Christopher J. Brightman, CFA

> *Unless we change our policies to encourage immigration, employment, and investment, our new normal growth rate will be 1%.*

1%... The New Normal Growth Rate?

In 1981 David Stockman, the Director of the Office of Management and Budget for newly elected President Ronald Reagan, published a budget using such an optimistic set of assumptions that it was derisively nicknamed Rosy Scenario. In Stockman's 1986 book, *The Triumph of Politics,* he explained in vivid detail his disillusionment with the politics that thwarted the spending reforms that were supposed to accompany Reagan's tax cuts. He also expressed his fear for the county's future, given the explosion in deficits and accumulation of debt. While dreading the consequences of the deficits and debt of the 1980s seems quaint from today's perspective, and memories of the Reagan era are fading into history, Rosy Scenario lives on.

Too many of today's fiscal projections extrapolate past growth trends without adjusting for the dramatic deterioration in our future growth outlook. The 2.5% long-term potential growth assumptions for the U.S. economy held out by the White House and Congressional Budget Office are wildly optimistic; indeed, the White House forecast centers on 4% real growth during the proposed recovery years of 2014–2017. While we wouldn't challenge the idea that such growth is *possible*, even the White House concedes that these are aggressive assumptions. Rosy Scenario indeed.

The Rosy forecasts are far too tightly anchored to past growth rates, during a demographic "sweet spot" for the developed world. They ignore the headwinds that have been central to our research in the past few years—the "3-D Hurricane" of deficits, debt, and demography. Specifically, the challenges to a Rosy Scenario arise in three core areas: population growth, employment rate growth, and productivity.

Population Growth

Our population growth has slowed and will continue to slow. Data from the U.S. Census Bureau shows that the annual growth of the U.S. population declined from an average of 1.8% in the 1950s to 1.0% by the 1970s and then down to 0.9% in recent years. This waning growth of our population should not be a surprise; population growth rates have already dropped to zero or less in Japan and much of Europe. The Census Bureau (Ortman and Guarneri, 2009) projects in their low immigration scenario that our population growth rate will decline to 0.8% in the next two decades.

Even these census projections do not take account of the possible demographic impact of the worst economic environment since the Great Depression. We don't yet know the full effect of the Great Recession on our
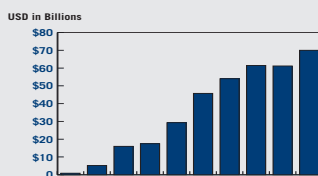
RAFI® Managed Assets*

USD in Billions

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

population growth, but the experience of the 1930s is instructive. During the first two decades of the 20th century, the U.S. population grew by an average of 1.5% per year. Then, population growth dropped by more than half to only 0.7% per year during the 1930s.

We have strong evidence that a similar drop in population growth is occurring now. The household formation rate has plummeted and with it the fertility rate. The Centers for Disease Control reports: "The 2011 preliminary number of U.S. births was 3,953,593, 1% less (or 45,793 fewer) births than in 2010; the general fertility rate (63.2 per 1,000 women age 15–44 years) declined to the lowest rate ever reported for the United States."

Immigration has also plummeted. The Pew Hispanic Center states: "From 1995 through 2000, we estimate that 3 million Mexicans moved to the United States, and nearly 700,000, including family members born in the United States, went

home. From 2005 through 2010, we estimate that about 1.4 million Mexicans arrived, and the same number, including U.S.-born children, left. Considering everything, a return to the migration levels of the late 1990s now seems inconceivable." Given these declines in both fertility and immigration, forecasts for annual population growth of 0.8% seem optimistic for the next two decades (see **Figure 1**).
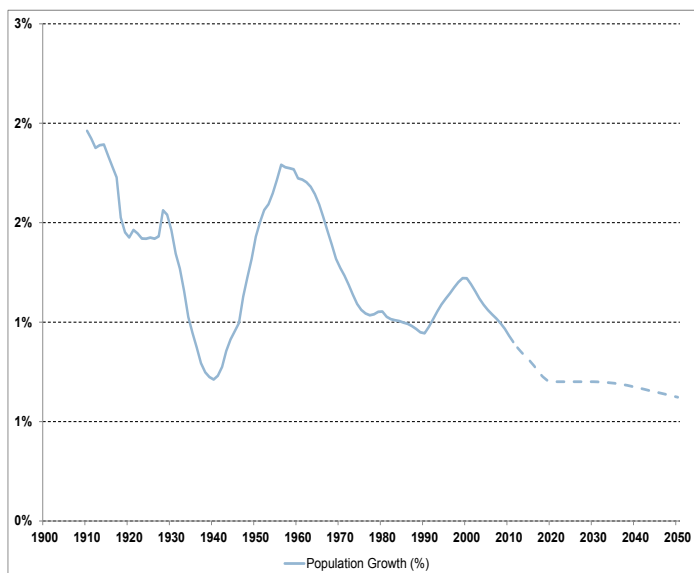
Employment Rate

