



Katrina Sherrerd, Ph.D., CFA

“Leaders of tomorrow’s successful investment management organizations need to foster a culture that values intellectual curiosity, the pursuit of knowledge, and the courage to communicate.”

## Truth vs. Ignorance—The Impactful Investment Manager of Tomorrow

Walking through the art studio at my son’s high school last year, I was drawn to a piece featuring a blindfolded woman trying to find an apple that she could not see in front of her. My son explained that this was the centerpiece in a series he was doing on “Truth vs. Ignorance.” Ignorance, that is the lack of knowledge and/or insight, is often a contributor to prejudices, biases, and bad decisions, he said.

The piece resonated immediately. No matter what the decision to be made, the solution will almost assuredly be better if the decision is based on truth (knowledge) rather than ignorance. It is hard to make good decisions when you are unaware of—or unwilling to accept—the relevant facts and circumstances. This is certainly true for investment decisions, in part because their consequences have a direct impact on the economic options for the ultimate beneficiary.

All too often, investment professionals are unwilling or unable to pursue and act on knowledge that would lead to better investment outcomes for their clients. The investment management industry tends to emphasize product, and its invariably linked goal of beating the benchmark, over education and counseling. Leaders of tomorrow’s successful investment management organizations, those that will have lasting impact, need to foster a culture that values intellectual curiosity, the pursuit of knowledge, and the courage to communicate freely and openly, especially if the truths uncovered are at odds with conventional wisdom.

### Ignorance

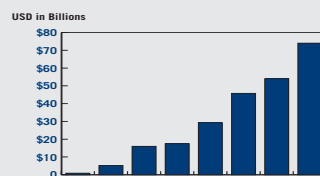
Ignorance is often used as a severely pejorative term. It shouldn’t be. Ignorance is merely a lack of knowledge, education, or awareness. By this definition, we must all live with the fact that we are ignorant in many areas, so ignorance in and of itself is not necessarily a problem. I and my colleagues would cheerfully acknowledge our ignorance of the latest innovations in medicine. Accordingly, we routinely seek the advice and counsel of doctors for medical issues. Merely seeking help from random medical professionals is not sufficient, however. I am likely to get better medical advice if I make the effort to learn something about my options, such as the credentials and specialties of the doctors under consideration. The key distinction is knowing when knowledge is necessary and, conversely, when a lack of knowledge is dangerous. As Benjamin Disraeli said, “To be conscious that you are ignorant of the facts is a great step to knowledge.”

While potentially not as serious for one’s health, ignorance in investing can have devastating consequences for individual portfolios and personal wealth. Too often, capital market participants have little knowledge of how markets work, how to make investment decisions, or how to manage their portfolios. For most, the standard operating procedure is to hire a collection of “good” managers in the hope of beating the benchmark. But this practice ignores the reality that alpha, the return attributable to skill, is incredibly scarce.



620 Newport Center Drive, Suite 900  
Newport Beach, CA 92660  
+1 (949) 325-8700  
info@researchaffiliates.com  
www.researchaffiliates.com

### RAFI® Managed Assets\*



\*Includes RAFI® assets managed or sub-advised by Research Affiliates or RAFI licensees.

### Media Contacts

Tucker Hewes  
Hewes Communications  
+1 (212) 207-9451  
tucker@hewescomm.com  
Joel Chernoff  
Research Affiliates  
+1 (949) 325-8729  
chernoff@ralic.com



©William Sherrerd-Smith. Reprinted with permission.

As an example, in 2010 Burt Malkiel analyzed the 358 equity mutual funds that were in existence in 1970.<sup>1</sup> Remarkably, only 119—less than one in three—survived through 2009, with the rest presumably closed because of poor performance. Of the survivors, only five managed to produce net returns more than 2% per annum above the S&P 500. Talk about long odds—that’s less than 1.5% of the starting universe! But many assume that top quartile managers can add value far in excess of 2% per annum. Our own research shows that even with perfect clairvoyance of future profits discounted to today’s price, a portfolio weighted by Clairvoyant Value would produce excess returns of about 6% per annum, a figure routinely “achieved” in shorter term manager rankings, creating an almost irresistible siren’s song. To be sure, alpha may be achieved—but only for a scant few.

