



Shane Shepherd, Ph.D.

“Emerging market bonds are cheap compared to their historical values.”

## KEY POINTS

1. Emerging market sovereign bonds are favorably priced relative to historical levels and other asset classes.
2. Because emerging market countries have high rates of productivity growth, their currencies are likely to strengthen.
3. The average volatility of emerging market and developed market currencies has converged substantially over recent years.
4. The credit quality of emerging market bonds has improved due to declining debt-to-GDP ratios.

## The Outlook for Emerging Market Bonds

*Emerging market sovereign bonds that are issued in local currencies are supported by high real yields and improving credit quality. In addition, their risk-to-reward profile is enhanced by declining currency volatility and a positive long-term outlook for currency appreciation. This article explains why local currency emerging market bonds are attractive relative to historical valuation levels as well as current developed market opportunities.*

If you are reading this article, you probably work in the financial services industry, and you have grown accustomed to friends, casual acquaintances, and even near-strangers expecting you to comment, with Cramer-esque authority, on penny-stock fliers, explain the latest day-to-day gyrations of the stock market, or reveal the secret code to the price path of gold futures. And, if you are like me, you might sidestep these questions and encourage your new friend to become a long-term investor in a diverse mix of index-based strategies.

Sometimes, however, you might receive a more interesting and open-ended investment question. My eyes always light up when I'm simply asked, "Where is your favorite place to invest today?" The answer, of course, depends heavily on current valuations and market conditions, but we always approach the question with an effort to understand the drivers of long-term risks and expected returns across many different asset classes.

So, you ask, where is my favorite place to invest? Right now, bonds issued by emerging market governments in their local currencies

appear to offer far and away the most compelling investment opportunity. These bonds have four underpinnings for their exceptional risk-to-reward profile:

- High real yields
- Positive expected currency appreciation
- Declining currency volatility
- Strengthening credit quality

## High Real Yields

First, note that emerging market sovereign bonds not only provide an attractive current yield relative to other market opportunities, but they are also relatively cheap compared to their historical average. The short- and medium-term "risk-free" government bond rates for the G-5 countries all currently reside in negative territory (see **Figure 1**). In developed markets, the right to a certain return of capital is actually costing anywhere from -1.5% to -0.5% per year in real purchasing power.<sup>1</sup> On the other hand, real yields in many of the larger emerging market economies reside solidly in positive territory—returning anywhere from about a 1% premium over inflation in Mexico and Russia to more than 6% in the case of Brazil.



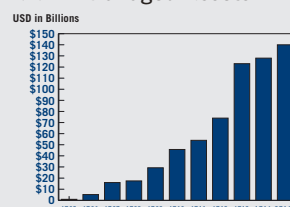
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### RAFI® Managed Assets\*

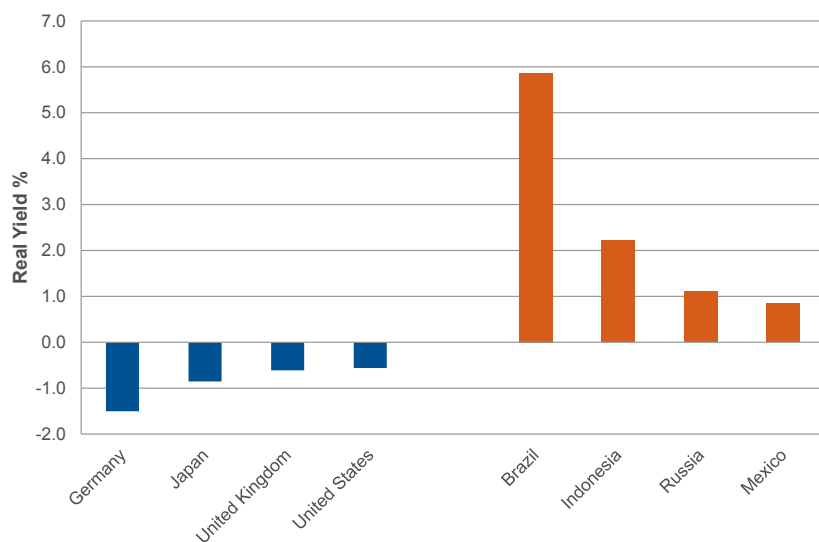


\*Includes RAFI® assets managed or sub-advised by Research Affiliates or RAFI licensees.

