



Chris Brightman, CFA

“Too many cling to the theory of a single market beta.”

KEY POINTS

1. Despite the many studies convincingly demonstrating that investors could dramatically improve their wealth accumulation by buying and holding index funds, most investors do not.
2. Contrary to the prediction of the CAPM, more current financial theory supported by strong empirical evidence explains why investors choose to trade frequently, chase past performance, increase risk as market prices rise, and sell when prices collapse.
3. Whether we label investors' wealth destroying choices as valid preferences or irrational behavior, the resulting lower than market returns is the source of the above market returns earned by those who are willing and able to behave in a contrarian manner.

A Preference for Discomfort

Yikes is right! Investors continue to underperform the market by a significant margin, as Russ Kinnel of Morningstar reminds us in his 2014 version of “Mind the Gap.”¹ While many theories try to explain this persistent underperformance, I will focus on one: Too many of today's commentators seem not to notice that our knowledge of investment markets has progressed well beyond the theories of the 1960s.

Today, too many cling to the simple to understand but thoroughly refuted theory of a single market beta. Too many misinterpret today's ongoing debate about market efficiency as supporting the long abandoned theory that all investors should hold an identical portfolio. Too many misinterpret the sound guidance from experts advising individual investors to buy and hold low cost index funds as proof that earning above market returns is unattainable.

To be sure, well informed and well intentioned commentators including Jack Bogle, David Swensen, and Warren Buffett, who advise investors to buy and hold the market in the form of a low cost index fund, are correct. Ample empirical evidence convincingly demonstrates that following such advice would

allow the vast majority of investors to dramatically improve their wealth accumulation, likely by a few percentage points per year. But our present understanding of financial markets is more interesting than this conclusion, as correct and as important as it is.

A more current understanding of financial market theory and evidence helps us understand why so many investors *choose* to behave in ways that produce lower-than-market returns. We now understand not just that these investors could improve their returns by indexing, but also why they don't, *and reciprocally why those who are willing and able to behave in a contrarian manner can and do earn market-beating returns.*²

Evolution of Finance Theory

Theories developed in the 1950s and 1960s provide the foundation of our current understanding of financial markets. Harry Markowitz introduced modern portfolio theory (MPT) with his study of portfolio selection, mean variance optimization, and the efficient frontier in 1952. In the early 1960s, building on Harry's work, Jack Treynor and Bill Sharpe developed the capital asset



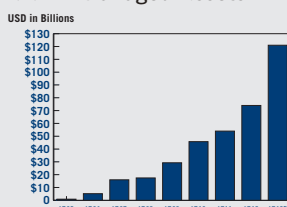
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pricing model (CAPM), predicting that security returns are explained by a single market beta. Also during the 1960s, Gene Fama developed the efficient market hypothesis (EMH).

In the 1970s and 1980s we learned that the single equity market beta prediction of the CAPM was, at best, incomplete. In 1976 Stephen Ross proposed the Arbitrage Pricing Theory (APT), introducing an asset pricing model with multiple factors determining the returns of individual securities. In the 1980s Ross, Roll, and Chen published convincing evidence that security returns are determined by multiple factors.

The very fact that the CAPM could be *disproved* demonstrated the revolutionary nature of the insights of MPT and the CAPM. A field of study is not science unless it produces falsifiable theories. Moving on from the CAPM to APT demonstrated important scientific progress in our study of markets. Oddly, three decades after APT, the disproved single equity market beta prediction of the CAPM remains the dominant pricing theory taught in many business schools.

In the early 1990s, Fama and French introduced their famous three-factor asset pricing model. Perhaps the most important, and too often overlooked, insight we take from Fama and French's work is the realization that any test of the EMH is really a joint test of the EMH and the particular asset pricing model

used to test for efficiency. The evidence refuting the joint hypothesis of the CAPM and EMH refutes the old CAPM but not the EMH. With Fama and French's three-factor model, the EMH was given a new lease on life—albeit with a new twist: We learned that some investors might prefer to earn higher returns than the market by owning lower priced stocks. All of the evidence gathered in the two decades since has confirmed that they can. Of course, Graham and Dodd told us much the same thing, but without the scientific evidence, in 1932.

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Also in the 1990s, Dick Thaler applied and extended the behavioral economics research of Kahneman and Tversky to question not just a single pricing model but the rational decision-making assumptions of MPT and the EMH. Thaler and many others have presented convincing evidence that people's decision-making process is far more complex than assumed by the mean variance optimization proposed by Markowitz back in 1952.³

More recently, neoclassical finance theory has cautiously embraced behavioral finance to suggest a risk premium that is both time-varying and cross-sectionally varying from one asset to the next. And so, the academic debate

about market efficiency remains unresolved.⁴ For each new pricing anomaly and behavioral deviation from mean-variance optimization that we find, a more complex pricing model is proposed, taking account of a wide variety of investor preferences, which may vary through time. Despite the unresolved nature of the EMH debate, no serious finance academics believe that all investors should, in theory, hold identical portfolios.

