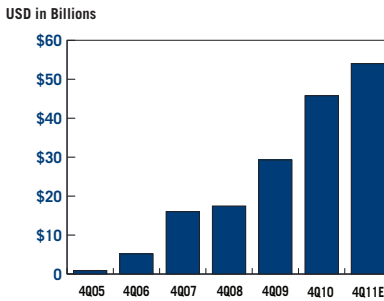


# Fundamentals



Jason Hsu, Ph.D.

## RAFI® Managed Assets\*



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



620 newport center drive, suite 900  
 newport beach, ca 92660 usa  
 phone +1 (949) 325-8700  
 fax +1 (949) 554-0192  
 info@rallc.com  
 www.rallc.com

### MEDIA CONTACTS

Tucker Hewes  
 Hewes Communications  
 +1 (212) 207-9451  
 tucker@hewescomm.com

Joel Chernoff  
 Research Affiliates  
 +1 (949) 325-8729  
 chernoff@rallc.com

## SHOULD YOU BE CONCERNED ABOUT THE U.S. GOVERNMENT DEBT?

With markets and news headlines reacting daily to the drama that is the European sovereign debt crisis, economic observers are emboldened in their claim that high government debt levels ultimately lead to disastrous outcomes (at least if you are a European Monetary Union member country without your own printing press). As investors, should we be concerned? What specifically makes high government debt-to-GDP bad? How much is “too much”? Does it matter who owns the debt? In this issue, we will review the basic economics of government debt financing to gain perspective on the consequences of high government debt levels.

### Government Debt Levels

In 2010, economists Carmen Reinhart and Kenneth Rogoff found that growth rates for countries display a strong negative relationship once their government debt-to-GDP ratios exceed 90%; below 90%, there seems to be little relationship between government debt and future growth.<sup>1</sup> As **Table 1** shows, many countries are near or at the “danger threshold” now. Unsurprisingly, Greece, Ireland, Italy, and Portugal are in that category. But Germany and

France, which anchor the European Monetary Union, are dangerously close to the threshold and, in fact, exhibit higher debt-to-GDP ratios than Spain. Japan, which has been the poster child for government deficit spending, has a 233% debt-to-GDP ratio. The United States and the United Kingdom, where government debt has dominated the political discussion, are at 100% and 81% respectively. We will not address issues related to the crowding out of the private sector by the government sector in this issue of *Fundamentals*.

Government debt is what a country’s government owes to domestic *and* foreign creditors.<sup>2</sup> The net foreign debt is the amount of debt the country owes to foreigners, netting out foreign assets, such as foreign securities held by its central bank, public and corporate pension schemes, and mutual funds.<sup>3</sup> Net foreign debt is often ignored in sovereign debt discussions, which is unfortunate as who owns the debt is an important factor in understanding the costs of indebtedness.

Let’s examine how countries stack up along these two debt dimensions. Within GIIPS, Italy appears to have a significantly less onerous net foreign debt

(at 24% of GDP) than might be suggested by its 121% government debt-to-GDP ratio. This fact suggests that the Italian private sector has been far more financially prudent and, as a result, has accumulated net foreign assets totaling nearly 100% of GDP. Similarly, the private sector holdings of foreign assets in the United Kingdom, France, Canada, and the United States very significantly offset the government indebtedness. Surprisingly, despite the frightful U.S. debt clock's constant reminder that each U.S. citizen is on the hook for more than \$48,000 of government debt, much of that is actually money that one household owes to another.

The much touted Japanese household frugality combined with the country's decades of trade surpluses has resulted in a net foreign investment of 56%; in effect, the Japanese private sector owns

233% of GDP in Japanese government bonds plus 56% of GDP in foreign assets. Similarly, the German private sector savings absorbs the equivalent of its government debt while owning 37% of GDP in foreign assets. Other examples include Singapore and Belgium, both of which register government debt-to-GDP ratios near 100% with net foreign investment of 224% and 45%, respectively.

