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MARKET OVERVIEW AND SYSTEM ASSETS
CAPITAL MARKET OVERVIEW

Third Quarter 2018 – Market Returns

Global Equity
- DJ US Total Stock Market Index: 7.1%
- MSCI ACWI ex-U.S.: 0.7%
- Barclays U.S. Agg Index: 0.0%
- Barclays HY Index: 2.4%
- FTSE NAREIT All Equity Index: 0.5%
- Blmbrg Cmtdy Index: -1.2%
- HFRI Fund Wtd Comp. Index: 0.6%

Fixed Income
- 1 Yr: 17.6%
- 5 Yrs Annualized: 13.4%

Data sources: Lipper and Hedge Fund Research
The System Operating and Endowment Funds were valued at $3.2 billion as of September 30, 2018.

The Operating Pool was valued at $2.7 billion and maintains a permanent core investment in the Endowment Pool (light-blue pie slice); this is a long-term investment to enhance Operating Pool returns.

The combined Endowment Pool is valued at $717.4 million (dark and light-blue pie slices) and is discussed further on the following slides.

The Pure Endowment Pool (excluding Operating) is valued at $384.0 million.

Note: The sum of the allocation may not equal 100% due to rounding.
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MARKET VALUE AND ASSET ALLOCATION: ENDOWMENT POOL

Total Pool: $717.4 Million as of 9/30/2018

- U.S. Equity 16.3%
- Non-U.S. Equity 12.0%
- Global Equity 26.8%
- Fixed Income 20.0%
- Private Equity 6.6%
- Hedge Funds 6.4%
- Farmland 4.7%
- Real Estate 6.4%
- Cash 0.8%

Over/Under Allocation to Long-Term Policy Targets

- U.S. Equity $117.2 M: +2.3%
- Non-U.S. Equity $85.9 M: +2.0%
- Global Equity $192.1 M: +2.8%
- Fixed Income $143.8 M: 0.0%
- Private Equity $47.1 M: -1.4%
- Hedge Funds $46.0 M: -3.6%
- Farmland $33.8 M: -2.3%
- Real Estate $45.8 M: -0.6%
- Cash $5.7 M: 0.8%

Note: Long-Term Policy Allocations: U.S. Equity 14%, Non-U.S. Equity 10%, Global Equity 24%, Private Equity 8%, Hedge Funds 10%, Fixed Income 20%, Farmland 7%, and Core Real Estate 7%
Note: Total sum of allocation may not equal 100% due to rounding.
Over the trailing one-year period ending September 30, 2018, the Endowment Pool returned 6.7%, trailing the benchmark. The main drivers of the Endowment Pool’s one-year return were:

- Hedge fund investments trailed their respective benchmark by 7.7%.
- Private equity investments performed well on an absolute basis with a return of 17.4%.

Over longer time periods, the Endowment Pool has produced solid absolute returns. Relative to the benchmark, the main drivers of the Endowment Pool’s returns were:

- U.S. equity investments underperformed, specifically the active managers that are no longer in the program.
- Hedge funds underperformed the benchmark.
- Private equity investments underperformed relative to the benchmark (public markets + 3%), but had attractive absolute returns.

Note: The beginning market value + net contributions + net investment gains referenced in the table may not equal the ending market value due to rounding.