During the second half of the 20th century, the proportion of our population over age 16 who were employed rose from 56% to 64%. As shown in **Figure 2**, more than all of this growth is attributable to the rise of the female employment rate from 32% in 1950 to 58% by 2000. The male employment rate declined steadily from 82% in 1950 to 72% in 2000.

The female employment rate crested in 2000, and the male rate has continued its long gradual decline. The total employ-

ment rate declined from its peak of 64% in 2000 to 58% in 2010. Some of this decline is attributable to the recession; some to policy changes that reduce incentives to work (Mulligan, 2012); and some to our aging, a trend that will undoubtedly continue. It bears noting that the effect of demography on employment is an issue on which a libertarian investment manager can agree with neo-Keynesian economist: Paul Krugman (2012) explains this same effect on his blog.

When baby boomers began to work in the 1970s, the proportion of the population over age 55 was less than 18%. Over the past decade, during which the leading edge of the boomers reached age 55, the proportion of the population aged over 55 has risen to 25% (see **Figure 3**). That may not sound like a big change, but it's a 19% jump in just half a generation. Those of us over age 55 will rise to 31% of the population by 2030, a 48% jump in 30 years, and will continue to grow thereafter.[1]

Figure 1. Population Growth

Source: Research Affiliates, based on 10-year annualized average data from the U.S. Census Bureau.

Figure 2. Employment Rates
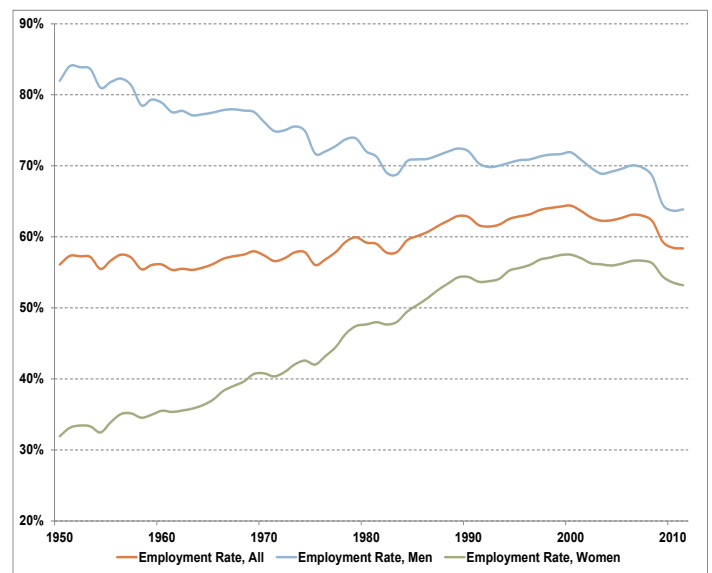
Source: Research Affiliates, based on data from BLS and the U.S. Census Bureau.

To state the obvious, we can't see a large jump in the share of the population over 55, without a corresponding drop in the roster under 55. The average employment rate for people aged 25–54 from 1990 through 2010 was 82%; in sharp contrast, the average employment rate for people over age 55 was only 29%. A fast rising proportion of the population in an age group with a low employment rate will lower the total employment rate. While boomers may have to remain employed at rates higher than today's oldsters, many will choose to retire and others will no longer be able to work.