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Figure 1. Five-Year Real Sovereign Yields in Selected Developed and Emerging Markets, June 2014



Source: Research Affiliates, based on data from Bloomberg.

Emerging market bonds are also cheap compared to their historical values. In this age of ultra-low interest rates and sky-high equity valuations, cheapness is nearly a forgotten concept. **Figure 2** charts the historical spread for the J.P. Morgan GBI-EM Global Index. At just under 7%, the difference between the index yield and the short-term U.S. Treasury rate lies well above its long-term average of 5.2%. But, most strikingly, this spread has rebounded (due to the well-documented “taper tantrum” of 2013) to levels just a touch below its all-time high during the 2008 global financial crisis!

In hindsight, we can reflect on the many good values the market offered us at the end of 2008. Certainly risk was elevated, but so, too, were the proffered fruits for taking on that risk. How many asset classes are currently trading at comparable valuations? Knowing what we know now, wouldn't we all love to have a second chance to buy risky assets at

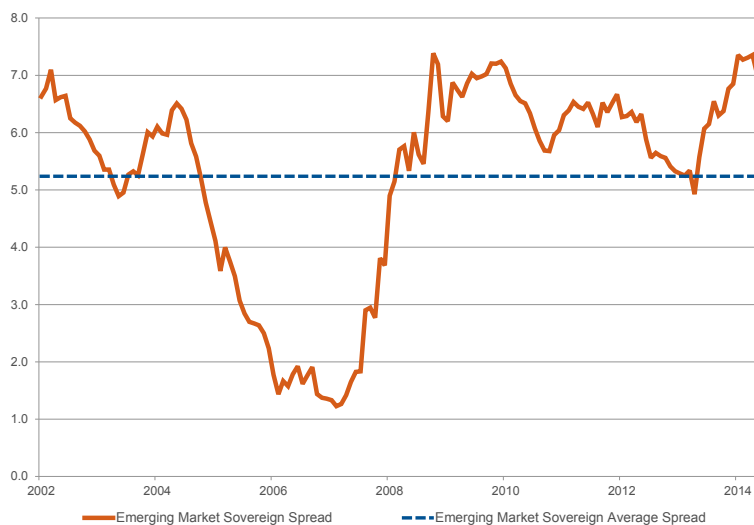
2008 valuations? Most are now vastly more expensive, trading at spreads or valuations considerably richer than historical averages. On a pure yield and valuation basis, emerging market sovereign bonds stand head and shoulders above the competition.

## Currency Appreciation

Skeptical readers might object that this must be a sign of stressed markets, a value trap ready to snap shut. Aren't the “fragile five” economies facing an impending rout of their currencies? This question brings us to the second and third factors supporting emerging market bonds. The volatility of local currencies is undeniably substantial; the currency risk swamps the volatility of the underlying bonds. Nonetheless, the currency exposures may provide an incremental boost to long-run expected return. Because of the differences in productivity growth, in the long run we expect emerging market currencies to appreciate relative to the U.S. dollar and other major developed world currencies.

The expected real return for investing in foreign bonds is the real yield on the bonds, less defaults, plus any movements in the *real* exchange rate.<sup>2</sup> So what drives movements in the real exchange rate? One of the primary long-term factors is

Figure 2. Emerging Market Sovereign Yield, January 2002-June 2014



Source: Research Affiliates, based on data from J.P. Morgan and Bloomberg. Currency returns are shown against the U.S. dollar.

“As we age, we expect to spend less on sports cars and more on health care.”

differing levels of productivity increase between two economies. Productivity matters because, even in open economies, not all goods are tradable. This drives higher inflation and thus appreciation in the real exchange rate in the economy with faster-growing productivity.<sup>3</sup>

Think of sports cars and hospital visits. Because cars are freely shipped across borders, their prices should be equalized. For example, suppose the nominal exchange rate of interest is 13 Mexican pesos to 1 U.S. dollar. Disregarding transportation costs and tariffs, a sports car selling for \$100,000 in the United States should sell for about 1.3 million pesos in Mexico. There are very few “bargains” to be found by shopping abroad for tradable goods.

Hospital services, however, are a different story because they are non-tradable goods. As we age, we expect to spend less of our consumption budget on sports cars and much more on health care. Yet a Mexican hospital is not a viable substitute for my health care needs, if for no other reason than proximity. It’s easy to drive across the border and save a few thousand dollars on a car, but not on an emergency appendectomy! This opens up the possibility for non-tradable goods of all sorts to have dramatically different real prices. An emergency medical procedure may cost half a sports car in California but only a tenth of the same sports car in Mexico. I, for one, am not willing to arbitrage away that price discrepancy.

