Fundamental Indexes™: *Current and Future Applications*

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Since the initial circulation of Fundamental Indexation research in mid-2004, the concept has spurred great interest and debate in the investment community.[1] At its core, Fundamental Indexing argues that cap weighting systematically overweights overvalued stocks and underweights undervalued stocks in a portfolio, which leads to a return drag in traditional indexes. Unless we believe that share prices are identically equal to the eventual true fair value of a company, this is an obvious truism. Advocates of cap weighting generally dismiss this concern with the equally true observation that we cannot know which companies are over or under valued.

We first outline the methodology and results of the original research in large company U.S. stocks, and then review some future applications of Fundamental Indexing; namely, extending down the size spectrum, applying internationally, and using in sector funds. The excess returns of Fundamental Indexing are found to be considerably larger in smaller company and international portfolios. And sector funds based upon Fundamental Indexes produce excess returns in all ten economic sectors over a 16-year period.

THE DRAG OF CAP WEIGHTING

The primary method for weighting each security in a conventional indexed portfolio is based on a company's market capitalization, the enterprise's market value. This approach has many advantages—diversification, low turnover, broad market participation, and modest expenses. However, capitalization-weighted indexes suffer an important structural flaw, which imposes a return drag on investors.

Even in a relatively efficient market, we know that most stocks will be priced above or below their eventual (and unknowable) true fair value. Those that are priced above true value will have an erroneously high capitalization and, therefore, erroneously high index weighting. These stocks will therefore compose the majority of an indexed portfolio and will suffer a performance drag. Those priced below true fair value will have an erroneously low capitalization, hence, an erroneously low index weighting, and will offer a performance boost, but one that is too small to offset the damage of the overpriced stocks because they comprise less of the portfolio. In this way, capitalization-weighted indexes systematically overweight overpriced securities and underweight underpriced securities.

Consider the top ten stocks in a cap-weighted portfolio. Some will get there because they are very large companies whose true value is accurately reflected. However, others will get there as a result of being overvalued. As this overpricing is realized and corrected by the market, the cap-weighted index suffers a major drag, relative to the average stock in the S&P 500, as seen in Exhibit 1.[2]

EXHIBIT 1

Historical Performance of the Top 10 Market Capitalization Stocks

What% ofthe top 10 outperformed the market average?				
	1 Year	3 Year	5 Year	10 Year
1926-2004	45%	41%	38%	32%
1964-2004	40%	37%	32%	29%

By What Amount Did the Top 10 Underperform?				
	1 Year	3 Year	5 Year	10 Year
1926-2004	(2.9%)	(9.6%)	(15.0%)	(26.3%)
1964-2004	(3.6%)	(13.2%)	(19.7%)	(30.7%)

Source: Research Affiliates, LLC. Extracted from ``What Cost Noise?'' Financial Analysts Journal, March/April 2005.

The Fundamental Indexation concept (2005) was developed and substantiated as an elegant way to address this structural return drag. Under the proposed methodology, each stock's index weighting is determined by the relative scale of an enterprise based on certain fundamental measures—not by its expected future scale, as reflected in market capitalization—thereby randomizing these weighting errors and eliminating the linkage between portfolio weight, and any over- or under-valuation. These size metrics are intended to accurately reflect the economic footprint of a company:

- Trailing Five-Year Cash Flow (Cash Flow)
- Trailing Five-Year Sales (Sales)
- Trailing Five-Year Gross Dividends (Dividends)
- Book Value (Book)

The top 1,000 stocks were selected in each metric and weighted proportionately. A Composite was then constructed that equally weights the four size metrics. For example, General Electric (GE) would receive a 3% weight in the Sales Index if its sales represented 3% of the combined trailing five-year total sales of the top 1,000 sales companies. If GE represents 3% of the economy by sales and cash flow, 2% by book value, and 4% by dividends, we average the four measures and infer that it represents about 3% of the economy. GE is given that weight in Fundamental Indexation—regardless of share price, valuation multiples, or market capitalization.

WHY MULTIPLE METRICS?

