Staying Ahead of the Investment Curve

Texas Municipal Retirement System

November 2013
Dedicated RVK Consulting Team

Texas Municipal Retirement System

Marcia Beard – Principal, Senior Consultant
Jeremy Miller – Director of Capital Markets Research, Senior Consultant
Nick Woodward, CFA – Consultant
Spencer Hunter – Associate Consultant
Lindsay Helseth – Investment Associate
Kenny King – Senior Investment Analyst
Jim Voytko – President, Senior Consultant

The RVK consulting team approach enables TMRS to leverage the diverse capabilities of our entire firm.
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How to Prepare for an Unknown Future

- **Balance volatility risk against actuarial risk**
  - It does no good to reduce actuarial benchmark risk at the price of uncomfortably high volatility risk

- **Reduce risk across the board via broad diversification; allocations to traditional and alternative asset classes**
  - Still the #1 risk mitigator

- **Be sensitive to valuation and adjust the strategic allocation accordingly**
  - Review asset allocation each time RVK changes capital markets assumptions in any material way or the valuation of any major asset class shift dramatically – or both (since we hope a valuation change would trigger an assumption change in most instances)

- **Be sensitive to valuation by considering managers with some tactical latitude**
  - This doesn’t mean total fund tactical asset allocation, but can mean allocations to Global Fixed Income managers, Liquid Alternatives, Global Tactical Asset Allocation managers, and Absolute Return Strategies, etc.
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TMRS Asset Allocation Philosophy

- Current policy assists to ensure that the risk tolerance remains appropriate
  - The Strategic Target Allocation will be reviewed at least annually to ensure that the long-term return objective and risk tolerance continues to be appropriate considering significant economic and market changes or changes in the Board’s long-term goals
  - A formal asset allocation study will be conducted at least every three years to verify or amend the targets
  - A formal pension financial (asset-liability) study will be conducted at least every five years

- TMRS Asset Management Decision Flow Process:

  Each step in the process allows for various forms of diversification; multiple asset classes, different size/style mixes, and unique manager philosophies/processes can all aid in achieving long-term goals.
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Review of Target Allocation

- Many steps along the way, with a slow and methodical pace

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Current (9/30/2013)</th>
<th>Target</th>
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</thead>
<tbody>
<tr>
<td>50/50 Equity</td>
<td>0</td>
<td>60</td>
<td>47</td>
<td>35</td>
</tr>
<tr>
<td>Int. Duration Fixed Income</td>
<td>0</td>
<td>100</td>
<td>46</td>
<td>30</td>
</tr>
<tr>
<td>Non-Core Fixed Income</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Custom Real Return</td>
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<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Global Linkers</td>
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<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Custom Real Estate</td>
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<td>10</td>
</tr>
<tr>
<td>ARS</td>
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<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Private Equity</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

|                         |      |     |
| Capital Appreciation    | 47   | 50  |
| Capital Preservation    | 46   | 30  |
| Alpha                   | 0    | 5   |
| Inflation               | 7    | 15  |

|                         |      |     |
| Expected Return         | 5.89 | 6.55|
| Risk (Standard Deviation)| 9.46 | 10.17|

|                         |      |     |
| Return (Compound)       | 5.47 | 6.07|
| Return/Risk Ratio       | 0.62 | 0.64|
| RVK Expected Eq Beta (LC US Eq = 1) | 0.49 | 0.50|
| RVK Liquidity Metric (T-Bills = 100) | 85   | 69  |

Efficient Frontiers

Frontier 1 = Considers Current Asset Classes
Frontier 2 = Considers All Asset Classes Included in Target
Investing in the combination of asset classes that tend to move in different directions at the same time provides a smoother return profile over time allows for better compounding

- Asset classes with historically low correlations to equities performed well during the tech bubble in the early 2000s

However, it is not a perfect solution - especially in periods of high correlation - but it is the best method for risk reduction

- Asset classes exhibited high level of correlation in 2008 as all (except Treasurys) moved downward in unison regardless of historical relationships
Asset class returns are not easily predicted; a well-diversified portfolio can help mitigate risks and provide attractive long-term returns.