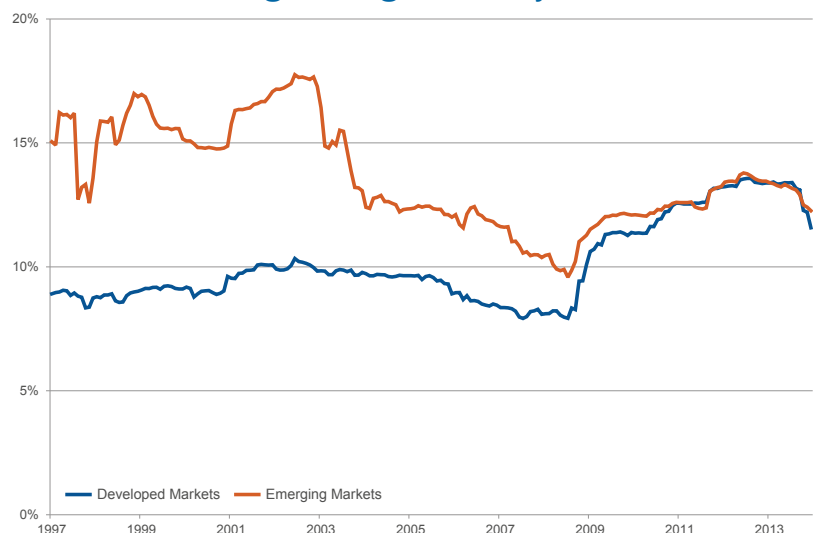
This relationship between productivity and the real exchange rate is known as the Balassa-Samuelson effect.<sup>4</sup> Emerging markets’ higher rates of productivity growth drive higher wage growth and, therefore, higher price inflation in non-tradable goods. This propels an increase in the emerging market consumption basket relative to the developed market consumption basket, resulting in a rising real exchange rate. In fact, the long-run expected increase in the real exchange rate between two countries can be approximated by the difference in productivity growth rates (estimated by real per capita GDP growth rates). Depending on which countries you include in the analysis, the expected real exchange rate appreciation in a basket of emerging market currencies should be about 50 bps annually. For perspective, the expected currency appreciation alone is slightly higher than the expected real yield on a 10-year U.S. Treasury bond. Of course, these expected currency gains are small compared to the real yield on emerging market bonds. But it is comforting to know that the local

currency exposure should add a long-term incremental return, rather than eat away at the attractive real yield through depreciation.

## Currency Volatility

The next question for most investors is: What about the increased volatility associated with local currency exposure, particularly in the case of fragile emerging market currencies? This has certainly been true historically; for instance, the volatility of emerging market currency returns soared during the East Asian financial crisis of 1997 and the devaluation of the ruble in 1998. But would it surprise you to learn that the volatility of the Mexican peso to U.S. dollar exchange rate over the last five years has equaled that of the Norwegian krone to U.S. dollar (both at 12.3%)? Or that the most volatile of the fragile five, the South African rand, has delivered but a tad higher risk than the Australian dollar (15.2% to 14.9%)? In fact, as shown in **Figure 3**, the trailing five-year average volatility for emerging market and developed

**Figure 3. Developed and Emerging Market Currency Volatility, Five-Year Rolling Average, January 1997–June 2014**



Source: Research Affiliates, based on data from Bloomberg. Currencies are shown against the U.S. dollar

market currencies<sup>5</sup> has converged substantially over recent years. Taking on any foreign currency exposure certainly adds volatility. But, at least for the past five years, a basket of emerging market currencies has contributed no more volatility to an international portfolio than a basket of developed currencies. And as emerging markets continue to do just that—emerge—the convergence of currency risks may be expected to continue.

## Credit Quality

The fourth factor is the strengthening credit quality of emerging market bonds. Indeed, it is not only currency risks that have been catching up with developed markets, but also the underlying economic risks to bond cash flow payments. Fifteen years ago trading in local currency emerging market bonds was negligible. Nobody wanted to lend to these countries unless the loan was denominated in an external currency, usually U.S. dollars. Since that time the market for local currency emerging markets debt has soared past \$1 trillion, while external currency debt has grown from about \$200 million to \$500 million.<sup>6</sup> Moreover, 15 years ago only a handful of countries were in a position to issue local currency debt, and their average credit rating was BBB+. Now

many more countries participate in the local currency debt market, and the average credit rating is closer to A- (see **Table 1**).

