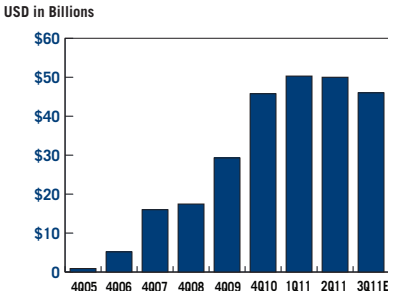
Fundamentals

Jason Hsu

RAFI® Managed Assets*



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

research® affiliates
620 newport center drive, suite 900
newport beach, ca 92660 usa
phone +1 (949) 325-8700
fax +1 (949) 554-0192
info@rallc.com
www.rallc.com

MEDIA CONTACTS
Tucker Hewes
Hewes Communications
+1 (212) 207-9451
tucker@hewescomm.com

Joel Chernoff
Research Affiliates
+1 (949) 325-8729
chernoff@rallc.com

ALTERNATIVE BETA—THE THIRD CHOICE

Before the publication of the Fundamental Index® concept in 2005, equity portfolio implementation was largely dependent on one's view of market efficiency. If markets were deemed mostly efficient, then the equity allocation would consist of index funds. If not, then active managers would fill out the equity slice.

Proponents of the Efficient Markets Hypothesis and proponents of active management disagreed vehemently; paradoxically, many organizations displayed schizophrenia in their investment philosophy by employing both a passive index team and an active management team. Passive proponents would point to performance databases that showed the failure of most active managers to produce index-beating results over the very long term. The active managers would parade examples of substantial mispricings (e.g., bubbles) in sectors, countries, and individual stocks that create opportunities for the disciplined and well-informed.

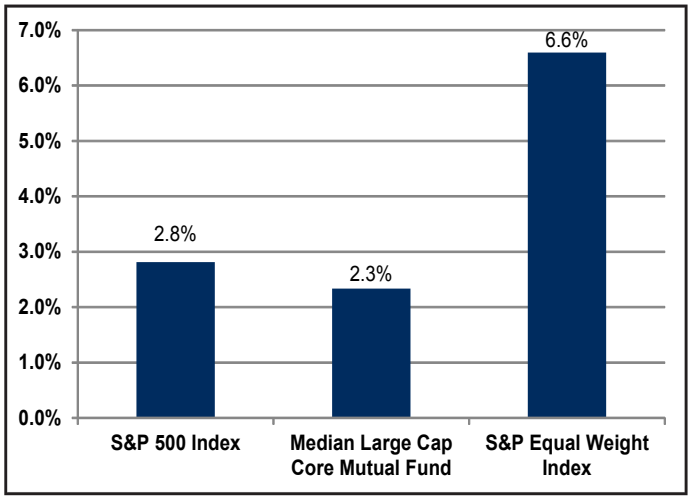
What does the past 10 years of data have to offer on this debate? As seen in **Figure 1**, the S&P 500 Index earned an annualized return of 2.8% through September 2011—not very good in absolute terms but good enough to beat 67% of large-cap core managers. The indexers have achieved better results than the large majority of their competitors with far less effort and heartache!

However, in the last decade, we have also observed some undeniable mispricings—technology stocks in early years of the decade and homebuilders and mortgage bankers in mid-2007. Arguably, financial and consumer cyclical stocks of early 2009 were significantly undervalued. The S&P 500 capitalization-weighted index, by systematically overweighting the overpriced and underweighting the underpriced stocks, trailed the S&P Equal Weight Index by 3.8% per annum. Unpleasantly for investors, both active and passive approaches have delivered poor results.

While we believe strongly in markets being inefficient, we underperform the benchmark net of costs. Additionally, we believe that cap-weighting is an inappropriate passive investment vehicle

continued on page two

Figure 1. Active and Passive Approaches Underperform Equal-Weighting
Annualized Returns, October 2001—September 2011



Source: Research Affiliates, based on data from eVestment Alliance.

where prices are inefficient as the index overallocates to expensive stocks and underallocates to cheap stocks. There is a third option for clients who wish to allocate to equities—non-price-weighted strategy indexes, which offer investors an alternative and complementary choice. Since the publication of "Fundamental Indexation" in the *Financial Analysts Journal*,[1] many asset managers and indexers have created a dizzying array of "alternative betas" or "strategy indexes" designed to offer investors passive investment vehicles that are grounded in the hypothesis of market inefficiency.