“Diversified Portfolio” consists of 17.5% US Stocks, 17.5% International Stocks, 30% US Bonds, 10% Non-Core Fixed Income, 5% Real Return Strategies, 10% Real Estate, 5% Hedge Funds, and 5% Private Equity.
## Texas Municipal Retirement System
### Why Diversify?

**Trailing Returns**

<table>
<thead>
<tr>
<th></th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>7 Years</th>
<th>10 Years</th>
<th>15 Years</th>
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</thead>
<tbody>
<tr>
<td>US Stocks</td>
<td>21.61</td>
<td>16.77</td>
<td>10.58</td>
<td>6.08</td>
<td>8.11</td>
<td>6.01</td>
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<tr>
<td>International Stocks</td>
<td>16.91</td>
<td>6.11</td>
<td>6.82</td>
<td>3.28</td>
<td>9.07</td>
<td>6.78</td>
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<tr>
<td>US Bonds</td>
<td>-1.68</td>
<td>2.86</td>
<td>5.41</td>
<td>5.12</td>
<td>4.59</td>
<td>5.27</td>
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<tr>
<td>Real Estate</td>
<td>11.97</td>
<td>13.17</td>
<td>-0.24</td>
<td>2.43</td>
<td>6.08</td>
<td>6.91</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>6.51</td>
<td>2.48</td>
<td>1.51</td>
<td>1.37</td>
<td>3.13</td>
<td>5.80</td>
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<tr>
<td>Private Equity</td>
<td>12.13</td>
<td>13.07</td>
<td>9.27</td>
<td>9.05</td>
<td>12.68</td>
<td>11.65</td>
</tr>
<tr>
<td>Diversified Portfolio</td>
<td>9.12</td>
<td>8.57</td>
<td>7.51</td>
<td>5.66</td>
<td>7.39</td>
<td>7.01</td>
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</table>

As of September 30, 2013.
Texas Municipal Retirement System

Why Diversify?

<table>
<thead>
<tr>
<th>Years</th>
<th>Portfolio 1</th>
<th>Portfolio 2</th>
<th>Portfolio 3</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>10%</td>
<td>30%</td>
<td>40%</td>
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<tr>
<td>2</td>
<td>10%</td>
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<td>18</td>
<td>10%</td>
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<td>19</td>
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<td>40%</td>
</tr>
<tr>
<td>20</td>
<td>10%</td>
<td>-10%</td>
<td>-20%</td>
</tr>
</tbody>
</table>

Average | 10% | 10% | 10%

Standard Deviation | 0% | 21% | 31%

- All portfolios start with $1 million.
- After 20 years, the difference of 31% standard deviation is $3.6 million.
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Why Diversify?

15 Year Growth of a Dollar

As of September 30, 2013.
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Asset Classes in Various Recent Market Environments

**From the beginning of the crisis to the bottom:**
January 2008 - February 2009

**From the bottom up,**
March 2009 - April 2013

**From the beginning of the crisis to the most recent quarter end,**
January 2008 - September 2013
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TMRS and its Diversification

<table>
<thead>
<tr>
<th>Market Environment vs. Asset Class</th>
<th>Strong Economy</th>
<th>Weak Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong Inflation</strong></td>
<td><strong>Inflation</strong></td>
<td><strong>Inflation</strong></td>
</tr>
<tr>
<td></td>
<td>Real Assets</td>
<td>Linkers</td>
</tr>
<tr>
<td></td>
<td>TMRS target allocation includes 10.0% Real Estate investments including 5.0% core, 2.5% value add and 2.5% opportunistic.</td>
<td>TMRS target allocation includes 5.0% Global Inflation Linked investments.</td>
</tr>
<tr>
<td><strong>Weak Inflation</strong></td>
<td><strong>Capital Appreciation</strong></td>
<td><strong>Capital Preservation</strong></td>
</tr>
<tr>
<td></td>
<td>Stocks</td>
<td>Bonds</td>
</tr>
<tr>
<td></td>
<td>TMRS target allocation includes 35.0% Global Equity investments including 17.5% domestic and 17.5% international; 10% Non-Core Fixed Income investments; and 5.0% Private Equity investments.</td>
<td>TMRS target allocation includes 30.0% Core Fixed Income investments.</td>
</tr>
</tbody>
</table>

The 5% Absolute Return target allocation is not included in the table.
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How is TMRS Positioned?

