Agenda

I. Private Equity Program: A Year in Review
II. PE Performance, Portfolio, and Compliance
III. Private Equity Market Review
IV. Forward Looking Plans
V. Conclusions
Section I

PRIVATE EQUITY 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.
Private Equity Initiatives Accomplished: Annual Review

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a blueprint to implement a Private Equity Investment Program</td>
<td>✔</td>
</tr>
<tr>
<td>Managerial prioritization, Staff experience and consultant resources enabled TMRS to develop a path to ensure this outcome was accomplished</td>
<td></td>
</tr>
<tr>
<td>Establish a due-diligence process to identify “best in class” manager opportunities</td>
<td>✔</td>
</tr>
<tr>
<td>Sourcing, investment and operational due diligence, and leveraging Staff and consultant relationships were key factors enabling the identification of opportunities</td>
<td></td>
</tr>
<tr>
<td>Initiate &amp; execute on manager selection, negotiation, and funding while maintaining consideration of portfolio construction and diversification looking forward 5 years</td>
<td>✔</td>
</tr>
<tr>
<td>Recommendations and approval of selected manager investments and funding are executed on a dynamic timeline taking into account anticipated portfolio diversification and market regimes</td>
<td></td>
</tr>
<tr>
<td>Progress Private Equity Portfolio towards a target NAV while managing commitment levels, portfolio construction and access to best in class managers</td>
<td>✔</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Construct and maintain the PE portfolio to accomplish TMRS’ investment objectives of return driver</td>
<td>✔</td>
</tr>
<tr>
<td>$ 1.0 billion of private equity capital committed since Dec. 2015. The risk/return profile of the invested portfolio achieves TMRS investment objectives relative to J-Curve considerations</td>
<td></td>
</tr>
<tr>
<td>Monitor existing portfolio. Source, research, and pursue new strategies and co-invest opportunities</td>
<td>✔</td>
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<tr>
<td>Additional strategies, including international exposure, earlier stage venture and direct co-investments may be used to further optimize the portfolio as well as blend down fees with existing funds</td>
<td></td>
</tr>
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</table>
Strong planning, execution & portfolio management has put TMRS on the path to achieving strategic investment objectives.
Funds & Capital Approved & Closed:

2015 Funds Approved: 6
2015 Capital: $350 mm approved / $317 closed
2015 Average weeks to closing: 8.4 weeks

2016 Funds Approved: 9
2016 Capital: $428.75 mm approved / $394.75 closed
2016 Average weeks to closing: 5.3 weeks

2017 Funds Approved: 8
2017 Capital: $372.5 mm approved / $286.75 closed
($50 million currently in negotiations)
2017 Average weeks to closing: 4.7 weeks

Total Managers / Vehicles:
20 / 23

Total Direct Capital Committed:
$998.5 mm ($1.05 bill)

*Strong execution & portfolio management* has driven performance and put TMRS on the path to achieving strategic investment objectives.
PE Program Review – Accountability in Action

PE Staff Resources

Private Equity
Chris Schelling
TBD

Risk Management
Dimitry Shishkoff
Melissa Jerkins
Ryan Conner

Absolute Return
Mark Leavitt
Kevin Notaro

Real Assets
Tom Masthay
Eddie Schultz
Rachel Cleak

Compliance
Kurt Cressotti

Public Equity
Kristin Qualls
Carol Leung

Fixed Income
Jason Weiner
German Gaymer

Operations
Sally Case
Geldon Vlluha
Susan Jaques

CIO
TJ Carlson

Admin. Support
Cindy Morse
Debbie Farahmandi

Operations
Sally Case
Geldon Vlluha
Susan Jaques

PE Team Experience
Chris Schelling
17 years experience
Asset Management, Broker/Dealer, Researcher,
Consultant & Pension experience
MBA, MSF
Chartered Alternative Investment Analyst

Analyst
TBD

• 235 applicants
• 7 first round / 2 second round
PE Program Review – Accountability in Action

Additional Information

Over 1,375 man-hours in meetings.