We have studied the similarities and differences among these alternative beta strategies. Our comprehensive research, which was published in the *Financial Analysts Journal*, compares the performance of several of the well-known alternative betas using a common data set and investment parameters.[2] We summarize the main findings of that research in this issue of *Fundamentals*.

The Methodologies

The non-price-weighted strategies examined can be classified into two categories: heuristic-based-weighting methodologies and optimization-based-weighting methodologies.

The heuristic-based strategies include naïve **Equal-Weighting** and its extensions that seek to eliminate the undesirable characteristics of a simple equal-weighting strategy (e.g., Equal-Weighting's sensitivity to the number of stocks in the portfolio). The strategies examined are **Diversity-Weighting**, which has limited turnover and tracking error relative to the cap-weighted benchmark as it is mathematically an interpolation of equal-weighting and cap-weighting; **Risk-Clusters Equal-Weighting**, which groups securities by country and risk factors, intuitively provides more robust diversification as it equal weights uncorrelated risk factors rather than individual securities; and the **Fundamental Index Strategy**, which completely severs the link with market prices, and instead uses variables tied to the economy to select and weight securities.

Optimization-based strategies are generally more complicated; they require complex mathematical and computational routines to arrive at a mean-variance optimal portfolio. While they are theoretically attractive, their models are difficult to apply in practice. Ad hoc assumptions for estimating the expected returns for all stocks and their covariance matrix are often required. The optimization-based strategies we look at are the **Minimum-Variance** strategy, a popular approach which assumes uniform expected returns for all stocks and targets the left end of the efficient frontier; the **Maximum Diversification Index**, which incorporates information on expected stock returns and seeks to reduce portfolio volatility; and **Risk Efficient Indexation**, which assumes risk and return are related to their downside risk and includes carefully designed portfolio constraints.

The Results

Our research involved simulations of the alternative beta strategies using a consistent database, risk factor construction, and portfolio parameters. Total returns were calculated for each strategy at a monthly frequency from 1964 through 2009 for the U.S. strategies, and from 1987 through 2009 for the global strategies. We compared these strategies to two leading cap-weighted indices—the S&P 500 for U.S. strategies and the MSCI World for global strategies. The choice of date ranges depended entirely on the breadth of historical data.

Portfolio parameters were synchronized to achieve a controlled environment for performance comparison.

As **Table 1** shows, all of the strategies produced meaningfully higher returns than their cap-weighted benchmarks over the full sample period. In general, the optimized strategies have higher tracking errors and lower volatilities, and the heuristic-weighting strategies tend to have relatively higher volatilities and lower tracking errors. As expected, the minimum-variance portfolios show the lowest volatilities of the strategies considered.

Is There Skill in Eliminating Negative Alpha?

All of the alternative betas surveyed produced excess returns. Indeed, there is no such thing as a bad backtest! But we attempted to dive a bit deeper and, odd as it sounds, assess the "manager skill" in each of the strategies. We used a four-factor analysis for the various strategies.[3] As **Table 2** shows, all of the strategies display positive and significant exposure to the size and value factors, resulting in their outperformance. Additionally, optimized strategies generally have a lower exposure to the market portfolio. We conclude that none of these strategies are different from naïve equal-weighting in their investment insights.

Despite the lack of statistically significant alpha based on the four factors, we conclude that these alternative betas are valuable to investors because they provide access to the size and value premia. Traditional value and small-cap indices exhibit negative Fama–French alphas, suggesting that they may not be the best ways to access value and small-cap tilts.[4] Furthermore, Fama–French factor portfolios are impractical for the vast majority of investors—big and small alike—because they require shorting, experience high turnover at monthly rebalancing, and contain many illiquid stocks. Thus, any portfolio that can capture the vast majority of these premia in a more reliable and cost-effective manner deserves careful consideration.

