FUNDAMENTALS

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John West, CFA

"Virtually all balanced portfolios are between a rock and a hard place. Accept lower prospective returns or go for broke in a quixotic quest to make 8%."

The Lure of Hedge Funds

I love meeting with clients. Sharing insights and engaging in lively dialogue about their fears, concerns, wants and needs, our ideas and strategies, and the ever-evolving capital markets… what's not to love? Well, maybe one thing. Downtime in reception areas, which inevitably leads to perusing the client's selection of industry publications and coffee table books. Over the years and lobbies, I have only found one truly worthwhile lobby book: *Poor Charlie's Almanack: The Wit and Wisdom of Charles T. Munger*. Charlie, of course, is Warren Buffet's longtime right-hand man, business partner, and friend since 1959, and the book offers worldly insights on Charlie's thoughts about decision-making, investing, and life.

When describing some of the "idiocy of investment management," Charlie tells a story of an encounter with a fishing tackle salesman who was selling lures that bore little resemblance to fish. "I asked him, 'My God, they're purple and green. Do fish really take these lures?' And he said, 'Mister, I don't sell to fish.'" (Munger, 2008). The analogy is a good one. Investors often buy what they think is exciting, sophisticated, and complex with the embedded assumption that all of these attributes will lead to greater returns. We see this today where we witness the continued explosive growth of hedge funds. But, a careful examination of the data reveals that these fancy lures fail to hook as much in excess, after-fee returns as more time tested strategies.

The Expectations Gap

Research Affiliates is on record stating that future capital market returns will be lower, indeed much lower, than the experience of past decades. Lower yields essentially assure this outcome (even as falling yields create outsized gains, raising client expectations!).

In mainstream stocks and bonds, we witness paltry yields and still high valuations by historical standards—hardly the sorts of levels indicative of a new secular bull. As of the end of March 2013, the price/earnings ratio (as measured by trailing 10-year earnings) is 23 for the S&P 500 Index, approximately 37% above the long-term average.[1] The yield on core bonds, as measured by the BarCap Aggregate Index, stands at 1.86% as of March 31, 2013.

By combining stock and bond return estimates in a typical balanced construct of 60% stocks and 40% bonds, we arrive at a sobering long-term return estimate of approximately 4%. A 4% return isn't terrible, especially when banks pay us about zero. It only seems dreadful when we are planning, based upon an historical accident of outsized returns experienced in our lifetime, for much more.

This leaves virtually all balanced portfolios between a rock and a hard place. Accept

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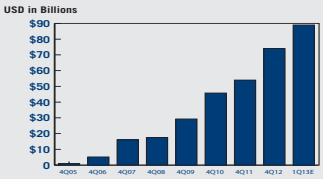
RAFI® Managed Assets*



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

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lower prospective returns or go for broke in a quixotic quest to make 8%. Today, we see too many investors trying to go for the latter. But, singed by two nasty bear markets in a decade and rolling bursts of volatility, they are leery of risk, which makes them prey to anyone willing to tell them what they want to hear. Who among us doesn't want less risk and more reward?