Endowment Pool Market Value Change  |  Quarter Ending September-2018
---|---
Beginning Market Value  |  $705.8 M
Net Contributions  |  ($6.3 M)
Gain/Loss  |  $18.0 M
Ending Market Value  |  $717.4 M
<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Quarter ending Sep-2018</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endowment Pool</td>
<td>2.5</td>
<td>6.7</td>
<td>8.9</td>
<td>6.9</td>
<td>8.5</td>
<td>8.3</td>
<td>Sep-87</td>
</tr>
<tr>
<td>Performance Benchmark</td>
<td>2.8</td>
<td>7.3</td>
<td>9.5</td>
<td>7.4</td>
<td>8.7</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Total U.S. Equity</td>
<td>6.4</td>
<td>17.1</td>
<td>15.8</td>
<td>12.5</td>
<td>12.0</td>
<td>9.5</td>
<td>Sep-87</td>
</tr>
<tr>
<td>DJ U.S. Total Stock Market Index</td>
<td>7.1</td>
<td>17.6</td>
<td>17.0</td>
<td>13.4</td>
<td>12.0</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>Total Non-U.S. Equity</td>
<td>0.4</td>
<td>1.9</td>
<td>10.2</td>
<td>4.4</td>
<td>4.9</td>
<td>5.5</td>
<td>Sep-93</td>
</tr>
<tr>
<td>Non-U.S. Equity Benchmark</td>
<td>0.4</td>
<td>1.8</td>
<td>10.1</td>
<td>4.4</td>
<td>5.3</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Total Global Equity</td>
<td>4.0</td>
<td>10.0</td>
<td>13.5</td>
<td>8.2</td>
<td>-</td>
<td>10.4</td>
<td>Jun-12</td>
</tr>
<tr>
<td>Global Equity Benchmark</td>
<td>3.9</td>
<td>9.6</td>
<td>13.5</td>
<td>8.7</td>
<td>-</td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>Total Fixed Income</td>
<td>0.2</td>
<td>-0.5</td>
<td>1.7</td>
<td>2.4</td>
<td>6.1</td>
<td>6.8</td>
<td>Sep-87</td>
</tr>
<tr>
<td>Bloomberg Barclays U.S. Aggregate</td>
<td>0.0</td>
<td>-1.2</td>
<td>1.3</td>
<td>2.2</td>
<td>3.8</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Total Hedge Funds</td>
<td>-0.4</td>
<td>-3.7</td>
<td>1.7</td>
<td>3.1</td>
<td>-</td>
<td>2.8</td>
<td>May-13</td>
</tr>
<tr>
<td>HFRI Fund Weighted Composite Index</td>
<td>0.5</td>
<td>3.9</td>
<td>5.3</td>
<td>4.1</td>
<td>-</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Total Private Equity¹</td>
<td>4.8</td>
<td>17.4</td>
<td>12.1</td>
<td>12.8</td>
<td>7.5</td>
<td>3.6</td>
<td>Jan-04</td>
</tr>
<tr>
<td>Private Equity Benchmark</td>
<td>7.7</td>
<td>20.6</td>
<td>20.0</td>
<td>16.4</td>
<td>15.0</td>
<td>12.2</td>
<td></td>
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<tr>
<td>Total Real Estate</td>
<td>1.8</td>
<td>6.9</td>
<td>8.1</td>
<td>10.8</td>
<td>-</td>
<td>11.4</td>
<td>Aug-13</td>
</tr>
<tr>
<td>Real Estate Benchmark</td>
<td>1.6</td>
<td>6.6</td>
<td>7.9</td>
<td>10.9</td>
<td>-</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Total Farmland²</td>
<td>0.0</td>
<td>-0.2</td>
<td>-1.2</td>
<td>-1.3</td>
<td>8.6</td>
<td>8.2</td>
<td>Dec-06</td>
</tr>
<tr>
<td>NCREIF Cornbelt Index</td>
<td>0.0</td>
<td>2.6</td>
<td>-0.5</td>
<td>1.9</td>
<td>9.3</td>
<td>9.6</td>
<td></td>
</tr>
</tbody>
</table>

¹The combined Adams Street Partners IRR at June 30, 2018 was 10.0% since inception.
²Farmland is valued annually on June 30. As such, the one-year return reflected above is the one-year return for Farmland as of June 30, 2018.
The asset allocation strategy for the Operating Pool consists of investing funds across four liquidity layers. Board-approved ranges are depicted by the bars, while the diamonds represent the actual allocation.

- Funds expected to be used within one year are invested in the primary liquidity layer.
- Longer-time horizon investments, including core and permanent core, are expected to provide higher rates of return and will experience some variation in market value as capital market conditions change.
- The System’s permanent core operating funds are invested in the System’s Endowment Pool investment program.
Over the trailing one-year period ending September 30, 2018, the Operating Pool returned 0.8% while outperforming the benchmark.

