# Is Smart Beta Strategy a Successful Guide for Creation of Superior Portfolios?

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## Abstract

**Every investor wants to invest in a portfolio which gives him/her the maximum returns. Building such efficient portfolios has been discussed since time immemorial. This paper described a new strategy called as smart beta which reveals a new and smart set of rules to create efficient portfolios. The main objective of this smart beta is to design a portfolio which manages the risk more effectively than a Cap - Weighted index, and provides a better performance. This paper outlined the limitations of traditional indexing and focused on the prospect of smart beta as a successor to traditional indexing.**

***Keywords :*** **fundamentally weighted indexing, minimum variance approach, maximum diversification strategy, equally-weighted portfolio, equal risk contribution portfolio**

**JEL Classification : G1 , G11, G12**

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There are two types of investments : active and passive. Active investment suffers from the drawback of high fees, excess trading, and in some cases, outright lack of skill have plagued the active industry. Whereas passive management is plagued with the defect that it overweighs overpriced stocks and underweighs underpriced stocks, which leads to a suboptimal portfolio outcome. These defects can be eliminated by constructing portfolio with the aid of smart beta. Smart beta has the advantage of being cheap and thus reaps the benefit of passive management and promises superior performance without the aid of an investment manager, thus flaunting the merit of active management.

Markowitz (1952) developed the modern portfolio theory which formulates a framework to select the optimum portfolio based on minimum risk and maximum returns. On the other hand, the important variables covered in the study deal only with mean and variance which form only the two moments and thus cannot be considered a comprehensive strategy for portfolio formulation. This paper describes certain innovative strategies which would help the investor to form better portfolios for gaining superior performance.

## Motivation for the Study

There exists a research gap with respect to empirical studies verifying the efficiency of the innovative strategies to build portfolios. Since there are only a limited studies done in the area of smart beta , the objective of this paper is to familiarize the readers with the concept of smart beta and to give insights into the various strategies included in smart beta. The paper also gives an outline of the development of smart beta in India.

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## Section I

**(i) What is Smart Beta? :** Portfolio selection models which follow any of the following criteria : equal weighted index, fundamental weighting, global minimum variance, equal risk contribution, and maximum diversification are generally known as smart beta strategies. In passive investing mentioned above, the investor holds the same security which are in the benchmark index in the same proportion, while active strategy tries to outperform the benchmark indices by holding positions that deviate from cap weighted indexes. The elegance of smart beta strategy is that it combines the strength of both passive and active approaches. As non-price-weighted indices, smart beta strategies offer investors a third choice. These strategies retain the benefits of traditional capitalization- or market-value-weighted approaches, such as broad market exposure, diversification, liquidity, transparency, and low cost access to markets. At the same time, they have the potential to achieve results that are superior to the market returns of cap-weighted benchmarks at lower cost than active management strategies.

**(ii) Indexing as a Passive Strategy :** Sharpe (2002) stated that , "Indexed investing is a strategy designed to match a market, not beat it". An indexed investor in a market can beat the average active investor as it would be cheap and tax-efficient. In Indexed Investing it is possible to earn the same returns as the index, for that an investor need to buy the exact proportion of shares in the index. For e.g. an investor wants to replicate Sensex. He could buy 1% of the outstanding shares of every company that make up BSE Sensex. All the prominent indices follow the methodology of market-cap weighting. The indices which follow market-cap weighting are S&P 500, NASDAQ Composite Index, The Rusell 2000, Sensex, Nifty.

**(iii) Emergence of Smart Beta :** The following limitation of market - cap weighting has led to the birth of smart beta alternative indexing(smart beta).Market-cap weighting inherently overweighs overvalued equities and under weighs undervalued equities, exposing investors to potentially lower returns with increased risk. If true that a stock's price reflects pricing inefficiency, it follows that overvalued equities would represent a greater weight in a market-cap-weighted index relative to undervalued equities. By focusing on market cap, traditional indexes are said to necessarily underperform strategies that focus on metrics other than price and shares outstanding (Hsu, 2006 ; Siegel, 2006).

One of the reasons for switching over from the traditional market cap indexing was 2000–2002 global bear market - the so-called TMT ("tech, media, and telecom") bubble. This global equity market decline featured significant equity losses by large companies the world over, leading investors to lose faith in traditional market-capindexes could be improved by divorcing a security's weight in an index from its capitalization weight in a market(Arnott, Hsu, & Moore, 2005).