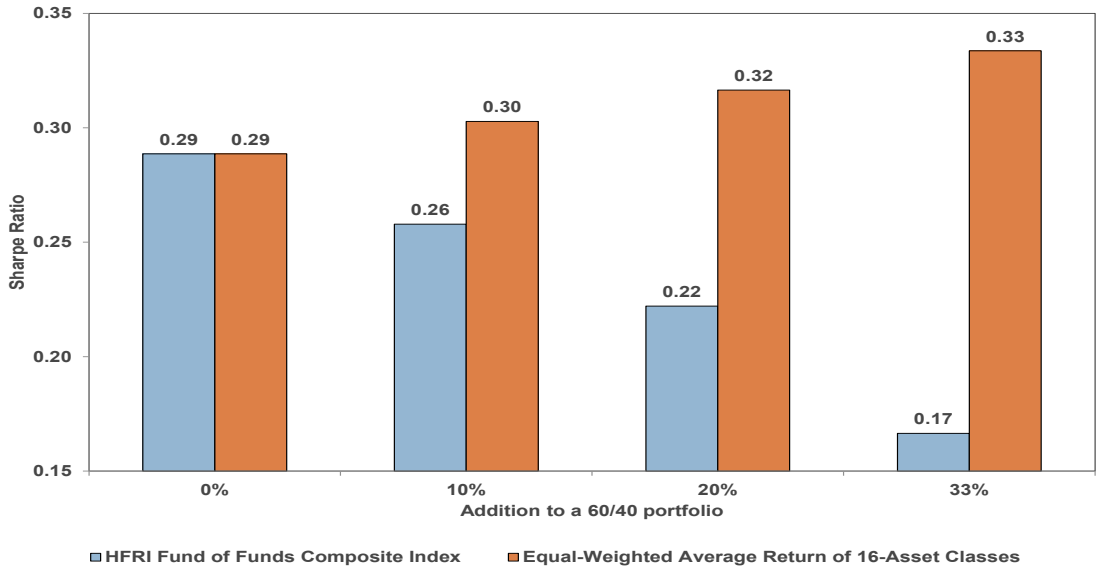
Enter the hedge fund and its implicit promise of absolute returns, largely independent of market direction. Some investors, notably mega endowments, have reaped both outsized returns and substantial diversification from these investments. Alas, while there are terrific hedge funds out there, most observers would agree that not everyone can hire them. As our own Chris Brightman (formerly of the endowment world) likes to say, "The hedge funds that produce these kinds of results will never manage *your* money."

Nevertheless, hedge funds' popularity and increasing adoption can't be disputed. But on average, do they *hedge* (reduce risk) and do they *fund* (i.e., deliver returns to serve our retirements and other liabilities)? To test this notion, we add various levels of the HFRI Hedge Fund of Funds Composite to a simple 60/40 blend of the S&P 500 and BarCap Aggregate Bond Index over the past five years as seen in **Figure 1**. Why the last five years? Because it represents what many newer investors, those rushing to follow the endowment model in the middle part of the last decade, have actually achieved. Between 2002 and mid-2007, total hedge fund assets went from $626 billion to $1.7 trillion, a nearly three-fold increase. Today the hedge fund industry manages $2.25 trillion of capital according to HFRI.[2] Plus, the last five years have seen a variety of environments to qualify as a market cycle.[3]

As shown in Figure 1, a pure 60/40 portfolio exhibited a Sharpe ratio of 0.29 over the five years ended December 31, 2012. Adding hedge fund of funds to a 60/40 portfolio reduces the overall return, resulting in a lower Sharpe ratio—a measure of portfolio efficiency.[4] Upon adding a 33% exposure of hedge funds to this portfolio, the return falls from 3.8% annualized with plain 60/40 to 2.0%. This substantial decline more than offsets the favorable risk impact (standard deviation falls from 11.7% to 9.4%, a 19% decline) and the resultant Sharpe ratio falls to 0.17. Over the past five years, this category of investments, on average, has resulted in substantially lower portfolio efficiency![5]