- The Operating Pool’s managers performed either in-line or slightly better than their respective benchmarks during the period.

Over longer time periods, the Operating Pool has exceed the benchmark on a consistent basis.

- The Operating Pool’s managers have produced competitive results relative to their respective benchmarks.

### Market Value Change

<table>
<thead>
<tr>
<th>Quarter Ending September-2018</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Market Value</td>
<td>$2,393.7 M</td>
</tr>
<tr>
<td>Net Contributions</td>
<td>$9.7 M</td>
</tr>
<tr>
<td>Gain/Loss</td>
<td>$11.2 M</td>
</tr>
<tr>
<td>Ending Market Value</td>
<td>$2,414.6 M</td>
</tr>
</tbody>
</table>

Note: The Total Pool’s beginning and ending market values include bank balances in which the System earns credit to offset bank fees. The beginning market value + net contributions + net investment gains referenced in the table may not equal the ending market value due to rounding.
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APPENDIX: MARKET ENVIRONMENT
## MARKET ENVIRONMENT

### 2009-2018 Annual Returns of Key Indices

<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Emerging Markets</td>
<td>MLPs</td>
<td>MLPs</td>
<td>Global REIT</td>
<td>Small Cap</td>
<td>Global REIT</td>
<td>Large Cap</td>
<td>Small Cap</td>
<td>Emerging Markets</td>
<td>Small Cap</td>
</tr>
<tr>
<td>78.5%</td>
<td>35.9%</td>
<td>13.9%</td>
<td>27.7%</td>
<td>38.8%</td>
<td>15.0%</td>
<td>1.4%</td>
<td>21.3%</td>
<td>37.3%</td>
<td>11.5%</td>
</tr>
<tr>
<td>MLPs</td>
<td>Small Cap</td>
<td>Bonds</td>
<td>Emerging Markets</td>
<td>Large Cap</td>
<td>Large Cap</td>
<td>Bonds</td>
<td>MLPs</td>
<td>Int'l</td>
<td>Large Cap</td>
</tr>
<tr>
<td>76.4%</td>
<td>26.9%</td>
<td>7.8%</td>
<td>18.2%</td>
<td>32.4%</td>
<td>13.7%</td>
<td>0.5%</td>
<td>18.3%</td>
<td>25.0%</td>
<td>10.6%</td>
</tr>
<tr>
<td>High Yield</td>
<td>Global REIT</td>
<td>High Yield</td>
<td>Int'l</td>
<td>MLPs</td>
<td>Bonds</td>
<td>Hedge Funds</td>
<td>High Yield</td>
<td>Large Cap</td>
<td>MLPs</td>
</tr>
<tr>
<td>58.2%</td>
<td>19.6%</td>
<td>5.0%</td>
<td>17.3%</td>
<td>27.6%</td>
<td>6.0%</td>
<td>-0.3%</td>
<td>17.1%</td>
<td>21.8%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Global REIT</td>
<td>Emerging Markets</td>
<td>Large Cap</td>
<td>Small Cap</td>
<td>Int'l</td>
<td>Small Cap</td>
<td>Global REIT</td>
<td>Large Cap</td>
<td>Small Cap</td>
<td>High Yield</td>
</tr>
<tr>
<td>37.1%</td>
<td>18.9%</td>
<td>2.1%</td>
<td>16.3%</td>
<td>4.9%</td>
<td>-0.8%</td>
<td>11.9%</td>
<td>14.6%</td>
<td>2.6%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Int'l</td>
<td>High Yield</td>
<td>Small Cap</td>
<td>Large Cap</td>
<td>Hedge Funds</td>
<td>MLPs</td>
<td>Int'l</td>
<td>Emerging Markets</td>
<td>Global REIT</td>
<td>Hedge Funds</td>
</tr>
<tr>
<td>31.8%</td>
<td>15.1%</td>
<td>-4.2%</td>
<td>16.0%</td>
<td>9.0%</td>
<td>4.8%</td>
<td>-0.8%</td>
<td>11.2%</td>
<td>10.4%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>Large Cap</td>
<td>Hedge Funds</td>
<td>High Yield</td>
<td>High Yield</td>
<td>High Yield</td>
<td>Hedge Funds</td>
<td>Small Cap</td>
<td>Global REIT</td>
<td>Global REIT</td>
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<td>27.2%</td>
<td>15.1%</td>
<td>-5.7%</td>
<td>15.8%</td>
<td>7.4%</td>
<td>3.4%</td>
<td>-4.4%</td>
<td>4.1%</td>
<td>7.8%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Large Cap</td>
<td>Int'l</td>
<td>Global REIT</td>
<td>MLPs</td>
<td>Global REIT</td>
<td>High Yield</td>
<td>High Yield</td>
<td>Bonds</td>
<td>High Yield</td>
<td>Int'l</td>
</tr>
<tr>
<td>26.5%</td>
<td>7.7%</td>
<td>-6.5%</td>
<td>4.8%</td>
<td>3.7%</td>
<td>2.5%</td>
<td>-4.5%</td>
<td>2.6%</td>
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<td>-1.4%</td>
</tr>
<tr>
<td>Hedge Funds</td>
<td>Bonds</td>
<td>Int'l</td>
<td>Hedge Funds</td>
<td>Bonds</td>
<td>Emerging Markets</td>
<td>Emerging Markets</td>
<td>Int'l</td>
<td>Bonds</td>
<td>Bonds</td>
</tr>
<tr>
<td>11.5%</td>
<td>6.5%</td>
<td>-12.1%</td>
<td>4.8%</td>
<td>-2.0%</td>
<td>-2.2%</td>
<td>-14.9%</td>
<td>1.0%</td>
<td>3.5%</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Bonds</td>
<td>Hedge Funds</td>
<td>Emerging Markets</td>
<td>Bonds</td>
<td>Emerging Markets</td>
<td>Int'l</td>
<td>MLPs</td>
<td>Hedge Funds</td>
<td>MLPs</td>
<td>Emerging Markets</td>
</tr>
<tr>
<td>5.9%</td>
<td>5.7%</td>
<td>-18.4%</td>
<td>4.2%</td>
<td>-2.6%</td>
<td>-4.9%</td>
<td>-32.6%</td>
<td>0.5%</td>
<td>-6.5%</td>
<td>-7.7%</td>
</tr>
</tbody>
</table>