Table 1. Return Characteristics of Annually Rebalanced Strategies: 1,000 Stocks

Strategy	Total Return	Volatility	Sharpe Ratio	Information Ratio	Tracking Error
Panel A. Global (1987–2009)					
MSCI World Index[a]	7.58%	15.65%	0.22	—	—
Equal-Weighting	8.64%	15.94%	0.28	0.35	3.02%
Diversity-Weighting	7.75%	15.80%	0.22	0.10	1.60%
Fundamentals-Weighting	11.13%	15.30%	0.45	0.74	4.77%
Maximum Diversification	7.77%	13.16%	0.27	0.02	7.41%
Minimum-Variance	8.59%	11.19%	0.39	0.12	8.66%
Risk-Clusters EW	10.78%	16.57%	0.40	0.52	6.18%
Risk Efficient	8.94%	14.90%	0.32	0.38	3.58%
Panel B. United States (1964–2009)					
S&P 500 Index[b]	9.46%	15.13%	0.26	—	—
Equal-Weighting	11.78%	17.47%	0.36	0.36	6.37%
Diversity-Weighting	10.27%	15.77%	0.30	0.31	2.63%
Fundamentals-Weighting	11.60%	15.38%	0.39	0.47	4.50%
Maximum Diversification	11.99%	14.11%	0.45	0.36	7.06%
Minimum-Variance	11.40%	11.87%	0.49	0.24	8.08%
Risk-Clusters EW	10.91%	14.84%	0.36	0.29	4.98%
Risk Efficient	12.46%	16.54%	0.42	0.48	6.29%

[a]For the MSCI Global Developed Index, they report turnover of a simulated global developed cap-weighted index of the top 1,000 stocks rebalanced annually on December 31.
[b]For the S&P 500 Index, they report turnover of a simulated U.S. cap-weighted index of the top 500 stocks rebalanced annually on December 31.

Note: For details of the portfolio weighting methodologies, see Tzee-man Chow, Jason Hsu, Vitali Kalesnik, and Bryce Little. (2011).
Source: Research Affiliates.

Table 2. Four-Factor Model Risk Decomposition

Strategy	Annual Alpha	Market (Mkt-Rf)	Size (SMB)	Value (HML)	Momentum (MOM)	R^2
Panel A. Global (1987–2009)						
MSCI World Index[a]	0.00%	1.000	0.000	0.000	0.000	1.00
Equal-Weighting	0.77%	1.015†	0.259†	0.025*	-0.008	0.98
Diversity-Weighting	0.38%	1.001†	0.087†	-0.058†	0.011*	0.99
Fundamentals-Weighting	2.18%†	0.970†	0.040*	0.332†	-0.090†	0.97
Maximum Diversification	0.49%	0.760†	0.097*	0.004	0.029	0.78
Minimum-Variance	1.25%	0.628†	0.001	0.138†	-0.013	0.73
Risk-Clusters EW	0.68%	1.071†	0.338†	0.232†	0.045†	0.90
Risk Efficient	0.97%	0.947†	0.176*	0.056†	-0.003	0.96
Panel B. United States (1964–2009)						
S&P 500 Index[b]	0.00%	1.000	0.000	0.000	0.000	1.00
Equal-Weighting	0.15%	1.043†	0.482†	0.144†	-0.012	0.96
Diversity-Weighting	0.07%	1.012†	0.173†	0.029†	0.002	0.99
Fundamentals-Weighting	0.50%	1.010†	0.128†	0.338†	-0.076†	0.97
Maximum Diversification	-0.02%	0.844†	0.342†	0.264†	0.061†	0.87
Minimum-Variance	0.30%	0.708†	0.198†	0.344†	0.011	0.81
Risk-Clusters EW	-0.13%	0.954†	0.116†	0.185†	0.040†	0.91
Risk Efficient	0.19%	1.002†	0.465†	0.250†	0.004	0.95

[a]The MSCI World Index was used in the market factor; the HML and SMB factors were simulated following the methodology outlined on Ken French's website.
[b]The S&P 500 Index was used in the market factor; SMB, HML, and MOM factor portfolios were downloaded from Ken French's website.

† Significant at 0.01 level
* Significant at 0.10 level

Source: Research Affiliates.