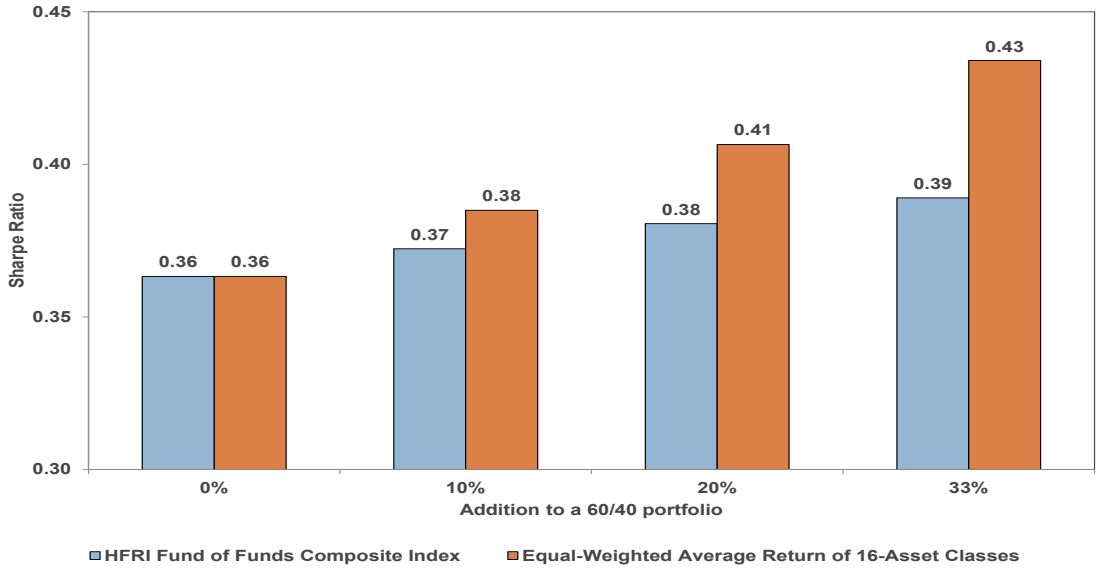
To ascertain whether this result is a fluke, we can dig a little deeper, extending the analysis back to March of 1997.[6] The results in **Figure 2** show a marginal positive impact on Sharpe ratios by adding hedge fund returns to the 60/40 portfolio. The improvement comes from risk reduc-

Figure 1. Efficiency Impact of Hedge Funds
January 1, 2008-December 31, 2012



Source: Research Affiliates based on data from Bloomberg and Morningstar Encorr.

Figure 2. Efficiency Impact of Hedge Funds
March 1, 1997-December 31, 2012



Source: Research Affiliates based on data from Bloomberg and Morningstar Encorr.

tion, as returns are still lower. Over the longer time period, adding a 33% allocation to alternative strategies would result in the same 19% reduction in risk that we found in the five-year period. We also found a similar, but smaller degradation in returns, from 6.3% to 5.8%. Because the return slippage is smaller while the risk reduction is comparable, portfolio efficiency (as measured by Sharpe ratio) improves modestly from 0.36 to 0.39. This hardly seems to measure up to the implied promise. They hedge but they fail to fund!

Sadly, most diversified portfolios of hedge funds have largely failed to live up to their promises, delivering less diversification than investors were encouraged to expect, paired with inadequate returns, especially with their current swollen asset base. Yet they are garnering substantial assets! Investors are so reluctant to confront the "expectations gap" that they will throw money at a proven return reducer, in order to maintain the façade that 8% is achievable if we just get some alpha, despite a historical track record amply proving otherwise.

A Simpler Path to Improved Returns?

Winston Churchill once declared, "Out of intense complexities intense simplicities emerge."[7] Since our founding in 2002, when we observed (to much consternation and opposition, even derision) that low yields will mean lower returns, we have advised investors to diversify more broadly into markets outside mainstream stocks and bonds. We've since termed this a "third pillar" approach, complementing the mainstream stocks and bonds, the two pillars that dominate most investors' portfolios. Why should the equity risk premium be the only dominant driver of our long-term success or lack thereof? Commodity futures, emerging market local currency bonds, bank loans, TIPS, high yield bonds, and REITs all have unique return drivers and will respond differently to various market environments. Shouldn't we employ these in our asset allocation *on a scale large enough to matter?*

Our oft-cited 16-asset class portfolio, equally weighted, is a good example of this. It has many of the same betas embedded in hedging strategies—credit, commodity, and currencies (through non-U.S. and emerging markets).[8] But when we return to Figures 1 and 2, we see such a simple expanded toolkit offers better risk-adjusted results than hedge funds.[9] With each shift from 60/40 to this diversified roster, the Sharpe ratios steadily improve with larger allocations rather than decline! The takeaway is clear—most investors should, following Churchill's advice, get simple in their diversification efforts before they get complex.

Take a look at our opportunity set. It includes commodities, high yield, local

currency emerging market debt, bank loans, TIPS, and REITs. Are we using the full toolkit? History shows such a diversified roster, annually rebalanced—or better yet tactically managed in a contrarian value-oriented process—as a far better way to improve portfolio efficiency than most of the hedge funds.