**Note:** See disclosure section for a description of key indices.
• Domestic equities broadly outpaced international equities, particularly emerging market equities.
• Ongoing trade war-related concerns, rising U.S. interest rates, an appreciating U.S. dollar, and a continued draining of Fed liquidity served as headwinds to international equity performance, particularly for emerging markets.
• Stylistically, value generally underperformed growth within domestic markets, however, value in the emerging markets has experienced solid relative performance versus growth.

Global Equity Year-to-Date Performance (in USD)

Data source: Bloomberg, L.P.; Data as of 9/28/2018
Rate-sensitive sectors, such as core bonds and investment-grade credit, continued to struggle as Treasury rates rose during the quarter.

Long Treasuries spent most of the third quarter in negative territory on expectations that the U.S. Federal Reserve will continue its efforts to tighten monetary policy and wind down its balance sheet.

Below investment-grade, such as high yield bonds, posted relative outperformance.

**Fixed Income Year-to-Date Performance**

Data source: Bloomberg, L.P.; Data as of 9/28/2018
• Energy infrastructure witnessed solid performance throughout the third quarter, following strong second quarter performance. Key drivers included upward pressure on energy prices, firming fundamentals within the energy market, and generally favorable domestic economic conditions.

• U.S. real estate investment trusts (REITs) performance was essentially flat, as solid real estate-related fundamentals were somewhat counterbalanced by an increase in interest rates.

• Commodities spent the entirety of the third quarter period in negative territory, despite rebounding energy prices and a somewhat supportive inflationary backdrop.