### Digging into the Numbers: American Domestic Debt

On the surface, U.S. government debt equal to 100% of GDP is a cause for concern. Looking closer, we see the U.S. government owes 83% of its debt to Americans and 17% to foreigners (see Table 1). Stated this way, the government debt is somewhat less intimidating. What do these numbers really mean? Let's dig a bit deeper.

**Table 1. Government Debt and Net Foreign Debt as Measured in Percent of GDP, 2011**

Country	GDP Billion (USD)	Per Capita GDP	Govt. Debt as % of GDP	Govt. Debt Per Capita (USD)	Net Foreign Debt as % of GDP	Foreign Debt Per Capita (USD)
<b>GIIPS</b>						
Greece	312	27,875	166%	46,273	83%	23,164
Ireland	222	48,517	109%	52,884	98%	47,450
Italy	2,246	37,046	121%	44,826	24%	9,002
Portugal	242	22,699	106%	24,061	109%	24,628
Spain	1,536	33,298	67%	22,309	87%	29,002
<b>BRIC</b>						
Brazil	2,517	12,917	65%	8,396	38%	4,844
Russia	1,884	13,235	12%	1,548	-18%	-2,369
India	1,843	1,527	62%	947	10%	153
China	6,988	5,184	27%	1,400	-37%	-1,923
<b>European</b>						
Germany	3,629	44,556	83%	36,981	-37%	16,619
United Kingdom	2,481	39,604	81%	32,079	13%	5,267
France	2,808	44,401	87%	38,629	11%	4,840
Switzerland	666	84,983	52%	44,191	-136%	-115,662
Belgium	529	48,110	94%	45,223	-45%	-21,650
<b>Americas</b>						
United States*	15,065	48,147	100%	48,147	17%	8,185
Canada	1,759	51,147	84%	42,964	8%	3,990
Mexico	1,185	10,803	43%	4,645	36%	3,889
<b>Asia/Australia</b>						
Japan	5,855	45,774	233%	106,653	-56%	-25,679
Australia	1,507	66,984	23%	15,406	64%	43,071
Hong Kong	247	34,393	33%	11,350	-353%	-121,443
Taiwan	505	21,592	38%	8,205	-153%	-33,100
Singapore	266	50,714	93%	47,164	-224%	-113,701
South Korea	1,164	23,749	32%	7,600	18%	4,227

\*Includes intra-government debt; excluding intra-government debt, the figure is reported at 62% of GDP.  
Source: Research Affiliates based on data from the International Monetary Fund World Economic Outlook Database.

Ultimately, U.S. government debt must be paid for by future tax revenues (and thus by future American taxpayers). For simplicity, let's ignore the foreign debt for the time being. Using a naïve extrapolation, the current debt amounts to \$114,000 owed by each future taxpayer to the American savers (domestic holders of U.S. Treasury bonds). This means future American "taxpayers" will consume less of future American GDP than they help produce. This translates into a "transfer" of about \$12.5 trillion in consumption from future taxpayers to savers (future debt owners).

Loosely speaking, three parties split the American pie: (1) taxpayers, who convert after-tax labor income into consumption, (2) savers, who convert assets [i.e., withdraw bank deposits] into consumption, and (3) the government [and its service and welfare recipients]. For the government to consume more of today's goods and services, either the taxpayers or the savers must consume less. Any government spending gap must be filled by raising taxes or issuing debt. When debt issuance is the funding source, savers must save more and consume less. When taxes are the funding source, taxpayers receive less after-tax income and consume less.

Let's acknowledge that a key function of the U.S. government is to ensure that a certain amount of wealth transfer occurs to maintain an orderly society. Given that government expenditures must be funded, debt-financed spending is a "wealth transfer" from savers to taxpayers. In the future, as that debt is paid back through future tax revenues, the repayment becomes a "wealth transfer" from taxpayers back to savers. The substantial impact of the U.S. government debt today is in the reshuffling of the sharing in American production (GDP) between savers and taxpayers. If, on average, taxpayers are also savers, the net effect is zilch—that is, raising taxes and issuing more debt are largely equivalent! Under this equivalence, if you are opposed to issuing more government debt, you should also be opposed to more taxes and vice versa.