<table>
<thead>
<tr>
<th>Total Managers Internal Data Base</th>
<th>Buy-out</th>
<th>Growth</th>
<th>Special Sits</th>
<th>Secondaries</th>
<th>Other</th>
<th>Total</th>
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<td>Buy-out</td>
<td>150</td>
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<td>Venture/Growth</td>
<td>143</td>
<td></td>
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<td>Special Sits</td>
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<tr>
<td>Secondaries</td>
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<tr>
<td>Other</td>
<td>72</td>
<td></td>
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<tr>
<td>Total</td>
<td>522</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Meetings In 2015</th>
<th>Buy-out</th>
<th>Growth</th>
<th>Special Sits</th>
<th>Secondaries</th>
<th>Other</th>
<th>Total</th>
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<tr>
<td>Meetings In 2015</td>
<td>41</td>
<td>24</td>
<td>73</td>
<td>35</td>
<td>58</td>
<td>231</td>
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<td>Meetings In 2016</td>
<td>88</td>
<td>74</td>
<td>35</td>
<td>7</td>
<td>12</td>
<td>216</td>
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<td>Meetings In 2017</td>
<td>58</td>
<td>29</td>
<td>27</td>
<td>3</td>
<td>15</td>
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<td>TOTAL</td>
<td>187</td>
<td>127</td>
<td>135</td>
<td>45</td>
<td>85</td>
<td>579</td>
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<table>
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<th>Other</th>
<th>Data Rooms Researched</th>
<th>95</th>
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<tr>
<td>Other</td>
<td>Formal Reference Calls</td>
<td>146</td>
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<tr>
<td>Other</td>
<td>Background Checks</td>
<td>67</td>
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<tr>
<td>Other</td>
<td>Personality Inventories</td>
<td>41</td>
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</table>
PE Program Review – Accountability in Action

Annual Review Highlights

Manager & Consultant Scorecard Summary:
All 20 manager relationships and 1 consultant relationship assessed are in satisfactory standing.

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, ILPA Templates and fee disclosures

StepStone Reports: Investment Due Diligence, Operational Due Diligence, Meeting Notes, Manager Summaries, Quarterly Portfolio Monitoring, Exposure Reporting and Market Reviews

IPS Compliance and Monitoring at the Portfolio Level
## PE Program Review – Accountability in Action

### Manager Monitoring Summary Report

<table>
<thead>
<tr>
<th>Manager</th>
<th>Fund Name(s)</th>
<th>Sub-Asset Class</th>
<th>Scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altaris</td>
<td>Altaris IV, Constellation IV</td>
<td>Buy-out, Small Market Growth</td>
<td>Excellent</td>
</tr>
<tr>
<td>Capital Partners</td>
<td>Capital Partners Fund III</td>
<td>Buy-out, Small Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>Carlyle</td>
<td>Carlyle Energy Mezzanine Fund II</td>
<td>Special Situations, Mezzanine</td>
<td>In good standing</td>
</tr>
<tr>
<td>Foundry Group</td>
<td>Foundry Group Next Fund</td>
<td>Venture Capital, Late Stage</td>
<td>Excellent</td>
</tr>
<tr>
<td>FTV</td>
<td>FTV V</td>
<td>Growth Equity, Middle Market</td>
<td>Excellent</td>
</tr>
<tr>
<td>GSO</td>
<td>GSO COF III, COF III Co-Inv Fund</td>
<td>Special Situations, Large Mezzanine</td>
<td>Excellent</td>
</tr>
<tr>
<td>GTCR</td>
<td>GTCR XII</td>
<td>Buy-out, Large Market Growth</td>
<td>Excellent</td>
</tr>
<tr>
<td>H.I.G.</td>
<td>H.I.G. Bayside Fund IV</td>
<td>Special Situations, Non-Control Distressed</td>
<td>Excellent</td>
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<td>Harvest</td>
<td>Harvest Partners VII</td>
<td>Buy-out, Middle Market Growth</td>
<td>Excellent</td>
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<tr>
<td>Incline</td>
<td>Incline Equity IV</td>
<td>Buy-out, Small Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>Kainos</td>
<td>Kainos II</td>
<td>Buy-out, Small Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>Marlin Equity</td>
<td>Marlin Equity V, Marlin Heritage II</td>
<td>Buy-out, Middle Market Value &amp; Small Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>Mercato</td>
<td>Mercato III</td>
<td>Growth Equity, Small Market</td>
<td>In good standing</td>
</tr>
<tr>
<td>One Rock</td>
<td>One Rock II</td>
<td>Buy-out, Small Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>Providence</td>
<td>PSG II</td>
<td>Growth Equity, Middle Market</td>
<td>Excellent</td>
</tr>
<tr>
<td>Searchlight</td>
<td>Searchlight Capital II</td>
<td>Buy-out, Middle Market Value</td>
<td>Excellent</td>
</tr>
<tr>
<td>TPG</td>
<td>TSSP Adjacent Opportunities</td>
<td>Special Situations, Diversified</td>
<td>Excellent</td>
</tr>
<tr>
<td>Tritium</td>
<td>Tritium I</td>
<td>Buy-out, Small Market Growth</td>
<td>Excellent</td>
</tr>
<tr>
<td>Updata</td>
<td>Updata Partners V</td>
<td>Growth Equity, Small Market</td>
<td>In good standing</td>
</tr>
</tbody>
</table>
PE Program Review – Accountability in Action
Manager Performance Monitoring