Chow, Hsu, Kalesnik, and Little (2011) empirically proved that the various smart beta strategies are capable of rewarding the investor with simulated excess returns compared to the cap-weighted benchmark over long periods of time. The superior performances of alternative betas are directly related to a strategy of naive equal weighting, which produces outperformance by tilting toward value and size factors. Nonetheless, the alternative betas represent an efficient and potentially low-cost way to access the value and size premiums because traditional style indices tend to have negative Fama - French alpha and direct replication of Fama - French factors is often impractical and costly. Moreover, combining alternative betas with one another (and with cash and equity index futures) would allow investors to better target desired levels of value and size tilt in their equity allocations.

Smart Beta strategies includes equally weighted, fundamental weighting, global minimum variance, equal risk contribution and maximum diversified ratio. These new approaches have attracted the attention of equity managers as different empirical analyses demonstrate the superiority of these strategies with respect to cap-weighted and to strategies that consider only mean and variance.

Arnott (2016) examined six smart beta portfolios to determine if they exhibited superior performance and they

found that most of the six conform to the definition of smart beta The six smart beta strategies all delivered positive excess returns over both the 10-year period and the full-sample period. But, net of the effect of changing valuations, results are mixed. They further substantiate that two strategies viz risk efficient and Fundamental Index were hurt by the declining valuations over the last decade. But despite valuations moving in an adverse direction, both strategies were able to outperform in the last 10-year period.

## Section II

This section shall describe the various strategies in smart beta.

**(i) Fundamentally Weighted Indexing :** It is a method of indexing where an equity which is fundamentally strong gets more weightage in index construction Instead of simply providing the biggest weights to the largest companies, fundamental strategies weight securities based on factors such as sales, cash flow, and dividends plus buybacks are considered for preparing the portfolio. By weighting according to fundamental variables, those companies or countries with better economic fundamentals receive higher weights and those with weaker fundamentals receive lower weights. This strategy is intermediate to active strategy and passive strategy. The main advantage of this method is, it evades the previously mentioned defect of market-cap method

Davidow (2014) stated that fundamental indexing weights securities based on economic factors, rather than merely on market cap, leads to a more sophisticated allocation of capital. They have delivered better risk-adjusted returns than their market-cap equivalents since inception and have been able to outperform many actively managed mutual funds. Fundamental strategies represent an evolutionary step in indexing, moving beyond traditional market-cap indexing by applying logic and intelligence to index construction.

While market-cap indexes and fundamentally weighted index strategies may begin with the same basket of eligible securities, the differences in construction can lead to dramatically different results. The strength of fundamentally weighted index is excellently demonstrated by the following result of Russell Fundamental U.S. Large Company Index which follows the fundamental weighted method. It has delivered excess returns (15.85% vs. 14.96%) with roughly the same amount of risk as the Russell 1000 Index (12.74% vs.12.72%) (Russell Indexes and Morning star direct data as of December 31, 2013).

A major advantage of fundamental indexing is that it also retains the advantage of market cap weighted index. Arnott et al. (2005) explains that most alternative measures of company size - such as book value, cash flow, sales, revenues, dividends, or employment which are considered in fundamental indexing are highly correlated with capitalization and liquidity. This means that the Fundamental indexes are also primarily concentrated in the large-cap stocks and preserve the liquidity and capacity benefits of traditional cap-weighted indexes. The findings in the study of Arnott et al. (2005) made a breakthrough finding which support the efficiency of fundamental indexing. They selected various group of fundamentals-basedmarket portfolios whose construction method is based on selection and weighting with metrics of company size other than cap weighting. These size measures include book value, revenues, dividends, and others. The resulting portfolios outperformed the S&P 500 by an average of 1.97 pps a year over the 43-year span tested.

**(ii) Minimum Variance Approach :** Another important strategy of smart beta is minimum variance approach. This approach combines stocks with the lowest overall volatility, which are subject to defined constraints and thereby creates the portfolio. The only optimization inputs required are correlations and volatilities and it is based only on risk parameters.

Richard and Roncalli (2015) have given a constrained optimization problem for implementing minimum variance portfolios :

$X^* = \arg\min 1/2 x^T \sum x$
U.C.
$x \sum C$
$1^T x = 1$
$X \geq 0$

The constraints $x \geq \mathbf{0}$ and $\mathbf{1}^T x = 1$ imply that the portfolio is long-only. The management of the weight concentration is specified by the constraint $x \sum C$.

