SMART BETA

The Second Generation of Index Investing

By Vitali Kalesnik, PhD

In 1976, under the leadership of Jack Bogle, Vanguard started a revolution in the asset management industry: It launched the first index mutual fund. Other firms followed suit, and in the final quarter of the 20th century the idea of earning the market return through low-cost indexing changed the way investors saw the world. This was the first generation of index investing.

In 2005, an article written by Rob Arnott, Jason Hsu, and Philip Moore started the second generation of indexing. "Fundamental Indexation," published in the *Financial Analysts Journal*, recognized that traditional indexes, with stocks weighted by market capitalization, hold large positions in high-priced stocks—undoubtedly including overpriced stocks—and smaller positions in stocks that might be undervalued. In the long run, they found, capitalization weighting leads to a return drag. Arnott et al. (2005) suggested an alternative index design, where company weight is proportional to the companies' accounting fundamentals, which do not depend upon current market values.

Fundamentals-weighted indexing leads to a long-term return advantage averaging historically about 200 basis points per annum in the United States and more in the less-developed markets. At the same time, fundamentals-weighted indexes share many desirable features with cap-weighted indexes. For instance, they are transparent, broadly representative, and, importantly, cost-effective. The objective of the first generation of index investing was to generate a return equal to the before-fees return of the average active manager and deliver it to investors without the costs associated with active management. The second generation of indexing seeks to earn long-term returns on a par with highly skilled managers, and to deliver those returns well below the costs of active management.

Cap Weighting in the Tech Bubble and the Global Financial Crisis

First-generation index funds track capitalization-weighted indexes. The use of market capitalization as the determinant of position size is both a blessing and a curse. The index allocates more to the larger stocks, resulting in high capacity and very low implementation costs—this is the blessing. But capitalization is a function of price. If a stock were to become overpriced, its capitalization also would go up, and so would its weight in a cap-weighted index. This is the curse, because overweighting overpriced stocks and underweighting underpriced stocks leads to a return drag.

There are periods when stock prices are propelled by investors' emotions. These emotions can be described as overoptimism, which prevailed during the dot-com bubble, and fear, which abounded during the global financial crisis. In such periods it's easy to see that the link between reason and stock valuation is quite fragile. Table 1 tracks the price evolution of a prominent network provider during the tech bubble and a major financial services company during the global financial crisis.

Cisco Systems was a star of the tech world at the turn of the century. In 1999 Cisco was overpriced and overweighted in the capitalization-weighted index. In March 1999, its weight was 1.7 percent of the Russell 1000® large-cap index while Cisco's economic footprint was only about 0.1 percent of the U.S. economy.[1] In the coming year the company became even more overpriced. Cisco's price-to-earnings (P/E) ratio went from an alarming 81.8 in 1999 to an absurd 181.9 in 2000; and as the stock grew more overpriced, its weight in the cap-weighted index rose, likewise, from an alarming 1.7 percent in 1999 to an absurd 4.1 percent in 2000. Investors subsequently tempered

Table 1: Two Stocks in Capitalization-Weighted Indexes

	Holding Data as of March 31			
Tech Bubble	**1999**	**2000**	**2001**	**2002**
Cisco Systems				
Percent in Russell 1000® Index	1.7%	4.1%	1.1%	1.3%
Percent of Economy	0.1%	0.2%	0.3%	0.4%
P/E Ratio	81.8	181.9	25.1	22.0
Global Financial Crisis	**2007**	**2008**	**2009**	**2010**
Barclays				
Percent in FTSE UK 100 Index	3.1%	2.1%	0.8%	2.7%
Percent of Economy	2.8%	3.1%	3.1%	3.5%
P/E Ratio	10.0	6.6	2.5	12.6

Source: Research Affiliates

their enthusiasm and stock valuations returned to more reasonable levels. In March 2001 Cisco already was trading at P/E of 25.1, and a year later at P/E of 22.0. Cisco Systems concretely demonstrates that if a security is overpriced in the market it is overweighted in a cap-weighted index. As overpriced, overweight stocks return to more normal valuations, they detract from the index return.

The opposite happens when a stock is underpriced. During the global financial crisis, many banks' stock prices manifested the fears of market participants. For example, in 2007 Barclays had a weight of 3.1 percent in the FTSE UK 100 index. Barclays is a big bank, and its footprint was 2.8 percent of the U.K. economy. As the financial crisis swept through the market, Barclays' weight in the cap-weighted index dropped to 2.1 percent in March 2008 and a low of 0.8 percent a year later. This reduction in weight was accompanied by a significant shrinkage in P/E, which declined from 10 in 2007 to 2.5 in 2009. Then, Barclays was trading at a rock-bottom valuation. It was a great buy precisely when it had the lowest weight in the cap-weighted index. As investors' fears abated the price of Barclays went up. The stock was becoming less attractive from the valuation perspective, but its weight in the index was growing.