Prior Fund

DPI | TVPI | IRR
---|---|---
26.3% | 10.5% | 10.5%
31.6% | 52.6% | 36.8%
31.6% | 26.3% | 42.1%
10.5% | 10.5% | 10.5%

DPI TVPI IRR Quartile
Top Quartile Second Quartile Third Quartile Fourth Quartile
Prior Fund Average Quartile Rank 2.16 2.05 1.89

Current Fund

DPI | TVPI | IRR
---|---|---
45.5% | 15.4% | 20.0%
27.3% | 27.3% | 27.3%
23.1% | 30.8% | 30.0%
10.5% | 10.5% | 10.5%

DPI TVPI IRR Quartile
Top Quartile Second Quartile Third Quartile Fourth Quartile
Current Fund Average Quartile Rank 2.00 2.38 2.30
Section II

PE PERFORMANCE, PORTFOLIO, & COMPLIANCE
IPS Stated Objective for the Private Equity Portfolio:
“The Private Equity asset class is intended to enhance the total fund performance through investment in non-publicly traded securities by generating a long-term rate of return that exceeds that of publicly-traded equities.”

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

Performance Goals:

- Long-term performance objective is a rate of return of Russell 3,000 + 3% or greater, net of investment management fees, over period of five years.

- For periods less than 5 years, reported performance is less meaningful and significantly more difficult to benchmark.

- Measures of success in portfolio construction: identify best in class managers, balance concentration and diversification, ensure sufficient strategy diversification, etc.
## Private Equity Asset Class Objectives

### Private Equity Benchmark and Performance Considerations

<table>
<thead>
<tr>
<th>Role of Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Has PE done better than simple, liquid approach?</td>
</tr>
<tr>
<td>• Has PE staff performed acceptably?</td>
</tr>
<tr>
<td>• How has PE portfolio performed relative to similar peers?</td>
</tr>
<tr>
<td>• How does PE performance compare to risk taken?</td>
</tr>
<tr>
<td>• Has PE achieved long term assumptions?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benchmark Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Investable</td>
</tr>
<tr>
<td>• Measurable/Transparent</td>
</tr>
<tr>
<td>• Comprehensive</td>
</tr>
<tr>
<td>• Representative/Appropriate</td>
</tr>
<tr>
<td>• Strategic</td>
</tr>
</tbody>
</table>
Private Equity Asset Class Objectives

Private Equity Benchmark and Performance Considerations

Pros:

Public Equity Plus Premium
- Investable?
- Measurable & transparent
- Strategic
- Simple!

Fund Index Benchmark
- Measurable
- Comprehensive
- Highly appropriate and representative

Absolute return or peer comparison
- Possibly strategic
- Possibly representative

Cons:

Public Equity Plus Premium
- Premium not investable!
- Not comprehensive
- Not representative of risk or timing

Fund Index Benchmark
- Not investable
- Not highly transparent
- Not strategic
- Not timely

Absolute return or peer comparison
- Not investable
- Not comprehensive
- Not necessarily appropriate

Long term, opportunity cost
Short term, opportunity set
Private Equity Asset Class Objectives