So, why do nearly all investors and professional investors continue to pursue returns from active management, an exercise shown to be suboptimal for investment performance? One reason is ignorance—the lack of awareness of, or inability to accept, the well-researched data that may, at first, conflict with standard practice. Too often in our industry,

people seek the safety of conventional wisdom.<sup>2</sup> Paraphrasing John Maynard Keynes, for most people it is better to fail conventionally than to succeed unconventionally. However, as Surowiecki describes in his book “The Wisdom of Crowds,” groups of people will generally make superior decisions *only* when the crowd exhibits independent thought and validation of premises and views. Merely mimicking others is not “wise” and can lead to suboptimal outcomes.

The scarcity of alpha is but one of many lessons of history that are ignored in today’s conventional practices. Some of the other more prevalent ones are:

- **Long-Term Returns.** Many investors are still expecting their investments to produce 7-8% nominal returns. With 2% bond yields, this requires some very heavy lifting from the rest of the portfolio. The sources of long-term equity returns are well-documented, so we know that dividends are the dominant contributors.<sup>3</sup> So how do investors extrapolate 8-10% stock market returns with dividend yields of 2%, a level half the historical average? If not from stocks, many believe they can “get there” from allocations to alternatives, such as

hedge funds. But the data suggest otherwise; the HFRI Hedge Fund of Funds Composite Index trailed a simple 60/40 blend by 300 bps per annum over the 10 years ended December 31, 2012. How can trillions of nest egg dollars be invested with such a blind eye to reasonable and logical expected returns?

- **Efficiency of Cap-Weighted Indexes.** Cap-weighted indexes represent the most reasonable and accurate manner to measure the performance of an asset class like equities. The collective returns of all investors will match the cap-weighted index. But, are these benchmarks the most effective way to build a portfolio? Only if we assume that prices are efficient. If they are not, do we really want to own *more* of a stock that doubled in price? Or, in bonds, should we really lend *more* to the most indebted? The literature of the past several years indicates there are opportunities for improvement. Yet tracking error to cap weights still dominates most investment decisions.
- **Two-Pillared Investment Portfolios.** Often, our ignorance is directly attributable to our experience set. Individuals and investors who lived through the Great Depression never considered equities a viable asset class for the bulk of one’s savings. Most individuals and investors today haven’t experienced a sizable bout of inflation and have structured their portfolios accordingly. Mainstream stocks and bonds dominate most allocations despite the fact that these two primary pillars fare poorly in an inflationary environment. Given this susceptibility to underperformance in a different economic regime, shouldn’t we be having more serious conversations about achieving truer diversification?

## Choose Truth

Clients rely on investment professionals to make sound decisions on their behalf, and thus would be better served if we

chase truth, not ignorance, in fulfilling our fiduciary duties. And, for the most part, we do. That said, there are many cases where we act “ignorantly,” and one of those is the tendency to become complacent—to discontinue the quest for more knowledge about the decisions we make—or to prefer the conventional wisdom even if the facts do not support conformist thinking. The quest does not have to lead to some world-changing discovery. In our experience, the quest for truth and knowledge brings us back, more times than not, to basic time-tested practices of investment success, such as reducing costs, rebalancing aggressively, being contrarian, and diversifying broadly. These basic tenets can always be sharpened and reinforced by rigorous research and education.

Success in the asset management industry is not guaranteed. It is hard enough to be successful when we are open and curious rather than defensively operating within familiar territory, blindfolded to the panoply of alternatives that are available to us. We are wise to remember that conventional wisdom may not always be “the truth.” The firms that succeed will be those that can take transformational steps to adapt to changes in the industry, take advantage of new and emergent opportunities, and, importantly, educate clients along the way. In such an environment, we see more emphasis on transparent, diversified, low-cost products as the core for most portfolios. We still see a role for higher-fee, alpha-oriented



©William Sherrerd-Smith. Reprinted with permission.

products, but the standards for evaluating their attractiveness will toughen, and many offerings will not be viable in the future. We believe that, increasingly, decision makers will seek more knowledge and insight based on independent thinking before making investment recommendations or taking action.

In the future, the successful investment management firm will be able to add more value to the client relationship than the simple bottom line of excess returns over the benchmark. The quest for insight and education should join—not subsume or downgrade—the quest for alpha.

Further, and potentially more important, we would like to see investment profes-

sionals take the lead in helping investors to understand the facts and considerations that are relevant to their investment decisions. At Research Affiliates, we are committed to conducting and publishing research on issues relevant to the investment decision.<sup>4</sup> We speak our mind, even if that leaves us seemingly standing alone and apart from conventional wisdom. We encourage investment professionals not to go blindfolded in their search for alpha but to make the effort to understand the alternatives and issues, and make sound decisions.<sup>5</sup> The pursuit of knowledge will not always lead to superior performance in the investment industry, but it is far better than making decisions from ignorance.