The Devil's in the Details

Thus far, we have only discussed "paper portfolios." If indeed alternative beta's main attraction is to provide efficient exposure to value and size effects, then we must turn our attention to implementation costs. We find, not surprisingly, that the trading cost estimates are economically higher for the alternative beta strategies than for the cap-weighted indices (see **Figure 2**). Of the alternatives, Diversity-Weighting and the Fundamental Index strategies generally have lower annual turnover and trading costs. These strategies, with their greater average market-capitalization and lower turnover, also are likely to have higher investment capacities. The Fundamental Index and Diversity-Weighting strategies also generally have lower bid–ask spreads and higher average daily trade volumes. The implication is clear—investors in alternative betas need to carefully weigh the ease and efficiency of implementation before making a determination on what strategy over another. Indeed, we may go so far as to say that it should be the primary driver of the decision-making process.

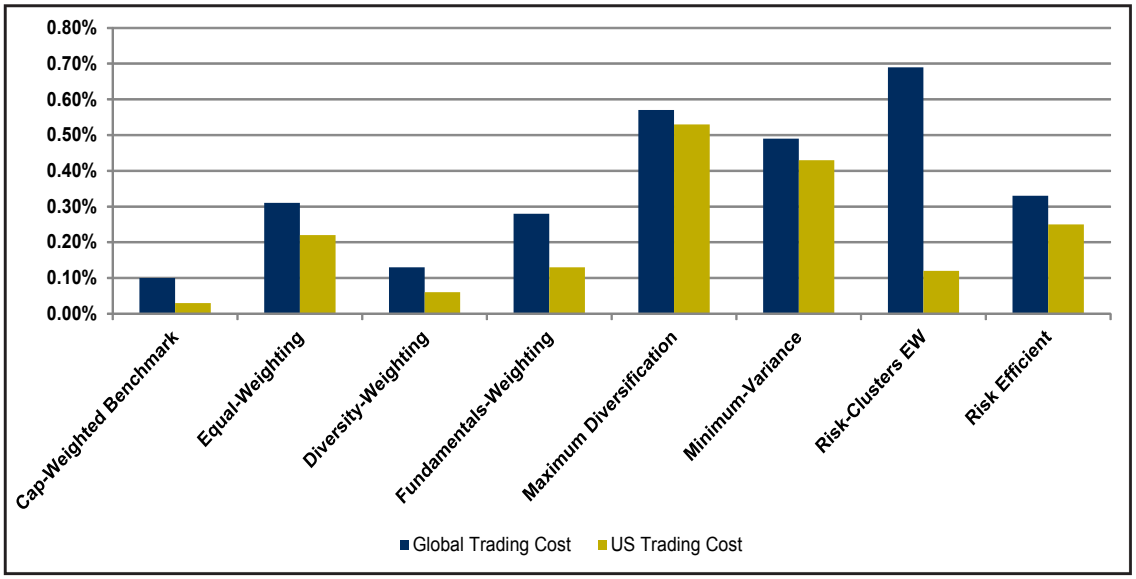
Conclusion

While the Fundamental Index strategy remains very close to our heart, we are very encouraged by the increasing innovation in the field of alternative betas. Despite often very different approaches, their respective results validate the entire idea of deviating from the binary active–passive world of the past. Some of the most compelling attributes of both are embedded in alternative betas. Like active managers, these methods can produce excess returns and produce different market exposures than mainstream indices, resulting in lower volatility and increased Sharpe ratios. Like traditional indices, most will have lower management costs, many will have similarly skinny implementation costs, and all will have lower governance/monitoring costs than active strategies. Furthermore, some of the most scalable

approaches efficiently capture the value and small-cap effects without the long/short requirement, monthly maintenance, and illiquidity of a true Fama–French implementation.

Most investors make their biggest bets on equities, comprising more than 50% of their asset allocation. Accordingly, they have sought to diversify risk within equities by style, size, and geography. We assert that investors should go to greater lengths to diversify their equity portfolio. The past 10 years have brought considerable pain to both sides of the equity active–passive aisle. The third choice of alternative betas—even the simplest such as Equal-Weighting—would have resulted in a far better outcome. Will history repeat? Nobody knows. However, we think the evidence is far too compelling to ignore. We suggest moving alternative betas up your to-do list.

Figure 2. Annual Estimated Trading Costs



Source: Research Affiliates.