Implications for Investors

So what is an investor to make of the evolving theory? Is the stock market inefficient or do investors have varying preferences? When some investors choose to buy stocks of companies that have been successful and shun those whose prices have fallen, are they irrational or do they have a valid behavioral preference? Is the choice to pay a premium price for a stock that may plausibly quintuple irrational, or is it a preference for positively skewed upside, like a lottery ticket? Is the choice to actively trade irrational, or do some investors receive non-monetary rewards from this short-term quest for instant gratification? Is the choice to take more risk as the market rises and to reduce risk as the market declines irrational, or is it a preference for portfolio insurance?

Whether we label investor choices as irrational behaviors or valid preferences, the results for investors' wealth accumulation are clear. In 2000, Terry Odean and Brad Barber documented that average individuals' investing behavior caused

them to underperform the market by 1.5% per year, even before taking account of fees and expenses. In the 2014 update to his seminal 2005 white paper, “Mind the Gap,” Kinnel shows that over the last 10 years the average mutual fund investor earned 2.5% less—on a dollar-weighted basis—than their funds delivered on a time-weighted basis. (In U.S. equity mutual funds, the gap was 1.7% per annum.) Their buy and sell decisions were *that bad!* Clearly, Bogle, Swensen, and Buffett are absolutely correct: most investors would accumulate more wealth by changing their behavior to buy and hold low cost index funds.

Most people, however, do not follow this advice. Whether from irrationality, time-varying risk-aversion, fear, greed, or other reasons, investors continue to actively trade, chasing fads and shunning

“Is the stock market inefficient or do investors have varying preferences?”

past disappointments. This predictable behavior, which objectively and materially detracts from the returns of most investors, is the source of the above-market returns earned by a few others, notably including Swensen, Buffett, and John Bogle, Jr. (Jack’s son!).

Today, above-market returns are readily available through simple, transparent, low cost, smart beta strategies.⁵ The excess returns are not relentless. If markets are rewarding momentum, growth, and risk aversion—in other words, when the “fear premium” for out-of-favor assets is growing—these strategies will lag the markets, until the markets begin

to reward discomfort again. If we label the predictable behavior that lowers the returns of most investors as irrational, then smart beta exploits market inefficiency. If we label investors’ predictable behavior as rational preferences, then these higher expected returns are fair compensation for tolerating discomfort.

The question an investor should ask is: “What is my preference? Do I choose to fund alpha for others with my own comfort-seeking behavior, harvest alpha from others with a disciplined tolerance for discomfort, or remain passive?” It’s a legitimate choice that we make, whether we realize it or not. The evidence is clear, however, that a preference for the disciplined contrarian approach is likely to result in more wealth over time than the alternatives.

Endnotes

1. Russel Kinnel, “Mind the Gap 2014,” Morningstar (Fund Spy), February 27, 2014.
2. Rob Arnott has suggested that much of the controversy about market efficiency could have been obviated if the term “fear premium” had been used, instead of “risk premium.” After all, does today’s buyer of Twitter feel *fear* when buying the stock, or excitement at being part of an adventuresome future? If the latter, should the stock be priced to offer a positive or a negative “risk premium,” regardless what beta is evident in its share price behavior? With a “fear premium,” CAPM’s *beta* would define the market-clearing equilibrium condition, and the “fear premium” would drive many of the observed market anomalies, a rising and falling “fear premium” would drive the growth/value cycle, and manifestations and nuances in the “fear premium” might even point the way towards a marriage of behavioral finance and neoclassical finance theory.
3. As with most of the legends of finance, who first propounded these wonderful theories, Harry Markowitz is the first to welcome these additional insights, and to acknowledge the limitations of a careless or naïve application of his own beloved optimization methods.
4. We would, however, question whether there is really much difference between an *inefficient* market and a market in which the discount rate can vary widely from one asset to another and over time. We would go so far as to suggest that EMH is, to borrow James Montier’s choice expression, as dead as Monty Python’s parrot. http://pythonline.com/youtube_archive/parrot-sketch.
5. See Feifei Li, Vitali Kalesnik, and Jason Hsu, 2012, “An Investor’s Guide to Smart Beta Strategies,” *AAll Journal*, December; and Robert D. Arnott, Jason Hsu, Vitali Kalesnik, and Phil Tindall, 2013, “The Surprising Alpha from Malkiel’s Monkey and Upside-Down Strategies,” *Journal of Portfolio Management*, vol. 39 no. 4 (Summer):91-105.