## Endnotes

1. Burton Malkiel presented these findings at the 2010 Research Affiliates Advisory Panel.
2. It is also possible that people pursue business interests over investment interests, which is a topic for another day.
3. Robert D. Arnott and Peter L. Bernstein, 2002, “What Risk Premium is ‘Normal?’” *Financial Analysts Journal*, (March/April):64-85.
4. For more information on our research, visit [www.researchaffiliates.com](http://www.researchaffiliates.com).
5. For many, including James R. Vertin, a leader in the move to passive investing, long-time advocate for research and continuing education, and one of my mentors, maintaining one’s knowledge base is both a duty and the prerequisite for practitioners’ involvement in the investment profession.

## Performance Update

### FTSE RAFI® Equity Index Series\*

| TOTAL RETURN AS OF 12/31/12                       | BLOOMBERG TICKER | YTD    | 12 MONTH | ANNUALIZED |        |         |                    |
|---|------------------|--------|----------|------------|--------|---------|--------------------|
|   |                  |        |          | 3 YEAR     | 5 YEAR | 10 YEAR | 10 YEAR VOLATILITY |
| FTSE RAFI® All World 3000 <sup>1</sup>            | TFRAW3           | 16.34% | 16.34%   | 6.36%      | 0.41%  | 11.60%  | 18.88%             |
| MSCI All Country World <sup>2</sup>               | GDUEACWF         | 16.80% | 16.80%   | 7.19%      | -0.61% | 8.66%   | 16.79%             |
| FTSE RAFI® Developed ex US 1000 <sup>3</sup>      | FRXIXTR          | 15.90% | 15.90%   | 2.20%      | -2.91% | 10.11%  | 20.43%             |
| MSCI World ex US Large Cap <sup>4</sup>           | MLCUWXUG         | 17.02% | 17.02%   | 4.15%      | -2.93% | 9.10%   | 18.43%             |
| FTSE RAFI® Developed ex US Mid Small <sup>5</sup> | TFRDXUSU         | 15.49% | 15.49%   | 6.63%      | 2.50%  | 14.47%  | 19.07%             |
| MSCI World ex US Small Cap <sup>6</sup>           | GCUDWXUS         | 17.93% | 17.93%   | 7.57%      | -0.32% | 12.46%  | 20.51%             |
| FTSE RAFI® Emerging Markets <sup>7</sup>          | TFREMU           | 15.58% | 15.58%   | 3.92%      | 0.70%  | 22.35%  | 24.74%             |
| MSCI Emerging Markets <sup>8</sup>                | GDUEEGF          | 18.63% | 18.63%   | 4.98%      | -0.61% | 16.88%  | 24.13%             |
| FTSE RAFI® 1000 <sup>9</sup>                      | FRIOXTR          | 17.21% | 17.21%   | 12.07%     | 3.70%  | 9.22%   | 17.41%             |
| Russell 1000 <sup>10</sup>                        | RU10INTR         | 16.42% | 16.42%   | 11.12%     | 1.92%  | 7.52%   | 15.06%             |
| S&P 500 <sup>11</sup>                             | SPTR             | 16.00% | 16.00%   | 10.87%     | 1.66%  | 7.10%   | 14.77%             |
| FTSE RAFI® US 1500 <sup>12</sup>                  | FR15USTR         | 18.53% | 18.53%   | 12.98%     | 6.75%  | 13.07%  | 22.15%             |
| Russell 2000 <sup>13</sup>                        | RU20INTR         | 16.35% | 16.35%   | 12.25%     | 3.56%  | 9.72%   | 20.10%             |
| FTSE RAFI® Europe <sup>14**</sup>                 | TFREUE           | 15.90% | 15.90%   | 3.64%      | -2.79% | 7.33%   | 18.09%             |
| MSCI Europe <sup>15**</sup>                       | GDDLE15          | 18.09% | 18.09%   | 6.87%      | -1.71% | 6.51%   | 15.08%             |
| FTSE RAFI® Australia <sup>16**</sup>              | FRAUSTR          | 23.53% | 23.53%   | 3.55%      | 0.27%  | 9.46%   | 13.33%             |
| S&P/ASX 200 <sup>17**</sup>                       | ASA51            | 20.26% | 20.26%   | 3.00%      | -1.62% | 9.12%   | 13.43%             |
| FTSE RAFI® Canada <sup>18**</sup>                 | FRCANTR          | 10.70% | 10.70%   | 5.33%      | 3.13%  | 10.69%  | 13.56%             |
| S&P/TSX 60 <sup>19**</sup>                        | TX60AR           | 8.07%  | 8.07%    | 3.81%      | 0.32%  | 9.28%   | 14.00%             |
| FTSE RAFI® Japan <sup>20**</sup>                  | FRJPNTR          | 18.30% | 18.30%   | -0.69%     | -8.05% | 3.34%   | 19.30%             |
| MSCI Japan <sup>21**</sup>                        | GDDLJN           | 21.78% | 21.78%   | -0.06%     | -8.90% | 1.79%   | 18.68%             |
| FTSE RAFI® UK <sup>22**</sup>                     | FRGBRTR          | 12.08% | 12.08%   | 7.00%      | 1.53%  | 8.60%   | 15.97%             |
| MSCI UK <sup>23**</sup>                           | GDDLUK           | 10.24% | 10.24%   | 6.70%      | 2.10%  | 7.98%   | 13.88%             |