*“Lower deficits do allow for greater savings after all.”*

Interestingly, despite the tremendous growth in debt issuance, emerging market economies have not become overburdened. In fact, their economies have grown more quickly than they have issued debt, leading to a substantial drop in their debt-to-GDP ratios.<sup>7</sup> Although their budget deficits remain higher than that of the average developed country, they are now well below their rate of GDP growth (something many developed market countries can't claim). And lower deficits do allow for greater savings after all: total foreign reserves as a percent of external debt has more than tripled, with the average country holding close to one unit of foreign reserves for every unit of externally issued debt.<sup>8</sup> And a major concern, sticky current account deficits, continues to pose problems for some countries, but the average deficit has shrunk. Additionally, a new

emphasis on stronger central banking in many emerging market countries (exemplified perhaps by India's Reserve Bank governor, Raghuram Rajan) should help these trends continue and lend additional support to the development of these economies. The weight of evidence shows that the fiscal stability of emerging market countries dramatically improved over the last 15 years. According to some key metrics, they actually appear stronger than many developed market countries—they have lower debt burdens, lower deficits, and higher reserves. In a blind test, to which government would you choose to lend your money?

## Summary

One of the most compelling investment opportunities at this time appears to be local currency emerging market debt. So, the next time you find yourself cornered at a cocktail party, just remember these four things: Emerging market local currency bonds appear to offer attractive real yields and improving credit quality. In addition, emerging market currencies may appreciate over the long term, and their volatility appears to be declining. While you may not be treated like a celebrity, you can take comfort in knowing that you are providing thoughtful advice.

**Table 1. Emerging Markets' Risk Characteristics Improve While Developed Markets' Risk Characteristics Deteriorate**

	Emerging Markets Improving Risk Characteristics		Developed Markets Risk Characteristics	
	1998	2013	1998	2013
Local Debt Credit Rating	BBB+	A-/BBB+	AAA/AA	AA
General Government Gross Debt (% GDP)	44.5%	42.1%	65.6%	86.4%
External Debt (% GDP)	53.2%	42.2%	95.1%	219.2%
General Government Structural Budget	-4.1%	-2.6%	-1.2%	-2.0%
Total Reserves (% of external debt)	33.0%	89.1%	13.4%	15.2%
Current Account Balance (% GDP)	-2.9%	-1.8%	1.7%	2.7%

Source: Research Affiliates, based on data from Bloomberg, International Monetary Fund, World Bank, Reinhart and Rogoff, and the Joint External Debt Hub.

## Endnotes

1. Real yields are calculated as current nominal yields of constant maturity five-year Treasury bonds less expected inflation. Expected inflation is calculated as the average of the current central bank policy rate and exponentially weighted average inflation over the prior 10-year period. We use a five-year bond as representative of the approximate duration risk an investor faces in a broad emerging markets local currency bond index.
2. And we can think of our expected nominal return as that expected real return plus our domestic inflation rate, without needing to incorporate the nominal exchange rate.
3. For an excellent short primer on the real exchange rate, see Catao (2007).
4. For a full treatment, see Balassa (1964) and Samuelson (1964).
5. Excluding, of course, those currencies with a peg to the U.S. dollar.
6. Based on par amount outstanding of J.P. Morgan EMBI Global (USD-denominated debt) and J.P. Morgan GBI-EM (local currency debt) indexes.
7. Contrast this to the slower-growth developed market economies, where the rate of debt issuance has far outpaced economic growth.
8. This average is certainly skewed by China's large foreign reserve holdings at 471% of external debt, but China is not alone. Five of the 17 countries in our data set have a ratio above 100%.

## References

- Balassa, Bela. 1964. "The Purchasing Power Parity Doctrine: A Reappraisal." *Journal of Political Economy*, vol. 72, no. 6 (December):584-596.
- Catao, Luis A.V. 2007. "Why Real Exchange Rates?" *Finance and Development*, vol. 44, no. 3 (September): <https://www.imf.org/external/pubs/ft/fandd/2007/09/basics.htm>
- Samuelson, Paul. 1964. "Theoretical Notes on Trade Problems." *Review of Economics and Statistics*, vol. 46, no. 2 (May):145-154.