Does this mean that we should abandon the notion of alternative strategies that are more reliant on alpha than beta for returns? Absolutely not! They can be an excellent tactical tool when returns from beta are skinny (as they increasingly are today). Of course, we need to be confident that they are the result of skill and are reasonably priced so that the bulk of the return from skill benefits the investor and not the manager. Assuming these are in place, we view lower risk alternative strategies as an excellent mechanism to de-risk a portfolio without the requisite exposure to duration in traditional countercyclical exposures like government bonds.

> *"Why should the equity risk premium be the only dominant driver of long-term success?"*

Conclusion

As a fishing enthusiast growing up in San Diego, I can tell you I caught more tuna on as plain a lure as you will ever find—the cedar plug. Vaguely resembling an oblong torpedo with a single hook, the cedar plug has a lead head and a tail of unpainted cedar wood. There's no fisheye, no silver and blue (let alone purple and green!), and no paint anywhere. Just dull lead and the rusty hew of cedar wood. If there was ever a lure that wouldn't sell in the tackle store, this is it. And yet it produces. To be sure, there are some days when the fancy lures with psychedelic colors will catch a few more fish and fishermen would be well advised to carry a little bit of everything in the tackle box. But, the first jig in the water oftentimes should be the simplest.

Like the tuna of San Diego, meaningful real rates of return are far less plentiful than they were in the past. Investors would be well advised to address this scarcity by practicing time tested methods for improving returns. We're confident that a more diversified roster of liquid asset classes carefully selected and, ideally, tactically managed will move investors towards materially better returns than hoped for hedge fund alpha.

Endnotes

1. See Robert Shiller, www.econ.yale.edu/~shiller/data/ie_data.xls.
2. See HFRI release "Relative Value Arbitrage Leads Hedge Fund Capital to New Record," https://www.hedgefundresearch.com/pdf/pr_20130118.pdf
3. Perhaps, the only exception would be the lack of a sustained run of value equity outperformance.
4. Richard Ennis and Michael Sebastian (2003) showed that much of the benefits attributed to hedge funds are traceable to commercial databases that display "after the fact" returns, which have several biases that artificially inflate returns (survivorship, selection, backfilling biases and other issues). They focused their analysis on fund of funds (FOF) returns (following Fung and Hsieh 2002) and found little in the way of excess returns versus U.S. stocks and bonds. Comparing Sharpe ratios at different levels of hedge fund of funds exposure, as we have done, is an extension of their analysis.
5. We have witnessed over the past few years explosive growth in mutual funds employing hedge fund strategies in what Morningstar groups as its "Multialternative" category. A similar Sharpe ratio analysis shows these have also failed to deliver improved portfolio efficiency.
6. This period is selected to coincide with the launch of TIPS for the forthcoming comparison to an equally weighted 16-asset class portfolio.
7. This might be considered an offshoot of "Ockham's Razor." In the 14th century, William of Ockham wrote that "plurality must never be posited without necessity." While his own confusing wording might even seem to flunk his own dictum, Albert Einstein was kind enough to clarify matters: "Make everything as simple as possible, but not simpler."
8. Short-term bonds (Merrill Lynch US Corporate & Government 1-3 Year); core bonds (Lehman Brothers US Aggregate Bond); long-term U.S. Treasury bonds (LB US Treasury Long); long-term corporate credit (LB US Long Credit); high-yield corporate bonds (LB US Corporate High Yield); floating-rate notes (Credit Suisse Leveraged Loan); emerging market bonds (JPM EMBI + Composite); emerging market local currency (JPM ELMI + Composite; convertible bonds (ML Convertible Bonds All Qualities); Treasury Inflation Protected Securities (LB Global Inflation Linked US TIPS); REITs (FTSE NAREIT All REITs); commodities (DJ AIG Commodity TR); U.S. large-capitalization equity (S&P 500); U.S. small-cap equity (Russell 2000); developed ex-U.S. country equity (MSCI EAFE TR); and emerging market equity (MSCI Emerging Markets).
9. The 16-asset class portfolio is limited in its history due to the inception of TIPS in 1997. Hence the reason why Figure 2 only extends back to 1997 rather than to the inception of hedge fund data in 1990.