Many have lamented the inter-generational transfer effect of government debt. This effect is more nuanced than intuition might suggest, and the real impact is ultimately small.<sup>4</sup> It is true that future generations of taxpayers lack the political power to impose strict debt ceilings on the government (because they do not yet have the right to vote). As a result, government deficit spending has been on a precipitous rise while tax rates have actually declined. Interestingly, this financing scheme leads

to an increase in the wealth of the savers and a simultaneous increase in the consumption of the current taxpayers, while allowing the state to provide amply for the "have nots." One can hardly argue that this is a calamitous outcome. However, the analysis changes substantially, once we consider foreign debt and the possibility for domestic debt to be exchanged for imported goods and to become foreign debt.

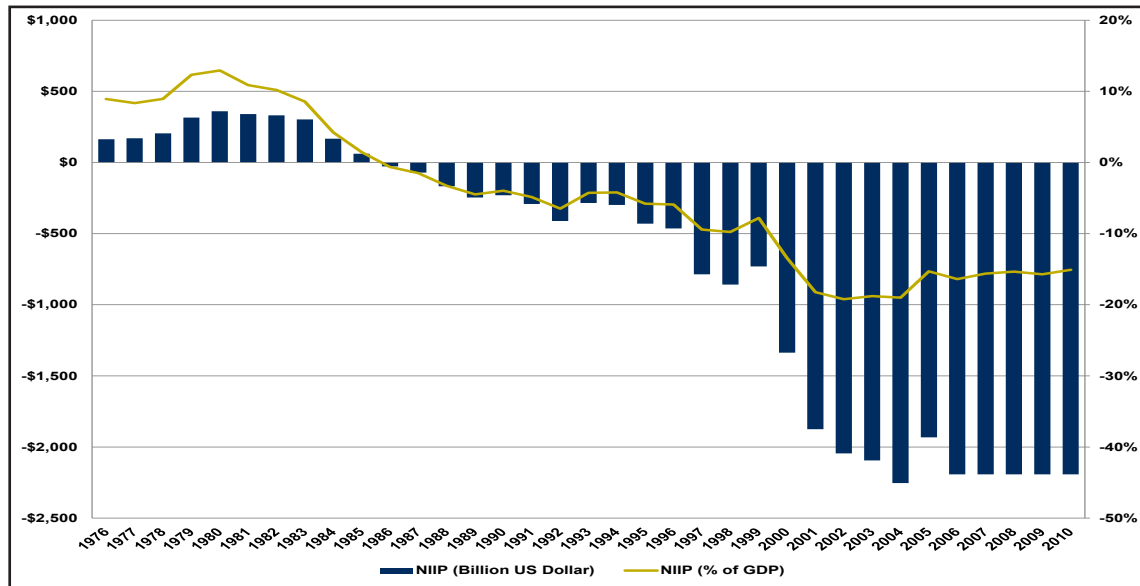
### Digging into the Numbers: American Foreign Debt

Over the past 30 years, the United States has swung from net foreign investment of +13% to a net debt of 17%, as can be seen in **Figure 1**. This dramatic shift means the United States has borrowed from foreigners to boost consumption by nearly 1% per annum. While U.S. GDP grew at nearly 4% per annum during this period, U.S. consumption increased by 5% per annum. The additional consumption was made possible by borrowing consumption from the young Asian working middle class.

This situation, however, is likely not sustainable. As Asia's asset-rich middle class begins to retire, they will begin to convert their savings in order to consume global goods, in effect, demanding the reversal of the trade surplus with the United States. The result could be a 1% headwind in consumption growth for Americans relative to GDP growth. U.S. GDP is already projected to slow from 4% to 3% due to aging demographics.<sup>5</sup> The combined effect of a reversal of the trade surplus and retirement of the Baby Boomers could mean a decline in consumption growth from 5% to 2% annually over a nearly 20-year span, which would be traumatic. The 17% in net foreign debt, while not quite as breathtakingly bad as Greece's 83%, is, nonetheless, no small matter. By comparison, Japan, with a net foreign investment of +56% can offset very significantly its unenviable demographics headwind.