## Performance Update

### FTSE RAFI® Equity Index Series\*

TOTAL RETURN AS OF 6/30/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR STANDARD DEV.
FTSE RAFI® All World 3000 <sup>1</sup>	TFRAW3	7.43%	26.71%	10.97%	15.77%	10.22%	18.56%
MSCI All Country World <sup>2</sup>	GDUEACWF	6.50%	23.58%	10.85%	14.88%	8.02%	16.61%
FTSE RAFI® Developed ex US 1000 <sup>3</sup>	FRXIXTR	6.77%	29.20%	7.79%	12.24%	8.59%	20.27%
MSCI World ex US <sup>4</sup>	MLCUWXUG	5.76%	24.39%	8.10%	12.20%	7.69%	18.24%
FTSE RAFI® Developed ex US Mid Small <sup>5</sup>	TFRDXSU	7.83%	28.06%	8.58%	14.85%	10.74%	18.70%
MSCI World ex US Small Cap <sup>6</sup>	GCUDWXUS	7.06%	30.01%	9.15%	15.72%	9.13%	20.08%
FTSE RAFI® Emerging Markets <sup>7</sup>	TFREMU	7.01%	14.71%	-2.17%	8.18%	14.61%	24.22%
MSCI Emerging Markets <sup>8</sup>	GDUEEGF	6.32%	14.68%	-0.06%	9.58%	12.30%	23.77%
FTSE RAFI® 1000 <sup>9</sup>	FRIOXTR	7.66%	25.12%	17.45%	21.48%	9.71%	17.16%
Russell 1000 <sup>10</sup>	RU10INTR	7.27%	25.35%	16.63%	19.25%	8.19%	15.00%
S&P 500 <sup>11</sup>	SPTR	7.14%	24.61%	16.58%	18.83%	7.78%	14.70%
FTSE RAFI® US 1500 <sup>12</sup>	FR15USTR	3.80%	25.55%	15.90%	23.53%	11.31%	21.76%
Russell 2000 <sup>13</sup>	RU20INTR	3.19%	23.64%	14.57%	20.21%	8.70%	19.73%
FTSE RAFI® Europe <sup>14**</sup>	TFREUE	8.49%	31.04%	10.79%	13.43%	7.62%	17.51%
MSCI Europe <sup>15**</sup>	GDDLE15	6.63%	23.38%	11.44%	14.26%	6.88%	14.47%
FTSE RAFI® Australia <sup>16**</sup>	FRAUSTR	3.18%	17.38%	12.90%	12.97%	9.72%	13.61%
S&P/ASX 200 <sup>17**</sup>	ASA51	3.04%	17.43%	10.38%	11.20%	9.01%	13.66%
FTSE RAFI® Canada <sup>18**</sup>	FRCANTR	12.22%	27.75%	9.43%	12.24%	10.19%	13.44%
S&P/TSX 60 <sup>19**</sup>	TX60AR	12.19%	28.31%	7.47%	9.66%	8.97%	13.79%
FTSE RAFI® Japan <sup>20**</sup>	FRJPNTR	-2.21%	12.45%	15.89%	8.27%	3.61%	19.76%
MSCI Japan <sup>21**</sup>	GDDLJN	-2.79%	12.30%	16.27%	8.48%	2.62%	19.21%
FTSE RAFI® UK <sup>22**</sup>	FRGBRTR	1.76%	13.05%	9.57%	13.77%	8.44%	15.67%
MSCI UK <sup>23**</sup>	GDDLUK	1.90%	12.31%	8.27%	13.65%	7.94%	13.73%