\*To see the complete series, please go to: [http://www.ftse.com/Indices/FTSE\\_RAFI\\_Index\\_Series/index.jsp](http://www.ftse.com/Indices/FTSE_RAFI_Index_Series/index.jsp).

\*\*The above indices have been restated to reflect the use of local currencies for all single country strategies and EUR for Europe regional strategies rather than USD.

### Russell Fundamental Index Series\*

| TOTAL RETURN AS OF 12/31/12   | BLOOMBERG TICKER | YTD    | 12 MONTH | ANNUALIZED |        |         |                    |
|---|------------------|--------|----------|------------|--------|---------|--------------------|
|   |                  |        |          | 3 YEAR     | 5 YEAR | 10 YEAR | 10 YEAR VOLATILITY |
| Russell Fundamental Global Index Large Company <sup>24</sup>          | RUFGLTU          | 16.45% | 16.45%   | 7.91%      | 1.45%  | 11.84%  | 17.37%             |
| MSCI All Country World Large Cap <sup>25</sup>                        | MLCUAWOG         | 16.68% | 16.68%   | 6.85%      | -0.80% | 8.06%   | 16.45%             |
| Russell Fundamental Developed ex US Index Large Company <sup>26</sup> | RUFDXLTU         | 15.55% | 15.55%   | 3.34%      | -1.89% | 11.47%  | 18.86%             |
| MSCI World ex US Large Cap <sup>27</sup>                              | MLCUWXUG         | 16.99% | 16.99%   | 3.79%      | -3.15% | 8.57%   | 18.29%             |
| Russell Fundamental Developed ex US Index Small Company <sup>28</sup> | RUFDXSTU         | 17.97% | 17.97%   | 7.84%      | 2.21%  | 14.42%  | 18.54%             |
| MSCI World ex US Small Cap <sup>6</sup>                               | GCUDWXUS         | 17.93% | 17.93%   | 7.57%      | -0.32% | 12.46%  | 20.51%             |
| Russell Fundamental Emerging Markets <sup>29</sup>                    | RUFGETRU         | 19.28% | 19.28%   | 7.28%      | 2.73%  | 22.15%  | 24.48%             |
| MSCI Emerging Markets <sup>8</sup>                                    | GDUEEGF          | 18.63% | 18.63%   | 4.98%      | -0.61% | 16.88%  | 24.13%             |
| Russell Fundamental US Index Large Company <sup>30</sup>              | RUFUSLTU         | 16.68% | 16.68%   | 12.29%     | 4.22%  | 9.69%   | 15.79%             |
| Russell 1000 <sup>10</sup>  | RU10INTR         | 16.42% | 16.42%   | 11.12%     | 1.92%  | 7.52%   | 15.06%             |
| S&P 500 <sup>11</sup>   | SPTR             | 16.00% | 16.00%   | 10.87%     | 1.66%  | 7.10%   | 14.77%             |
| Russell Fundamental US Index Small Company <sup>31</sup>              | RUFUSSTU         | 18.89% | 18.89%   | 14.65%     | 8.18%  | 13.49%  | 21.02%             |
| Russell 2000 <sup>13</sup>  | RU20INTR         | 16.35% | 16.35%   | 12.25%     | 3.56%  | 9.72%   | 20.10%             |
| Russell Fundamental Europe <sup>32**</sup>                            | RUFEUTE          | 17.17% | 17.17%   | 6.34%      | -0.73% | 10.11%  | 16.87%             |
| MSCI Europe <sup>15**</sup>   | GDDLE15          | 18.09% | 18.09%   | 6.87%      | -1.71% | 6.51%   | 15.08%             |

\*To see the complete series, please go to: [http://www.russell.com/indexes/data/Fundamental/About\\_Russell\\_Fundamental\\_indexes.asp](http://www.russell.com/indexes/data/Fundamental/About_Russell_Fundamental_indexes.asp).