References

Ennis, Richard M., and Michael D. Sebastian. 2003. "A Critical Look at the Case for Hedge Funds." *Journal of Portfolio Management*, vol. 29, no. 4 (Summer):103–112.

Fung, William, and David Hseih. 2002. "Benchmarks of Hedge Fund Performance: Information Content and Measurement Biases." *Financial Analysts Journal*, vol. 58, no. 1 (January/February):22–34.

Munger, Charles T. 2008. "Talk Two: A Lesson on Elementary, Worldly Wisdom as It Relates to Investment Management and Business." *Poor Charlie's Almanack: The Wit and Wisdom of Charles T. Munger*, Peter D. Kaufman, ed., expanded third edition, PCA Publications.

Performance Update

FTSE RAFI® Equity Index Series*

TOTAL RETURN AS OF 3/31/13	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	10 YEAR VOLATILITY
FTSE RAFI® All World 3000[1]	TFRAW3	6.43%	11.37%	7.09%	3.51%	12.96%	18.86%
MSCI All Country World[2]	GDUEACWF	6.63%	11.19%	8.35%	2.63%	9.92%	16.77%
FTSE RAFI® Developed ex US 1000[3]	FRX1XTR	2.85%	7.80%	2.87%	-0.53%	11.25%	20.41%
MSCI World ex US Large Cap[4]	MLCUWXUG	4.81%	10.99%	5.29%	-0.24%	10.46%	18.38%
FTSE RAFI® Developed ex US Mid Small[5]	TFRDXUSU	6.39%	9.87%	7.41%	5.06%	15.05%	19.09%
MSCI World ex US Small Cap[6]	GCUDWXUS	7.32%	11.29%	8.19%	2.43%	13.56%	20.52%
FTSE RAFI® Emerging Markets[7]	TFREMU	-3.35%	-2.24%	1.81%	2.23%	22.11%	24.79%
MSCI Emerging Markets[8]	GDUEEGF	-1.57%	2.31%	3.59%	1.39%	17.41%	24.08%
FTSE RAFI® 1000[9]	FR10XTR	12.81%	18.74%	13.38%	8.45%	11.17%	17.43%
Russell 1000[10]	RU10INTR	10.96%	14.43%	12.93%	6.15%	8.97%	15.12%
S&P 500[11]	SPTR	10.61%	13.96%	12.67%	5.81%	8.53%	14.82%
FTSE RAFI® US 1500[12]	FR15USTR	12.06%	16.69%	13.38%	11.22%	14.91%	22.15%
Russell 2000[13]	RU20INTR	12.39%	16.30%	13.45%	8.24%	11.52%	20.13%
FTSE RAFI® Europe[14**]	TFREUE	2.86%	10.82%	3.18%	1.25%	9.14%	17.87%
MSCI Europe[15**]	GDDLE15	5.58%	15.42%	7.33%	2.80%	8.55%	14.81%
FTSE RAFI® Australia[16**]	FRAUSTR	10.89%	26.93%	7.19%	5.40%	11.04%	13.40%
S&P/ASX 200[17**]	ASA51	8.15%	19.98%	5.25%	3.09%	10.29%	13.42%
FTSE RAFI® Canada[18**]	FRCANTR	5.14%	8.91%	5.13%	5.39%	11.38%	13.55%
S&P/TSX 60[19**]	TX60AR	3.26%	6.73%	4.04%	1.48%	9.92%	13.96%
FTSE RAFI® Japan[20**]	FRJPNTR	21.14%	20.89%	2.54%	-0.83%	5.73%	19.59%
MSCI Japan[21**]	GDDLJN	21.46%	24.20%	3.73%	-1.50%	4.64%	18.95%
FTSE RAFI® UK[22**]	FRGBRTR	9.71%	17.27%	8.04%	6.14%	10.57%	15.78%
MSCI UK[23**]	GDDLUK	9.72%	15.52%	7.99%	6.32%	9.77%	13.63%

