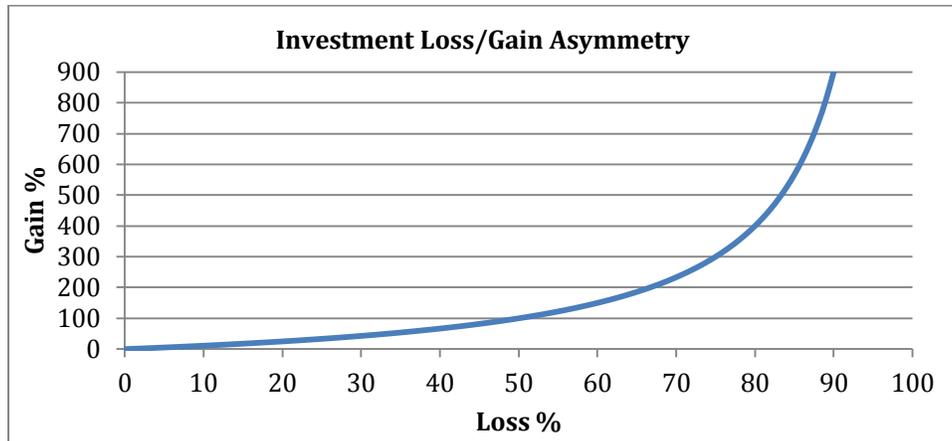




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May 2015

Smart Beta – Chance of a Free Lunch?



Investors will be familiar with the illustration above, showing the corresponding gains required to achieve break-even after suffering a loss. Portfolios that are cut in half necessitates 100% gains subsequently to breakeven and vice-versa. After 90% losses, the line effectively goes vertical and there is no chance of recovering anything when all capital is lost. Ergo, it is of paramount importance that investors focus on capital preservation first (horizontal axis) before thinking of capital growth (vertical axis). It is much easier to avoid a 90% loss than finding a 10-bagger investment.

That is the reason why diversification is such a godsend. Increasing the number of holdings and type of asset classes reduces the possibility of the entire capital being annihilated by the ruin from an individual security. It essentially increases the return per amount of risk, and probably is the only free lunch available in the investing world. First launched in 1973, index funds became the means to achieve diversification at a low cost and gained popularity. Two decades later came the passive exchange-traded funds (ETFs) in 1993 which added liquidity over the day. Assets of index funds and ETFs were \$1.7 and \$2.3 trillion respectively in 2013, which has experienced rapid growth of net inflows (\$114 and \$180 billion in 2013) since their inception but still insignificant compared to the industry's total assets of \$30 trillion.¹

A new approach towards indexing has emerged in the past few years. Alternative weighting; or "Smart Beta" has been touted by financial industry as a method of achieving higher returns without taking proportional more risk, in effect promising a free lunch (including drinks we would add) to investors. In this article, we will expound more on this topic and hopefully be able to contribute thoughts whether this asset class merits a role in investors' portfolio.

The Case against Traditional Indexing

Traditional indexes are capitalization weighted, meaning they allocate more to larger/mature companies and less to smaller ones/newcomers. The S&P500 is such an index, and the largest company with a market cap of \$721 billion, Apple Inc. (Ticker: AAPL) constitutes around 3.9% of the index (around \$19.5 trillion in size) as of 30th April 2015. Due to the reason that it is simple to calculate, capitalization weighting became the first choice of constructing an index in the early days. Return achieved from exposure to the overall market is termed “beta” in financial jargon.

However, there are inherent flaws in such a method. Nobody has a crystal ball; therefore investors will have different opinions, as a result every stock will be trading above or below the ultimate true fair value of a company on random. Even the most zealous advocate of the efficient market hypothesis will agree that the previous statement is reasonable. Now in this case, any index that is capitalization-weighted is automatically going to have us overexposed to stocks that are overvalued and underexposed to those that are undervalued (please see appendix for a concrete example).² Eventually, when the price and value of stocks converges as time passes, investors obtain a return drag - losing out the appreciation from the undervalued stocks and getting hurt by the depreciation of the overvalued stocks. This process of buying high and selling low implicitly goes against the rule of making money at investing.