\*\*The above indices have been restated to reflect the use of local currencies for all single country strategies and EUR for Europe regional strategies rather than USD.

## Performance Update

### Fixed Income/Alternatives

| TOTAL RETURN AS OF 12/31/12   | BLOOMBERG<br>TICKER | YTD    | 12 MONTH | ANNUALIZED |        |         |                       |
|---|---------------------|--------|----------|------------|--------|---------|-----------------------|
|   |                     |        |          | 3 YEAR     | 5 YEAR | 10 YEAR | 10 YEAR<br>VOLATILITY |
| RAFI® Bonds US Investment Grade Master <sup>33</sup>                                | —                   | 8.93%  | 8.93%    | 8.99%      | 8.40%  | 6.51%   | 5.97%                 |
| ML Corporate Master <sup>34</sup>   | COAO                | 10.37% | 10.37%   | 9.13%      | 7.72%  | 6.31%   | 6.13%                 |
| RAFI® Bonds US High Yield Master <sup>35</sup>                                      | —                   | 15.13% | 15.13%   | 12.09%     | 12.41% | 11.36%  | 9.81%                 |
| ML Corporate Master II High Yield BB-B <sup>36</sup>                                | H0A4                | 14.71% | 14.71%   | 11.46%     | 9.07%  | 9.38%   | 9.23%                 |
| RAFI® US Equity Long/Short <sup>37</sup>  | —                   | 3.83%  | 3.83%    | 2.79%      | 4.66%  | 5.54%   | 11.50%                |
| 1-Month T-Bill <sup>38</sup>  | GB1M                | 0.05%  | 0.05%    | 0.08%      | 0.33%  | 1.60%   | 0.51%                 |
| FTSE RAFI® Global ex US Real Estate <sup>39</sup>                                   | FRXR                | 39.59% | 39.59%   | 8.97%      | -0.17% | —       | —                     |
| FTSE EPRA/NAREIT Global ex US <sup>40</sup>   | EGXU                | 38.57% | 38.57%   | 10.82%     | -1.14% | —       | —                     |
| FTSE RAFI® US 100 Real Estate <sup>41</sup>   | FRUR                | 22.30% | 22.30%   | 18.80%     | 6.81%  | —       | —                     |
| FTSE EPRA/NAREIT United States <sup>42</sup>  | UNUS                | 17.98% | 17.98%   | 17.65%     | 4.82%  | —       | —                     |
| Citi RAFI Sovereign Developed Markets Bond Index Master <sup>43</sup>               | CRFDMU              | 6.17%  | 6.17%    | 5.55%      | 5.48%  | 7.15%   | 7.71%                 |
| Merrill Lynch Global Governments Bond Index II <sup>44</sup>                        | WOG1                | 1.74%  | 1.74%    | 4.72%      | 5.42%  | 6.08%   | 7.02%                 |
| Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Master <sup>45</sup> | CRFELMU             | 16.64% | 16.64%   | —          | —      | —       | —                     |
| JPMorgan GBI-EM Global Diversified <sup>46</sup>                                    | JGENVUUG            | 16.76% | 16.76%   | —          | —      | —       | —                     |

