Fact Sheet  As of 06/30/2019
MM MSCI EAFE® International Index Fund

Northern Trust Investments, Inc.


Fund Objective:
The Fund seeks to provide investment results approximating (before fees and expenses) the aggregate price and dividend performance of the securities included in the MSCI EAFE® Index.*

Trailing Returns:*

<table>
<thead>
<tr>
<th></th>
<th>QTD</th>
<th>YTD</th>
<th>1Y</th>
<th>3Y</th>
<th>5Y</th>
<th>Since Incep.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM MSCI EAFE®</td>
<td>3.66</td>
<td>14.19</td>
<td>1.09</td>
<td>8.83</td>
<td>2.11</td>
<td>7.90</td>
</tr>
<tr>
<td>International R5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSCI EAFE NR USD</td>
<td>3.68</td>
<td>14.03</td>
<td>1.08</td>
<td>9.11</td>
<td>2.25</td>
<td>8.62</td>
</tr>
<tr>
<td>Category Average Return</td>
<td>-</td>
<td>-</td>
<td>-0.6</td>
<td>8.13</td>
<td>2.03</td>
<td>-</td>
</tr>
<tr>
<td>Category Rank</td>
<td>-</td>
<td>-</td>
<td>37</td>
<td>35</td>
<td>49</td>
<td>-</td>
</tr>
<tr>
<td># Funds in Category</td>
<td>-</td>
<td>-</td>
<td>722</td>
<td>611</td>
<td>488</td>
<td>-</td>
</tr>
</tbody>
</table>

Calendar Year Returns:*

-14%  -12%  -10%  -8%  -6%  -4%  -2%  0%  2%  4%  6%  8%  10%  12%  14%
2013  2014  2015  2016  2017  2018

Asset Allocation:

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Cash</td>
<td>0.73%</td>
</tr>
<tr>
<td>US Equity</td>
<td>1.74%</td>
</tr>
<tr>
<td>Non-US Equity</td>
<td>96.18%</td>
</tr>
<tr>
<td>Other</td>
<td>1.35%</td>
</tr>
<tr>
<td># of Stock Holdings</td>
<td>923</td>
</tr>
</tbody>
</table>

Morningstar Category: Foreign Large Blend
Fund Net Assets: $234M
Fund Inception Date: 07/25/2012

Growth of $10,000:*

Fund Performance Over 10 Years

Sector Allocation:

- Consumer Discretionary: 10.99%
- Consumer Staples: 11.62%
- Energy: 5.58%
- Financials: 18.47%
- Healthcare: 11.12%
- Industrials: 14.15%
- Information Technology: 6.71%
- Materials: 7.21%
- Real Estate: 3.42%
- Communication Services: 5.18%
- Utilities: 3.47%