Promises of Smart Beta

With no disrespect for traditional betas, “Smart Beta” like most new financial lexicon lacks an established meaning. Its initial success has attracted a plethora of products falsely claiming to be such strategies and became to be the most overused and controversial terms in the industry presently. Assets under management of smart beta funds stood at \$544 billion at end of 2014, a fivefold increase since the financial crisis in 2008, according to data company Morningstar. Towers Watson, a consultancy firm provides the following definition:

“Smart beta is simply about trying to identify good investment ideas that can be structured better, whether that is improving existing beta opportunities or creating exposures or themes that are implementable in a low cost, systematic way”³

Essentially, smart beta seeks to deliberately break the link between price of an asset and its weight in the portfolio, while retaining most of the positive attributes of passive indexing. These strategies can be constructed using intuitive weighting methods which are simple and sensible such as equal weighting and fundamental indexing (by sales, cash flow, book value etc.); or using optimization-based strategies which are complex and subject to estimation errors such as minimum variance, maximum diversification and risk-efficient.

Performance of Smart Beta Strategies (1967 – 2010)

Strategy	Total Return (%)	Volatility (%)	Sharpe Ratio (X)	Relative Return (%)	Tracking Error (%)	Information Ratio (X)
S&P 500	9.86	15.52	0.28	-	-	-
Equal-Weighted	11.96	17.81	0.36	2.10	6.28	0.33
Fundamental Index	12.06	15.82	0.41	2.20	4.61	0.48
Minimum-Variance	11.61	12.10	0.50	1.75	8.18	0.21

(Source: Hsu et. al., 2012)⁴

Since smart beta strategies are rules-based, it is therefore possible to back-test them. The above back-tested results from Research Affiliates, a pioneer in the field shows that market-capitalization is probably the worst weighting method out there, being outperformed by 1.75-2.20% annually over the period of 43 years ending 2010 by other methods of weighting, also on a risk adjusted basis (comparing Sharpe ratios). However, these results must be viewed with a healthy dose of skepticism, since tortured data will confess to anything. Thus, we search for some smart beta products on large-cap US equities to examine the live results.

	Equal Weighting	Fundamental Indexing	Minimum Variance
Product	Guggenheim S&P Equal Weight ETF	PowerShares FTSE RAFI US 1000 Portfolio	PowerShares S&P 500 Low Volatility Portfolio
Ticker	RSP	PRF	SPLV
Expense Ratio	0.40%	0.39%	0.25%
Inception Date	30 th Apr 2003	19 th Dec 2005	5 th May 2011
Period	11y 7m	9y	3y 7m
Annual Return^a	11.81%	9.00%	15.11%
Volatility^a	27.70%	24.31%	13.25%
Sharpe Ratio^a	0.38	0.32	1.14
Risk-free Rate^b	1.38%	1.22%	0.05%
Comparison	iShares Core S&P 500 ETF (Ticker: IVV; Expense Ratio: 0.07%)		
Annual Return^a	9.32%	7.94%	14.97%
Volatility^a	21.07%	21.14%	17.07%
Sharpe Ratio^a	0.43	0.32	0.83

^a Since inception until 31st December 2014 for each respective product

(Source: Bloomberg)

^b 3-Month Treasury Bill: Secondary Market Rate, Federal Reserve Bank of St. Louis

The results shown that absolute annual returns are higher in all cases, but on a risk-adjusted basis, performance of various smart beta products are quite mixed: equal-weighting, fundamental indexing and minimum variance are respectively worse, about equal and better than cap-weighting. However, the unprecedented liquidity craze created by the Federal Reserve's and other central banks' QE programs in the previous years to support the financial system is worth mentioning in this context. Having larger weights to undervalued companies (in cases of equal or fundamental indexing) might provide higher returns at the expense of higher volatility, since these stocks tend to have relatively larger movements compared to the market, hence driving down the Sharpe ratio. We would reserve judgement until all the chickens come home to roost.

Still investors cannot live on relative performance; those able to weather the volatility will be happily outperforming the market. Academics like to think in risk-adjusted terms on the assumption that it is possible to lever up indefinitely with minimal cost to achieve the desired return, which is unrealistic. It is important to point out that these products (especially minimum variance) are relatively new and necessitates longer horizons to ascertain the existence of free lunches. Nevertheless, it would be intriguing to list down the drivers of purported excess returns from non-capitalization weighting products.

