Fundamentals

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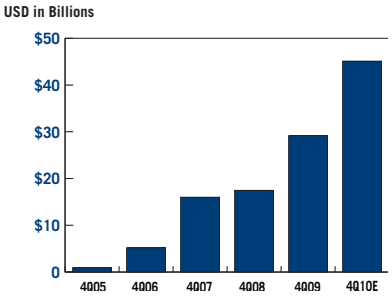
RAFI® Managed Assets*



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"LITTLE THINGS MAKE BIG THINGS HAPPEN"[1]

Last June, we lost arguably the greatest coach the sporting world will ever see when John Wooden passed away three months shy of his 100th birthday. His track record was staggering—a record 10 national championships (including seven consecutive), 16 Final Fours, a record 88-game winning streak from 1971–73, and 8 undefeated perfect conference seasons.[2] But his reach extends far beyond college basketball as his teachings formed the basis for several books about achieving success in life and business (a few of which can be seen in bookcases at Research Affiliates).

How did this paradigm of success begin the first practice of each new season? Perhaps some fundamental drills on dribbling, passing, and shooting? Actually, it began with socks. Asking all of his players to remove their shoes and socks, a bare-footed Wooden would proceed to instruct them on how to put on their socks and lace up their sneakers properly. Wooden explained that "…sweat socks, put on correctly, reduce the chance of blisters, which, in turn, ensures that a player can rebound—or shoot free throws or play defense—free from pain or distraction."[3] Such attention to detail was a hallmark of Wooden's achievements. "These seemingly trivial matters, taken together and added to many, many other so-called trivial matters build into something very big: namely, your success."[4]

Last month, we showed that five years of "live" results corroborate decades of similar empirical results for the Fundamental Index® methodology. Closing in on $50 billion in global assets, RAFI® investors and their advisers are sending a strong message that Fundamental Index portfolios merit strong consideration as a core holding. But success brings competition. New alternative beta variants have multiplied nearly as fast as assets invested in these strategies in recent years. Given the alternatives, one might ask, *"What characteristics maximize the efficiency of a fundamentally weighted implementation?"* In this issue we outline three seemingly innocuous construction details of the Fundamental Index methodology that can have sizeable impacts on performance.

Smoothing Fundamental Measures—Avoiding "Back Door" Price Influences

People are often surprised when we explain that our Fundamental Index methodology utilizes trailing five years of financial data to determine fundamental weights.[5] Why give any weight to 2006 data when we already have data from 2010? We understand that individual companies often experience results in a given year that are far ahead or far behind where they were five years ago. Google and Ford provide two vivid examples. However, history

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clearly shows that relying solely on the most recent financial information leads to worse performance than using stale data. Let's examine why this somewhat counter-intuitive methodological detail adds value.

As **Table 1** shows, smoothing data over five years adds more value than using the most current one-year financial data. Interestingly, the relative results *improve* as we add additional years. By the time we get to the "5-year" portfolio and its annualized excess return of 2.24%, an additional 17 basis points per annum accrues to "smoothing" financial results to five years from one. Incidentally, portfolio turnover also drops, as multiple years of data mitigate the trading impact of short-term swings in fundamentals.

Table 1. Averaging Financial Measures from Longer Periods Aids Returns and Reduces Turnover

	5-Yr Avg	4-Yr Avg	3-Yr Avg	2-Yr Avg	1-Yr	S&P 500
Annual Return	11.66%	11.64%	11.60%	11.55%	11.49%	9.42%
Value Add	2.24%	2.22%	2.18%	2.13%	2.07%	
Turnover	11.71%	11.84%	12.03%	12.34%	13.10%	

Note: January 1962-December 2010 for the largest 1,000 U.S. companies, based on economic size.

Source: Research Affiliates, LLC.

So why does old, stale data work better? The reason is relatively straightforward. The Fundamental Index advantage comes from breaking the link between price and portfolio weight, rather than from having the "right" weight. What drives price movements? Recent changes in financial results, which alter our expectations for the future! So, by using shorter term results to construct fundamental weights, we tacitly re-introduce price back into the equation, through the "back door." This results in demonstrably worse returns.

Multiple Measures—Avoiding the Biases of Single Factor Portfolios

Which is the largest company in the United States—Exxon, Walmart, General Electric, or Bank of America? The answer is… all of the above. Walmart ranks first on five-year average sales. Exxon ranks first on five-year average cash flow or earnings or market cap. General Electric is at the top of dividend payer list for the past five years. And, even after all of its write-offs, Bank of America remains the largest company by book value.