Private Equity Benchmark and Performance Considerations

**Public Equity Plus Premium**
- Majority of pensions (75%) use as predominant benchmark.

**Fund Index Benchmark**
- 51% of endowments use as predominant benchmark.
- Majority of users have two benchmarks

**Other**
- Absolute return target (10.5% assumption)
- RVK and StepStone Peer Clients

**Public Index**
- Russell 3,000: 37%
- S&P 500: 20%
- Other: 20%
- MSCI ACWI: 10%
- MSCI World: 5%

**Premium**
- < 200 bps: 55%
- 200 to 299: 22%
- 300 to 399: 10%
- 400 to 499: 3%
- 500+: 10%

**Fund Index**
- Burgiss: 11%
- Cambridge: 49%
- Preqin: 10%
- State Street: 10%
- Other: 20%

Source: 2017 ILPA Survey
Cash outflows, fees, expenses, and little appreciation recognized early results in negative early reported returns. Capital gains upon realizations later in the life of the fund turn the internal rate of return positive.
# Private Equity Performance

## Period Ending July, 2017 (Net All)

<table>
<thead>
<tr>
<th></th>
<th>MKT VAL (MM)</th>
<th>% of plan</th>
<th>1 Month</th>
<th>3 Months</th>
<th>YTD</th>
<th>1 Yr.</th>
<th>ITD</th>
<th>Incept Date</th>
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<tbody>
<tr>
<td><strong>TMRS TOTAL PRIVATE EQUITY</strong></td>
<td>$188.13</td>
<td>0.69</td>
<td>0.00</td>
<td>2.22</td>
<td>9.33</td>
<td>22.75</td>
<td>6.57</td>
<td>12-01-15</td>
</tr>
<tr>
<td>RUSSELL 3000+3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12-01-15</td>
</tr>
<tr>
<td>Excess</td>
<td></td>
<td></td>
<td>-2.13</td>
<td>-2.40</td>
<td>-3.56</td>
<td>3.17</td>
<td>-11.08</td>
<td></td>
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<tr>
<td><strong>BUY-OUT TOTAL</strong></td>
<td>$46.55</td>
<td>0.17</td>
<td>0.00</td>
<td>-6.31</td>
<td>3.60</td>
<td>24.81</td>
<td>16.19</td>
<td>12-01-15</td>
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<tr>
<td>RUSSELL 3000+3%</td>
<td></td>
<td></td>
<td>2.13</td>
<td>4.62</td>
<td>12.89</td>
<td>19.58</td>
<td>17.64</td>
<td>12-01-15</td>
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<tr>
<td>Excess</td>
<td></td>
<td></td>
<td>-2.13</td>
<td>-10.93</td>
<td>-9.29</td>
<td>5.23</td>
<td>-1.45</td>
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<td><strong>VENTURE-GROWTH TOTAL</strong></td>
<td>$75.52</td>
<td>0.28</td>
<td>0.00</td>
<td>8.42</td>
<td>11.37</td>
<td>-5.08</td>
<td>-4.69</td>
<td>07-01-16</td>
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<tr>
<td>RUSSELL 3000+3%</td>
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<td></td>
<td>2.13</td>
<td>4.62</td>
<td>12.89</td>
<td>19.58</td>
<td>22.49</td>
<td>07-01-16</td>
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<tr>
<td>Excess</td>
<td></td>
<td></td>
<td>-2.13</td>
<td>3.80</td>
<td>-1.52</td>
<td>-24.66</td>
<td>-27.18</td>
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<td><strong>SPECIAL SITUATIONS SUB TOTAL</strong></td>
<td>$66.06</td>
<td>0.24</td>
<td>0.00</td>
<td>4.49</td>
<td>10.18</td>
<td>22.70</td>
<td>6.97</td>
<td>03-01-16</td>
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Source: State Street Investment Analytics
Performance Review

As of March 31, 2017 (US$ in millions)