Investors' Worst Enemy

Asset-Weighted and Average Total and Investor Return: Trailing Through Dec. 31, 2013			
	Average 10 Year Total Return (%)	Asset-Weighted 10 Year Investor Return (%)	Returns Gap (%)
US Equity	8.18	6.52	-1.66
Sector Equity	9.46	6.32	-3.14
Balanced	6.93	4.81	-2.12
International Equity	8.77	5.76	-3.01
Taxable Bond	5.39	3.15	-2.24
Municipal	3.53	1.65	-1.88
Alternative	0.96	-1.15	-2.11
All Funds	7.30	4.81	-2.49

(Source: Morningstar)

Making money in investing is easy in theory, yet rather difficult in practice. With the benefit of hindsight, the burst of the tech bubble and aftermath of the financial crisis present great buying opportunities, but few ever did. Many sold near the bottom and failed to get in afterwards, waiting for the market to correct back below the level they exited. A study by Morningstar "Mind the Gap" in 2014 demonstrates that investors are poor market timers, the action of trading in and out of funds cause actual returns (investor return) to lag behind the overall fund performance.⁵ As much as we do not like to admit it, humans are social creatures and primitive instincts drive our decision making. We have a tendency to herd and seek comfort in numbers. Fear of missing out cause us to chase the popular stock and greed leads us astray from our asset allocation after a powerful bull run. Great investors thrive by keeping check on the man in the mirror. A financial advisor once described the nature of his business as such: "I don't have people with investment problems, but investments with people problems".

Smart beta tends to overcome the behavioral gap which modern behavioral finance clearly shows through systematic rebalancing. As time passes, smart beta indexes have to incorporate new information available on the holdings: changes in market prices, fundamentals, volatility etc. For example in the case of equal-weighting, if a stock has doubled in value after 3 months and now becomes too large in the index relative to other holdings, during rebalancing a portion of the stock need to be sold so all holdings become equal in weight again. This built-in contrarian approach and trading against market sentiment is the source of long-term outperformance of smart betas, which is very difficult to embrace. It is not easy to sell favored stocks or buy hated sectors and suffer from short periods of underperformance waiting for

valuations to correct. That very human factor is the reason why most funds are closet-indexers due to career risk, to fail conventionally is much easier for market participants to forgive.

Economic Size vs. Market Size

Top 10 Constituents – FTSE RAFI US 1000 Index				
		FTSE RAFI US 1000 (Wgt %)	FTSE USA All Cap (Wgt %)	Diff %
	ICB Sector			
Exxon Mobil Corporation	Oil & Gas Producers	2.98	1.63	1.35
Chevron	Oil & Gas Producers	2.13	0.93	1.20
AT&T	Fixed Line Telecommunications	2.01	0.80	1.21
JPMorgan Chase & Co	Banks	1.88	1.04	0.84
General Electric	General Industrials	1.80	1.21	0.59
Wells Fargo & Company	Banks	1.53	1.27	0.26
Bank of America	Banks	1.41	0.75	0.66
Citigroup	Banks	1.38	0.72	0.66
Verizon Communications	Fixed Line Telecommunications	1.37	0.92	0.45
Apple Inc.	Technology Hardware & Equipment	1.31	3.24	-1.93
Totals		17.80	12.51	

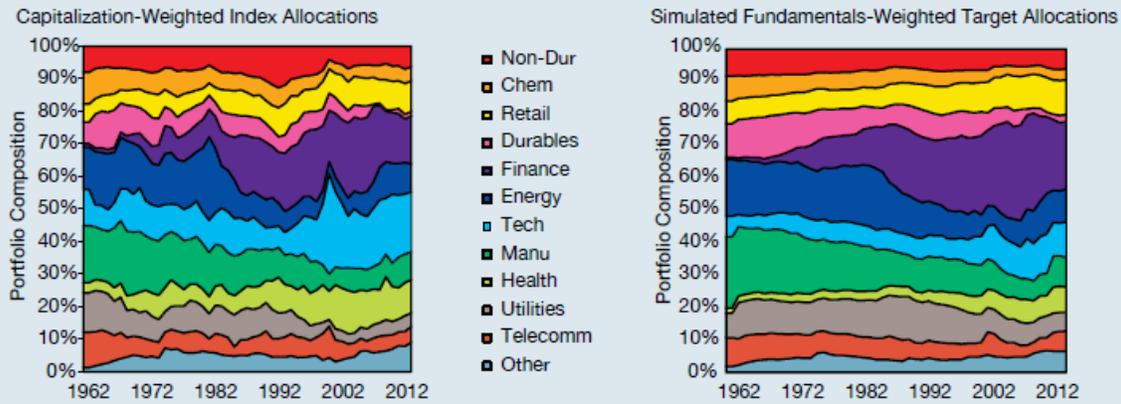
(Source: FTSE, 30 April 2015)

