Benchmark:** 0.28%

- **TMRS Public Markets:** 0.29%
- **Barclay’s GILBs Index:** -1.98%

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*State Street Performance for private markets is lagged one quarter; Figures includes 4Q 2017, 1Q 2018 private markets plus cash flows through 7/23/18*
PERFORMANCE MEASUREMENT
ANSWERING PERFORMANCE QUESTIONS

Absolute Return

Relative to Benchmark

TMRS: Was short term positioning good? Was it intentional?
YES (Public Mkts.)
Manager: If valid benchmark, good positioning? Intentional?
Mixed

Relative to Peers

N/M

Short Term

Longer Term

TMRS: Is asset class meeting asset allocation objective? Is BM choice appropriate? No, Yes
Manager: Is manager/strategy meeting a priori expectations? On Average, YES

TMRS: Given BM choice, has program been successful? YES
Manager: If valid benchmark, has strategy been implemented well? Mixed

TMRS: Has our program design been different from consensus? Have our choices been better or worse?
Manager: Do you deserve to be invested with still?

Questions must always be asked
Section IV

DEFINING PORTFOLIO MANAGEMENT
Portfolio Management is the art and science of making decisions about investment mix and policy, matching investments to objectives, asset allocation for individuals and institutions, and balancing risk against performance.

--Investopedia
Portfolio Management

*The Day to Day*

- Manager Research
- Execution
- Economic Research
- Monitoring / Decision Revision
Portfolio Management

The Day to Day

Manager Research

Due Diligence

Offering Materials
Intro Meetings/Calls
In-Person Meetings
Conferences
On-Site Diligence
References
Desk Work
Portfolio Management
The Day to Day

Monthly Market Meeting

Journals

Books

Conferences

Economic Research

Internet

Manager Research

Team Discussions

Data Vendors
Portfolio Management

The Day to Day

Manager Research
Market Research
Contractual/Negotiation
Signature Submissions
Board Approval
Inv. Committee
Final Closing
Funding

Execution
The Art of Portfolio Management is in Asking the Right Questions Across the Multitude of Individual Decisions made to arrive at a portfolio:

- Is pacing progressing as planned?
- Are managers performing differently?
- Are managers making different decisions?
- Are there collective risks we did not see prior?
- Can we achieve the same outcome more cheaply?
- What were we wrong about?
- What can we correct?
- ...and many more questions.
Manager Monitoring
A Refresher

The Manager Monitoring Process: “TPS Reports”
The Quarterly monitoring process was enhanced during 2016 to make monitoring process more value-additive from a content perspective, create clear lines of communication for the CIO review of team work product, and more time efficient due to streamlining. At the Manager level, this is where Decision Revision begins.

The Real Asset team has been forced to reorganize monitoring efforts in face of growing vehicle count. Formal delegation of manager coverage within the Real Asset Team is the mechanism used to increase the team's coverage capacities. Delegation within the team has successfully created:

- Greater Intra-team Communication
- Manager Monitoring Redundancy
- Personal Accountability & Job Satisfaction
- Opportunities for Career Advancement
- Clean and Comprehensive Audit Trails

*Slide originally appeared in August 2017
Real Estate Annual Review Board materials
Quarterly & Annual Review Processes
A Refresher

Formal Monitoring ensures all matters of Policy & Procedure are followed, documented, and held accountable to evolve as necessary.
Manager Monitoring
Manager Scorecards, Fees, Meetings & Travel

Manager & Consultant Scorecard Summary:
All 34 manager relationships and 2 consultant relationships assessed are in satisfactory standing*.

Contractual Compliance:
All managers have certified compliance with relationship governing documents.

Fees paid summary:

Real Estate:
Total 2017 Management Fees Paid: $27.4mm ($21.1mm in 2016)
2017 Fee % of Wtd. Avg. AUM: 1.20% (1.25%)
% of 2017 Profits Paid to GP as Incentive: 6.7% (5.8%)
% of 2017 Profits Paid to GP as Fees & Incentive: 16.3% (17.2%)
% Income Earned on Avg. AUM: 3.9%

Real Return:
Total 2017 Management Fees Paid (RR): $17.0mm ($8.1mm)
2017 Fee % of Wtd. Avg. AUM: .65% (0.47%)

Additional Information:
Total Manager Meetings (Last Twelve Months): 273 (338)
Person Days of Travel (LTM): 100 (92)
LPAC Seats: 34

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<th>Assessment Area</th>
<th>Grade</th>
<th>Update &amp; Comments</th>
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<td>Organization</td>
<td></td>
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<td>People</td>
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<td>Philosophy/Strategy/Process</td>
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<tr>
<td>Other</td>
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*Inclusive of Real Estate & Real Return
Accountability in Action
What did we say we were going to do? (Other than Portfolio Performance)

Real Estate & Real Return Projects & Initiatives

- Allocate greater time resources to manager, market and portfolio research.  
  Continued operational resource expansion and implementation of new initiatives has continued to enable more time to be spent on portfolio management. Team turnover at the beginning of 2018 set this back in 1H 2018.

- Complete format design and implementation of Albourne generated quarterly Real Return Report.  
  Initial Draft completed in Q2 and is continuing to be refined. The report will create more value as time progresses and TMRS’ private real return portfolio begins to drive more of the returns.

- Complete Benchmark enhancement for Real Return Portfolio.  
  Real Return Benchmark revision approved in conjunction with 2017 IPS Revisions.

- Conduct research projects on various market segments including Timber, Real Estate debt, and real return portfolio management construction.  
  Market research projects have served as opportunities to train junior personnel more formally. Accordingly, a Timber research project was completed in 2017. Research more directly pertaining to active due diligence is carried out by more senior team members with results appearing in recommendation memos.

- Real Estate & Real Asset Manager Database enhancement.  
  Standard nomenclature has been adopted and project is roughly 2/3rds complete. With the addition of an analyst and intern, it is anticipated this project will be completed during 2018.

- Complete backdating of manager Investment Vehicle Summaries.  
  Project has been pursued in fits and starts, with its main benefit being to serve as a centralized document for key contractual terms, important dates, and otherwise serve as a comprehensive reference document. Team turnover in the first half of 2018 has held this project up and is currently on hold for other initiatives.
Portfolio Management Initiatives

What did we say we were going to do? (Other than Portfolio Performance)

**Real Estate & Real Return Projects & Initiatives**

- Move forward strategic relationships across Real Estate and Real Return portfolios.
  
  Relationships established under improved frameworks & exploring ways to scale co-investment are key initiatives underway.

- Consider Rebalancing initiatives in the Real Estate Portfolio.
  
  TMRS last conducted a comprehensive review of its Core Real Estate program in 2016, at that time deciding to stay put with the then current portfolio positioning. The TMRS core equity real estate portfolio is currently approaching the exit of lock-up periods, thus making portfolio revision more feasible.

- Further standardization of the diligence process, particularly with respect to time management & manager meeting approaches.
  
  Further research into managing emotional and intellectual responses to marketing is a continuing and active process. Considering approaches for how much time should be spent in manager meetings and sourcing specifically are also actively contemplated.

- Improve communication formats at the Board and Investment Committee levels.
  
  Highlighting and prioritization of the most important content for time constrained individuals and bodies is a continued priority for the Real Assets team.
Portfolio Management Initiatives
Becoming a Strategic Partner

More Expensive

Direct Investor
Asset Managers
Sophisticated Institutions

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

Direct Fund
Sophisticated Institutions
Resourced Institutions
TMRS

Fund of Funds
Resourced Institutions
Resource Constrained Institutions

More Specialized Expertise
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.