In the construction of the Composite, we recognize that each metric has its own special vulnerabilities. While the dividend-based model has the most glaring issues, none is without its legitimate detractors:

- *Dividend-based indexes*. This type of metric is becoming popular, but of the six size metrics published (and the dozen-odd tested), a dividend-weighted index is the weakest measure of size, as measured by excess returns, and has the largest tracking error, relative to the cap-weighted indexes, which leads to the least consistent value added of the metrics. It's the only measure we tested that, on average, underperforms in bull markets. Past is not prologue; past disappointments with a dividend-weighted index do not presage future disappointments. Accordingly, we include dividends as one of our four metrics.
  However, the most important Achilles' heel of dividend-based indexes is that they exclude well over half of all publicly traded companies in the market, including most growth stocks and essentially all emerging growth companies. For this very reason, we deliberately made a special provision for zero-yield companies; those companies that have paid no dividends in the past five years are weighted equally according to the other three metrics.
- *Sales metric.* This metric is ill-defined in some of the services industries, notably financial services and trading companies.
- *Profits-based index*. This metric may lead to over- or under-exposure to companies with highly cyclical income.
- *Book value metric.* This metric may lead to over- or under-exposure to companies with aggressive or conservative accounting practices.

Clearly, for any Fundamental Index, using a single metric can lead to a skewed sample of companies. A blend of multiple measures, along with the use of multi-year smoothing, mitigates our exposure to any of these risks

EXHIBIT 2

Annualized Performance of Fundamental Indexes, 1962–2005

1962–2005 Results	Ending Value of $10	Ann. Return	Vol.	Sharpe Ratio	Excess Return vs. REF CAP	Excess Return t-stat
S&P 500	$73.49	10.26%	14.9%	0.306	0.00%	0.02
CAP 1000	$73.37	10.25%	15.1%	0.301		
BOOK	$149.18	12.05%	14.8%	0.429	1.79%	3.34
CASH FLOW	$171.06	12.40%	14.8%	0.452	2.14%	3.61
SALES	$195.44	12.74%	15.7%	0.448	2.48%	3.34
GROSS DIV	$137.92	11.85%	13.5%	0.454	1.59%	2.01
LARGE COMPOSITE	$166.56	12.33%	14.6%	0.452	2.07%	3.28

Source: Research Affiliates, LLC.

and sharply reduces turnover.[3] While our published research explores individual fundamental metrics of company size, the Large Composite[4] is the central focus of the published results, as it provides the greatest diversification, broadest cross section of companies within the economy, highest capacity, and lowest tax consequences.

What's the intuition behind a fundamentally weighted index as a broad market index? A proper benchmark or index should be representative of the asset class or opportunity set. For cap weighting, we're tracking the average result for the broad market, which is itself cap weighted. Cap weighting favors the companies that are expected to be future successes—and pays for those anticipated future successes today! Fundamental Indexes are valuation indifferent; they care not a jot about the price, the valuation multiples, or the market cap of a company. They track the result for stocks in the broad economy, weighted in accordance to a company's economic footprint.

Critics have suggested that Fundamental Indexation ignores all of the information that's reflected in a company's share price. That's the whole point! The information that is reflected in price, if correct, means that the stock will be priced to offer *average* long-term risk-adjusted performance. Accordingly, no harm is done by holding more or less than the cap-weighted index. If that information is incorrect, the error is also perfectly and harmfully correlated with the weight in the cap-weighted portfolio.

Using fundamental measures of firm size removes the structural return drag of capitalization weighting, which comes from underweighting the undervalued and overweighting the overvalued—even though we cannot know which companies fall in either category. With this return drag gone, the results are compelling. Over the 44-year evaluation period, the Large Composite produced excess returns of 2.1% with less volatility than similar cap-weighted indexes. Exhibits 2 and 3 show that this 2.1% annual advantage leads to an ending wealth value of over twice that of a cap-weighted composite of the 1,000 largest-cap companies.[5]

Observe that weighting by any of the four fundamental measures of company size leads to statistically significant excess returns over cap weighting. However, there are differences. The sales metric produces the highest excess returns and Sharpe ratio, but also the highest volatility. The dividends metric produces the lowest excess returns, highest tracking error, and lowest volatility, with the least statistical significance. As shown in Exhibit 4 under different market environments, the Large Composite outperforms marginally in bull markets, on average, while producing significant excess returns in bear markets—exactly when investors need outperformance.

The Large Composite portfolio is rebalanced once annually. The historical turnover is just over 10% versus approximately 6% for an annually rebalanced portfolio of the 1,000 largest-capitalization stocks. So the turnover of a fundamentally weighted index remains considered extremely low relative to an actively managed portfolio (one of the real benefits of a passive portfolio) and only slightly above that of the cap-weighted indexes.

Further, we found the Large Composite's turnover tends to be in larger-capitalization issues (which presumes smaller transaction costs) that have seen changes in their fundamentals. Meanwhile, cap-weighted portfolios tend to experience most of their turnover in the smaller companies (higher transaction costs) that fall off, or step up onto, the cap-weighted list, typically near the bottom of that list. One of the best-kept secrets of the indexing world is that trading costs are a disaster, mitigated only by the fact that the turnover is so very low. Fundamental Indexes involve less difficult turnover, much of it reweighting larger securities with smaller transaction costs.