Endnotes

1. See Robert D. Arnott, Jason C. Hsu, and Philip Moore, 2005, "Fundamental Indexation," *Financial Analysts Journal*, vol. 61, no. 2 (March/April):83–99.
2. For detailed descriptions of the strategies and research tests, see Tzee-man Chow, Jason Hsu, Vitali Kalesnik, and Bryce Little, 2011, "A Survey of Alternative Equity Index Strategies," *Financial Analysts Journal*, vol. 67, no. 5 (September/October):37–57.
3. Investors traditionally use a three-factor model based on the Fama–French size and value factors, plus a market factor. We added momentum factors based on the methodology described by Mark Carhart in "On Persistence in Mutual Fund Performance," *Journal of Finance*, vol. 52, no. 1 (March 1997):57–82.
4. Jason Hsu, Vitali Kalesnik, and Himanshu Surti (2010) attribute the negative Fama–French alpha for traditional style indices to the cap-weighting construction, where the more expensive value stocks and small stocks take up larger weights than the cheaper value and small stocks ("An Examination of Traditional Style Indices," *Journal of Index Investing*, vol. 2, no. 2 [Fall]:14–23).

Performance Update

FTSE RAFI® Equity Index Series*

TOTAL RETURN AS OF 10/31/11	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
FTSE RAFI® All World 3000[1]	TFRAW3	-5.79%	-1.23%	14.96%	2.04%	9.79%	19.16%
MSCI All Country World[2]	GDUEACWF	-3.88%	0.94%	12.62%	0.23%	5.82%	17.52%
FTSE RAFI® Developed ex US 1000[3]	FRX1XTR	-8.13%	-5.98%	12.32%	-0.53%	8.32%	20.42%
MSCI World ex US Large Cap[4]	MLCUWXUG	-6.32%	-3.41%	10.19%	-1.47%	6.04%	18.61%
FTSE RAFI® Developed ex US Mid Small[5]	TFRDXUSU	-6.33%	0.41%	22.59%	3.47%	14.09%	18.86%
MSCI World ex US Small Cap[6]	GCUDWXUS	-9.31%	-1.67%	20.32%	-0.06%	10.83%	20.42%
FTSE RAFI® Emerging Markets[7]	TFREMU	-12.11%	-8.51%	23.86%	9.93%	23.77%	24.85%
MSCI Emerging Markets[8]	GDUEEGF	-11.27%	-7.44%	23.59%	6.83%	17.16%	24.38%
FTSE RAFI® 1000[9]	FR10XTR	-1.13%	6.96%	16.15%	1.55%	6.28%	18.42%
Russell 1000[10]	RU10INTR	0.92%	8.01%	12.22%	0.54%	4.17%	16.31%
S&P 500[11]	SPTR	1.30%	8.09%	11.41%	0.25%	3.69%	16.09%
FTSE RAFI® US 1500[12]	FR15USTR	-5.64%	6.21%	20.43%	3.89%	11.18%	22.96%
Russell 2000[13]	RU20INTR	-4.46%	6.71%	12.87%	0.68%	7.02%	21.27%
FTSE RAFI® Europe[14]	TFREUE	-11.70%	-9.33%	7.14%	-3.84%	3.50%	19.26%
MSCI Europe[15]	GDDLE15	-8.57%	-6.77%	6.66%	-2.99%	2.52%	16.97%
FTSE RAFI® Australia[16]	FRAUSTR	-4.52%	-2.77%	6.71%	0.96%	8.06%	13.16%
S&P/ASX 200[17]	ASA51	-6.05%	-3.65%	6.94%	-0.18%	7.29%	13.33%
FTSE RAFI® Canada[18]	FRCANTR	-6.55%	-1.63%	11.97%	4.14%	9.42%	14.38%
S&P/TSX 60[19]	TX60AR	-7.28%	-1.65%	8.70%	2.47%	8.21%	14.72%
FTSE RAFI® Japan[20]	FRJPNTR	-15.28%	-6.00%	-1.26%	-10.88%	0.44%	18.44%
MSCI Japan[21]	GDDLJN	-14.41%	-5.30%	-2.50%	-12.56%	-1.65%	18.08%
FTSE RAFI® UK[22]	FRGBRTR	-3.73%	0.36%	12.77%	0.82%	5.25%	17.14%
MSCI UK[23]	GDDLUK	-2.89%	1.18%	12.42%	1.66%	4.47%	15.18%

*To see the complete series, please go to: http://www.ftse.com/Indices/FTSE_RAFI_Index_Series/index.jsp.