Data source: Bloomberg, L.P.; Data as of 9/28/2018
Hedge funds focused on emerging markets (EM) struggled throughout the quarter. A number of idiosyncratic events—ranging from tariff negotiations between the U.S. and China to extreme measures taken by the Argentinian government to protect its currency—adversely impacted certain countries and led to spillover effects more broadly across EM.

Systematic macro strategies rebounded from a challenging start to the year. Also, persistent trends in the U.S. dollar and certain commodities drove gains for trend followers during the third quarter.

Event driven strategies performed well, particularly those with large merger and acquisition (M&A) portfolios. The courts overruled the Department of Justice’s attempt to block the vertical merger of AT&T and Time Warner earlier in the year, clearing the way for the closure and announcement of similar deals.

HFRI INDICES PERFORMANCE RETURNS IN U.S. DOLLARS

Data source: HedgeFund Research
THE BIG PICTURE

Purchasing Manager Index at highest level on record

Unemployment rate dropped to lowest level since 1969

Confidence – Not for Redistribution

Data sources: ISM, NBER, Bloomberg, L.P.; Data as of September 2018

Leading Economic Indicators set new cycle high

Conference Board LEI (YoY) & Business Cycles

Data sources: Conference Board, NBER, Bloomberg, L.P.; Data as of September 2018
Note: Shaded areas represent recessionary periods

China GDP growth slowed to a 9-year low

China Real GDP (YoY)

Data sources: National Bureau of Statistics of China, Bloomberg, L.P.; Data as of 3Q 2018

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**Large Cap** is represented by the S&P 500 Index which measures the performance of large capitalization U.S. stocks. The S&P 500 is a market-weighted index of 500 stocks that are traded on the NYSE, AMEX, and NASDAQ. [www.standardandpoors.com](http://www.standardandpoors.com)

**Mid Cap** is represented by the Russell Mid Cap Index which measures performance of U.S. mid capitalization stocks. The Russell Mid Cap Index is a capitalization-weighted index of the 800 smallest companies in the Russell 1000 Index. The stocks are traded on the NYSE, AMEX, and NASDAQ. [www.russell.com](http://www.russell.com)

**Small Cap** is represented by the Russell 2000 Index which measures the performance of U.S. small capitalization stocks. The Russell 2000 is a capitalization-weighted index of the 2,000 smallest stocks in the broad U.S. equity market, as defined by the Russell 3000 Index. These stocks are traded on the NYSE, AMEX, and NASDAQ. [www.russell.com](http://www.russell.com)

**International** is represented by the MSCI EAFE Index which is a Morgan Stanley Capital International index that is designed to measure the performance of the developed stock markets of Europe, Australasia, and the Far East. [www.mscibarra.com](http://www.mscibarra.com)

**Emerging Markets** are represented by the MSCI Emerging Markets Index which is a Morgan Stanley Capital International index that is designed to measure the performance of emerging market stock markets. [www.mscibarra.com](http://www.mscibarra.com)

**Hedged Equity** is represented by the Hedge Fund Research, Inc. Fund Weighted Composite Index, an equal weighted index that includes over 2,000 constituent funds, both domestic and offshore with no Fund of Funds included in the index. [www.hfri.com](http://www.hfri.com)

**Bonds** are represented by the Barclays U.S. Aggregate Bond Index which includes U.S. government, corporate, and mortgage-backed securities with maturities up to 30 years. [www.barclays.com](http://www.barclays.com)

**High Yield** is represented by the Barclays U.S. Corporate High Yield Index. [www.barclays.com](http://www.barclays.com)

**Global REIT** is represented by the FTSE EPRA/NAREIT Developed Index which is designed to track the performance of listed real estate companies and REITS worldwide. [www.ftse.com](http://www.ftse.com)

**MLPs** are represented by the Alerian MLP Index. [www.alerian.com](http://www.alerian.com)

**Hedge Funds** are represented by the Hedge Fund Research, Inc. Fund of Funds Composite Index. [www.hfri.com](http://www.hfri.com)