The study logically focused on large-company stocks as they have the longest stream of quality historical data

EXHIBIT 3

Growth of $1, 1961–2005, Fundamental Index Versus Cap Weighting

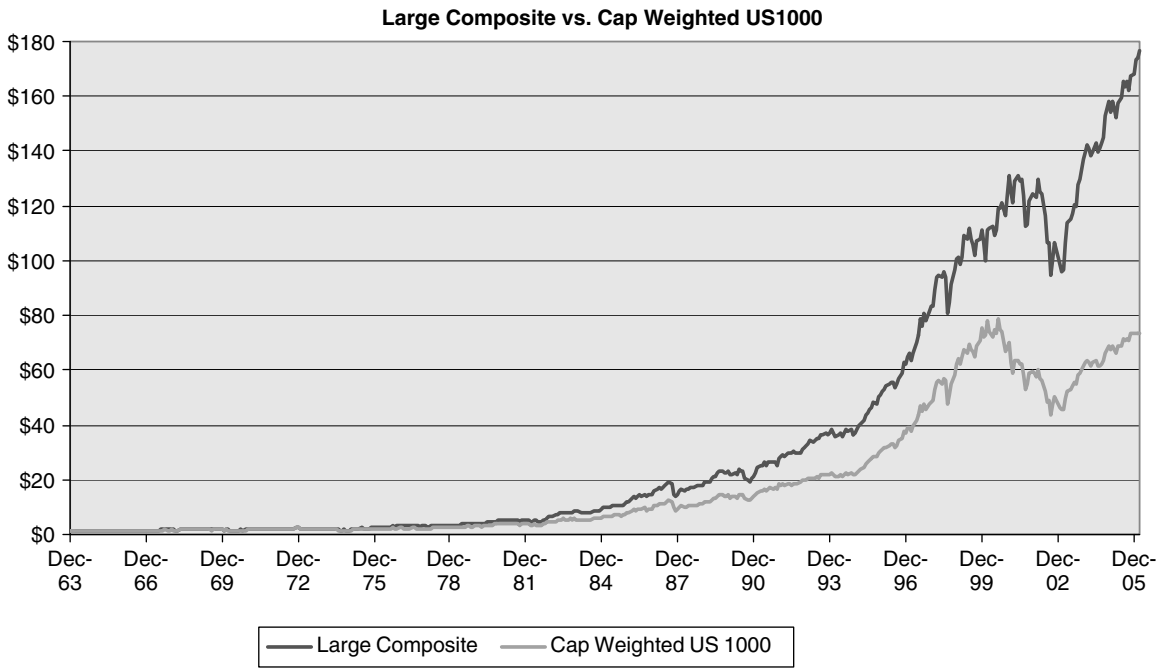

EXHIBIT 4

Fundamental Index Performance over Different Market Environments

1962–2006 Q2	Bull Markets	Bear Markets
Large Composite	21.5%	–16.4%
S&P 500 Index	20.7%	–21.9%
Short Term Treasury Yield	5.4%	6.8%
Large Composite Volatility	13.4%	15.6%
S&P 500 Volatility	13.4%	15.7%
Large Composite Sharpe Ratio	1.2	–1.5
S&P 500 Sharpe Ratio	1.1	–1.8
Large Composite Excess Return Over S&P 500	0.7%	5.5%
Large Composite Tracking Error wrt S&P 500	3.3%	5.4%
Large Composite Information Ratio	0.2	1.0

and represent the lion's share of indexed assets. The robustness of the results in large-company U.S. stocks leads to a couple of natural follow-up questions. Can we use Fundamental Indexing to fulfill a complete equity allocation, spanning large and small, as well as domestic and international stocks? How does the concept enable advisors to more effectively actively manage client portfolios? The remainder of our discussion will focus on answering these inquiries.

EXTENDING DOWN THE SIZE SPECTRUM

Small-company stocks play an important role in asset allocation. Studies, notably Fama and French (1992), have confirmed smaller stocks produce greater long-term returns than their larger counterparts. This return premium carries greater risk, both perceived and actual. They credit this return premium to size and value effects proxying for a hidden systematic risk. Berk (1997) has questioned how much of this is due to a tangling of the value effect with the cap effect, showing that the size effect—measured on book value or sales rather than market cap—is one-third as powerful as it is on market cap.

Regardless of the source of the small-cap effect, investors seeking higher returns will often make significant allocations to this asset class. Like their large company brethren, small-cap indexes are almost without exception capitalization weighted. So does the return advantage of fundamentally weighted indexes also apply to smaller-company portfolios?