There is no *right* answer. If the goal is to build an alternative equity beta that can serve as a core portfolio position, shouldn't the resulting portfolio be representative of the economic opportunity set? When we rely on only one metric, we begin to lose the broad representation that is a key part of index investing. Structural biases pop up in a variety of unintended ways. For example, using only sales leaves the portfolio overexposed to large companies with thin margins. Using only cash flow or profits may lead to a bias toward cyclical stocks at profit peaks. An emphasis on dividends will naturally favor mature, high-yield companies and will largely exclude growth companies. Lastly, book value may favor firms with aggressive accounting.

Unquestionably, using a single measure of firm size can expose investors to a skewed sample of companies that fails to adequately reflect the economy. The introduction of multiple measures of firm size mitigates such biases, leading to a more efficient performance profile and lower portfolio turnover. The average information ratio of the four single metric Fundamental Index portfolios from 1962–2010 was 0.43 relative to a portfolio of the top 1,000 companies measured by capitalization. The RAFI composite, which equally blends the four metrics, was 0.47, roughly a 10% increase in efficiency. The methodology also results in more stable weights over time and, thus, lower turnover. In our original research, the annualized turnover of single metric portfolios was 12.5% from 1962–2004, which fell to 10.6% when we utilized a composite approach.[6]

Selection Bias Strategy—Why Start with a Capitalization Roster When Building a Fundamental Index?

One of the oft-overlooked index design details is the importance of selection criteria—which securities are included within an index. Stocks with rising market capitalizations make their way into large-cap indexes, such as the S&P 500 Index, while ones with shrinking market caps drop out.

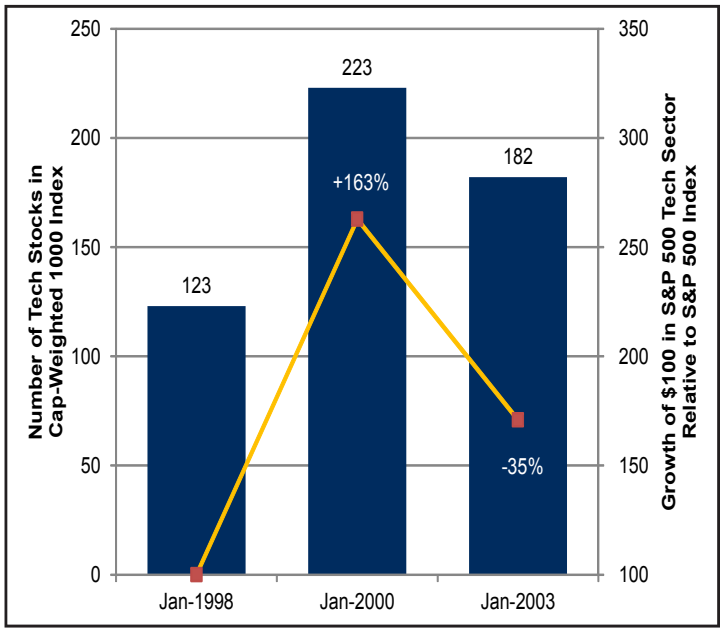
The tech bubble of the late 1990s illustrates what happens when inclusion in an index is based on relative capitalization. As **Figure 1** shows, a simulated cap-weighted index of the top 1,000 U.S. stocks had 123 technology companies at the beginning of 1998. With the S&P 500 Technology Sector rising 218% over the next two years, the number of technology firms making the top 1,000 by market cap nearly doubled to 223. The cap-weighted index added these stocks *because* they had high prices. Even the most casual market historian knows this dynamic would have led to significant erosion in returns due to the tech-led bear market of 2000–2002.

Who gets shoved off of the list by these high flyers? Big companies that have recently depressed prices. Why? *Because* they have low prices. Is there a performance differential between these high-priced small companies and low-priced big companies?

Yes. Our work indicates that these small-cap large companies outperformed their large-cap small companies by nearly 1,000 basis points per annum in the United States since 1962. By fundamentally re-weighting a cap-weighted starting universe—but failing to adjust the selection criteria—we miss these wonderful opportunities.

How much are those opportunities worth? A lot. As **Table 2** shows the impact of selection bias ranges from 59 basis points per year to 376 basis points per year; the more inefficient the market, the greater the outperformance. Interestingly, the ratio of the value-add between selection and weighting remain relatively constant at 23% to 34% across markets. In other words, re-weighted indexes eliminate the RAFI selection effect and re-introduce a link with price which the Fundamental Index methodology seeks to avoid. This costs us one-fourth to one-third of the potential benefits of a true Fundamental Index strategy.

Figure 1. Technology Holdings of Cap-Weighted Index During Dot-Com Bubble



Source: Research Affiliates, LLC.

Table 2. Re-Weighting Without Re-Selecting Leads to Lower Returns

Region	RAFI Return	Fundamentally Reweighted Index Return	RAFI Minus Reweighted Return	Start Year
US Large	11.6%	11.0%	0.59%	1962
Global Dev 3000	13.0%	12.2%	0.77%	1984
Dev ex US Large	13.5%	12.7%	0.77%	1984
All World 3000	11.2%	9.9%	1.29%	1996
Emerging Market	18.5%	14.8%	3.76%	1996

Note: Data is through December 2010.