\*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 6/30/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR STANDARD DEV.
Russell Fundamental Global Index Large Company <sup>24</sup>	RUFGLTU	7.31%	26.66%	12.18%	16.60%	10.35%	16.89%
MSCI All Country World Large Cap <sup>25</sup>	MLCUAWOG	6.29%	23.42%	10.89%	14.46%	7.70%	16.31%
Russell Fundamental Developed ex US Index Large Company <sup>26</sup>	RUFDXLTU	7.66%	30.67%	9.04%	13.06%	9.17%	18.36%
MSCI World ex US Large Cap <sup>27</sup>	MLCUWXUG	5.48%	24.30%	8.09%	11.92%	7.47%	18.14%
Russell Fundamental Developed ex US Index Small Company <sup>28</sup>	RUFDXSTU	7.09%	27.35%	11.07%	15.52%	10.64%	17.99%
MSCI World ex US Small Cap <sup>6</sup>	GCUDWXUS	7.06%	30.01%	9.15%	15.72%	9.13%	20.08%
Russell Fundamental Emerging Markets <sup>29</sup>	RUFGETRU	5.76%	17.50%	0.68%	11.41%	15.75%	23.72%
MSCI Emerging Markets <sup>8</sup>	GDUEEGF	6.32%	14.68%	-0.06%	9.58%	12.30%	23.77%
Russell Fundamental US Index Large Company <sup>30</sup>	RUFUSLTU	7.30%	24.41%	17.50%	20.92%	10.01%	15.55%
Russell 1000 <sup>10</sup>	RU10INTR	7.27%	25.35%	16.63%	19.25%	8.19%	15.00%
S&P 500 <sup>11</sup>	SPTR	7.14%	24.61%	16.58%	18.83%	7.78%	14.70%
Russell Fundamental US Index Small Company <sup>31</sup>	RUFUSSTU	6.41%	28.10%	16.57%	24.50%	12.50%	20.72%
Russell 2000 <sup>13</sup>	RU20INTR	3.19%	23.64%	14.57%	20.21%	8.70%	19.73%
Russell Fundamental Europe <sup>32**</sup>	RUFUETE	8.55%	29.88%	11.17%	15.06%	8.86%	15.83%
MSCI Europe <sup>15**</sup>	GDDLE15	6.63%	23.38%	11.44%	14.26%	6.88%	14.47%

\*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 6/30/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR STANDARD DEV.
RAFI® Bonds US Investment Grade Master <sup>33</sup>	—	5.62%	7.12%	6.05%	7.82%	6.22%	5.70%
ML Corporate Master <sup>34</sup>	COA0	5.95%	7.98%	6.25%	8.27%	5.94%	5.84%
RAFI® Bonds US High Yield Master <sup>35</sup>	—	4.91%	10.10%	8.86%	13.40%	9.50%	9.41%
ML Corporate Master II High Yield BB-B <sup>36</sup>	HOA4	5.55%	11.35%	8.99%	12.58%	8.26%	9.11%
RAFI® US Equity Long/Short <sup>37</sup>	—	0.54%	3.61%	3.72%	7.68%	4.61%	11.25%
3-Month T-Bill <sup>38</sup>	GB3M	0.02%	0.04%	0.05%	0.08%	1.54%	0.54%
FTSE RAFI® Global ex US Real Estate <sup>39</sup>	FRXR	5.86%	16.07%	7.23%	14.20%	—	—
FTSE EPRA/NAREIT Global ex US <sup>40</sup>	EGXU	6.97%	11.69%	7.30%	12.26%	—	—
FTSE RAFI® US 100 Real Estate <sup>41</sup>	FRUR	16.61%	15.58%	12.14%	25.95%	—	—
FTSE EPRA/NAREIT United States <sup>42</sup>	UNUS	17.82%	13.47%	11.73%	23.63%	—	—
Citi RAFI Sovereign Developed Markets Bond Index Master <sup>43</sup>	CRFDMU	5.33%	8.87%	3.59%	5.15%	5.93%	7.18%
Merrill Lynch Global Governments Bond Index II <sup>44</sup>	WOG1	5.01%	6.62%	1.65%	3.70%	4.87%	6.54%
Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Master <sup>45</sup>	CRFELMU	5.90%	2.74%	—	—	—	—
JPMorgan GBI-EM Global Diversified <sup>46</sup>	JGENVUUG	5.99%	3.91%	—	—	—	—

**Sources and Method:** 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. Annualized returns are geometrically linked returns, calculated using monthly data. Annualized standard deviation is calculated using sample standard deviation and monthly return data.

### 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 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 3-Month T-bill return is calculated using the Bloomberg Generic 3-month T-bill. The index is interpolated based off of the currently active U.S. 3 Month T-bill and the cash management bill closest to maturing 90 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/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 22 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. Performance may be positive or negative. Past performance is not an indication of future results. Historical data used from index inception date of 09/30/2001 (index = 100) until 12/31/2011. Live data used since 01/01/2012.
- (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 15 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. Performance may be positive or negative. Past performance is not an indication of future results. Historical data used from index inception date of 09/30/2011 (index = 100) until 12/31/2011. Live data used since 1/1/2012.
- (46) The JPMorgan GBI-EM Diversified Index seeks exposure to the local currency sovereign debt of over 15 countries in the emerging markets.



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