Through applying the previous Composite methodology to the next 2,000 smaller companies, we are able construct a small-company Fundamental Index that we'll label Small Composite.[6] Since 1979, which corresponds to the inception of the widely used (and cap-weighted) small-cap benchmark Russell 2000 Index, the Small Composite has produced significant excess returns as illustrated in Exhibit 5.

The Small Composite outperformed the Russell 2000 Index by an annualized 3.6% compared to the 2.1% excess returns of the Large Composite. This outperformance also comes with less annual volatility—19.0% versus 19.4%. Accordingly, Fundamental Indexing appears to produce larger excess returns in the smaller end of the capitalization range than most of the better, active managers in this domain (Exhibit 6). We might parenthetically note that turnover for the Small Composite is actually lower than for the Russell 2000, since a company's fundamental measures of size change less over time than its market cap, and the Russell 2000 has companies disappearing on both the large and the small end of the spectrum due to price change.

This even stronger value-added deserves some exploration. Recall the crux of Fundamental Indexing—to eliminate the return drag of overweighting the overpriced and underweighting the underpriced. In a perfectly efficient market, prices will always equal the enterprise's true fair value. As uncertainty is introduced, prices will drift above and below true fair value, leading cap-weighted indexes to overweight the overpriced and vice versa. As the market loses efficiency, the magnitude of this mispricing will increase and, correspondingly, the cap-weighted performance drag is magnified in lock step—in proportion to the *square* of the pricing error! Exhibit 7 graphically displays this process. In this manner, the amount of excess returns rises as we apply Fundamental

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EXHIBIT 5

Small Composite Performance, February 1979 to June 2006

Small Composite Standardized Performance

	6-Mo	12- Mo	3 Yr (ann.)	5 Yr (ann.)	10 Yr (ann.)	79~06 (ann.)
Small Composite	**8.8%**	**18.4%**	**24.8%**	**14.9%**	**14.9%**	**16.8%**
Russell 2000 Index	8.2%	14.6%	18.7%	8.5%	9.0%	13.2%
Short Term Treasury Yield	2.4%	4.3%	2.5%	2.2%	3.6%	6.1%
Small Composite Volatility (ann.)		**13.2%**	**14.4%**	**19.0%**	**19.9%**	**19.0%**
Russell 2000 Volatility (ann.)		14.6%	14.6%	18.9%	20.3%	19.4%
Small Composite Sharpe Ratio		**1.1**	**1.6**	**0.7**	**0.6**	**0.6**
Russell 2000 Sharpe Ratio		0.7	1.1	0.3	0.3	0.4
Small Composite Excess Return Over Russell 2000	**0.5%**	**3.8%**	**6.1%**	**6.4%**	**5.8%**	**3.6%**
Small Composite Tracking Error wrt Russell 2000 (ann.)		**2.4%**	**2.7%**	**3.3%**	**6.1%**	**4.1%**
Small Composite Information Ratio		**1.6**	**2.3**	**1.9**	**1.0**	**0.9**

†Past performance is no guarantee of future results. This fact sheet provides historical performance information on a broad-based securities index, subject to the explanatory disclosures and qualifications set forth herein.