*To see the complete series, please go to: 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 3/31/13	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	10 YEAR VOLATILITY
Russell Fundamental Global Index Large Company[24]	RUFGLTU	6.73%	11.61%	8.81%	4.66%	13.24%	17.35%
MSCI All Country World Large Cap[25]	MLCUAWOG	6.35%	10.95%	8.05%	2.40%	9.31%	16.43%
Russell Fundamental Developed ex US Index Large Company[26]	RUFDXLTU	2.89%	7.50%	3.77%	0.43%	12.51%	18.86%
MSCI World ex US Large Cap[27]	MLCUWXUG	4.67%	11.08%	4.99%	-0.39%	9.94%	18.24%
Russell Fundamental Developed ex US Index Small Company[28]	RUFDXSTU	7.98%	12.29%	8.55%	5.01%	15.31%	18.56%
MSCI World ex US Small Cap[6]	GCUDWXUS	7.32%	11.29%	8.19%	2.43%	13.56%	20.52%
Russell Fundamental Emerging Markets[29]	RUFGETRU	-2.42%	0.92%	5.15%	4.50%	22.30%	24.45%
MSCI Emerging Markets[8]	GDUEEGF	-1.57%	2.31%	3.59%	1.39%	17.41%	24.08%
Russell Fundamental US Index Large Company[30]	RUFUSLTU	12.92%	18.23%	14.16%	8.69%	11.67%	15.82%
Russell 1000[10]	RU10INTR	10.96%	14.43%	12.93%	6.15%	8.97%	15.12%
S&P 500[11]	SPTR	10.61%	13.96%	12.67%	5.81%	8.53%	14.82%
Russell Fundamental US Index Small Company[31]	RUFUSSTU	12.71%	17.63%	14.68%	12.42%	15.39%	21.04%
Russell 2000[13]	RU20INTR	12.39%	16.30%	13.45%	8.24%	11.52%	20.13%
Russell Fundamental Europe[32**]	RUFEUTE	2.86%	10.80%	5.41%	3.43%	11.81%	16.65%
MSCI Europe[15**]	GDDLE15	5.58%	15.42%	7.33%	2.80%	8.55%	14.81%

*To see the complete series, please go to: 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 3/31/13	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	10 YEAR VOLATILITY
RAFI® Bonds US Investment Grade Master[33]	—	-0.03%	6.89%	8.12%	8.15%	6.26%	5.97%
ML Corporate Master[34]	C0A0	0.05%	7.79%	8.16%	7.75%	6.05%	6.12%
RAFI® Bonds US High Yield Master[35]	—	1.93%	11.79%	11.30%	12.28%	10.83%	9.76%
ML Corporate Master II High Yield BB-B[36]	H0A4	2.40%	12.48%	10.76%	10.10%	9.03%	9.21%
RAFI® US Equity Long/Short[37]	—	5.33%	10.82%	2.18%	6.61%	6.64%	11.43%
1-Month T-Bill[38]	GB1M	0.01%	0.06%	0.08%	0.23%	1.57%	0.51%
FTSE RAFI® Global ex US Real Estate[39]	FRXR	3.22%	26.86%	10.16%	2.94%	—	—
FTSE EPRA/NAREIT Global ex US[40]	EGXU	4.49%	25.69%	11.44%	1.59%	—	—
FTSE RAFI® US 100 Real Estate[41]	FRUR	12.75%	22.56%	18.18%	10.30%	—	—
FTSE EPRA/NAREIT United States[42]	UNUS	7.92%	14.84%	16.99%	6.15%	—	—
Citi RAFI Sovereign Developed Markets Bond Index Master[43]	CRFDMU	-1.82%	2.75%	5.15%	3.48%	6.54%	7.72%
Merrill Lynch Global Governments Bond Index II[44]	W0G1	-2.78%	-0.45%	4.11%	2.96%	5.46%	7.05%
Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Master[45]	CRFELMU	1.09%	10.07%	—	—	—	—
JPMorgan GBI-EM Global Diversified[46]	JGENVUUG	-0.12%	7.68%	—	—	—	—

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 andweighted 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 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.
(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.