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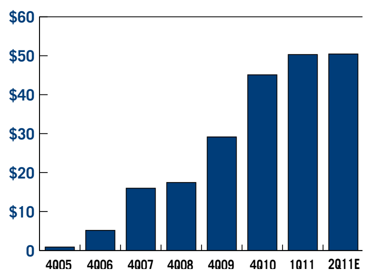
Fundamentals

Rob Arnott

RAFI® Managed Assets*

USD in Billions



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KING OF THE MOUNTAIN

Most of us remember playing "king of the mountain" as children. The goal, often accompanied by a certain measure of roughhousing, was to summit a little hill and stay at the top while others vied to push us off and take our place.

King of the Mountain is not merely a child's game. The U.S. stock market has been straddling a surprisingly precarious "mountain" in asset valuation for nearly two decades, resisting efforts to push us back below historical norms of valuation levels except for brief periods in 2002 and 2009.

We've written about the challenges over the past two years. In 2009, we described the coming "3-D Hurricane's" soaring deficits and debts, in which we expect the post-baby-boom generations to pay down debts that we (1) promised to ourselves, (2) failed to prefund, and (3) failed to consult the generations that will be expected to honor these debts. In 2010, we addressed the consequence of soaring debt burdens in most of the developed world, as compared with the generally well-managed debt burdens of our primary external creditors in the developing world.

In this issue, we explore the challenges to our lofty perch in the equity markets. Specifically, we examine the potential consequences of understated inflation and too-low real interest rates, paired with a Fed policy that seems intent on further boosting inflation and eroding real interest rates.

The Valuation Mountain

First, let's look at how real interest rates and inflation affect valuation multiples. Some years ago, Marty Leibowitz and Anthony Bova pointed out a "hill" in valuation multiples.[1] When real interest rates—which we define as 10-year Treasury bond yields less the trailing three-year average Consumer Price Index—are mid-range, suggesting solid economic growth, the stock market sports a robust P/E ratio, often well above 20 times earnings.[2] When real interest rates are either negative (reflecting a desire to aggressively stimulate the economy) or unusually high (reflecting a desire to rein in an overheated economy), the average P/E ratio plummets below 11.

The real-rates valuation hill is illustrated in **Figure 1**. It's quite a lofty hill. Over the past 140 years, whenever real short-term interest rates have been in their 3–4% "sweet spot," the market has exhibited a price 21 times 10-year smoothed real earnings. At real interest rates that are either lofty (above 6% in real terms) or negative, the average P/E ratio

continued on page two

tumbles to 11. If we limit ourselves to more recent results—over the past 50 years—we find that the peak is a little bit taller, with more tolerance for slightly lower real rates. But the shape of the curve changes remarkably little. It's also very interesting to note that this valuation hill accounts for some 40% of the variation in P/E ratios. Real interest rates really matter to equity valuations.

It turns out that there's another valuation hill, related to the rate of inflation. Of course, inflation generally moves in opposition to real rates: when inflation rises, often real rates fall, until the Fed decides to do something about it. In some ways, this second hill is even more powerful than the real rates hill. As we can see in **Figure 2**, the peak is taller, with typical P/E ratios of over 23 whenever inflation is 2–3%. However, high inflation is far more damaging to P/E ratios than high real interest rates: When trailing three-year inflation is above 6%, the P/E ratio plunges to an average of 9.4 times average 10-year real earnings.