Source: Research Affiliates, LLC.

Conclusion

John Wooden's final NCAA championship came in 1975. Having taken the title in 8 of the prior 10 years, the UCLA juggernaut was extremely talented and heavily favored. Nonetheless, they were pushed to the edge—four of their five tournament games were decided by seven points or less with two going to overtime. In any one of these contests, the game was likely decided by one or two of the small details constantly drilled in the players from day one—potentially even proper footwear! Wooden later recounted his philosophy on seemingly small details:

> *I consider each detail like the rivet on the wing of an airplane. Remove one rivet from the wing, and it remains intact; remove enough of them, however, and the wing falls off.*[7]

All fundamentally weighted indexes are not created equal. While most should be able to get off the ground by breaking the link with price, not all fundamentally weighted strategies will fly as true a course. We should be very cautious of those that are missing a critical rivet or two. As in flight, there is no room for error in an era of 5% projected long-term (10 to 20 years) equity returns. In our mind, missing up to one-third of the benefits of the Fundamental Index approach is an exorbitant price for neglecting small but critical details.

Endnotes

1. Given the opening and closing sections, we couldn't help but title this piece with a "Woodenism."
2. See Coach John Wooden's website: http://www.coachwooden.com/index2.html.
3. See *Wooden on Leadership* by John Wooden and Steve Jamison, 2005, New York: McGraw–Hill, pp. 144–145.
4. See *Wooden: A Lifetime of Observations and Reflections On and Off the Court* by John Wooden, 1997, New York: McGraw–Hill, p. 63.
5. The one exception is book value which is measured at a single point in time. That is because book value is cumulative: it measures assets as cost minus their accumulated depreciation, and liabilities adjusted for changes in debt over time.
6. See "Fundamental Indexation" by Robert D. Arnott, Jason Hsu, and Philip Moore, March/April 2005, *Financial Analysts Journal.*
7. See *Wooden on Leadership*, p. 141.

Performance Update

TOTAL RETURN AS OF 1/31/10	BLOOMBERG TICKER	YTD	12 MONTH	ANNUALIZED 3 YEAR	ANNUALIZED 5 YEAR	ANNUALIZED 10 YEAR	ANNUALIZED 10 YEAR VOLATILITY
FTSE RAFI® 1000 Index[A]	FR10XTR	2.34%	26.06%	3.21%	4.58%	5.31%	18.20%
S&P 500[B]	SPTR	2.37%	22.19%	-0.05%	2.24%	1.30%	16.36%
Russell 1000[C]	RU10INTR	2.40%	23.33%	0.45%	2.51%	1.74%	16.58%
FTSE RAFI® US 1500 Index[D]	FR15USTR	0.06%	33.09%	9.87%	6.36%	11.04%	22.77%
Russell 2000[E]	RU20INTR	-0.26%	31.36%	4.57%	2.64%	5.77%	21.09%
FTSE RAFI® Developed ex US 1000 Index[F]	FRX1XTR	4.11%	17.84%	-0.12%	4.72%	7.36%	20.16%
MSCI EAFE[G]	GDDUEAFE	2.37%	15.87%	-2.72%	2.20%	4.18%	18.66%
FTSE All World Series Developed ex US[H]	FTS5DXUS	2.32%	18.02%	-1.69%	3.29%	5.03%	18.86%
FTSE RAFI® Developed ex US Mid Small[I]	FRSDXUS	1.17%	20.84%	4.33%	4.32%	11.23%	18.71%
MSCI EAFE Small[J]	MCUDEAFE	0.74%	21.59%	-0.45%	-0.52%	6.97%	20.35%
FTSE RAFI® Emerging Markets[K]	TFREMU	-0.70%	23.78%	7.46%	14.77%	22.15%	24.83%
MSCI Emerging Markets[L]	GDUEEGF	-2.69%	22.81%	3.55%	10.13%	14.43%	24.49%
FTSE RAFI® Canada[M]	FRCANTR	1.65%	21.63%	7.31%	7.27%	9.26%	14.27%
S&P/TSX 60[N]	TX60AR	1.47%	23.23%	3.11%	5.55%	5.75%	15.59%
FTSE RAFI® Australia[O]	FRAUSTR	0.71%	5.52%	0.08%	4.43%	9.06%	13.10%
S&P/ASX 200 Index[P]	ASA51	0.18%	8.46%	-1.26%	3.64%	7.97%	13.53%
FTSE RAFI® Japan[Q]	FRJPNTR	1.32%	4.18%	-8.57%	-7.67%	0.95%	18.62%
MSCI Japan[R]	GDDLJN	1.15%	2.65%	-11.01%	-9.93%	-2.21%	18.33%
FTSE RAFI® UK[S]	FRGBRTR	0.36%	17.01%	3.15%	3.87%	4.34%	17.23%
MSCI UK[T]	GDDUUK	-0.32%	16.61%	3.86%	4.04%	2.92%	15.25%
RAFI Investment Grade Master[U]		0.15%	7.16%	7.45%	6.85%	6.54%	6.03%
Merrill Lynch US Corporate Master[V]	C0A0	0.24%	7.63%	6.58%	6.04%	6.35%	6.21%
RAFI High Yield Master[W]		2.06%	14.43%	13.01%	10.68%	9.95%	11.05%
Merrill Lynch US High Yield BB-B Rated[X]	H0A4	1.92%	15.28%	9.41%	7.80%	7.30%	9.95%
RAFI US Equity Long/Short Index[Y]		1.40%	7.89%	7.13%	5.75%	8.41%	12.15%
1-Month T-Bill[Z]	GB1M	0.01%	0.13%	0.42%	2.02%	2.06%	0.48%