How Weighting by Fundamentals Adds Value

Fundamentals-weighted indexes belong to a category that is variously identified as smart beta (our preference), strategy indexes, or alternative indexes. The term "smart beta" was coined by Towers Watson. In coming up with the term, the consultants from Towers Watson meant that investors need to be "smart" about these "betas"; no disrespect for traditional betas was intended.

What smart beta indexes have in common is weighting constituents by measures that are unrelated to stock prices. Because financial accounting values are a good proxy for company size, the Fundamental Index® methodology results in a highly investable portfolio broadly representative of the regional or national economy in which the companies participate. Because financial accounting values do not contain current company prices, the Fundamental Index methodology effectively breaks the link between price and company weight. The fundamentals-weighted index first developed by our firm used four measures of size: five-year averages of cash flow, sales, dividends, and the most recent book value of shareholders' equity.

A company's market capitalization—shares outstanding multiplied by share price—reflects both the hard, objective reality of the company's economic size and the soft, subjective opinions of market participants about its fair value. Even allowing for the exercise of professional judgment in the application of financial accounting principles, company fundamentals are significantly less prone to misvaluation. Fact-based, they dispassionately reflect the company's economic footprint. This makes fundamentals a much more stable anchor for indexation. Moreover, by breaking the link between price and weight, it frees the index from the return drag inherent in cap-weighted indexing. Table 2 demonstrates how fundamentals-weighted indexes can add long-term value in major equity markets.

Table 2: Simulated Performance of Fundamental Index Strategies

	Periods Ended December 31, 2013			
	Return %	Volatility %	Value Added %	Start Date
FTSE RAFI 1000	11.8	15.3	2.0	1962
S&P 500	9.8	15.0		
FTSE RAFI – 23 Country Average	12.9	16.2	2.1	1984
MSCI – 23 Country Average	10.8	15.6		
FTSE RAFI Developed ex US M/S 1500	12.4	18.0	2.8	2001
MSCI EAFE Small Cap	9.6	19.6		
FTSE RAFI All World 3000	11.7	15.6	3.8	1988
MSCI AC World	8.0	15.5		
FTSE RAFI US 1500	15.9	19.4	3.8	1979
Russell 2000	12.1	19.8		
FTSE RAFI Emerging Markets	12.9	25.1	7.2	1994
MSCI EM	5.7	23.8		

Source: Research Affiliates using data from FactSet

In the most-established, most-efficient markets, switching from capitalization-weighted to fundamentals-weighted indexes generates on average about 200 basis points extra return per annum. In less-developed markets, the mispricing tends to be more severe, resulting in a greater return drag from cap weighting. The estimated value added is about 300–400 basis points in the broad developed markets and their small-cap segments; it goes up to more than 700 basis points in the emerging markets.

The source of long-term outperformance is not magical. Relative to capitalization-weighted indexes, fundamentals-weighted indexes underweight the stocks that are most in favor and overweight those that are most feared. They consistently trade against market sentiment and get rewarded for doing it. This contrarian strategy is hard for active managers to embrace, in part because it isn't always easy to tell clients that stocks that everybody loves should be sold and in part because fundamentals-weighted indexes may experience sustained

periods of underperformance before misvaluations are corrected. But standing opposite the crowd is an investment posture that potentially earns substantial long-term rewards.

Comparative Investment Properties

Both capitalization- and fundamentals-weighted indexes base company exposures on size, and an investor who examines the holdings of two such indexes will see many of the same names. Table 3 displays, side by side, the top 20 holdings of the fundamentals-weighted FTSE RAFI US 1000 index and the cap-weighted Russell 1000 index. Fourteen companies are among the top 20 holdings of both indexes. They are highlighted with bold font.

Interestingly, Google is missing from the FTSE RAFI US 1000 top-20 list, and Intel is missing from the Russell 1000 top-20 list. Google is a glamorous, fast-growing technology company that fascinates market participants. Intel, by contrast, has struggled for a competitive position in the mobile devices market, and it causes a certain discomfort among the investing public. Fundamentals-weighted indexes are happy to ignore the glamour stocks and do not mind buying the high-discomfort stocks. It is by shying away from the former and favoring the latter that fundamentals-weighted indexes add value relative to their cap-weighted counterparts.