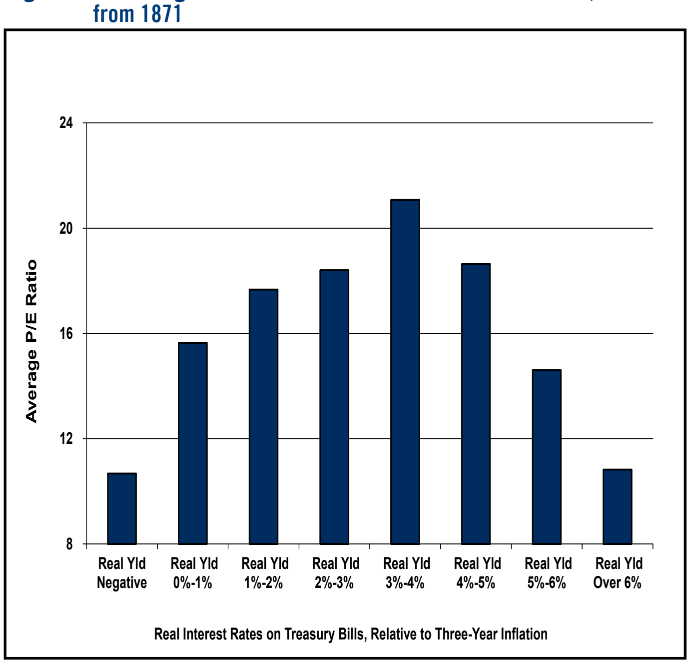
Because real interest rates and the rate of inflation are negatively correlated, the two hills combine to create an impressive three-dimensional mountain, formed by plotting P/E ratios against both real interest rates and inflation (see **Figure 3**). Of course, there are some scenarios that either never happened or almost never will.

When real rates are 3–5% (moderately high) and inflation is 1–3% (reasonably benign), the average P/E ratio is 26. But it's a sharp peak. When real rates are a bit lower (1–3%), the average P/E ratio drops to 19, a drop of more than 25%. When real rates are high (above 5%), the average P/E ratio nearly halves to 14. When inflation is a bit stronger, the average P/E ratio drops to 20; when inflation is a bit weaker, the average P/E ratio drops to 17.

The linkages are strong. The correlation between the indicated P/E ratio drawn from this valuation mountain and the actual Shiller P/E ratio is 68%. To be sure, this is an in-sample comparison, but even after adjusting for overlapping samples, we get a *t*-statistic of over 7 for this comparison—a strong confirmation of the validity of the data. The bottom line: over half of the variability in P/E ratios over the past 140 years can be explained by real interest rates and the rates of inflation.

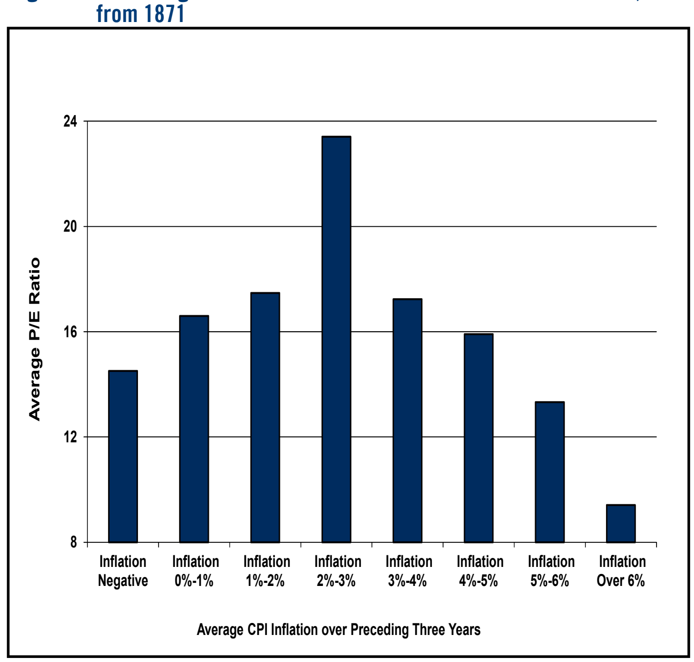
Further, the linkages are strong enough to provide an indication of whether valuation multiples ought to be higher or lower. The correlation between the "predicted" real return for stocks, based on the difference between the model P/E ratio and the current actual Shiller P/E ratio, and subsequent five-year real returns is 40%. Again, the *t*-statistic is significant, topping 4.