Performance Update

FTSE RAFI® Equity Index Series*

TOTAL RETURN AS OF 2/28/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR VOLATILITY
FTSE RAFI® All World 3000 ¹	TFRAW3	0.82%	21.89%	8.51%	23.04%	9.63%	18.60%
MSCI All Country World ²	GDUEACWF	0.71%	18.77%	8.94%	20.21%	7.42%	16.64%
FTSE RAFI® Developed ex US 1000 ³	FRXIXTR	1.99%	24.04%	5.79%	19.79%	8.28%	20.30%
MSCI World ex US Large Cap ⁴	MLCUWXUG	1.24%	18.44%	6.23%	18.04%	7.31%	18.27%
FTSE RAFI® Developed ex US Mid Small ⁵	TFRDXSUS	2.63%	19.46%	7.28%	23.47%	10.93%	18.84%
MSCI World ex US Small Cap ⁶	GCUDWXUS	3.87%	24.40%	8.04%	23.57%	9.26%	20.19%
FTSE RAFI® Emerging Markets ⁷	TFREMU	-6.57%	-11.62%	-5.91%	15.58%	12.40%	24.37%
MSCI Emerging Markets ⁸	GDUEEGF	-3.35%	-5.67%	-1.66%	17.24%	10.26%	23.95%
FTSE RAFI® 1000 ⁹	FRIOXTR	0.45%	26.19%	14.63%	28.14%	8.99%	17.19%
Russell 1000 ¹⁰	RU10INTR	1.40%	26.34%	14.60%	23.63%	7.58%	15.03%
S&P 500 ¹¹	SPTR	0.96%	25.37%	14.35%	23.00%	7.16%	14.72%
FTSE RAFI® US 1500 ¹²	FR15USTR	0.85%	33.56%	14.68%	32.90%	11.38%	21.78%
Russell 2000 ¹³	RU20INTR	1.81%	31.56%	14.41%	26.63%	8.71%	19.74%
FTSE RAFI® Europe ^{14**}	TFREUE	4.18%	26.80%	7.54%	19.29%	7.38%	17.54%
MSCI Europe ^{15**}	GDDLE15	2.96%	19.48%	9.11%	18.06%	6.66%	14.47%
FTSE RAFI® Australia ^{16**}	FRAUSTR	1.79%	11.37%	11.08%	17.17%	10.25%	13.60%
S&P/ASX 200 ^{17**}	ASA51	1.79%	10.64%	8.68%	15.08%	9.59%	13.67%
FTSE RAFI® Canada ^{18**}	FRCANTR	3.62%	14.54%	5.47%	18.21%	9.07%	13.45%
S&P/TSX 60 ^{19**}	TX60AR	4.23%	13.63%	3.02%	13.91%	7.86%	13.89%
FTSE RAFI® Japan ^{20**}	FRJPNTR	-6.32%	29.13%	9.81%	13.00%	4.13%	19.86%
MSCI Japan ^{21**}	GDDLJN	-7.13%	26.58%	10.45%	12.21%	3.04%	19.32%
FTSE RAFI® UK ^{22**}	FRGBRTR	2.09%	14.03%	9.50%	18.36%	8.71%	15.62%
MSCI UK ^{23**}	GDDLUK	1.23%	10.57%	8.24%	16.45%	8.02%	13.69%

*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 2/28/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR VOLATILITY
Russell Fundamental Global Index Large Company ²⁴	RUFGLTU	0.73%	22.72%	9.77%	22.32%	9.76%	16.93%
MSCI All Country World Large Cap ²⁵	MLCUAWOG	0.32%	18.21%	8.83%	19.62%	7.01%	16.33%
Russell Fundamental Developed ex US Index Large Company ²⁶	RUFDXLTU	2.52%	26.40%	6.78%	18.79%	8.87%	18.41%
MSCI World ex US Large Cap ²⁷	MLCUWXUG	0.85%	17.86%	6.12%	17.62%	6.99%	18.16%
Russell Fundamental Developed ex US Index Small Company ²⁸	RUFDXSTU	2.34%	23.01%	9.41%	23.28%	11.04%	18.19%
MSCI World ex US Small Cap ⁶	GCUDWXUS	3.87%	24.40%	8.04%	23.57%	9.26%	20.19%
Russell Fundamental Emerging Markets ²⁹	RUFGETRU	-4.92%	-5.00%	-1.26%	19.09%	13.60%	23.93%
MSCI Emerging Markets ⁸	GDUEEGF	-3.35%	-5.67%	-1.66%	17.24%	10.26%	23.95%
Russell Fundamental US Index Large Company ³⁰	RUFUSLTU	0.14%	24.97%	14.97%	25.96%	9.35%	15.58%
Russell 1000 ¹⁰	RU10INTR	1.40%	26.34%	14.60%	23.63%	7.58%	15.03%
S&P 500 ¹¹	SPTR	0.96%	25.37%	14.35%	23.00%	7.16%	14.72%
Russell Fundamental US Index Small Company ³¹	RUFUSSTU	1.81%	31.65%	15.15%	32.54%	12.39%	20.78%
Russell 2000 ¹³	RU20INTR	1.81%	31.56%	14.41%	26.63%	8.71%	19.74%
Russell Fundamental Europe ^{32**}	RUFEUTE	3.54%	24.17%	8.05%	19.30%	8.55%	15.86%
MSCI Europe ^{15**}	GDDLE15	2.96%	19.48%	9.11%	18.06%	6.66%	14.47%