EXHIBIT 6

Small Composite Versus Active Managers, July 1996 to June 2006

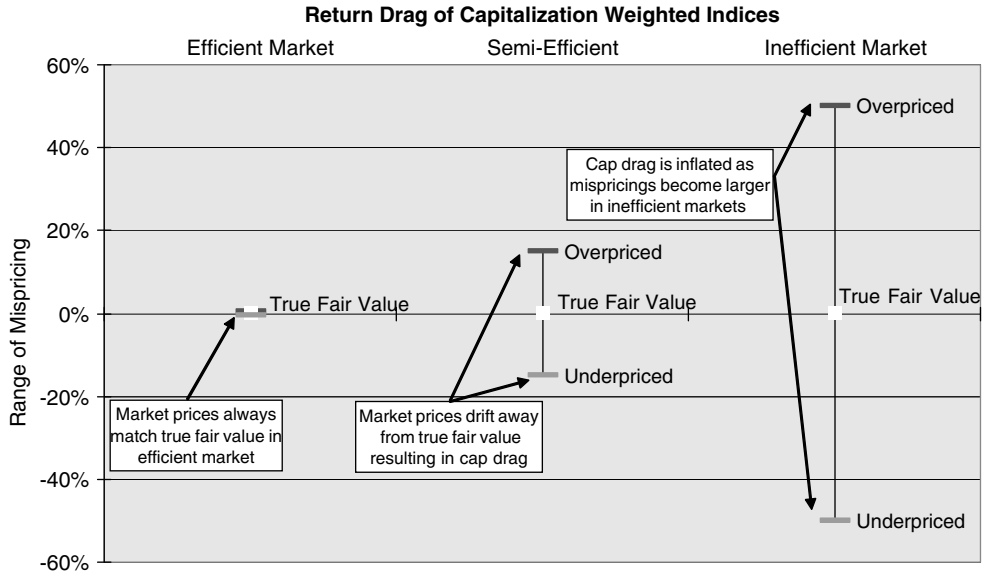
Peer Group Performance

	12–Mo	3 Yr (ann.)	5 Yr (ann.)	10 Yr (ann.)
Small Composite	**18.4%**	**24.8%**	**14.9%**	**14.9%**
eA Small Cap Core Equity 25th Percentile Return	17.5%	21.6%	12.9%	14.1%
eA Small Cap Core Equity Median Return	14.1%	19.9%	11.6%	12.7%

Source: eVestment Alliance, LLC.

EXHIBIT 7

Return Drag of Cap-Weighted Indexes in Different Markets



Indexing to less efficient markets, such as small companies with their diminished research coverage by Wall Street analysts and institutional managers. Mispricings above or below true fair value should occur with greater frequency and scope in small-company versus large-company stocks.

We've already noted that critics of Fundamental Indexation dismiss the concept as proxying for the small-cap and value effects. In the large-company arena, this has some slight merit. Fundamental Indexes are always value-tilted relative to equivalent cap-weighted indexes,[7] sometimes by a little and sometimes by a lot, depending upon how far the multiples of the growth and value segments of the markets have diverged. They are usually a little smaller in market-cap than the cap-weighted indexes, though not always (at this writing, it's the other way around!), but reciprocally cap-weighted indexes will generally have a small-*company* tilt relative to Fundamental Indexes.

So, what of the factor or style tilts of the Small Composite? Is the small-company alpha partly attributable to a small-cap or value tilt? No! Some large companies are trading at small-cap multiples; by definition, they are trading at deep discounts to the market valuation multiples. These companies are in the Large Composite and Russell's next 2,000. They boost the valuation multiples of the Russell 1000—by *not* being on that list—and lower the valuation multiples of the Russell 2000. For the same reason, they reduce the valuation multiples of the Large

Composite and increase the multiples of the Small Composite. Reciprocally, there are small companies trading at sufficiently lofty multiples to be large-cap stocks. These companies are in the Russell 1000 and the Small Composite. They have the same impact; they boost the multiples of the Russell 1000 and Small Composite, and lower the multiples of the Russell 2000 and Large Composite. So, on average over time, the Small Composite has a trivial value tilt, relative to the Russell 2000, and typically has a large-cap tilt! So much for the notion that factor tilts create the 360-bp excess return in the small-company world. It's simply not true.

GLOBAL RESULTS

The superiority of the Fundamental Index methodology in U.S. applications is robust and significant over long periods of time. A logical next step is to examine performance of the Fundamental Index concept in a global context. Exhibits 8 and 9 summarize the results of studies done by Nomura Securities, testing Fundamental Indexes in the world's 23 developed equity markets, using price-only data.

Among the 23 developed markets in the MSCI or FTSE Developed World Indexes, Nomura Securities finds that the Fundamental Indexation methodology produces excess returns in all of them. The average performance advantage among the individual markets is 263 bps annually. The Fundamental Indexes are also on average slightly less volatile, with an average beta just below one. If a global portfolio is constructed among these markets, the Fundamental Index advantage increases to 347 bps due to country rebalancing.

An intuitive approach to gaining an understanding of why a global Fundamental Index outperforms a cap-weighted index is to examine the volatility of the cap index's country exposure versus the fundamental index's country exposure. Not only does cap weighting assuredly overweight the overvalued and underweight the undervalued *companies*, it also overweights the overvalued and underweights the undervalued *countries*. Consider the example of Japan which represented 51% of world stock market capitalization at the end of the 1980s and 8% a decade later. We cannot know, until we see future decades of cash flows for these equity investments, that either approach is wrong, but we can know that they were not *both* right.