Ultimately, it is the net foreign debt, built up from years of trade deficits, which actually ties future generations to the sins of our current excess consumption. We must understand the danger of high domestic debt in that context as well. American savers may decide to liquidate their savings to buffer their retirement consumption. Clearly, non-savers are in no position to be buyers of trillions of dollars in Treasury bonds or to give

Figure 1. U.S. Net Foreign Debt as Measured by Net International Investment Position (NIIP)



Source: Research Affiliates, LLC, based on data from U.S. Bureau of Economic Analysis.

up the equivalent amount in consumption. Foreign buyers must come in to clear the trade (exporting more consumer goods to Americans in exchange for more U.S. debt), resulting in an increase in the U.S. net foreign debt. Even a partial conversion of the American investment portfolio into retirement consumption could easily take U.S. net foreign debt to well above 50% of GDP over the next 10 years.<sup>6</sup> Future generations of Americans will have to share a much more significant portion of the GDP they produce with the Asians, resulting in an even more terrifying decline in future American consumption.

### Conclusion

So, what are we to make of the government debt level, which stands at nearly 100% of GDP? The part that corresponds to foreign debt tells us how much of our future GDP we must share with foreigners. The larger our net foreign debt level is, the less of the fruit-of-their-own-labor our children will

consume. Insofar that we have added 30% to our net foreign debt in the past 30 years, the Boomers and their government have indeed robbed future generations. There are reasons to believe that as Boomers retire, the trade deficit will accelerate and cause a continual deterioration of the U.S. net foreign debt.

The domestic component, which accounts for 83% of the government debt, carries a far more ambiguous interpretation. In the worst of situations, a substantial part of the domestic debt converts into foreign debt, which further erodes the future standard of living for Americans. In the best of situations, it forecasts how much future political and social bickering will result as savers and non-savers, taxpayers and non-taxpayers, and bankers and Occupy Wall-Streeters fight over their interpretation of the equitable sharing of the American pie—but then again, that’s almost always true regardless of the level of government debt.

### Endnotes

1. Reinhart, Carmen M., and Kenneth S. Rogoff. 2010. "Growth in a Time of Debt." *American Economic Review*, vol. 100, no. 2 (May):573–578.
2. For simplicity, we report the International Monetary Fund's 2011 estimation without any further modification. The reported amount can often understate or fail to properly include debt of the local governments and related government agencies. Additionally, the aggregate numbers for countries vary significantly from one source to the other.
3. In this article, we use Net International Investment Position (NIIP) as an estimate of the net foreign debt. Again, this number is estimated with a high degree of noise.
4. While the socioeconomic transfer impact is small, the negative impact on aggregate future production is not negligible by any means. I refrain from further complicating this by discussing impacts on growth due to the crowding out of the private sector by the public sector.
5. Arnott, Robert D., and Denis B. Chaves. 2012. "Demographic Changes, Financial Markets, and the Economy." *Financial Analysts Journal*, vol. 68, no. 1 (January/February):23–46.
6. Currently, the U.S. trade deficit runs at 4.3% of GDP; we would reach 50% net foreign debt to GDP in less than eight years. In this simple calculation, we ignore the possibility that U.S. foreign investments could produce significantly better returns than the interest yield on its debt.