- TMRS was invested in 100% bonds due to plan design…
  - Lacked diversification and potentially insufficient return given long-term market dynamics

- …but, a different way to structure the portfolio was considered
  - Broad diversification and a long-term perspective can lead to higher returns without undue risk

- Timeline:
  - *Adopted Interim Target with 12% equity allocation in December 2007*
  - *Adopted current Strategic Target Allocation in June 2009*
    - Legislation in 2009 allowed for diversification and management to total return objectives
    - Plan objectives, risk tolerance, and viable structures guided the analysis
  - *TMRS has continued to methodically move towards the Strategic Target (revisions adopted in Aug 2012)*
    - Interest rate risk was reduced and the portfolio has become more diversified
    - Continued need for implementation changes along the way
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Why Add Alternative Asset Classes

- **Real Estate**
  - Real estate-oriented investments have generated attractive long-term returns with low correlations to traditional asset classes and can provide an inflationary hedge

- **Absolute Return**
  - Absolute Return Strategies can have a significant impact on the expected risk/return profile of a portfolio, even with a relatively small allocation
    - Attractive correlations and risk adjusted returns over the long-term
    - Important piece of the total fund allocation (alpha)
    - Management fees and costs to be considered in selecting an implementation approach
      - Generally fees in this asset class are coming down

- **Private Equity**
  - Unique cash flow structure requiring paced cash funding and distributions
    - Investments are long-term, typically 10 years or more, with limited ability to liquidate before the termination of a partnership
    - Capital is called “as needed,” slowly over a period of years, and distributions occur irregularly as investments are sold
  - Additional costs, fees, and staffing needs to be considered

- **Non-Core Fixed Income**
  - US Treasury Yields near historical lows, creating a need to look elsewhere for yield and protection
  - Sector risks are increasing
  - Forward looking return outlook has been declining
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TMRS - Then and Now

Allocation as of September 30, 2007
(RVK Start Date)

- Core Fixed Income: 100.0%
- Non-Core Fixed Income: 0.0%
- Real Return: 0.0%
- Domestic Equity: 0.0%
- International Equity: 0.0%
- Real Estate: 0.0%
- Absolute Return: 0.0%
- Private Equity: 0.0%
- Unallocated Cash: 0.0%
- Total Fund: 100.0%

Allocation as of September 30, 2013

- Core Fixed Income: 45.9%
- Non-Core Fixed Income: 0.0%
- Real Return: 4.4%
- Domestic Equity: 24.7%
- International Equity: 22.1%
- Real Estate: 2.8%
- Absolute Return: 0.0%
- Private Equity: 0.0%
- Unallocated Cash: 0.1%
- Total Fund: 100.0%

Final Target Allocation

- Core Fixed Income: 30.0%
- Non-Core Fixed Income: 10.0%
- Real Return: 5.0%
- Domestic Equity: 17.5%
- International Equity: 17.5%
- Real Estate: 10.0%
- Absolute Return: 5.0%
- Private Equity: 5.0%
- Unallocated Cash: 0.0%
- Total Fund: 100.0%
The long-term portfolio will be diversified, and similar to peers, yet unique to TMRS’ risk tolerance and return objectives.
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Peer Comparison - Risk/Return

As of September 30, 2013.
Performance shown is gross of fees. Peer group contains “All Public Plans > $1B”.
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Next Steps

- **Continue progress toward diversification in a methodical manner**
  - Continue to diversify equity allocation by adding complementary active strategies in 2013-14

- **Consideration for further fixed income diversification**
  - Completed search process for non-core fixed income mandates (Bank Loans/CLO) in September 2013

- **Continue to build real estate allocation by conducting additional manager/fund searches in 2013-14**

- **Consideration for absolute return implementation**
  - Search currently under way for fund-of-one provider

- **Continue to explore real return investment strategies and implementation options**

- **Private Equity education in 2014**
  - Leave 5% overweight to equities in passive core equity index funds as a placeholder for private equity allocation pending implementation of the 5% private equity allocation