The rise in the employment rate from 56% in 1950 to 64% in 2000 boosted GDP growth by 0.3% per year relative to a constant employment rate. From 2000 through 2010, the employment rate declined to 58%, enough to shave 1% per year off of GDP, relative to a constant employment rate. Matters have not improved since 2010. While the recession accelerated this decline, demography will continue to exert downward pressure on the U.S. employment rate. A simple calculation, assuming constant employment rates by demographic sub-group, suggests a 0.2% per year continued demographic reduction in GDP growth over the next two decades as boomers move into their retirement years.

The best data for assembling these forecasts comes from the U.S. Census Bureau and the Bureau of Labor Statistics. The Census Bureau provides future population growth rate estimates. Near-term, these are highly reliable. Next year's 65-year-olds are alive today, age 64; we can count them. The census forecasts do not become blurry, as to the scale of the working age population, until well past 2030. Only the very distant forecasts should be viewed as speculative.

The future path for the total U.S. employment rate can then be calculated with some precision using the detailed demographic data readily available from the Bureau of Labor Statistics (though surprisingly few bother to do so). Any careful examination of the data will confirm our conclusions regarding a slowing rate of population growth and a declining trend in the total employment rate.

Productivity

The third component of GDP growth, productivity, is more difficult to predict.

Here again demography provides some strong clues. Arnott and Chaves (2012) explain that "For each of us, the biggest jump in our contribution to GDP occurs as we transition from nonworking adolescents into gainfully employed 20-somethings. Another, often smaller, jump in our contribution to GDP occurs as we mature into our 30s. By our 40s, the evidence of real wages would suggest that most of us are at or approaching our peak contribution to GDP, with a falling contribution to GDP in our 50s and 60s." It's not that mature adults are unproductive; rather, once we reach peak productivity (outside of unskilled labor, this appears to happen in our 40s and 50s), our productivity crests; our contribution to GDP *growth* turns negative. The aging of the baby boom generation over the next two decades will depress the U.S. employment rate, and the aging of the labor force will slow our productivity growth.

The unavoidable fiscal contraction required to address our unsustainable budget deficit also dampens the outlook for productivity growth. The U.S. government deficit, as officially measured, has grown to nearly 10% of GDP; if the government were to rely on generally accepted accounting principles (GAAP), our deficit has averaged 10% *of GDP for a generation*. Debt as officially reported has grown to over 100% of GDP. But, again, this figure soars when we add in state and local government debt and govern-

Figure 3. Aging Population
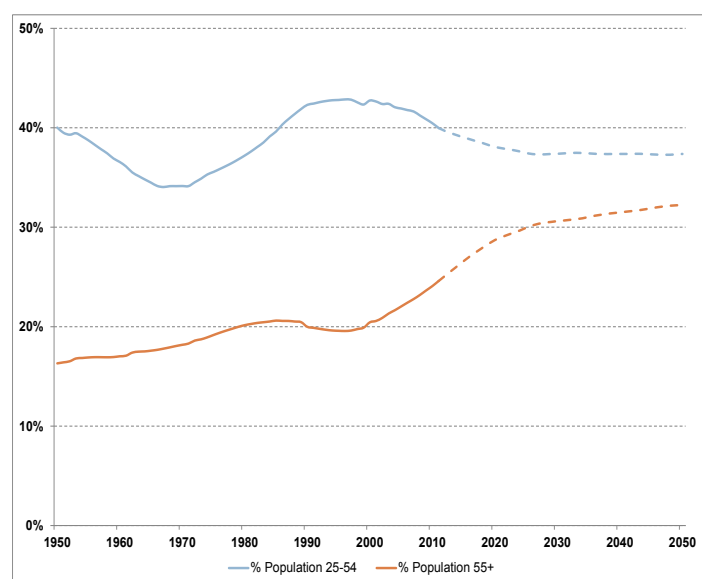
Source: Research Affiliates, based on data from the U.S. Census Bureau.

ment sponsored enterprises (FNMA and FHLMC). The debt level is truly horrific if we count the present value of entitlement commitments (see **Figure 4**).