# Performance Update

## FTSE RAFI® Equity Index Series\*

TOTAL RETURN AS OF 2/29/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
FTSE RAFI® All World 3000 <sup>1</sup>	TFRAW3	10.89%	-4.66%	28.14%	1.92%	9.89%	19.18%
MSCI All Country World <sup>2</sup>	GDUEACWF	11.22%	-0.96%	24.35%	0.60%	6.25%	17.50%
FTSE RAFI® Developed ex US 1000 <sup>3</sup>	FRX1XTR	11.87%	-10.65%	23.01%	-1.35%	8.77%	20.49%
MSCI World ex US Large Cap <sup>4</sup>	MLCUWXUG	11.15%	-7.34%	20.40%	-1.77%	6.77%	18.62%
FTSE RAFI® Developed ex US Mid Small <sup>5</sup>	TFRDXXUS	11.94%	-4.91%	30.24%	2.25%	14.41%	18.97%
MSCI World ex US Small Cap <sup>6</sup>	GCUDWXUS	14.42%	-6.50%	28.78%	-0.96%	11.34%	20.57%
FTSE RAFI® Emerging Markets <sup>7</sup>	TFREMU	19.33%	-1.23%	34.73%	9.66%	21.91%	24.89%
MSCI Emerging Markets <sup>8</sup>	GDUEEGF	18.05%	0.19%	32.65%	6.51%	15.53%	24.41%
FTSE RAFI® 1000 <sup>9</sup>	FRI0XTR	8.27%	2.11%	32.79%	2.56%	6.35%	18.27%
Russell 1000 <sup>10</sup>	RUI0INTR	9.48%	4.86%	26.25%	1.77%	4.63%	16.18%
S&P 500 <sup>11</sup>	SPTR	9.00%	5.12%	25.56%	1.58%	4.17%	15.95%
FTSE RAFI® US 1500 <sup>12</sup>	FRI5USTR	11.05%	-1.45%	39.40%	4.84%	10.98%	22.83%
Russell 2000 <sup>13</sup>	RU20INTR	9.63%	-0.15%	29.48%	1.83%	7.00%	21.10%
FTSE RAFI® Europe <sup>14</sup>	TFREUE	8.72%	-10.27%	20.35%	-3.22%	3.61%	19.21%
MSCI Europe <sup>15</sup>	GDDLE15	8.10%	-4.17%	19.16%	-2.84%	2.05%	16.76%
FTSE RAFI® Australia <sup>16</sup>	FRAUSTR	5.52%	-6.69%	14.56%	-0.85%	7.07%	13.14%
S&P/ASX 200 <sup>17</sup>	ASA51	7.09%	-6.57%	13.67%	-1.64%	6.88%	13.39%
FTSE RAFI® Canada <sup>18</sup>	FRCANTR	6.12%	-6.96%	22.32%	3.62%	9.04%	14.10%
S&P/TSX 60 <sup>19</sup>	TX60AR	5.91%	-9.24%	16.77%	1.96%	7.55%	14.49%
FTSE RAFI® Japan <sup>20</sup>	FRJPNTR	15.38%	-12.33%	6.84%	-11.05%	1.54%	18.75%
MSCI Japan <sup>21</sup>	GDDLJN	15.51%	-11.09%	5.49%	-12.51%	-0.61%	18.36%
FTSE RAFI® UK <sup>22</sup>	FRGBRTR	6.09%	0.47%	21.14%	1.92%	5.68%	17.08%
MSCI UK <sup>23</sup>	GDDLUK	5.98%	1.64%	19.73%	2.68%	4.93%	15.11%

\*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).