It is also instructive to compare the sector and country allocations of indexes constructed in accordance with the two weighting methods. Figure 1 displays similar cap- and fundamentals-weighted indexes' allocations over time. Figure 1A presents the economic sector weights of the cap-weighted benchmark (left) and the fundamentals-weighted FTSE RAFI US 1000 index (right). Figure 1B shows the country allocations of the cap-weighted benchmark (left) and the fundamentals-weighted FTSE RAFI All World 3000 index (right).

We can learn two lessons from figure 1. First, on average the allocations to sectors and countries are quite similar. Second,

Table 3: Top 20 Holdings (December 31, 2013)

FTSE RAFI US 1000 Index		Russell 1000 Index	
Company	**Weight %**	**Company**	**Weight%**
Exxon Mobile	2.9	**Apple**	2.8
Bank of America	2.3	**Exxon Mobil**	2.4
General Electric	2.0	**Microsoft**	1.6
JPMorgan Chase & Co.	1.8	Google	1.6
Chevron Corporation	1.7	**General Electric**	1.5
AT&T	1.7	**Johnson & Johnson**	1.4
Citigroup	1.6	**Chevron Corporation**	1.3
Wells Fargo & Co.	1.5	**Procter & Gamble**	1.2
ConocoPhillips	1.3	**JPMorgan Chase & Co.**	1.2
Pfizer	1.3	**Wells Fargo & Co.**	1.2
Verizon Communications	1.2	**Berkshire Hathaway**	1.1
Microsoft	1.1	**Pfizer**	1.1
Johnson & Johnson	1.1	IBM	1.0
Berkshire Hathaway	1.1	**AT&T**	1.0
Procter & Gamble	1.0	**Bank of America**	0.9
Wal-Mart	0.9	**Citigroup**	0.8
Apple	0.9	Coca-Cola	0.8
Intel	0.8	Merck & Co.	0.8
Hewlett-Packard	0.8	Amazon.com	0.8
AIG	0.8	Philip Morris Int'l Inc.	0.8

Source: Research Affiliates

cap-weighted index allocations tend to oscillate more; the sector and country exposures of fundamentals-weighted indexes appear to be more stable. And the biggest oscillations are easy to identify as the biggest bubbles. For instance, the tech bubble of the turn of the century shows as a spike in figure 1A (left), and the Japanese upsurge of the late 1980s is clearly visible in figure 1B (left). These changes are considerably less dramatic in the corresponding sections of the right-hand charts.

Why Not Choose a Value Index?

The fundamentals-weighted index has a value feel. How does it relate to other value strategies?

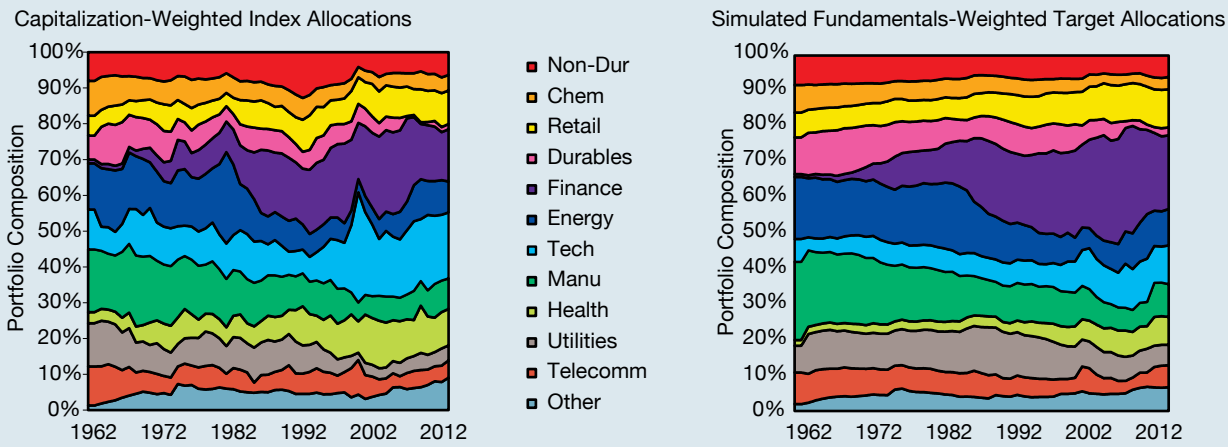
The methodology, of course, is different. Fundamentals-weighted indexes do not explicitly screen and select stocks on the basis of financial ratios such as book-to-market, earnings-to-price, or dividend yield. Instead they invest in proportion to companies' accounting measures of size. However, when compared to broad capitalization-weighted indexes they favor stocks with stronger fundamentals and weaker prices. Naturally, this gives a value tilt to the portfolio. Nonetheless, the index construction methodology and rebalancing procedure lead to significant differences. Figure 2 compares the performance of a fundamentals-weighted index, the FTSE RAFI US 1000 index, to the performance of two cap-weighted indexes: a value index and a broad market index.