## Definition of Indices:

- (1) The FTSE RAFI® All World 3000 Index is a measure of the largest 3,000 companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value), across both developed and emerging markets.
- (2) The MSCI All Country World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets.
- (3) The FTSE RAFI® Developed ex US 1000 Index is a measure of the largest 1,000 non U.S. listed, developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (4) The MSCI World ex US Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, excluding the United States.
- (5) The FTSE RAFI® Developed ex US Mid Small Index tracks the performance of small and mid-cap companies domiciled in developed international markets (excluding the United States), selected and weighted based on the following four fundamental measures of firm size: sales, cash flow, dividends and book value.
- (6) The MSCI World ex US Small Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of small cap developed markets, excluding the United States.
- (7) The FTSE RAFI® Emerging Markets Index comprises the largest 350 Emerging Market companies selected and weighted using fundamental factors (sales, cash flow, dividends, book value).
- (8) The MSCI Emerging Markets Index is an unmanaged, free-float-adjusted cap-weighted index designed to measure equity market performance of emerging markets.
- (9) The FTSE RAFI® 1000 Index is a measure of the largest 1,000 U.S. listed companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (10) The Russell 1000 Index is a market-capitalization-weighted benchmark index made up of the 1,000 highest-ranking U.S. stocks in the Russell 3000.
- (11) The S&P 500 Index is an unmanaged market index that focuses on the large-cap segment of the U.S. equities market.
- (12) The FTSE RAFI® US 1500 Index is a measure of the 1,001st to 2,500th largest U.S. listed companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (13) The Russell 2000 is a market-capitalization weighted benchmark index made up of the 2,000 smallest U.S. companies in the Russell 3000.
- (14) The FTSE RAFI® Europe Index is comprised of all European companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (15) The MSCI Europe Index is a free-float adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in Europe.
- (16) The FTSE RAFI® Australia Index is comprised of all Australian companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (17) The S&P/ASX 200 Index, representing approximately 78% of the Australian equity market, is a free-float-adjusted, cap-weighted index.
- (18) The FTSE RAFI® Canada Index is comprised of all Canadian companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (19) The S&P/Toronto Stock Exchange (TSX) 60 is a cap-weighted index consisting of 60 of the largest and most liquid (heavily traded) stocks listed on the TSX, usually domestic or multinational industry leaders.
- (20) The FTSE RAFI® Japan Index is comprised of all Japanese companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (21) The MSCI Japan Index is an unmanaged, free-float-adjusted cap-weighted index that aims to capture 85% of the publicly available total market capitalization of the Japanese equity market.
- (22) The FTSE RAFI® UK Index is comprised of all UK companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (23) The MSCI UK Index is an unmanaged, free-float-adjusted cap-weighted index that aims to capture 85% of the publicly available total market capitalization of the British equity market.
- (24) The Russell Fundamental Global Index Large Company is a measure of the largest companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks), across both developed and emerging markets.
- (25) The MSCI All Country World Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets.
- (26) The Russell Fundamental Developed ex US Large Company is a subset of the Russell Fundamental Developed ex US Index, and is a measure of the largest non-U.S. listed developed country companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (27) The MSCI World ex US Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of large cap-developed markets, excluding the United States.
- (28) The Russell Fundamental Developed ex US Index Small Company is a subset of the Russell Fundamental Developed ex US Index, and is a measure of small non-U.S. listed developed country companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (29) The Russell Fundamental Emerging Markets Index is a measure of Emerging Market companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (30) The Russell Fundamental U.S. Index Large Company is a subset of the Russell Fundamental US Index, and is a measure of the largest U.S. listed companies, selected and weighted using fundamental measures; (adjusted sales, retained cash flow, dividends + buybacks).