## Russell Fundamental Index® Series\*

TOTAL RETURN AS OF 2/29/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
Russell Fundamental Global Index Large Company <sup>24</sup>	RUFGLTU	10.70%	-2.23%	26.50%	2.74%	9.98%	17.86%
MSCI All Country World Large Cap <sup>25</sup>	MLCUAWOG	11.01%	-0.74%	23.55%	0.64%	5.72%	17.17%
Russell Fundamental Developed ex US Index Large Company <sup>26</sup>	RUFDLTU	11.73%	-9.43%	20.72%	-0.15%	10.35%	18.91%
MSCI World ex US Large Cap <sup>27</sup>	MLCUWXUG	11.15%	-7.34%	20.40%	-1.77%	6.77%	18.62%
Russell Fundamental Developed ex US Index Small Company <sup>28</sup>	RUFSDTU	12.14%	-4.33%	27.66%	1.47%	13.64%	18.56%
MSCI World ex US Small Cap <sup>6</sup>	GCUDWXUS	14.42%	-6.50%	28.78%	-0.96%	11.34%	20.57%
Russell Fundamental Emerging Markets <sup>29</sup>	RUFGETRU	19.30%	1.95%	36.39%	10.98%	21.27%	24.67%
MSCI Emerging Markets <sup>8</sup>	GDUEEGF	18.05%	0.19%	32.65%	6.51%	15.53%	24.41%
Russell Fundamental US Index Large Company <sup>30</sup>	RUFUSLTU	8.32%	4.40%	29.64%	3.32%	6.96%	16.77%
Russell 1000 <sup>10</sup>	RUI0INTR	9.48%	4.86%	26.25%	1.77%	4.63%	16.18%
S&P 500 <sup>11</sup>	SPTR	9.00%	5.12%	25.56%	1.58%	4.17%	15.95%
Russell Fundamental US Index Small Company <sup>31</sup>	RUFUSSTU	11.47%	0.83%	39.28%	6.06%	11.57%	21.52%
Russell 2000 <sup>13</sup>	RU20INTR	9.63%	-0.15%	29.48%	1.83%	7.00%	21.10%
Russell Fundamental Europe <sup>32</sup>	RUFEUETE	10.06%	-6.75%	21.33%	-0.74%	6.42%	18.11%
MSCI Europe <sup>15</sup>	GDDLE15	8.10%	-4.17%	19.16%	-2.84%	2.05%	16.76%

\*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).

## Fixed Income/Alternatives

TOTAL RETURN AS OF 2/29/12	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
RAFI® Bonds Investment Grade Master <sup>33</sup>		2.74%	11.12%	13.24%	7.87%	6.79%	6.05%
ML Corporate Master <sup>34</sup>	COAO	3.05%	9.75%	13.73%	6.78%	6.48%	6.23%
RAFI® Bonds High Yield Master <sup>35</sup>		5.22%	9.42%	24.35%	10.38%	9.95%	10.93%
ML Corporate Master II High Yield BB-B <sup>36</sup>	HOA4	4.67%	6.94%	20.92%	7.21%	8.29%	9.84%
RAFI® US Equity Long/Short <sup>37</sup>		-0.43%	-7.67%	17.08%	1.26%	4.77%	11.70%
1-Month T-Bill <sup>38</sup>	GB1M	0.00%	0.04%	0.08%	1.06%	1.73%	0.49%
FTSE RAFI® Global ex US Real Estate <sup>39</sup>	FRXR	17.19%	-7.89%	32.58%	—	—	—
FTSE EPRA/NAREIT Global ex US <sup>40</sup>	EGXU	18.24%	-1.83%	28.75%	—	—	—
FTSE RAFI® US 100 Real Estate <sup>41</sup>	FRUR	7.66%	0.67%	49.90%	—	—	—
FTSE EPRA/NAREIT United States <sup>42</sup>	UNUS	5.43%	5.23%	42.48%	—	—	—
Citi RAFI® Sovereign Developed Markets Bond Index Master <sup>43</sup>	CRFDMU	2.60%	7.91%	8.92%	7.01%	8.97%	7.94%
Merrill Lynch Global Governments Bond Index II <sup>44</sup>	WGT1	0.43%	6.92%	7.69%	7.11%	7.97%	7.29%
Citi RAFI® Sovereign Emerging Markets Local Currency Bond Index Master <sup>45</sup>	CRFELMU	9.38%	—	—	—	—	—
JPMorgan GBI-EM Global Diversified <sup>46</sup>	JGENVUUG	10.49%	—	—	—	—	—



**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 1,000 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/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 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.