Definition of Indices: (A) The FTSE RAFI® 1000 comprises the 1000 largest companies selected and weighted using our Fundamental Index methodology; (B) The S&P 500 Index is an unmanaged market index that focuses on the large-cap segment of the U.S. equities market; (C) 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; (D) The FTSE RAFI® 1500 comprises the 1001st to 1500th largest companies selected and weighted using our Fundamental Index methodology; (E) The Russell 2000 is a market-capitalization weighted benchmark index made up of the 2,000 smallest U.S. companies in the Russell 3000; (F) The FTSE RAFI® Developed ex US 1000 Index comprises the largest 1000 non US-listed companies by fundamental value, selected from the constituents of the FTSE Developed ex US Index; (G) MSCI EAFE (Morgan Stanley Capital International Europe, Australasia, Far East) is an unmanaged index of issuers in countries of Europe, Australia, and the Far East represented in U.S. dollars; and (H) The FTSE All World ex-US Index comprises Large and Mid-Cap stocks providing coverage of Developed and Emerging Markets excluding the United States. It is not possible to invest directly in any of the indexes above; (I) The FTSE RAFI® Developed ex US Mid Small Index tracks the performance of small- and mid-cap equities of companies domiciled in developed international markets (excluding the United States), selected based on the following four fundamental measures of firm size: book value, cash flow, sales, and dividends. The equities with the highest fundamental strength are weighted according to their fundamental scores. The Fundamentals Weighted® portfolio is rebalanced and reconstituted annually. Performance represents price return only; (J) The MSCI EAFE Small Cap Index targets 40% of the eligible small-cap universe (companies with market capitalization ranging from US$200 to US$1,500 million) in each industry group of each country in the MSCI EAFI Index; (K) The FTSE RAFI® Emerging Markets Index comprises the largest 350 companies selected and weighted using the Fundamental Index® methodology; (L) The MSCI Emerging Markets Index is an unmanaged, free-float-adjusted cap-weighted index designed to measure equity market performance of emerging markets; (M) The FTSE RAFI® Canada Index comprises the Canadian stocks represented among the constituents of the FTSE RAFI® Global ex US 1000 Index, which in turn comprises the 1,000 non-U.S.-listed companies with the largest fundamental value, selected from the constituents of the FTSE Developed ex US Index; (N) 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; (O) The FTSE RAFI® Australia Index comprises the Australian stocks represented among the constituents of the FTSE RAFI® Global ex US 1000 Index, which in turn comprises the 1,000 non-U.S.-listed companies with the largest fundamental value, selected from the constituents of the FTSE Developed ex US Index; (P) The S&P/ASX 200 Index, representing approximately 78% of the Australian equity market, is a free-float-adjusted, cap-weighted index; (Q) The FTSE RAFI® Japan Index comprises the Japanese stocks represented among the constituents of the FTSE RAFI® Global ex US 1000 Index, which in turn comprises the 1,000 non-U.S.-listed companies with the largest fundamental value, selected from the constituents of the FTSE Developed ex US Index; (R) 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; (S) The FTSE RAFI® UK Index comprises the U.K. stocks represented among the constituents of the FTSE RAFI® Global ex US 1000 Index, which in turn comprises the 1,000 non-U.S.-listed companies with the largest fundamental value, selected from the constituents of the FTSE Developed ex US Index; (T) 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; (U) The RAFI® 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; (V) 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; (W) The RAFI®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; (X) The Merrill Lynch U.S. High Yield Master II 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; (Y) 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; (Z) 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.

Source: All index returns are calculated using Total Return data from Bloomberg except for the FTSE RAFI Developed ex US Mid Small (FRSDXUS) and the MSCI EAFE Small (MCUDEAFE) which uses price return data.

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