- (31) The Russell Fundamental US Index Small Company is a subset of the Russell Fundamental US Index, and is a measure of U.S. listed small companies, selected and weighted using fundamental measures; (adjusted sales, retained cash flow, dividends + buybacks).
- (32) The Russell Fundamental Europe Index is a measure of European companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (33) The RAFI® Bonds US Investment Grade Master Index is a U.S. investment-grade corporate bond index comprised of non-zero fixed coupon debt with maturities ranging from 1 to 30 years issued by publicly traded companies. The issuers held in the index are weighted by a combination of four measures of their fundamental size—sales, cash flow, dividends, and book value of assets.
- (34) The Merrill Lynch U.S. Corporate Master Index is representative of the entire U.S. corporate bond market. The index includes dollar-denominated investment-grade corporate public debt issued in the U.S. bond market.
- (35) The RAFI® Bonds US High Yield Master is a U.S. high-yield corporate bond index comprised of non-zero fixed coupon debt with maturities ranging from 1 to 30 years issued by publicly traded companies. The issuers held in the index are weighted by a combination of four measures of their fundamental size—sales, cash flow, dividends, and book value of assets.
- (36) The Merrill Lynch Corporate Master II High Yield BB-B Index is representative of the U.S. high yield bond market. The index includes domestic high-yield bonds, including deferred interest bonds and payment-in-kind securities. Issues included in the index have maturities of one year or more and have a credit rating lower than BBB-/Baa3, but are not in default.
- (37) The RAFI® US Equity Long/Short Index utilizes the Research Affiliates Fundamental Index® (RAFI®) methodology to identify opportunities that are implemented through long and short securities positions for a selection of U.S. domiciled publicly traded companies listed on major exchanges. Returns for the index are collateralized and represent the return of the strategy plus the return of a cash collateral yield.
- (38) The 1-Month T-bill return is calculated using the Bloomberg Generic 1-month T-bill. The index is interpolated based off of the currently active U.S. 1 Month T-bill and the cash management bill closest to maturing 30 days from today.
- (39) The FTSE RAFI® Global ex US Real Estate Index comprises 150 companies with the largest RAFI fundamental values selected from the constituents of the FTSE Global All Cap ex U.S. Index that are classified by the Industry Classification Benchmark (ICB) as Real Estate.
- (40) The FTSE EPRA/NAREIT Global ex US Index is a free float-adjusted index, and is designed to represent general trends in eligible listed real estate stocks worldwide, excluding the United States. Relevant real estate activities are defined as the ownership, trading and development of income-producing real estate.
- (41) The FTSE RAFI® US 100 Real Estate Index comprises of the 100 U.S. companies with the largest RAFI fundamental values selected from the constituents of the FTSE USA All Cap Index that are classified by the Industry Classification Benchmark (ICB) as Real Estate.
- (42) The FTSE EPRA/NAREIT United States Index is a free float-adjusted index, is a subset of the EPRA/NAREIT Global Index and the EPRA/NAREIT North America Index and contains publicly quoted real estate companies that meet the EPRA Ground Rules. EPRA/NAREIT Index series is seen as the representative benchmark for the real estate sector.
- (43) The Citi RAFI Sovereign Developed Markets Bond Index Series seeks to reflect exposure to the government securities of a universe of 23 developed markets. By weighting components by their fundamentals, the indices aim to represent each country's economic footprint and proxies for its ability to service debt.
- (44) The Merrill Lynch Global Government Bond Index II tracks the performance of investment grade sovereign debt publicly issued and denominated in the issuer's own domestic market and currency.
- (45) The Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Series seeks to reflect exposure to the government securities of a universe of 14 emerging markets. By weighting components by their fundamentals, the indices aim to represent each country's economic footprint and proxies for its ability to service debt.
- (46) The JPMorgan GBI-EM Diversified Index seeks exposure to the local currency sovereign debt of over 15 countries in the emerging markets.