Borrowing to invest can raise our future productivity growth, *but only if the return on capital exceeds the cost of debt*. Unfortunately, we did not borrow to invest; we borrowed to consume. Debt-financed consumption did not just raise employment. It inflated our measure of output per person. As the global financial crisis so convincingly demonstrated, much of our recent GDP growth was unsustainable, debt-financed consumption. For this reason, reported GDP over recent decades overstates both our true prosperity and our true growth.[2] If GDP more properly measured production instead of consumption, then measured productivity growth would have been significantly lower. Reducing consumption to a level that may be sustained by domestic production requires sharply lower growth

> **Considering both the aging of our population and the required fiscal contraction, we estimate productivity growth of 0.5% per year for the next several decades.**

in real GDP per capita, until we are no longer spending beyond our means (see Arnott, 2011a).

Considering both the aging of our population and the required fiscal contraction, we estimate productivity growth of 0.5% per year for the next several decades. This forecast may strike many as overly pessimistic. But before dismissing our estimate, consider the 2012 writing of Robert J. Gordon of Northwestern University, perhaps the world's foremost

expert on productivity growth. Professor Gordon says: "Even if innovation were to continue into the future at the rate of the two decades before 2007, the U.S. faces six headwinds that are in the process of dragging long-term growth to half or less of the 1.9% annual rate experienced between 1860 and 2007. These include demography, education, inequality, globalization, energy/environment, and the overhang of consumer and government debt. A provocative 'exercise in subtraction' suggests that future growth in consumption per capita for the bottom 99 percent of the income distribution could fall below 0.5% per year for an extended period of decades." We would include the top 1% in Dr. Gordon's assessment; slow growth will not spare the affluent.

1% Growth Rate

For the 50 years from 1951 through 2000, U.S. GDP growth averaged 3.3% per year.[3] We can attribute this historical growth to three primary components:

Figure 4. Public Debt and Unfunded Obligations, Percent of GDP from 1945
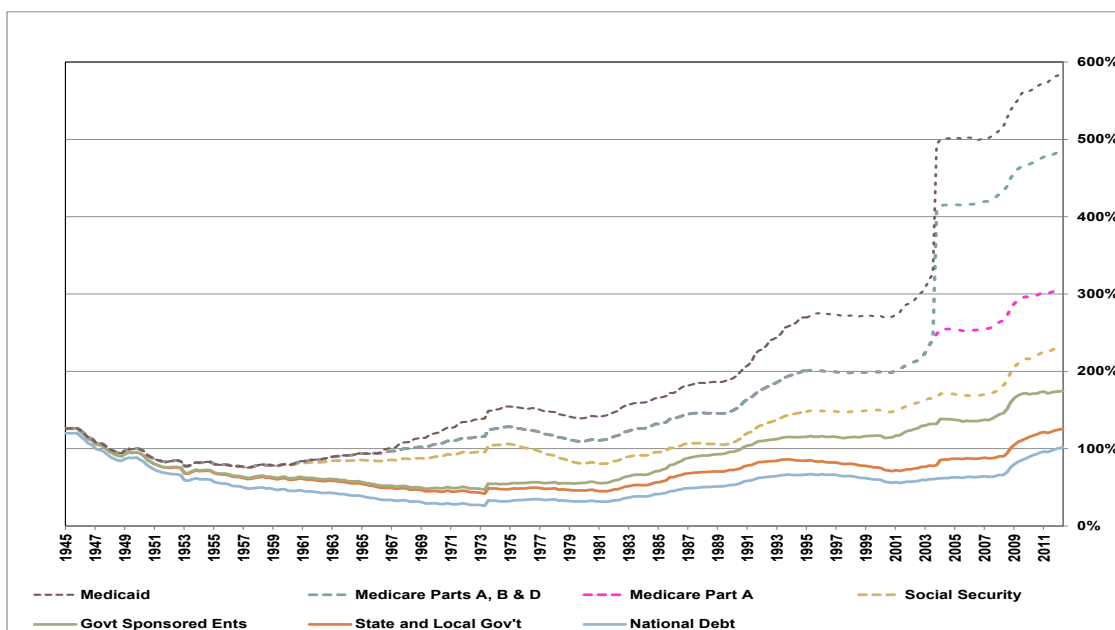
Source: Research Affiliates, based on data from Centers for Medicare & Medicaid Services, U.S. Social Security Administration, The Federal Reserve, and TreasuryDirect.

1.4% from population growth, 0.3% from a rising employment rate, and 1.6% from growth of output per person employed (productivity). In the coming 20 years, all three components of growth will be much lower.