Figure 2 shows that the fundamentals-weighted index outperformed the value index, and both outperformed the broad market index, over the 35-year measurement period. Table 4 provides additional information about the simulated performance record.

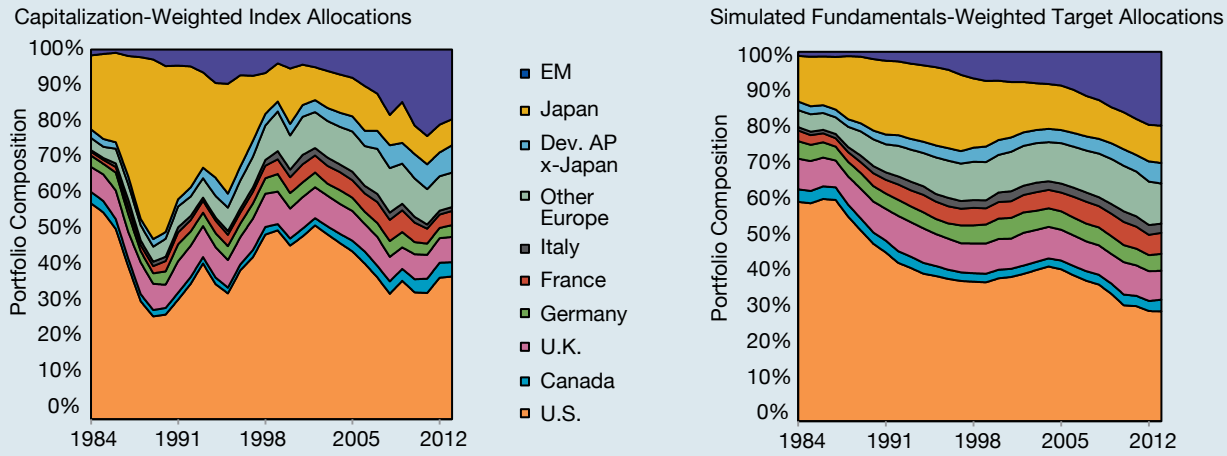
Table 4 confirms that the hypothetical fundamentals-weighted index handily beat the value index. Its value added over the broad market benchmark, the S&P 500 index, was

Figure 1: Comparative Sector and Country Exposures

A. Sector Allocations, 1962–2013

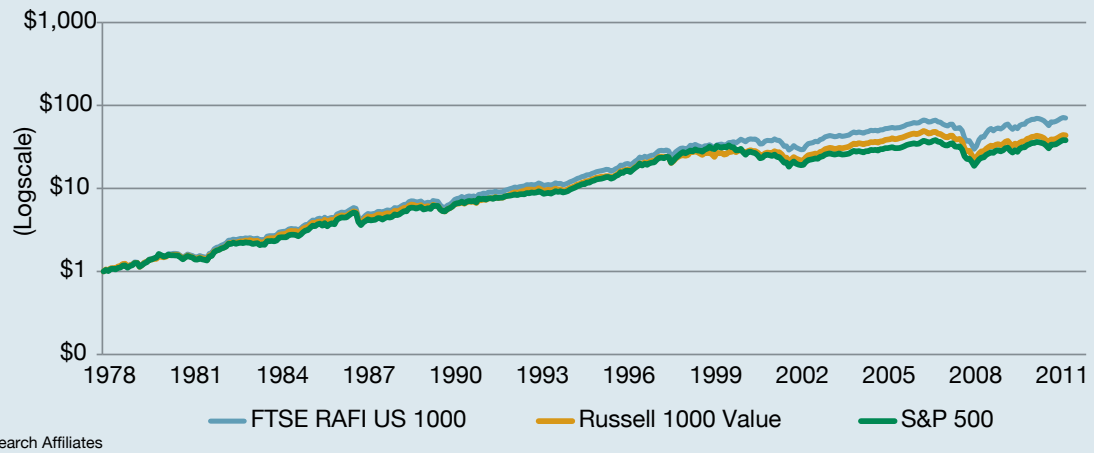


B. Country Allocations, 1984–2013



Source: Research Affiliates using data from FactSet

Figure 2: Simulated Growth of a Dollar (1979–2013)



Source: Research Affiliates

Table 4: Simulated Risk and Return Measures (1979–2013)

Index	Return	Volatility	Value Added	Tracking Error	Value Risk Loading (HML)
FTSE RAFI US 100	14.1%	15.5%	2.2%	4.5%	0.36
Russell 1000 Value	12.5%	14.8%	0.5%	4.7%	0.39
S&P 500	12.0%	15.3%			

Source: Research Affiliates.