Source: All index returns are calculated using total return data from Bloomberg and FactSet. Returns for all single country strategies and Europe regional strategies are in local currency. All other returns are in USD.

©2013 Research Affiliates, LLC. The material contained in this document is for general information purposes only. It is not intended as an offer or a solicitation for the purchase and/or sale of any security or financial instrument, nor is it advice or a recommendation to enter into any transaction. Research results relate only to a hypothetical model of past performance (i.e., a simulation) and not to an asset management product. No allowance has been made for trading costs or management fees, which would reduce investment performance. Actual results may differ. Index returns represent back-tested performance based on rules used in the creation of the index, are not a guarantee of future performance, and are not indicative of any specific investment. Indexes are not managed investment products and cannot be invested in directly. This material is based on information that is considered to be reliable, but Research Affiliates® and its related entities (collectively "RA") make this information available on an "as is" basis and make no warranties, express or implied, regarding the accuracy of the information contained herein. RA is not responsible for any errors or omissions or for results obtained from the use of this information. Nothing contained in this material is intended to constitute legal, tax, securities, financial or investment advice, nor an opinion regarding the appropriateness of any investment. The information contained in this material should not be acted upon without obtaining advice from a licensed professional. Research Affiliates, LLC, is an investment adviser registered under the Investment Advisors Act of 1940 with the U.S. Securities and Exchange Commission (SEC). Citigroup Index LLC (Citigroup), a subsidiary of Citigroup Inc., and RA have agreed to jointly create and distribute investable bond indices (the "Citi RAFI Bond Index Series") based on the RA patented Fundamental Index methodology. Neither Citigroup nor RA make any warranties regarding the accuracy or completeness of any data related to the Citi RAFI Bond Index Series. All information is provided for information purposes only. Neither Citigroup nor RA accept any liability for any errors or any loss arising from the use of any data or information set forth in this publication. CITI is a registered trademark and service mark of Citigroup Inc. or Citibank, N.A., is used under license by RA, and is used and registered throughout the world. All intellectual property contributed by RA and Citigroup shall remain solely vested with the respective contributor. The RAFI® US Equity Long/Short Index is calculated by S&P Dow Jones Indices LLC or its affiliates. S&P® is registered trademark of Standard & Poor's Financial Services LLC and Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC; the marks have been licensed for use by S&P Dow Jones Indices LLC and its affiliates. Investment products based on the RAFI® US Equity Long/Short Index are not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates and none of S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates makes any representation regarding the advisability of investing in such product(s). S&P Dow Jones Indices LLC, its affiliates, sources and distribution agents, and each of their respective officers, directors, employees, agents, representatives and licensors (collectively, the "Index Calculation Agent") shall not be liable to RA, any customer or any third party for any loss or damage, direct, indirect or consequential, arising from (i) any inaccuracy or incompleteness in, or delays, interruptions, errors or omissions in the delivery of the RAFI® US Equity Long/Short Index or any data related thereto (the "Index Data") or (ii) any decision made or action taken by RA, any customer or third party in reliance upon the Index Data. The Index Calculation Agent does not make any warranties, express or implied, to RA, any of its customers or anyone else regarding the Index Data, including, without limitation, any warranties with respect to the timeliness, sequence, accuracy, completeness, currentness, merchantability, quality or fitness for a particular purpose or any warranties as to the results to be obtained by RA, any of its customers or other person in connection with the use of the Index Data. The Index Calculation Agent shall not be liable to RA, its customers or other third parties for loss of business revenues, lost profits or any indirect, consequential, special or similar damages whatsoever, whether in contract, tort or otherwise, even if advised of the possibility of such damages. The RAFI® Bonds US Investment Grade Index and the RAFI® Bonds US High Yield Index are calculated by ALM Research Solutions, LLC, (ALM) in conjunction with RA. All rights and interests in the RAFI® Bonds US Investment Grade Index and the RAFI® Bonds US High Yield Index vest in RA. All rights in and to the RA Fundamental Index® concept used in the calculation of the RAFI® Bonds US Investment Grade Index and the RAFI® Bonds US High Yield Index vest in RA. The above RAFI® indexes are not sponsored or promoted by ALM or its respective affiliates. Neither ALM nor RA make any warranties, express or implied, to any of their customers or anyone else regarding the accuracy or completeness of any data related to the RAFI® Bonds US Investment Grade Index, or the RAFI® Bonds US High Yield Index. All information is provided for information purposes only. Neither ALM nor RA accept any liability for any errors or any loss arising from the use of information in this publication. Russell Investments is the source and owner of the Russell Index data contained or reflected in this material and copyrights related thereto. Russell Investments and RA have entered into a strategic alliance with respect to the Russell Fundamental Index Series. Subject to RA's intellectual property rights in certain content (see below), Russell Investments is the owner of all copyrights related to the Russell Fundamental Indexes. Russell Investments and RA jointly own all trademark and service mark rights in and to the Russell Fundamental Indexes. The presentation may contain confidential information and unauthorized use, disclosure, copying, dissemination, or redistribution is strictly prohibited. Russell Investments is not responsible for the formatting or configuration of this material or for any inaccuracy in the presentation. MSCI returns information provided under license through MSCI. All returns based calculations are calculated by Research Affiliates, LLC. MSCI Index returns information provided under license through MSCI. Without prior written permission of MSCI, this information and any other MSCI intellectual property may only be used for your internal use, may not be reproduced or re-disseminated in any form and may not be used to create any financial instruments or products or any indices. This information is provided on an "as is" basis, and the user of this information assumes the entire risk of any use made of this information. Neither MSCI nor any third party involved in or related to the computing or compiling of the data makes any express or implied warranties, representations or guarantees concerning the MSCI index-related data, and in no event will MSCI or any third party have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) relating to any use of this information. Investors should be aware of the risks associated with data sources and quantitative processes used in our investment management process. Errors may exist in data acquired from third party vendors, the construction of model portfolios, and in coding related to the index and portfolio construction process. While RA takes steps to identify data and process errors so as to minimize the potential impact of such errors on index and portfolio performance, we cannot guarantee that such errors will not occur. The trade names Fundamental Index® and RAFI®, the RAFI logo, and the Research Affiliates® corporate name and logo are registered trademarks and are the exclusive intellectual property of RA. Any use of these trade names and logos without the prior written permission of RA is expressly prohibited. RA reserves the right to take any and all necessary action to preserve all of its rights, title and interest in and to these marks. The Fundamental Index® method is patented and patent-pending; proprietary intellectual property of RA. (US Patent No. 7,620,577; 7,747,502; 7,792,719; 7,778,905; and 8,005,740; Patent Pending Publ. Nos. US-2007-0055598-A1, US-2008-0288416-A1, US-2010-0191628, US-2010-0262563, WO 2005/076812, WO 2007/078399 A2, WO 2008/118372, EPN 1733352, and HK1099110). The views and opinions expressed are those of the author and not necessarily those of RA. The opinions are subject to change without notice.