Births and fertility rates are declining. Immigration has slowed to a trickle in response to harsh immigration policies and a dimmed growth outlook. For the next two decades, the U.S. population will grow by only 0.7% per year, half the rate of growth witnessed in the late 20th century.

The total employment rate will continue to decline as boomers move from their 50s into their 60s and 70s. Whereas a rising employment rate added 0.3% per year to GDP growth from 1950 through 2000, the demographic effect on the employment ratio will subtract 0.2% for the next two decades. The population will be growing by 0.7% per year, but the employable work force will be growing by only about 0.5% per year.

Productivity growth faces severe headwinds from both demography and fiscal contraction. If the productivity growth of our aging labor force is 0.5%, then future GDP growth will be centered around 1%.

Demography guarantees a sharp slowdown in GDP growth. 1% real growth is still growth. It's a joy to behold, if our expectations are anchored on zero, as was the case throughout human history before the industrial revolution. But, if our expectations are tied to the 3% growth from 1950 to 2000, the 1% growth seems abysmal.

Slower growth is not a serious problem; it's the expectations gap that poses economic and political dangers in the years ahead.

Demography is Destiny?

Demography is destiny. But, while it is the most immutable force shaping our future, it is not the only force that matters.

This 1% "new normal" for GDP growth is, of course, subject to considerable uncertainty. Our policy choices will have a dramatic influence on all three drivers of economic growth. Immigration reform, while politically difficult, could help slow the decline in population growth. We can increase the rate of employment by revising our transfer payment policies to provide ample incentives for employers to employ and for the labor force to seek employment. We can boost productivity by changing our tax policy to encourage savings and investment, rather than printing money to support debt-financed consumption.

> ❝Investing requires savings and we have been saving far too little.❞

It seems unlikely that we can reverse the decline in fertility rates observed across the developed world.[4] Immigration can, however, move the needle on U.S. population growth by several tenths of a percentage point per year. The United States absorbed one million immigrants per year in the past when our total population was much smaller than today. The positive contributions of immigration to growth are well documented, as summarized by Professor Gordon Hanson (2012) at UC San Diego. While the economics are uncontroversial, the politics are not promising. Both the right and the

left have their own separate reasons to resist changing our immigration policies.

The structure of our tax and transfer payment systems has a significant influence on employment rates. Our combination of regressive payroll taxes and phase-out of transfer payments results in *effective* marginal tax rates above 40%—in some cases far above 40%—for the working poor (Kotlikoff and Rapson, 2006), while we tax carried interest in private equity deals at only 15%. As the authors observe: "The patterns by age and income of marginal net tax rates on earnings, marginal net tax rates on saving, and tax-arbitrage opportunities can be summarized with one word—bizarre." Reform of our tax and transfer payment systems, to reward work instead of penalizing it, could add as many as 30 million jobs in a few short years (Arnott, 2011b).

The most important determinant of our productivity per person is the amount of capital we have available for investment, and wise use of that capital. Investing to improve productivity in all of its forms, from machine tools, to transportation infrastructure, to education, can all raise our productivity. Investing requires savings and we have been saving far too little. To increase productivity requires that we reorient our economy away from debt-financed consumption and toward saving-financed investment.

In this context, ending the mortgage interest deduction seems oddly absent from our political debate, perhaps because it would run counter to long-standing bipartisan policies promoting the American dream of home ownership and perhaps because it would simply be too unpopular. Nonetheless, the

tax deductibility of interest on home mortgages (which was effectively reaffirmed when the Tax Reform Act of 1986 rescinded the deductibility of credit card interest) has been credibly identified as one of the factors that eventuated in the financial crisis (Szegö, 2011). Because borrowing against one's house is inexpensive on an after-tax basis, it was easy to rationalize converting the wealth effect of rising prices from a psychological phenomenon to actual cash on hand for consumer spending. Banks and families are still paying for the good times, and the overhang of properties in foreclosure ensures that the residential real estate market will not fully recover for years to come. Yet there is little discussion of changing the tax code with regard to debt collateralized by borrowers' homes.

Unless we change our policies to encourage immigration, employment, and investment, our new normal growth rate will be 1%. Government tax and spending plans, based upon the Rosy Scenario of extrapolating past growth rates, are likely to exacerbate our already unsustainable deficits and dangerous accumulation of debt.