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

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Performance Update

Fixed Income/Alternatives

TOTAL RETURN AS OF 2/28/14	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR VOLATILITY
RAFI® Bonds US Investment Grade Master ³³	—	2.95%	0.97%	5.92%	9.21%	5.68%	5.82%
ML Corporate Master ³⁴	COA0	2.90%	1.42%	6.03%	9.83%	5.38%	5.95%
RAFI® Bonds US High Yield Master ³⁵	—	2.64%	6.34%	8.77%	17.73%	9.25%	9.45%
ML Corporate Master II High Yield BB-B ³⁶	HOA4	2.78%	7.66%	8.60%	16.19%	7.94%	9.15%
RAFI® US Equity Long/Short ³⁷	—	-2.60%	5.69%	1.74%	12.85%	4.45%	11.21%
1-Month T-Bill ³⁸	GB1M	0.00%	0.03%	0.04%	0.07%	1.48%	0.53%
FTSE RAFI® Global ex US Real Estate ³⁹	FRXR	-3.38%	0.78%	4.66%	23.74%	—	—
FTSE EPRA/NAREIT Global ex US ⁴⁰	EGXU	-0.81%	-2.46%	5.34%	20.50%	—	—
FTSE RAFI® US 100 Real Estate ⁴¹	FRUR	7.65%	6.31%	9.49%	34.44%	—	—
FTSE EPRA/NAREIT United States ⁴²	UNUS	9.52%	7.01%	9.73%	29.43%	—	—
Citi RAFI Sovereign Developed Markets Bond Index Master ⁴³	CRFDMU	2.15%	2.46%	4.01%	6.14%	5.36%	—
Merrill Lynch Global Governments Bond Index II ⁴⁴	WOG1	2.89%	0.96%	2.16%	4.49%	4.44%	—
Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Master ⁴⁵	CRFELMU	-1.11%	-11.98%	—	—	—	—
JPMorgan GBI-EM Global Diversified ⁴⁶	JGENVUUG	-0.89%	-10.14%	—	—	—	—

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 Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, excluding the United States.
- (5) The FTSE RAFI® Developed ex US Mid Small Index tracks the performance of small and mid-cap companies domiciled in developed international markets (excluding the United States), selected and weighted based on the following four fundamental measures of firm size: sales, cash flow, dividends and book value.
- (6) The MSCI World ex US Small Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of small cap developed markets, excluding the United States.
- (7) The FTSE RAFI® Emerging Markets Index comprises the largest 350 Emerging Market companies selected and weighted using fundamental factors (sales, cash flow, dividends, book value).
- (8) The MSCI Emerging Markets Index is an unmanaged, free-float-adjusted cap-weighted index designed to measure equity market performance of emerging markets.
- (9) The FTSE RAFI® 1000 Index is a measure of the largest 1,000 U.S. listed companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (10) The Russell 1000 Index is a market-capitalization-weighted benchmark index made up of the 1,000 highest-ranking U.S. stocks in the Russell 3000.
- (11) The S&P 500 Index is an unmanaged market index that focuses on the large-cap segment of the U.S. equities market.
- (12) The FTSE RAFI® US 1500 Index is a measure of the 1,001st to 2,500th largest U.S. listed companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (13) The Russell 2000 is a market-capitalization weighted benchmark index made up of the 2,000 smallest U.S. companies in the Russell 3000.
- (14) The FTSE RAFI® Europe Index is comprised of all European companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (15) The MSCI Europe Index is a free-float adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in Europe.
- (16) The FTSE RAFI® Australia Index is comprised of all Australian companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (17) The S&P/ASX 200 Index, representing approximately 78% of the Australian equity market, is a free-float-adjusted, cap-weighted index.
- (18) The FTSE RAFI® Canada Index is comprised of all Canadian companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (19) The S&P/Toronto Stock Exchange (TSX) 60 is a cap-weighted index consisting of 60 of the largest and most liquid (heavily traded) stocks listed on the TSX, usually domestic or multinational industry leaders.