<table>
<thead>
<tr>
<th>Strategy/Sub-Strategy</th>
<th>Committed Capital</th>
<th>Contributed Capital</th>
<th>Distributed Capital</th>
<th>Market Value</th>
<th>Total Value</th>
<th>Total Gain/ (Loss)</th>
<th>Unfunded Commitment</th>
<th>Exposure</th>
<th>DPI</th>
<th>TVPI</th>
<th>IRR</th>
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<tr>
<td>Special Situations</td>
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<td>$64.0</td>
<td>$12.9</td>
<td>$54.0</td>
<td>$66.9</td>
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<td>$293.2</td>
<td>$347.2</td>
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<td>Distressed/Restructuring</td>
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<td>46.8</td>
<td>12.5</td>
<td>37.8</td>
<td>50.3</td>
<td>3.6</td>
<td>170.0</td>
<td>207.8</td>
<td>0.3x</td>
<td>1.1x</td>
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<td>Mezzanine</td>
<td>140.0</td>
<td>17.2</td>
<td>0.4</td>
<td>16.2</td>
<td>16.5</td>
<td>(0.7)</td>
<td>123.2</td>
<td>139.3</td>
<td>0.0x</td>
<td>1.0x</td>
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<td>Growth Equity</td>
<td>196.0</td>
<td>52.2</td>
<td>0.0</td>
<td>50.9</td>
<td>50.9</td>
<td>(1.4)</td>
<td>144.5</td>
<td>195.3</td>
<td>0.0x</td>
<td>1.0x</td>
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<td>Buyout</td>
<td>237.0</td>
<td>40.7</td>
<td>1.4</td>
<td>44.1</td>
<td>45.5</td>
<td>4.8</td>
<td>198.1</td>
<td>242.2</td>
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<td>1.1x</td>
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<td>Small Buyout</td>
<td>170.0</td>
<td>22.0</td>
<td>0.1</td>
<td>25.1</td>
<td>25.1</td>
<td>3.1</td>
<td>148.4</td>
<td>173.4</td>
<td>0.0x</td>
<td>1.1x</td>
<td>NM</td>
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<td>Middle-Market Buyout</td>
<td>67.0</td>
<td>18.7</td>
<td>1.4</td>
<td>19.0</td>
<td>20.4</td>
<td>1.7</td>
<td>49.7</td>
<td>68.8</td>
<td>0.1x</td>
<td>1.1x</td>
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<td>Venture Capital</td>
<td>30.0</td>
<td>8.0</td>
<td>0.0</td>
<td>7.8</td>
<td>7.8</td>
<td>(0.2)</td>
<td>22.0</td>
<td>29.8</td>
<td>0.0x</td>
<td>1.0x</td>
<td>NM</td>
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<tr>
<td>Late Stage VC</td>
<td>30.0</td>
<td>8.0</td>
<td>0.0</td>
<td>7.8</td>
<td>7.8</td>
<td>(0.2)</td>
<td>22.0</td>
<td>29.8</td>
<td>0.0x</td>
<td>1.0x</td>
<td>NM</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$809.3</strong></td>
<td><strong>$164.9</strong></td>
<td><strong>$14.3</strong></td>
<td><strong>$156.7</strong></td>
<td><strong>$171.0</strong></td>
<td><strong>$6.1</strong></td>
<td><strong>$657.8</strong></td>
<td><strong>$814.5</strong></td>
<td>0.1x</td>
<td>1.0x</td>
<td>NM</td>
</tr>
</tbody>
</table>

Source: StepStone Monitoring Report, March 31, 2017
Performance Comparisons

<table>
<thead>
<tr>
<th>Date</th>
<th>TMRS PE</th>
<th>Russell 3000 + 3.00%</th>
<th>ILPA Cambridge</th>
<th>Burgiss (15-17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/31/2016</td>
<td>2.55%</td>
<td>1.72%</td>
<td>0.31%</td>
<td>-0.52%</td>
</tr>
<tr>
<td>6/30/2016</td>
<td>-12.43%</td>
<td>3.38%</td>
<td>2.42%</td>
<td>1.18%</td>
</tr>
<tr>
<td>9/30/2016</td>
<td>5.62%</td>
<td>5.15%</td>
<td>3.68%</td>
<td>3.00%</td>
</tr>
<tr>
<td>12/31/2016</td>
<td>7.20%</td>
<td>4.96%</td>
<td>2.79%</td>
<td>1.96%</td>
</tr>
<tr>
<td>3/31/2017</td>
<td>6.96%</td>
<td>6.49%</td>
<td>3.69%</td>
<td>3.88%</td>
</tr>
<tr>
<td>6/30/2017</td>
<td>2.22%</td>
<td>3.77%</td>
<td>–</td>
<td>3.12%</td>
</tr>
<tr>
<td>9/30/2017</td>
<td>1.19%</td>
<td>5.32%</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Annualized</td>
<td>6.56%</td>
<td>17.64%</td>
<td>7.30%</td>
<td>6.87%</td>
</tr>
</tbody>
</table>

Source: State Street Investment Analytics
Implementation Risk Ranges Implied by IPS Asset Class Guidelines
March 2017

Based on current (and approved but unfunded) strategy allocations and Investment Department long-term assumptions regarding each strategy.