Endnotes

1. See Current Estimates Data, Population Estimates, United States Census Bureau: http://www.census.gov/popest/data/
2. We think our reliance on GDP aggravates and encourages our current problems. GDP measures consumption. So, we think we're gaining ground when we increase consumption, even if that consumption is funded by deficit spending or by increases in personal debt. See Arnott (2011a).
3. U.S. Department of Commerce: Bureau of Economic Analysis.
4. For each the G-7, fertility rates fell below replacement levels between 1965 and 1975. Among the BRIC's, only India still has a fertility rate above replacement levels, and that rate is falling very fast. Fertility rates that are below replacement rates eventually lead to a population of zero (as John Calhoun's rats demonstrated in the 1960s). But we'll leave this puzzle for future generations to solve.

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Performance Update

FTSE RAFI® Equity Index Series*

TOTAL RETURN AS OF 10/31/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			10 YEAR VOLATILITY
				3 YEAR	5 YEAR	10 YEAR	
FTSE RAFI® All World 3000[1]	TFRAW3	11.08%	7.22%	6.53%	-1.65%	11.35%	18.95%
MSCI All Country World[2]	GDUEACWF	12.67%	9.17%	8.10%	-2.42%	8.32%	16.94%
FTSE RAFI® Developed ex US 1000[3]	FRX1XTR	9.01%	1.64%	0.93%	-5.16%	9.64%	20.47%
MSCI World ex US Large Cap[4]	MLCUWXUG	11.21%	4.96%	3.79%	-5.03%	8.68%	18.50%
FTSE RAFI® Developed ex US Mid Small[5]	TFRDXUSU	9.28%	2.49%	5.36%	-0.41%	14.06%	19.05%
MSCI World ex US Small Cap[6]	GCUDWXUS	12.99%	5.27%	6.77%	-3.42%	12.11%	20.52%
FTSE RAFI® Emerging Markets[7]	TFREMU	9.00%	1.84%	4.67%	-2.03%	22.41%	24.78%
MSCI Emerging Markets[8]	GDUEEGF	11.66%	2.98%	5.70%	-3.17%	16.56%	24.21%
FTSE RAFI® 1000[9]	FR10XTR	14.26%	15.64%	14.01%	1.96%	9.17%	17.61%
Russell 1000[10]	RU10INTR	14.32%	14.97%	13.48%	0.53%	7.31%	15.29%
S&P 500[11]	SPTR	14.29%	15.21%	13.21%	0.36%	6.91%	15.01%
FTSE RAFI® US 1500[12]	FR15USTR	12.73%	12.36%	15.22%	4.06%	12.85%	22.26%
Russell 2000[13]	RU20INTR	11.75%	12.08%	14.82%	1.19%	9.58%	20.35%
FTSE RAFI® Europe[14]	TFREUE	11.11%	2.61%	-0.56%	-6.87%	9.39%	23.16%
MSCI Europe[15]	GDDLE15	13.66%	6.91%	3.57%	-5.69%	8.51%	20.38%
FTSE RAFI® Australia[16]	FRAUSTR	19.78%	10.68%	9.24%	0.68%	16.01%	23.38%
S&P/ASX 200[17]	ASA51	17.13%	7.77%	8.44%	-1.26%	15.67%	23.80%
FTSE RAFI® Canada[18]	FRCANTR	9.51%	5.31%	9.84%	0.41%	16.26%	21.34%
S&P/TSX 60[19]	TX60AR	9.16%	4.41%	8.74%	-1.75%	14.93%	21.54%
FTSE RAFI® Japan[20]	FRJPNTR	-4.07%	-7.40%	-1.41%	-5.87%	5.91%	17.08%
MSCI Japan[21]	GDDLJN	0.52%	-3.11%	-0.18%	-6.65%	4.42%	16.68%
FTSE RAFI® UK[22]	FRGBRTR	12.56%	9.59%	6.52%	-4.90%	8.31%	20.03%
MSCI UK[23]	GDDLUK	11.38%	8.45%	7.65%	-4.23%	7.79%	18.13%