©2012 Research Affiliates, LLC. The material contained in this document is for general information purposes only. It relates only to a hypothetical model of past performance of the Fundamental Index® strategy itself, and not to any asset management products based on this index. No allowance has been made for trading costs or management fees which would reduce investment performance. Actual results may differ. This material is not intended as an offer or a solicitation for the purchase and/or sale of any security or financial instrument, nor is it advice or a recommendation to enter into any transaction. This material is based on information that is considered to be reliable, but Research Affiliates® and its related entities (collectively "RA") make this information available on an "as is" basis and make no warranties, express or implied regarding the accuracy of the information contained herein, for any particular purpose. RA is not responsible for any errors or omissions or for results obtained from the use of this information. Nothing contained in this material is intended to constitute legal, tax, securities, financial or investment advice, nor an opinion regarding the appropriateness of any investment. The general information contained in this material should not be acted upon without obtaining specific legal, tax or investment advice from a licensed professional. Indexes are not managed investment products, and, as such cannot be invested in directly. Returns represent back-tested performance based on rules used in the creation of the index, are not a guarantee of future performance and are not indicative of any specific investment. Research Affiliates, LLC is an investment adviser registered under the Investment Advisors Act of 1940 with the U.S. Securities and Exchange Commission (SEC).

The RAFI® US Equity Long/Short Index is calculated by Dow Jones Indexes, the marketing name and a licensed trademark of CME Group Index Services LLC ("CME Indexes"). "Dow Jones Indexes" is a service mark of Dow Jones Trademark Holdings LLC ("Dow Jones"). The RAFI® US Investment Grade Bond Index and RAFI® US High Yield Bond Index is calculated by ALM Research Solutions, LLC in conjunction with Research Affiliates, LLC. All rights and interests in the RAFI® US Investment Grade Bond Index and the RAFI® US High Yield Bond Index vest in Research Affiliates, LLC. All rights in and to the Research Affiliates, LLC Fundamental Index® concept used in the calculation of the RAFI® US Investment Grade Bond Index and the RAFI® US High Yield Bond Index vest in Research Affiliates, LLC. The above RAFI® indexes are not sponsored or promoted by CME Indexes, ALM Research Solutions, LLC or their respective affiliates.

Neither CME Indexes, ALM Solutions, nor Research Affiliates, LLC make any warranties, express or implied, to any of their customers nor anyone else regarding the accuracy or completeness of any data related to the RAFI® US Equity Long/Short Index, RAFI® US Investment Grade Bond Index, or the RAFI® US High Yield Bond Index. All information is provided for information purposes only. Neither CME Indexes, ALM Solutions, LLC, nor Research Affiliates, LLC accept any liability for any errors or any loss arising from the use of information in this publication.

Russell Investments is the source and owner of the Russell Index data contained or reflected in this material and copyrights related thereto. Russell Investments and Research Affiliates, LLC have entered into a strategic alliance with respect to the Russell Fundamental Indexes. Subject to Research Affiliates, LLC's intellectual property rights in certain content, Russell Investments is the owner of all copyrights related to the Russell Fundamental Indexes. Russell Investments and Research Affiliates, LLC jointly own all trademark and service mark rights in and to the Russell Fundamental Indexes. Research Affiliates, LLC is the owner of the trademarks, service marks, patents and copyrights related to the Fundamental Index and the Fundamental Index methodology. The presentation may contain confidential information and unauthorized use, disclosure, copying, dissemination, or redistribution is strictly prohibited. This is a presentation of Research Affiliates, LLC. Russell Investments is not responsible for the formatting or configuration of this material or for any inaccuracy in Research Affiliates' presentation thereof.

The trade names Fundamental Index®, RAFI®, the RAFI logo, and the Research Affiliates® corporate name and logo are registered trademarks and are the exclusive intellectual property of RA. Any use of these trade names and logos without the prior written permission of RA is expressly prohibited. RA reserves the right to take any and all necessary action to preserve all of its rights, title and interest in and to these marks. Fundamental Index® concept, the non-capitalization method for creating and weighting of an index of securities, is patented and patent-pending proprietary intellectual property of RA. (US Patent No. 7,620,577; 7,747,502; 7,792,719; 7,778,905; and 8,005,740; Patent Pending Publ. Nos. US-2007-0055598-A1, US-2008-0288416-A1, US-2010-0191628, US-2010-0262563, WO 2005/076812, WO 2007/078399 A2, WO 2008/118372, EPN 1733352, and HK1099110).

The views and opinions expressed are those of the author and not necessarily those of Research Affiliates, LLC. The opinions are subject to change without notice.