- **Current TMRS Risk Estimate**
- **RVK Long-Term Assumption**
- **Risk range implied by IPS Rebalancing Policy**
- **Minimum risk implied by IPS**
- **Maximum risk implied by IPS**

= Realized risk
Deployment Pace

Source: StepStone Monitoring Report, March 31, 2017
Strategy Diversification

Private Equity Strategy Diversification by Commitment

- Buy-out (40.0% to 75.0%): 27.4%
- Growth (5.0% to 25.0%): 51.6%
- Special Situations (10.0% to 35.0%): 21.1%

Private Equity Target Diversification

- Buy-out (40.0% to 75.0%): 40.7%
- Growth (5.0% to 25.0%): 21.1%
- Special Situations (10.0% to 35.0%): 16.6%
- Un-allocated: 21.6%

Private Equity Diversification by NAV

- Buy-out (40.0% to 75.0%): 35.2%
- Growth (5.0% to 25.0%): 24.2%
- Special Situations (10.0% to 35.0%): 40.6%

Private Equity Diversification by Market Adjusted Basis

- Buy-out (40.0% to 75.0%): 54.6%
- Growth (5.0% to 25.0%): 25.5%
- Special Situations (10.0% to 35.0%): 19.9%
Manager Diversification

Private Equity Manager Diversification by Commitment

Private Equity Manager Diversification by NAV
Geographic Diversification

Private Equity Geographic Diversification by Commitment
- U.S.A.: 81.8%
- International: 18.2%

Private Equity Target Geographic Diversification
- U.S.A.: 64.5%
- International: 21.1%
- Un-Allocated: 14.3%

Private Equity Geographic Diversification by NAV
- U.S.A.: 89.0%
- International: 11.0%
As of March 31, 2017, TMRS had exposure to 174 separate portfolio companies.

Source: StepStone Monitoring Report, March 31, 2017
Additional IPS Compliance Items

Vintage Year Concentration – TMRS has not breached the 35% concentration limit in any calendar year.

Manager Concentration – TMRS is within the limits of 1) 35% of total assets of the PE portfolio invested with any one PE manager and 2) 25% of the total assets under management for any PE manager.

Vehicle Concentration – TMRS is in compliance with the 25% limit to any given investment vehicle.

Co-Investment – TMRS is within co-investment guidelines. TMRS has 2 co-investment funds and no direct co-investments.

Valuation Policy – TMRS’ managers are in compliance with IPS valuation policy requirements.
Section III
PRIVATE EQUITY MARKET REVIEW
Private Equity Fundraising

Global Quarterly Private Equity Fundraising, Q1 2012 - Q3 2017

- **No. of Funds Closed**
- **Aggregate Capital Raised ($bn)**

**Source:** Prequin
Private Equity Fundraising

Proportion of Target Size Achieved by Private Equity Funds, 2013 - 2017 YTD

Source: Preqin
Private Equity Deal Flow

Global Quarterly Private Equity-Backed Buyout Deals, Q1 2012 - Q3 2017

Source: Preqin
Private Equity Valuations

Source: Preqin
Private Equity Exit Environment

Global Quarterly Private Equity Buyout-Backed Exits, Q1 2012 - Q3 2017

Source: Preqin
Private Equity Exit Environment

Private Equity Buyout-Backed Exits in Q3 2017 by Type

- **No. of Exits**
  - Trade Sale: 59%
  - Sale to GP: 7%
  - IPO & Follow-On: 1%
  - Restructuring: 1%

- **Aggregate Exit Value**
  - Trade Sale: 68%
  - Sale to GP: 6%
  - IPO & Follow-On: 26%

Source: Preqin
Private Equity Performance

Quarterly ILPA Pooled Index Returns

Source: ILPA
# Private Equity Performance

**ILPA Private Markets Benchmark – All Funds**

All Funds: Fund Index Summary: Horizon Pooled Return Compared to CA Modified Public Market Equivalent (mPME) Net to Limited Partners