Figure 1. The Linkage of Shiller P/E Ratios and Real Interest Rates, from 1871



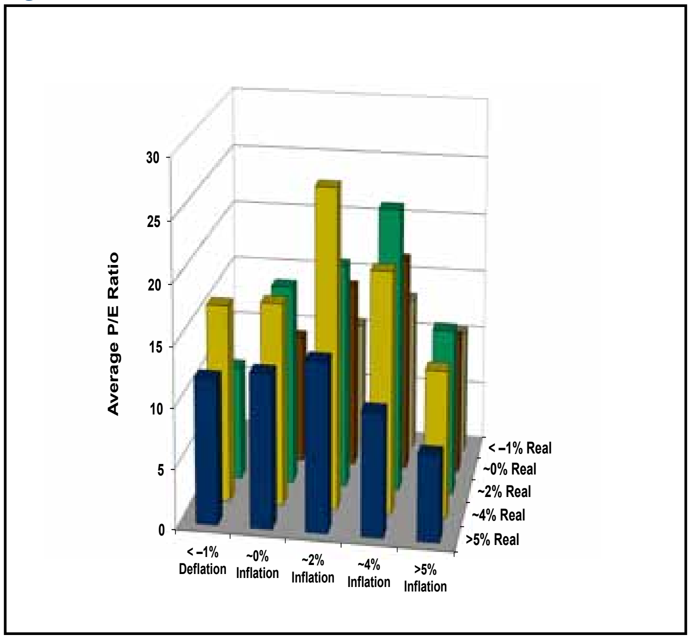
Source: Research Affiliates.

Figure 2. The Linkage of Shiller P/E Ratios and Three-Year CPI Inflation, from 1871



Source: Research Affiliates.

Figure 3. P/E Ratios vs. Real Interest Rates and Inflation, from 1871



Source: Research Affiliates.

What does this mean? Modest—or even moderate—inflation seems to have a benign impact on valuation multiples. Modest—or even moderate—positive real interest rates seem to have similarly benign consequences. Indeed, with real rates and inflation ranging from 1–5%, the average Shiller P/E ratio hovers around 22 times 10-year smoothed earnings, give or take a mere 15%. P/E ratios fall off a cliff outside of this range.

Our Current Perch

For most of the past 20 years, we've occupied a benign range of low-to-moderate real interest rates and low-to-moderate inflation. Where are we today? It's hard to know! As of September 8, 2011, the S&P 500 stood at 20 times the 10-year average real earnings, the Bureau of Labor Statistics shows trailing three-year inflation at 1% per annum, and the 10-year Treasury bond offered a yield of 2.0%. On that basis, the real yield is 1.0%. History suggests that the normal P/E ratio, when inflation and real yields are both in the 1–3% range, is about 19. So, maybe stocks are slightly expensive relative to historical norms for benign inflation and low real interest rates.

But, this arithmetic misses something important: radical changes in the way the federal government calculates the Consumer Price Index. Using today's methods, the 1981 inflation rate of 14% would have been reported as just under 10%. Based on official statistics, today's method runs 3–4% lower than the 1980s method. To be conservative, let's assume a far smaller 2% effect. This means that the reported three-year inflation of 1% would, under the old rules, equate to 3%. This, in turn, suggests that real long-bond interest rates are not 1.0%; under the old CPI rules, real yields for 10-year Treasury bonds are negative. What does this do to our outlook? It puts us right on the edge of the valuation sweet spot, with a "normal" P/E ratio of about 18.

The Outlook

What about the future? In the next six months, the deflation from late 2008 will shortly drop out of our three-year rates. CPI is up by 7% over the past 30 months, which works out to 2.3% per year. If we add our 2% adjustment to create more of an apples-to-apples comparison with history, "true" inflation is above 4% and the "true" real interest rate is very low, around –2%. At these levels, the normal Shiller P/E ratio would be 13 times our 10-year average earnings, which takes us below 800 on the S&P 500 Index.