The Fundamental Index, by comparison, has remarkably steady allocations that change solely in response to the company fundamentals in each country. The Fun-

EXHIBIT 8

Country-by-Country, Fundamental Index Versus Cap-Weighted Return and Risk Comparison

Return Statistics for 23 Countries (December 1987 to June 2005)

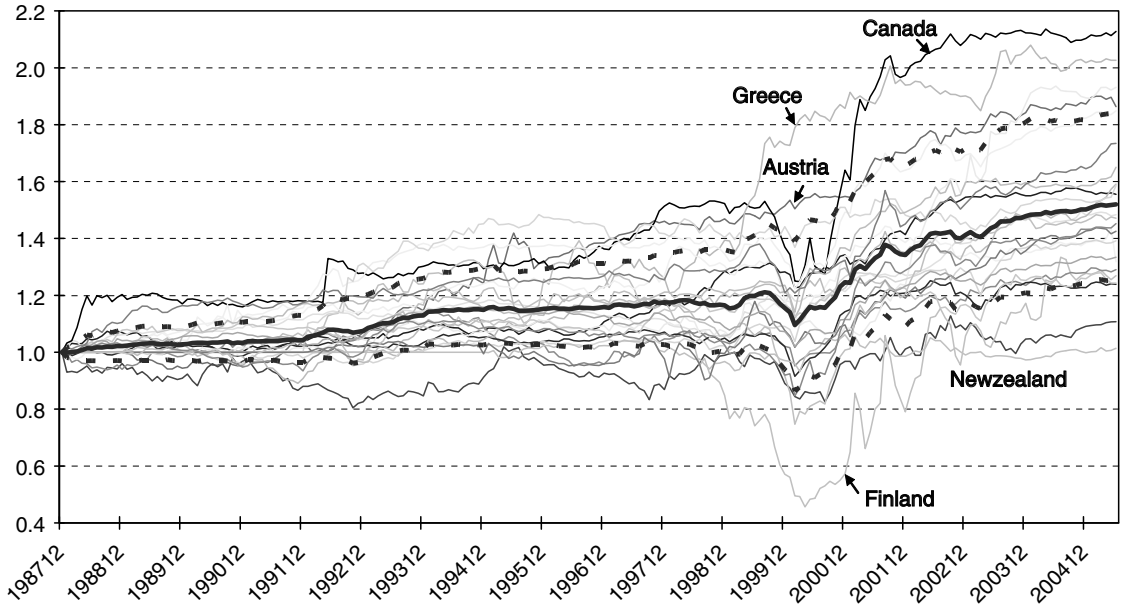
Excess Return Rank	Country	Excess Return	Beta	Correlation	Alpha	CAPM Alpha t-Statistic	Excess Turnover vs Cap Index
1	Greece	*6.39*	1.09	0.98	**6.39**	4.27	2.16
2	Austria	*4.16*	0.97	0.98	**4.16**	3.57	4.16
3	Spain	*3.38*	0.93	0.98	**3.38**	3.57	5.1
4	Belgium	*2.46*	0.99	0.99	**2.46**	3.28	4.92
5	Hong Kong	*3.76*	0.88	0.93	**3.76**	3.08	5.93
8	Japan	*3.13*	1	0.98	**3.13**	2.86	-3.86
13	United States	*2.34*	0.88	0.92	**2.34**	2.05	5.98
19	Sweden	*2.62*	0.95	0.95	**2.62**	1.38	15.28
20	Finland	*1.71*	0.66	0.86	**1.71**	1.18	10.2
21	Denmark	*0.67*	0.89	0.92	**0.67**	0.89	12.43
22	Switzerland	*1.37*	1.07	0.98	**1.37**	0.79	14.21
23	New Zealand	*0.13*	1.02	0.98	**0.13**	0.16	1.11
	23 Country Average	*2.63*	0.98	0.98	**2.63**	9.2	5.78
	23 Country Global	*3.47*	0.88	0.94	**3.47**	3.03	6.83

*- t-Statistic adjusted for cross-correlation of alphas

Source: Nomura Securities.

EXHIBIT 9

Value-Added above Cap-Weighted Returns, 23 Countries, January 1988 to June 2005



damental Index weight for Japan, in a global portfolio, has ranged from 12% to 22% of the world portfolio, not from 8% to 51%. The opposite was true for the U.S.-weight in a global portfolio, with a historically low cap-weighted allocation at the end of the 1980s and a historically high allocation ten years later.

Whichever of the cap-weighted extremes was in error, the Fundamental Index weight was less vulnerable to these cap-weighting errors, and earned a significant additional excess return from country rebalancing. Fundamental Index International contra-trades against these extremes, although we cannot know until decades after the fact which specific weight was correct. Thus, Fundamental Indexing avoids the cap drag associated with overweighting overpriced *countries* and underweighting undervalued *countries.* Empirically, this is worth an additional 90 bps, over and above the average intra-country excess return.