The exhibit above presents top 10 constituents of the FTSE RAFI US 1000, a fundamental index developed by Research Affiliates, with the market-cap weights at the side. It shows that the largest company, Apple Inc. is at the tenth spot of the fundamental index. Given that the great returns it has generated for the past decade, with critics lagging behind and short-sellers burnt, not many fund managers dare to underweight the stock. However, the fundamental index assigns a weight proportionally to a company based on their economic size rather than what the market is willing to pay for.

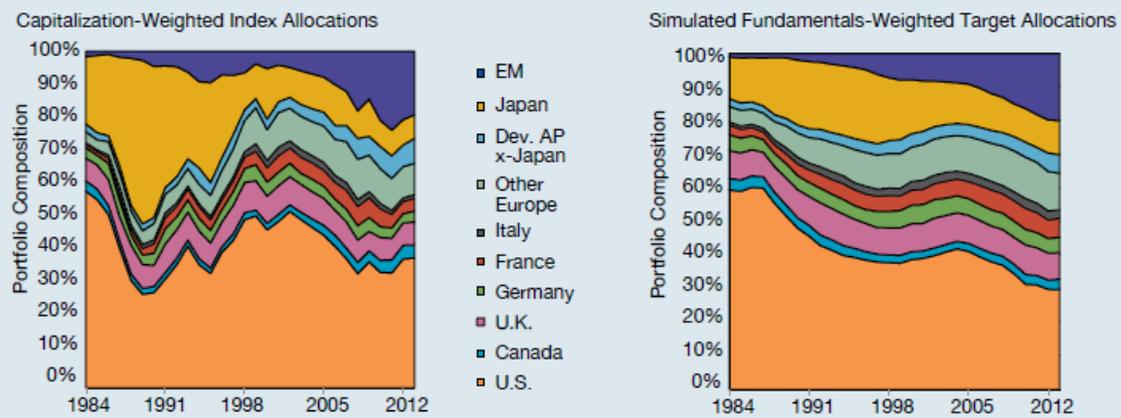
It will be informative to compare the sector and country allocations conforming to cap- and fundamental-weighted indexes over time. Shown below, the cap-weighted index tends to fluctuate more, with the wildest moves recognizable as bubbles. For instance, the tech bubble in early 2000s and surge of Japanese equities in late 1980s. In contrast, oscillations are less dramatic in the fundamental index and investors will enjoy less and smaller drawdowns.

Figure 1: Comparative Sector and Country Exposures

A. Sector Allocations, 1962–2013



B. Country Allocations, 1984–2013



Source: Research Affiliates using data from FactSet

Regardless, smart beta is not without critics, whose arguments will be examined below.

When Bogle Speaks, Heads Listen

Jack Bogle, founder of The Vanguard Group and trailblazer of low-cost index investing who generates a wide following and a wiki named after him (Bogleheads.org) is a fierce attacker of smart beta, describing it as “baloney” and adding complexity for no good reason.⁶ In his opinion, in the long run performance will be the same.

We think smart beta has two disadvantages compared to traditional indexes: cost and capacity.

Bogle claims that smart beta is a marketing gimmick by active managers to recapture the outflows from their funds in recent years and provide investors with passive-like returns with active fees.⁷ Bogle is cheap, in a good way. Vanguard S&P 500 ETF (Ticker: VOO) is the best performing ETF in the space due to its lowest expense ratio of 5 basis points (0.05%).