We're not saying that the P/E ratio will fall to 13 in the year ahead. We're merely pointing out that the path we're on—low or negative real interest rates, with a conscious attempt to introduce moderate levels of inflation—is *very* dangerous. While low interest rates are fueling higher stock market multiples, this policy may haunt investors in the years ahead. The combination of higher inflation and lower real interest rates poses a dangerous threat to stock market valuation levels.

The risk is that current Fed policies may throw the stock market king off the mountain.

Endnotes

1. Martin L. Leibowitz and Anthony Bova, CFA, 2007, "P/Es and Pension Funding Ratios," *Financial Analysts Journal*, vol. 63, no. 1 (January/February):84–96.
2. As many of our readers know, we're fond of the "Shiller P/E Ratio" as a basis for gauging stock market valuation levels. Thus, we define the P/E ratio as the current real level of S&P 500 prices divided by the 10-year average for real S&P 500 earnings.

Performance Update

FTSE RAFI® Equity Index Series*

TOTAL RETURN AS OF 8/31/11	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	-6.15%	12.12%	2.23%	3.04%	8.73%	18.96%
MSCI All Country World[2]	GDUEACWF	-4.19%	14.28%	-0.01%	1.14%	5.00%	17.21%
FTSE RAFI® Developed ex US 1000[3]	FRX1XTR	-7.60%	8.65%	-0.93%	0.49%	7.30%	20.29%
MSCI World ex US Large Cap[4]	MLCUWXUG	-5.53%	10.34%	-2.58%	-0.59%	5.36%	18.35%
FTSE RAFI® Developed ex US Mid Small[5]	TFRDXUSU	-2.35%	19.42%	8.84%	5.14%	13.66%	18.77%
MSCI World ex US Small Cap[6]	GCUDWXUS	-5.28%	19.10%	4.15%	1.56%	10.32%	20.42%
FTSE RAFI® Emerging Markets[7]	TFREMU	-8.35%	9.00%	7.14%	11.98%	23.00%	24.62%
MSCI Emerging Markets[8]	GDUEEGF	-8.31%	9.40%	5.36%	8.72%	16.29%	24.20%
FTSE RAFI® 1000[9]	FR10XTR	-3.78%	17.24%	4.46%	2.19%	5.07%	18.18%
Russell 1000[10]	RU10INTR	-1.93%	19.06%	0.84%	1.11%	3.16%	16.00%
S&P 500[11]	SPTR	-1.77%	18.50%	0.54%	0.78%	2.70%	15.80%
FTSE RAFI® US 1500[12]	FR15USTR	-7.50%	21.66%	6.94%	4.84%	9.90%	22.72%
Russell 2000[13]	RU20INTR	-6.54%	22.19%	0.83%	1.53%	5.85%	20.98%
FTSE RAFI® Europe[14]	TFREUE	-14.53%	-6.14%	-2.91%	-3.24%	2.18%	19.48%
MSCI Europe[15]	GDDLE15	-11.09%	-1.65%	-3.43%	-2.52%	1.51%	17.14%
FTSE RAFI® Australia[16]	FRAUSTR	-6.95%	0.60%	0.32%	1.56%	7.83%	13.09%
S&P/ASX 200[17]	ASA51	-6.67%	1.92%	-1.44%	0.85%	7.21%	13.32%
FTSE RAFI® Canada[18]	FRCANTR	-4.46%	6.79%	4.05%	5.44%	8.87%	14.30%
S&P/TSX 60[19]	TX60AR	-3.79%	7.57%	-1.23%	3.92%	7.79%	14.62%
FTSE RAFI® Japan[20]	FRJPNTR	-15.48%	-3.87%	-12.76%	-10.96%	-0.24%	18.70%
MSCI Japan[21]	GDDLJN	-14.50%	-3.11%	-14.03%	-12.58%	-2.36%	18.32%
FTSE RAFI® UK[22]	FRGBRTR	-7.82%	5.22%	2.21%	0.96%	3.79%	17.32%
MSCI UK[23]	GDDLUK	-5.82%	6.84%	2.39%	1.87%	3.61%	15.14%