SECTOR APPLICATIONS

Sector index funds and ETFs are an increasingly popular option amongst advisors and their investors. However, essentially all sector-based funds and ETFs use cap weighting in their construction and, correspondingly, suffer the same return drag. To quantify, we compared the sector performance of the Large Composite to that of the S&P 500. The results are illustrated in Exhibit 10 and show annualized excess returns of Large Composite Sectors over S&P Sectors. Fundamental Indexing produced excess returns in all 10 sectors over the $16^1/_2$-year evaluation period. Thus, Fundamental Indexation is able to demonstrate superior stock selection ability within sectors over time.

Utilities led the way with 7% annualized excess return. The next 8 sectors also produced meaningful excess returns between 3.5% and 5.3%, annually. Only the Consumer Discretionary sector failed to produce excess returns of at least 3%. On each outlier, a hypothesis is in order.

In Utilities, faster growing companies naturally see increased valuations, and often increased valuation multiples. However, unlike other industries, extremely profitable utilities tend to run into the not-so-invisible hand of government regulation. The state utility commissions typically step in to extract rate concessions from the most successful utilities, reducing profits, and causing share prices to reverse course, often dramatically. This artificial, non-economic factor produces a number of temporarily overpriced and underpriced securities, exactly the kind of environment that produces the biggest drag from cap weighting.

EXHIBIT 10

Large Composite Excess Returns by Sector, January 1990 to June 2006

Large Composite By Sector Excess Return Over S&P By Sector

	6–Mo	12–Mo	3 Yr (ann.)	5 Yr (ann.)	10 Yr (ann.)	90~06 (ann.)
Large Composite - Utilities	2.4%	3.2%	5.0%	10.8%	8.5%	7.7%
Large Composite - Financials	1.9%	6.7%	6.1%	3.8%	5.3%	5.3%
Large Composite - Energy	1.0%	2.2%	4.4%	5.2%	5.8%	5.0%
Large Composite - Consumer Staples	3.5%	3.9%	6.2%	4.9%	7.7%	4.8%
Large Composite - Health Care	4.3%	4.9%	7.2%	5.4%	4.3%	4.4%
Large Composite - Materials	0.8%	0.1%	6.9%	4.1%	4.8%	4.2%
Large Composite - Industrials	3.2%	7.9%	6.0%	7.5%	4.0%	4.1%
Large Composite - Telecommunications	4.6%	11.3%	6.5%	2.3%	2.6%	3.8%
Large Composite - Information Technology	2.1%	5.7%	4.9%	4.6%	4.8%	3.5%
Large Composite - Consumer Discretionary	5.7%	–2.9%	5.0%	1.9%	0.0%	1.0%

In contrast, Consumer Discretionary companies tend to have a non-economic factor that actually helps cap weighting—branding. A powerful brand keeps consumers coming back despite higher prices and perhaps even inferior products. Companies enjoying such brands will often carry a high valuation multiple longer than companies in other economic sectors. Thus, the adjustment back to true fair value and, consequently, the return drag of cap weighting is delayed. Furthermore, the volatile sales and earnings in this sector may be far less mean-reverting than investors suppose (and certainly far less so than in the Utilities sector).

IMPLEMENTATION

Fundamental Indexing produces excess returns in small-company portfolios, global contexts, and within economic sectors. So how can investors benefit from these findings? What are some of the possible value-added strategies of implementation? How do they contrast with current practices?

Let's start with small-company portfolios. As previously discussed, this (arguably) less efficient segment of the market is often implemented by selecting actively managed funds. While active funds have tended to best the relevant cap-weighted indexes, issues still abound in their retention, such as

- Higher management fees and trading expenses,
- Increased monitoring of organizational and personnel moves,
- Limited capacity for assets under management, and
- Broad asset class coverage necessitating multiple managers.

Indexing to a more efficient fundamentally weighted small-company benchmark solves all of these problems without giving up expected excess returns. The strategy is clearly passive—replicable, formulaic, transparent, and objectively constructed. An ETF based upon a small-company Fundamental Index should have lower fees and very little in the way of organizational and personnel monitoring. Capacity in such an index should be extraordinary. A Composite approach on multiple size-metrics is broad, representative, and a one-stop alternative for fulfilling an entire small-company asset allocation.

Globally, the methodology also adds significant value. ETFs based upon the concept have a range of practical applications. Country and regional allocators that employ Fundamental Index vehicles already have a source of excess returns before accounting for their allocation alpha. Likewise, basic investors can effectively use Fundamental Indexing to create a one-portfolio solution to their international equity allocation. However, unlike existing cap-weighted indexes, these *completeness* investors don't have to give up potential excess returns.