2.2 percent in this time period, while the value index only outperformed by 0.5 percent. Was the fundamentals-weighted index simply providing more "value risk" exposure? Table 4 uses a measure called "HML," widely used in the academic literature, to compare how much value risk the two indexes accepted. The FTSE RAFI US 100 and the Russell 1000 Value indexes had very similar exposures to value risk as estimated by the HML measure.

Then how does a fundamentals-weighted index add value? We have seen that it effectively has an embedded value strategy. However, it differs from how other value indexes and many value managers access the value premium. Unlike other value strategies, fundamentals-weighted indexing does not assume that the value premium is compensation for some kind of value risk. Rather, the Fundamental Index construction methodology assumes that securities are mispriced and that prices eventually revert toward their long-term averages.

This subtle, seemingly philosophical point can make a big difference. If value is driven by mispricing, and not by risk, then many traditional value managers make two mistakes that significantly hinder them from capturing the entire value premium.

The first mistake is assuming it is enough to select value companies and assign them capitalization-based weights in the belief that the well-established correlation across value stocks will generate an added return to compensate for value risk. Capitalization weighting gives the smallest allocation to the cheapest stock; if, as we have found, the return is driven by mispricing, then cap-weighted indexes will not derive the full benefit from value stocks' price appreciation. In our earlier example, Barclays would have a small position in a cap-weighted value portfolio, even though it was very cheap at the bottom of the global financial crisis. Fundamentals-weighted indexing would avoid making this first mistake by allocating a relatively stable weight in proportion to the bank's economic footprint.

Figure 3: Time-Varying Value Exposure (December 2005-November 2013)

Source: Research Affiliates

The second mistake typically made by cap-weighted indexers and traditional value managers is trying to maintain a constant value loading over time. Some managers, in fact, explicitly try to keep their tracking error within a very narrow range. This logic makes sense if you believe that the value premium is based upon risk and is constant over time—in other words, that investors always have the same sensitivity to this supposed risk. If, on the other hand, you recognize that the value premium is driven by mispricing, then it is natural to assume that the degree of market mispricing can vary over time. An efficient value strategy would increase the value exposure when the mispricing is greatest.

Several studies, notably the work of Asness et al. (2000) and Cohen et al. (2001), demonstrate that the value premium is time varying. They also show that certain measures that purportedly reflect the degree of mispricing, such as the dispersion of valuation multiples, are helpful in forecasting the prospective value premium.

The Fundamental Index approach is a simple strategy that can generate sophisticated dynamics. It turns out that fundamentals-weighted indexes tend to increase their value exposure relative to their cap-weighted counterparts at times when mispricing and buying opportunities increase.

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Fundamentals-weighted indexes have a tendency to go deeper into value when the value outlook is favorable and become more growth-like amid fewer mispricing opportunities. Using a measure based upon the price-to-book value ratio, figure 3 shows how a Fundamental Index strategy dynamically increases and reduces its value exposure over time. In contrast, the value exposure of the cap-weighted index is significantly more invariant. Figure 3 also shows that the fundamentals-weighted index on average has a bigger discount. It pays less per unit of a company's hard fundamentals compared to a capitalization-weighted value index.

Conclusion

The first generation of index investing had as its investment objective to capture the average returns of the market and deliver them to the ultimate investor with minimal shortfalls due to management fees or transaction costs. The Fundamental Index approach, a smart beta strategy, is the second generation. It no longer seeks to earn average returns. It recognizes that markets are less than fully efficient; there are mispricing opportunities. Cap-weighted indexes unavoidably overweight overpriced stocks and underweight underpriced stocks. By assigning stocks nonprice-related weights, fundamentals-weighted indexes can cost-effectively deliver significant long-term return advantages on a par with those earned by highly skilled, highly compensated active managers. Investors are the beneficiaries.

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Endnotes

1. In the Fundamental Index approach, a company's weight in the index reflects its economic size, estimated on the basis of key accounting measures.

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