<table>
<thead>
<tr>
<th>ILPA Index</th>
<th>1-Year</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year</th>
<th>15-Year</th>
<th>20-Year</th>
<th>25-Year</th>
<th>30-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILPA Private Markets Benchmark – All Funds Index¹</td>
<td>13.14</td>
<td>8.96</td>
<td>11.51</td>
<td>9.12</td>
<td>11.56</td>
<td>12.73</td>
<td>13.66</td>
<td>13.35</td>
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</tbody>
</table>

**mPME Analysis²**

<table>
<thead>
<tr>
<th></th>
<th>1-Year</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year</th>
<th>15-Year</th>
<th>20-Year</th>
<th>25-Year</th>
<th>30-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500 Index</td>
<td>17.03</td>
<td>10.23</td>
<td>13.50</td>
<td>8.83</td>
<td>8.64</td>
<td>8.42</td>
<td>8.90</td>
<td>9.02</td>
</tr>
<tr>
<td>Value-Add (bps)</td>
<td>-389</td>
<td>-127</td>
<td>-199</td>
<td>29</td>
<td>291</td>
<td>431</td>
<td>476</td>
<td>434</td>
</tr>
<tr>
<td>Russell 3000 Index</td>
<td>17.95</td>
<td>9.58</td>
<td>13.43</td>
<td>8.89</td>
<td>8.87</td>
<td>8.63</td>
<td>9.07</td>
<td>9.17</td>
</tr>
<tr>
<td>Value-Add (bps)</td>
<td>-481</td>
<td>-62</td>
<td>-192</td>
<td>23</td>
<td>269</td>
<td>409</td>
<td>460</td>
<td>418</td>
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<tr>
<td>MSCI World Index (net)</td>
<td>14.65</td>
<td>5.34</td>
<td>9.60</td>
<td>5.44</td>
<td>6.69</td>
<td>6.20</td>
<td>6.46</td>
<td>6.39</td>
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<tr>
<td>Value-Add (bps)</td>
<td>-151</td>
<td>362</td>
<td>190</td>
<td>368</td>
<td>487</td>
<td>663</td>
<td>721</td>
<td>696</td>
</tr>
<tr>
<td>MSCI Europe Index (net)</td>
<td>9.65</td>
<td>-1.68</td>
<td>6.09</td>
<td>1.95</td>
<td>4.83</td>
<td>4.51</td>
<td>4.95</td>
<td>5.01</td>
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<tr>
<td>Value-Add (bps)</td>
<td>349</td>
<td>1064</td>
<td>542</td>
<td>717</td>
<td>673</td>
<td>822</td>
<td>872</td>
<td>834</td>
</tr>
</tbody>
</table>

*Source: ILPA*
Private Equity Performance

Cumulative Returns Comparison

<table>
<thead>
<tr>
<th></th>
<th>1 Yr</th>
<th>5 Yr</th>
<th>10 Yr</th>
<th>1990–2017</th>
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</thead>
<tbody>
<tr>
<td>Buy-out</td>
<td>13.6%</td>
<td>12.0%</td>
<td>9.1%</td>
<td>13.2%</td>
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<tr>
<td>Venture</td>
<td>6.7%</td>
<td>13.1%</td>
<td>9.7%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Mezzanine</td>
<td>8.0%</td>
<td>9.2%</td>
<td>7.2%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Distressed</td>
<td>9.7%</td>
<td>7.8%</td>
<td>7.2%</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

Source: Burgiss
Private Equity Performance

Historical Risk/Return

- Mezzanine
- Distressed Growth
- Late Stage / Growth
- Small Buy-out
- Early Stage Venture
- Large Buy-out

Return

Risk

Expected Risk/Return

- Distressed
- Early Stage Venture
- Late Stage / Growth
- Small Buy-out
- Mezzanine
- Large Buy-out