Eventually, fees are the best predictors of future performance.⁸ Due to the higher initial costs in terms of people and infrastructure needed to create the algorithms and perform complex calculations respectively, smart beta strategies have to scale up substantially before being able to lower down fees, which then they will face an implementation problem to be discussed later. Second, unless smart beta peddlers share the same philosophy as Vanguard which is to maximize investors' return through lower cost, justification for higher fees will remain for extra work carried out.

Further, the cost dimension must not be thought only as management fees and expense ratios. More often than not the largest expense incurred in funds is hidden from sight and has a significant incentive to stay so. Trading cost in the form of broker commissions, bid-ask spreads and stamp duties are significant drags to return. Average turnover for actively managed funds exceeds 100% annually, resulting in a hidden cost of about 1%.⁹ Cap-weighted index funds do trade, but only when there is "reconstitution" (inclusions or exclusions through de-listings, mergers, changes in capital, etc.), whereas investors have to be wary of smart beta products that might tend to enrich brokers as a side effect. The estimated trading costs for various strategies are highlighted below, with cap-weighted benchmarks generating the least activity. The undiscovered Newton's Fourth Law of Motion perfectly sums this up: for investors as a whole, returns decrease as motion increases.

Annual Estimated Trading Costs for Smart Beta Strategies

Trading costs for smart beta strategies vary significantly



Next is capacity. Reason that alternative weighting cannot scale up substantially in the previous discussion is because implementation then becomes difficult. For instance, currently the smallest company in the S&P 500 is Diamond Offshore Drilling, Inc. (Ticker: DO). At a market cap of \$4.3 billion, imagine what an equal-weighted version the size of Vanguard's VOO (\$32

billion) will do to the company – a 0.2% allocation will be more than twice the average daily trading volume of the company, not to mention the largest S&P 500 ETF (by SPDR) is 5 times larger. For all it's worth, alternative indices might not be able to achieve such size, but history tells us never say never in finance. Traditional indexing allocates weights according to market size; thus have lots of capacity and lesser impact to the market, another hidden cost of actively managed funds.

Weighing Up

Smart beta breaks the link between market price and portfolio weight and provides an opportunity to outperform using a rules-based contrarian strategy to overcome cognitive biases. It definitely warrants a position in the portfolio of investors who believe that markets are not efficient all the time and would like to exploit that in a cost-efficient manner. Nonetheless, like all financial products, buyers beware and investors have to understand what they are getting. Smart beta strategies must achieve its higher returns without sacrificing most of the benefits from passive indexing. These include having high transparency, being rules-based, low cost, sufficient liquidity and well-diversified.

We are invested in some funds that provide minimum variance strategies and quite happy to stay so. The managers keep a lid on costs by negotiating lower commissions and trading infrequently as possible, in addition to charging lower management fees as assets grow. Also that the managers we face have a substantial portion of their net worth invested in the funds, always a plus to know that they are eating their own cooking. Never trust a skinny Italian chef.

No strategy is expected to be so perfect that it will always outperform in all market cycles. Ultimately, patience and discipline is the key for obtaining the right results. But as per today, we would favor the minimum variance product as a strategy to protect against significant drawdowns while capturing most of the upside.

The team at Helvetic Investments would very much appreciate evaluating how a potential investment in the mentioned field might fit into your strategy and portfolio. Please don't hesitate to contact us for an in-depth discussion and potential implementation of an investment.

Your Helvetic team/YYZ

Appendix – Illustration of Cap- vs. Equal-weighting²

Suppose we have a world with two groups of stocks, one consisting all of the overvalued companies and the other undervalued companies. Each has a true fair value of \$100, although the market estimates the value to be \$150 and \$50 respectively. Cap-weighting will put 75% of the index on that overvalued group. As market prices and true value converge, investors investing in this index will have stayed the same ($75\% / \$150 \times \100) + ($25\% / \$50 \times \100).

On the contrary, an equal-weighted index will put 50% each into the 2 groups of companies. At the end, the index will produced a return of 33% ($50\% / \$150 \times \100) + ($50\% / \$50 \times \100). If the errors take 10 years to correct, cap-weighting would have cost investors 2.8% per year. Allocating weights according to size increases the error magnitude between market price and true value.

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