*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 8/31/11	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	-4.82%	14.12%	2.38%	3.26%	8.85%	17.67%
MSCI All Country World Large Cap[25]	MLCUAWOG	-4.22%	13.63%	-0.53%	0.90%	4.39%	16.89%
Russell Fundamental Developed ex US Index Large Company[26]	RUFDXLTU	-6.96%	9.40%	3.04%	1.81%	8.99%	18.70%
MSCI World ex US Large Cap[27]	MLCUWXUG	-5.53%	10.34%	-2.58%	-0.59%	5.36%	18.35%
Russell Fundamental Developed ex US Index Small Company[28]	RUFDXSTU	-3.91%	17.01%	6.30%	3.69%	12.24%	18.63%
MSCI World ex US Small Cap[6]	GCUDWXUS	-5.28%	19.10%	4.15%	1.56%	10.32%	20.42%
Russell Fundamental Emerging Markets[29]	RUFGETRU	-7.21%	12.79%	9.55%	13.26%	22.73%	24.53%
MSCI Emerging Markets[8]	GDUEEGF	-8.31%	9.40%	5.36%	8.72%	16.29%	24.20%
Russell Fundamental US Index Large Company[30]	RUFUSLTU	-2.22%	18.89%	3.63%	2.56%	5.86%	16.63%
Russell 1000[10]	RU10INTR	-1.93%	19.06%	0.84%	1.11%	3.16%	16.00%
S&P 500[11]	SPTR	-1.77%	18.50%	0.54%	0.78%	2.70%	15.80%
Russell Fundamental US Index Small Company[31]	RUFUSSTU	-5.04%	23.16%	7.94%	6.30%	10.96%	21.17%
Russell 2000[13]	RU20INTR	-6.54%	22.19%	0.83%	1.53%	5.85%	20.98%
Russell Fundamental Europe[32]	RUFEUTE	-12.94%	-2.85%	-0.76%	-0.99%	5.17%	18.40%
MSCI Europe[15]	GDDLE15	-11.09%	-1.65%	-3.43%	-2.52%	1.51%	17.14%

*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 8/31/11	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
RAFI® Bonds Investment Grade Master[33]		5.99%	4.80%	10.18%	7.62%	6.50%	6.07%
ML Corporate Master[34]	C0A0	5.77%	4.70%	9.30%	6.75%	6.23%	6.21%
RAFI® Bonds High Yield Master[35]		2.05%	8.61%	13.72%	10.12%	9.01%	11.03%
ML Corporate Master II High Yield BB-B[36]	H0A4	2.67%	8.10%	10.08%	7.20%	7.39%	9.95%
RAFI® US Equity Long/Short[37]		-5.95%	-2.00%	10.75%	2.31%	4.88%	11.74%
1-Month T-Bill[38]	GB1M	0.04%	0.10%	0.16%	1.55%	1.85%	0.48%
FTSE RAFI® Global ex US Real Estate[39]	FRXR	-8.18%	7.51%	-0.98%	-3.28%	8.41%	22.57%
FTSE EPRA/NAREIT Global ex US[40]	EGXU	-5.96%	9.04%	-3.88%	-5.24%	6.60%	20.44%
FTSE RAFI® US 100 Real Estate[41]	FRUR	-0.94%	15.00%	1.87%	-5.51%	4.46%	27.25%
FTSE EPRA/NAREIT United States[42]	UNUS	2.90%	14.37%	-3.18%	-4.74%	4.24%	25.60%

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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.