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

Russell Fundamental Index Series*

TOTAL RETURN AS OF 10/31/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			10 YEAR VOLATILITY
				3 YEAR	5 YEAR	10 YEAR	
Russell Fundamental Global Index Large Company[24]	RUFGLTU	11.52%	8.57%	8.48%	-0.51%	11.61%	17.50%
MSCI All Country World Large Cap[25]	MLCUAWOG	12.82%	9.58%	7.77%	-2.47%	7.70%	16.60%
Russell Fundamental Developed ex US Index Large Company[26]	RUFDXLTU	8.67%	1.73%	2.50%	-4.02%	11.03%	18.91%
MSCI World ex US Large Cap[27]	MLCUWXUG	11.15%	5.05%	3.44%	-5.11%	8.14%	18.35%
Russell Fundamental Developed ex US Index Small Company[28]	RUFDXSTU	11.66%	5.66%	6.46%	-0.64%	14.04%	18.54%
MSCI World ex US Small Cap[6]	GCUDWXUS	12.99%	5.27%	6.77%	-3.42%	12.11%	20.52%
Russell Fundamental Emerging Markets[29]	RUFGETRU	11.65%	4.10%	7.51%	-0.37%	22.12%	24.54%
MSCI Emerging Markets[8]	GDUEEGF	11.66%	2.98%	5.70%	-3.17%	16.56%	24.21%
Russell Fundamental US Index Large Company[30]	RUFUSLTU	14.33%	16.19%	14.73%	2.72%	9.68%	16.02%
Russell 1000[10]	RU10INTR	14.32%	14.97%	13.48%	0.53%	7.31%	15.29%
S&P 500[11]	SPTR	14.29%	15.21%	13.21%	0.36%	6.91%	15.01%
Russell Fundamental US Index Small Company[31]	RUFUSSTU	12.99%	12.54%	17.15%	5.51%	13.25%	21.15%
Russell 2000[13]	RU20INTR	11.75%	12.08%	14.82%	1.19%	9.58%	20.35%
Russell Fundamental Europe[32]	RUFEUTE	12.12%	3.67%	2.68%	-4.91%	12.22%	22.17%
MSCI Europe[15]	GDDLE15	13.66%	6.91%	3.57%	-5.69%	8.51%	20.38%

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

Performance Update

Fixed Income/Alternatives

TOTAL RETURN AS OF 10/31/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED			
				3 YEAR	5 YEAR	10 YEAR	10 YEAR VOLATILITY
RAFI® Bonds Investment Grade Master[33]	—	9.41%	9.87%	9.22%	8.78%	6.92%	6.01%
ML Corporate Master[34]	C0A0	10.48%	10.51%	9.31%	7.92%	6.79%	6.18%
RAFI® Bonds High Yield Master[35]	—	13.46%	13.99%	12.85%	11.66%	12.35%	10.13%
ML Corporate Master II High Yield BB-B[36]	H0A4	12.31%	12.90%	11.82%	8.34%	9.89%	9.37%
RAFI® US Equity Long/Short[37]	—	1.57%	2.39%	3.44%	3.23%	5.90%	11.57%
1-Month T-Bill[38]	GB1M	0.04%	0.04%	0.07%	0.46%	1.62%	0.50%
FTSE RAFI® Global ex US Real Estate[39]	FRXR	27.88%	16.45%	6.41%	-2.30%	—	—
FTSE EPRA/NAREIT Global ex US[40]	EGXU	30.57%	18.91%	8.96%	-4.69%	—	—
FTSE RAFI® US 100 Real Estate[41]	FRUR	19.58%	18.89%	24.28%	5.90%	—	—
FTSE EPRA/NAREIT United States[42]	UNUS	14.09%	14.66%	21.63%	1.00%	—	—
Citi RAFI Sovereign Developed Markets Bond Index Master[43]	CRFDMU	5.02%	3.06%	4.64%	5.55%	7.61%	7.84%
Merrill Lynch Global Governments Bond Index II[44]	W0G1	2.90%	2.52%	4.40%	6.13%	6.72%	7.14%
Citi RAFI Sovereign Emerging Markets Local Currency Bond Index Master[45]	CRFELMU	12.97%	8.11%	—	—	—	—
JPMorgan GBI-EM Global Diversified[46]	JGENVUUG	12.70%	7.25%	—	—	—	—

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 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.