Additionally, sector investors benefit greatly from Fundamental Indexing. Advisors who claim to add value

through sector rotation can enjoy an additional source of excess returns—stock selection—by using sector-based Fundamental Indexes. This same stock selection alpha is available to sector-specific managers who are asked to run a broader portfolio. For example, a manager with stock-picking expertise in health care and technology is asked to run a portfolio benchmarked against a broader index of growth stocks. While a sizeable amount of the assigned benchmark may be in Technology and Health Care, the manager can fill in the sector holes like Financials and Energy without giving up projected alpha by using Fundamental Index sector ETFs.

WHY DIDN'T FUNDAMENTAL INDEXATION APPEAR DECADES AGO?

Equity market investors have lived in a cult of capitalization weighting since the inception of the S&P 500 Index in 1957, reinforced by the introduction of the Capital Asset Pricing Model (CAPM) just seven years later. CAPM shows that, based on an array of factually-incorrect simplifying assumptions, the market-clearing portfolio (i.e., cap weighting) is mean-variance efficient (i.e., can't be beat without leverage). Instead of hailing CAPM as an important advance in finance theory, a valuable enhancement in our understanding of market pricing, and an insightful approximation of the real world, too many investment practitioners and academics take it as *fact*. Too many in the investment community interpret CAPM as an invitation to stop thinking about indexes, because CAPM shows that S&P accidentally got the theoretically robust, "correct" answer in 1957!

The creation of index funds linked to such indexes in the early 1970s was a major advancement and has subsequently served investors well. ETFs based upon cap weighting were another useful innovation in the mid 1990s that allowed investors intraday trading and more effective tax treatment. Nevertheless, a critical problem has always been imbedded in the methodology—the overweighting of overpriced stocks and corresponding underweighting of underpriced stocks. Fundamental Indexing addresses this flaw in a simple and straightforward manner with scale and representation.

Fundamental Index-based ETFs are an important addition to the investment toolkit for investors and their advisors, seeking to increase returns in what we believe is an era of paltry capital market results. The concept can be applied to any area of the equity markets in a multitude of value-added applications. FTSE maintains over 60,000 indexes, most of them cap weighted, all of them unique and live, all serving a demand in the marketplace; other index providers maintain many thousands more. In the years ahead, we see no reason to doubt that Fundamental Indexation strategies will be managed in *as* many different permutations (sectors, styles, varying fundamental metrics and mixes, size categories, countries, regions, and a host of custom applications). It will be thrilling to observe, and even more thrilling to actively participate in developing this vast array of applications.

ENDNOTES

[1]We should note that we have two patents pending (filed in 2002 and 2004) on selecting and weighting indexes on fundamental measures of company size. We also hold a trademark on variations of "Fundamental Index" on the Supplemental Register of the United States Patent and Trademark Office (USPTO) in the U.S., as well as full trademarks in Europe and Japan. We respectfully ask investors to honor this intellectual property until the patents are decided.

[2]The theoretical foundations of this phenomenon, and of the incremental returns of valuation-indifferent approaches to indexing, including Fundamental Indexation, have been explored by Treynor (2005), Hsu (2006) and others. One implication is that the incremental returns of valuation-indifferent indexes and the factor returns observed by Fama and French (1992) and others may have the same shared source, namely, the actions of an imperfect market in seeking out an unknowable true fair value, and in prices which over- or under-estimate this true fair value. Arnott, Hsu, Liu, and Markowitz (2006, working paper) explore these nuances.

[3]Arnott, Hsu, and Moore (2005) also examined an index weighted by the number of employees. It has some peculiar effects. It tacitly values a McDonalds burger-flipper the same as a Genentech biochemist, it emphasizes labor-intensive industries, and it leads to Kelly Services regularly ranking in the top ten. Turnover is high, beta is high, and liquidity is poor compared with the other measures that we studied. Accordingly, even though an employment-based index offers brilliant returns, we excluded this measure of company size from our Composite because it's a non-financial measure of size, and because we think these flaws are relatively serious.

[4]This index consists of the 1,000 largest U.S. companies based on the four equally-weighted measures of company size, weighted by that same measure of company size.

[5]This work has been independently verified, though over somewhat different spans, by FTSE (2005), Nomura Securities (2005), and StyleResearch (2006), to name a few.

[6]This measure consists of the 1001st to 3000th largest US companies, based on the four equally-weighted measures of company size, weighted by that same measure of company size.

[7]We would attribute this to the cap-weighted indexes having a structural growth bias, not to any bias in Fundamental Indexes. After all, cap weighting will double-weight companies at twice the market multiple, and halve the weight of companies at half the market multiple, while Fundamental Indexes are blissfully indifferent to price, to market cap, and to valuation multiples.

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