- (20) The FTSE RAFI® Japan Index is comprised of all Japanese companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (21) The MSCI Japan Index is an unmanaged, free-float-adjusted cap-weighted index that aims to capture 85% of the publicly available total market capitalization of the Japanese equity market.
- (22) The FTSE RAFI® UK Index is comprised of all UK companies listed in the FTSE RAFI® Developed ex U.S. 1000 Index, which in turn is comprised of the largest 1,000 non-U.S. listed developed market companies, selected and weighted using fundamental factors; (sales, cash flow, dividends, book value).
- (23) The MSCI UK Index is an unmanaged, free-float-adjusted cap-weighted index that aims to capture 85% of the publicly available total market capitalization of the British equity market.
- (24) The Russell Fundamental Global Index Large Company is a measure of the largest companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks), across both developed and emerging markets.
- (25) The MSCI All Country World Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets.
- (26) The Russell Fundamental Developed ex US Large Company is a subset of the Russell Fundamental Developed ex US Index, and is a measure of the largest non-U.S. listed developed country companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (27) The MSCI World ex US Large Cap Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of large cap-developed markets, excluding the United States.
- (28) The Russell Fundamental Developed ex US Index Small Company is a subset of the Russell Fundamental Developed ex US Index, and is a measure of small non-U.S. listed developed country companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (29) The Russell Fundamental Emerging Markets Index is a measure of Emerging Market companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (30) The Russell Fundamental U.S. Index Large Company is a subset of the Russell Fundamental US Index, and is a measure of the largest U.S. listed companies, selected and weighted using fundamental measures; (adjusted sales, retained cash flow, dividends + buybacks).
- (31) The Russell Fundamental US Index Small Company is a subset of the Russell Fundamental US Index, and is a measure of U.S. listed small companies, selected and weighted using fundamental measures; (adjusted sales, retained cash flow, dividends + buybacks).
- (32) The Russell Fundamental Europe Index is a measure of European companies, selected and weighted using fundamental factors; (adjusted sales, retained cash flow, dividends + buybacks).
- (33) The RAFI® Bonds US Investment Grade Master Index is a U.S. investment-grade corporate bond index comprised of non-zero fixed coupon debt with maturities ranging from 1 to 30 years issued by publicly traded companies. The issuers held in the index are weighted by a combination of four measures of their fundamental size—sales, cash flow, dividends, and book value of assets.
- (34) The Merrill Lynch U.S. Corporate Master Index is representative of the entire U.S. corporate bond market. The index includes dollar-denominated investment-grade corporate public debt issued in the U.S. bond market.
- (35) The RAFI® Bonds US High Yield Master is a U.S. high-yield corporate bond index comprised of non-zero fixed coupon debt with maturities ranging from 1 to 30 years issued by publicly traded companies. The issuers held in the index are weighted by a combination of four measures of their fundamental size—sales, cash flow, dividends, and book value of assets.
- (36) The Merrill Lynch Corporate Master II High Yield BB-B Index is representative of the U.S. high yield bond market. The index includes domestic high-yield bonds, including deferred interest bonds and payment-in-kind securities. Issues included in the index have maturities of one year or more and have a credit rating lower than BBB-/Baa3, but are not in default.
- (37) The RAFI® US Equity Long/Short Index utilizes the Research Affiliates Fundamental Index® (RAFI®) methodology to identify opportunities that are implemented through long and short securities positions for a selection of U.S. domiciled publicly traded companies listed on major exchanges. Returns for the index are collateralized and represent the return of the strategy plus the return of a cash collateral yield.
- (38) The 1-Month T-bill return is calculated using the Bloomberg Generic 1-month T-bill. The index is interpolated based off of the currently active U.S. 1 Month T-bill and the cash management bill closest to maturing 30 days from today.
- (39) The FTSE RAFI® Global ex US Real Estate Index comprises 150 companies with the largest RAFI fundamental values selected from the constituents of the FTSE Global All Cap ex U.S. Index that are classified by the Industry Classification Benchmark (ICB) as Real Estate.
- (40) The FTSE EPRA/NAREIT Global ex US Index is a free float-adjusted index, and is designed to represent general trends in eligible listed real estate stocks worldwide, excluding the United 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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