*Performance shown is for class R5 shares. Current performance may be higher or lower. Max Sales charge for R5 is 0%.
Performance data given represents past performance and does not guarantee future results. Current performance may be lower or higher than return data quoted herein. For more current information, including month-end performance, please call 1-866-444-2601. The investment return and the principal value of an investment will fluctuate; so an investor’s shares, when redeemed, may be worth more or less than their original cost.
Investment portfolio statistics change over time. Returns shown do not reflect the impact of plan fees, which will reduce performance. Investment portfolio statistics change over time. You cannot invest directly in an index.
Pre-Inception Returns - The inception date listed is that of the oldest share class of the Fund. The inception date for each individual share class can be found on page 2. Performance shown subsequent to the inception date is the actual performance of the share class. Other share classes of the investment itself (depending upon the investment) may have existed longer, which may account for any pre-inception performance shown. If pre-inception performance is shown, it is generally the performance of an older share class of the investment itself (depending upon the investment) adjusted for fees and expenses of the newer share class. However, if using the expenses of the newer share class rather than the expenses of the older share class (due to lower expenses of the newer share class) would result in better performance, then pre-inception performance represents that of the older share class without any expense adjustment.
Performance Returns - reflect performance of the investment without adjusting for sales charges or the effects of taxation, but is adjusted to reflect actual ongoing investment expenses and assumes reinvestment of dividends and capital gains (if applicable). If adjusted, sales charges would reduce the performance quoted. In addition, due to market volatility, performance may vary greatly over short periods of time. The investment’s performance is generally compared with that of an index. The index is an unmanaged portfolio of specified securities and does not reflect any initial or ongoing expenses nor can it be invested in directly. An investment’s portfolio may differ significantly from the securities in the index. The index may not be the same as the comparative index noted in the investment’s prospectus (if applicable).
The Growth of $10,000 - graph shows an investment’s performance based on how $10,000 invested in the investment would have grown over time. The growth of $10,000 begins at the investment’s inception date or the first year listed on the graph, whichever is appropriate.
The Fund is not sponsored, endorsed, sold, or promoted by MSCI Inc. (“MSCI”), any of its affiliates, any of its information providers, or any other third party involved in, or related to, compiling, computing, or creating any MSCI index (collectively, the “MSCI Parties”). The MSCI indexes are the exclusive property of MSCI. MSCI and the MSCI index names are service mark(s) of MSCI or its affiliates and have been licensed for use for certain purposes by MML Advisers. None of the MSCI Parties makes any representation or warranty, express or implied, to the issuer or owners of the Fund or any other person or entity regarding the advisability of investing in funds generally or in the Fund particularly or the ability of any MSCI index to track corresponding stock market performance.

NOT FDIC INSURED ● MAY LOSE VALUE ● NO BANK GUARANTEE
**Risk statistics are calculated over a five year period, computed monthly.**

For each investment with at least a three-year history, Morningstar calculates a Morningstar Rating™ based on how an investment ranks on a Morningstar Risk-Adjusted Return measure against other investments in the category. This measure takes into account variations in an investment’s monthly performance after adjusting for sales loads (except for load-waived A shares), redemption fees, and the risk-free rate, placing more emphasis on downward variations and rewarding consistent performance. The top 10% of investments in each category receive 5 stars, the next 22.5% receive 4 stars, the next 35% receive 3 stars, the next 22.5% receive 2 stars, and the bottom 10% receive 1 star. The Overall Morningstar Rating for an investment is derived from a weighted average of the ratings for the three-, five- and ten-year (if applicable) time periods. The Morningstar percentile ranking is based on the fund’s total-return percentile rank relative to all funds that have the same category for the same time period. The highest (or most favorable) percentile rank is 1%, and the lowest (or least favorable) percentile rank is 100%. Morningstar total return includes both income and capital gains or losses and is not adjusted for sales charges.

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The Fund’s **Principal Risks** include: Cash Position Risk, Derivatives Risk, Equity Securities Risk, Foreign Investment Risk; Emerging Markets Risk; Currency Risk; Geographical Focus Risk, Indexing Risk, Industry Concentration, Large Company Risk, Management Risk, Market Risk, Valuation Risk. Please refer to the summary prospectus (a copy can be obtained by sending an email to fundinfo@massmutual.com) for more information on the specific risks.

**Risk Statistics-Alpha** is a measure of the difference between a fund’s actual returns and its expected performance, given its level of risk as measured by beta. A positive alpha figure indicates the fund has performed better than its beta would predict. In contrast, a negative alpha indicates the fund’s performance is to its index. **Tracking Error** is also known as active risk and is the degree to which the strategy differed from its index or benchmark. The higher the Tracking Error, the more the fund deviated from its index. **Sharpe Ratio** measures risk adjusted performance; it is calculated as the real total return of the fund (total return-risk free rate) divided by the risk of the fund (standard deviation). **Upside/downside capture shows whether a given fund has outperformed--gained more or lost less than--a broad market benchmark during periods of market strength and weakness, and if so, by how much. An upside capture ratio over 100 indicates a fund has generally outperformed the benchmark during periods of positive returns for the benchmark. A downside capture ratio of less than 100 indicates that a fund has lost less than its benchmark in periods when the benchmark has been in the red. **Betting Average** is a measure of a manager’s ability to consistently beat its benchmark over the trailing five-year period.

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