Russell Fundamental Index® Series*

TOTAL RETURN AS OF 10/31/11	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
Russell Fundamental Global Index Large Company[24]	RUFGLTU	-3.34%	1.79%	14.47%	2.54%	9.94%	17.87%
MSCI All Country World Large Cap[25]	MLCUAWOG	-3.62%	0.92%	11.65%	0.08%	5.17%	17.20%
Russell Fundamental Developed ex US Index Large Company[26]	RUFDXLTU	-6.80%	-4.39%	-1.49%	-0.89%	10.02%	18.83%
MSCI World ex US Large Cap[27]	MLCUWXUG	-6.32%	-3.41%	10.19%	-1.47%	6.04%	18.61%
Russell Fundamental Developed ex US Index Small Company[28]	RUFDXSTU	-6.32%	0.72%	20.02%	2.36%	12.97%	18.48%
MSCI World ex US Small Cap[6]	GCUDWXUS	-9.31%	-1.67%	20.32%	-0.06%	10.83%	20.42%
Russell Fundamental Emerging Markets[29]	RUFGETRU	-10.40%	-4.29%	26.35%	11.01%	23.57%	24.71%
MSCI Emerging Markets[8]	GDUEEGF	-11.27%	-7.44%	23.59%	6.83%	17.16%	24.38%
Russell Fundamental US Index Large Company[30]	RUFUSLTU	1.26%	9.05%	14.53%	2.15%	7.02%	16.90%
Russell 1000[10]	RU10INTR	0.92%	8.01%	12.22%	0.54%	4.17%	16.31%
S&P 500[11]	SPTR	1.30%	8.09%	11.41%	0.25%	3.69%	16.09%
Russell Fundamental US Index Small Company[31]	RUFUSSTU	-3.22%	8.12%	21.17%	5.30%	12.08%	21.65%
Russell 2000[13]	RU20INTR	-4.46%	6.71%	12.87%	0.68%	7.02%	21.27%
Russell Fundamental Europe[32]	RUFEUTE	-9.97%	-6.47%	8.79%	-1.56%	6.43%	18.16%
MSCI Europe[15]	GDDLE15	-8.57%	-6.77%	6.66%	-2.99%	2.52%	16.97%

*To see the complete series, please go to: http://www.russell.com/indexes/data/Fundamental/About_Russell_Fundamental_indexes.asp.

Fixed Income/Alternatives

TOTAL RETURN AS OF 10/31/11	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
RAFI® Bonds Investment Grade Master[33]		8.52%	6.69%	15.67%	7.70%	6.45%	6.04%
ML Corporate Master[34]	C0A0	7.48%	5.55%	15.62%	6.68%	6.14%	6.20%
RAFI® Bonds High Yield Master[35]		6.97%	6.52%	24.07%	10.07%	9.58%	10.99%
ML Corporate Master II High Yield BB-B[36]	H0A4	4.88%	5.08%	20.22%	7.10%	7.94%	9.85%
RAFI® US Equity Long/Short[37]		-6.02%	-2.61%	11.67%	1.85%	4.99%	11.73%
1-Month T-Bill[38]	GB1M	0.05%	0.07%	0.09%	1.39%	1.80%	0.48%
FTSE RAFI® Global ex US Real Estate[39]	FRXR	-14.46%	-13.46%	13.49%	-6.32%	8.91%	23.08%
FTSE EPRA/NAREIT Global ex US[40]	EGXU	-10.00%	-9.32%	10.12%	-7.40%	7.01%	20.70%
FTSE RAFI® US 100 Real Estate[41]	FRUR	-0.82%	3.38%	17.60%	-6.85%	5.27%	27.71%
FTSE EPRA/NAREIT United States[42]	UNUS	4.21%	6.23%	11.18%	-5.91%	5.68%	26.06%

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 1000 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 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 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 State. 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/NARIET Global Index and the EPRA/NAREIT North America Index and contains publicly quoted real estate companies that meet the EPRA Ground Rules. EPRA/NARIET Index series is seen as the representative benchmark for the real estate sector.

Source: All index returns are calculated using total return data from Bloomberg, except for the real estate indices and benchmarks, which use price return data. Returns for all single country strategies and Europe regional strategies are in local currency. All other returns are in USD.