Return

Risk

Source: Burgiss, TMRS Staff
# Private Equity Performance

<table>
<thead>
<tr>
<th></th>
<th>ILPA</th>
<th>10 Year</th>
<th>20 Year</th>
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</thead>
<tbody>
<tr>
<td>3/31/2017</td>
<td>All Funds</td>
<td>9.12%</td>
<td>13.66%</td>
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<tr>
<td></td>
<td>Top Quartile</td>
<td>13.57%</td>
<td>16.96%</td>
</tr>
<tr>
<td></td>
<td>S&amp;P 500</td>
<td>7.51%</td>
<td>7.86%</td>
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<table>
<thead>
<tr>
<th></th>
<th>ThomsonReuters</th>
<th>20 Year</th>
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<tbody>
<tr>
<td>12/31/2016</td>
<td>PE Index</td>
<td>16.62%</td>
</tr>
<tr>
<td></td>
<td>S&amp;P 500</td>
<td>7.68%</td>
</tr>
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<table>
<thead>
<tr>
<th></th>
<th>Cliffwater</th>
<th>20 Year</th>
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<tbody>
<tr>
<td>6/30/2016</td>
<td>67 State Pension Funds</td>
<td>5.70%</td>
</tr>
<tr>
<td></td>
<td>Private Equity Allocation</td>
<td>9.90%</td>
</tr>
<tr>
<td></td>
<td>Public Equity Allocation</td>
<td>7.20%</td>
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<table>
<thead>
<tr>
<th></th>
<th>Cambridge</th>
<th>10 Year</th>
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</thead>
<tbody>
<tr>
<td>6/30/2015</td>
<td>Private Equity</td>
<td>12.60%</td>
</tr>
<tr>
<td></td>
<td>Russell 3,000</td>
<td>8.20%</td>
</tr>
</tbody>
</table>

Sources: ILPA, ThomsonReuters, Cliffwater, Cambridge
Section IV

FORWARD LOOKING PLANS
Private Equity Pacing

2017 Staff Pacing Model

Value in US$ (Millions)

- Actual PE NAV
- Annual Commitment
- PE % of Plan
- Original Model
- Target % of Plan

% of Total Plan Value

- 2017
- 2018E
- 2019E
- 2020E
- 2021E
- 2022E
- 2023E
- 2024E
- 2025E

- $235
- $511
- $853
- $1,198
- $1,465
- $1,709
- $1,865
- $1,926
- $1,929

- $450
- $500
- $525
- $550
- $575
- $600
- $635
- $660
- $675

- $200
- $400
- $600
- $800
- $1,000
- $1,200
- $1,400
- $1,600
- $1,800

- $0
- $200
- $400
- $600
- $800
- $1,000
- $1,200
- $1,400
- $1,600

- 16%
- 14%
- 12%
- 10%
- 8%
- 6%
- 4%
- 2%
- 0%
Private Equity Agenda

- Target annual commitment of $500 million for 2018 (plus potential $150 MM in opportunistic secondary exposure)

- Pursue modestly more international diversification – 75% USA / 25% international and potentially first dedicated European exposure

- Continue to seek policy and process improvements to allow TMRS to execute on co-investments

- Initiative – core private equity

<table>
<thead>
<tr>
<th></th>
<th>1 Yr</th>
<th>5 Yr</th>
<th>10 Yr</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy-out</td>
<td>13.55%</td>
<td>11.99%</td>
<td>9.14%</td>
<td>15.85%</td>
</tr>
<tr>
<td>Europe Buy-out</td>
<td>17.18%</td>
<td>11.08%</td>
<td>8.23%</td>
<td>14.93%</td>
</tr>
<tr>
<td>Pair-wise correlation</td>
<td>0.53</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-investments</th>
<th>Top Quartile Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>StepStone TVPI</td>
<td>2.31x</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-investments</th>
<th>Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braun et al PME</td>
<td>1.71</td>
</tr>
<tr>
<td>Preqin</td>
<td>5% outperformance vs fund</td>
</tr>
<tr>
<td>Texas TRS</td>
<td>7% outperformance vs fund</td>
</tr>
</tbody>
</table>
Core Private Equity – A New Approach

• Long term fund
• Lower fees, expenses and transaction costs
• Better alignment of interests
• LP oversight
Section V

CONCLUSION
Conclusions

• TMRS has made substantial progress towards its strategic private equity objectives. Deployment has been a bit slower than expected, and there is still more work to be done.

• Interim measures of performance are good, but it remains far too early to be truly meaningful.

• Private equity continues to become increasingly competitive and transactional in nature. An adaptive organization will be successful in the long run, but static policies and processes can be damaging. Governance and policies should evolve accordingly.

• On the back of such evolution, additional opportunities such as co-investments, as well as innovative new structures and models, can allow TMRS to become a leader within the private equity marketplace.
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.