✦ **Advantages and Disadvantages of Minimum Variance Approach :** Clarke, De Silva, and Thorley (2006) advocated this approach due to the advantage of achieving substantial volatility reduction. Minimum-variance portfolios that do not rely on any specific expected return theory or return forecasting signal show promise in terms of adding value over the market-capitalization weighted benchmark. They found that stocks constructed using minimum variance approach had realized standard deviation which is lowered by about one-fourth, and risk as measured by market beta is lowered by about one-third, compared to the capitalization- weighted market benchmark.

Portfolios constructed according to minimum variance suffer from the defect of illiquidity. Since such stocks are divorced from market cap weighting , it may enhance the trading costs. Also they may tend to shift their concentration to small cap stocks making them vulnerable to inefficient performance. Amenc, Goltz, and Martellini (2013) criticized minimum variance portfolios as being heavily concentrated in the assets with the lowest volatility. In equity portfolio construction, such concentration in low volatility stocks leads to a pronounced sector bias towards utility stocks.

**(iii) Maximum Diversification Strategy :** This strategy advocates the elimination of risk by constructing a portfolio which is maximum diversified and this can be achieved by including stocks which have no or negative correlation between their returns. Thus it also known as maximum de-correlated portfolios. Amenc et al. (2013) demonstrated that a maximum diversified ratio, known as diversification index, can be defined in terms of distance between portfolio volatility and individual components' volatility:

$$DI = \left( \frac{\sum_i w_i \sigma_i}{\sqrt{\sum_{ij} w_i w_j \sigma_{ij}}} \right)$$

where,
$w_i$ is the portfolio weight, and $\sigma_i$ is the volatility of stock $i$, and $\sigma_{ij}$ the covariance between stocks $i$ and $j$.

Choueifaty and Coignard (2008) conducted an empirical study to analyze the effectiveness of maximum diversified portfolio in the Eurozone and US equities. The Most-Diversified Portfolio consistently delivers superior risk-adjusted returns in both regions. As expected, it is consistently less risky than the market cap–weighted indices(i.e., volatility is 13.9% versus 17.9% for Eurozone equities, and 12.7% versus 13.4% for U.S. equities). The Most-Diversified Portfolio shows a higher Sharpe ratio than the marketcap - weighted benchmark, minimum-variance portfolio and equal-weight portfolio over the entire period. They support maximum diversified strategy as the best one most-diversified portfolios have higher Sharpe ratios than the market cap–weighted indices and have had both lower volatilities and higher returns in the long run, which can be interpreted as capturing a bigger part of the risk premium.

**(iv) The Equally-Weighted Portfolio :** Equally-weighted or ew portfolio is constructed by attributing the same weight to all the assets of the portfolio. It follows the 1/*n* rule. This strategy is an improvement over the concentration method adopted in the traditional cap-weighted methods. Benartzi and Thaler (2001) show that some investors follow the "1/*n* strategy": they divide their contributions evenly across the funds offered in the plan. Consistent with this naive notion of diversification. The irony of the paper is that they describe this strategy as naïve and try to investigate the reason for people to do so. The authors further argue that the 1/*n* rule could not be a sensible option as it could prove to be costly. For example, individuals who are using this rule and are enrolled in plans with predominantly stock funds will find themselves owning mostly stocks, while those in plans that have mostly fixed income funds will own mostly bonds. While either allocation could be on the efficient frontier, the choice along the frontier should reflect factors other than the proportion of funds that invest in stocks.

DeMiguel, Garlappi, and Uppal (2009) studied 14 models that were evaluated across seven empirical datasets and their results were strongly in favour of the 1/*n* rule. None of the datasets under study were consistently better than the 1/*N* rule in terms of Sharpe ratio, certainty-equivalent return, or turnover, which indicates that, out of sample, the gain from optimal diversification is more than offset by estimation error.

A demerit of equal-weighting is that portfolio weights keep on changing from the standard, so frequent rebalancing is to be done so that they remain at the target levels of equal weights which is done by selling recent winners and buying recent losers, which may go against the momentum effect.

**(v) Equal Risk Contribution Portfolio :** Equal risk contribution portfolio or ERC portfolio is a strategy of maximizing the diversification of risk by making the risk contribution from the stocks that make up the portfolio, equal. The sum of risk contributions of the stock that make the ERC portfolio is exactly equal to the portfolio volatility and the important characteristics of the risk contributions being the same for all assets make it superior to minimum variance and equally weighted portfolio.

Qian (2005) states that ERC portfolio are are actually mean-variance optimal if the underlying components have equal Sharpe ratios and their returns are uncorrelated. In the study the author have introduced a concept called Risk Parity Portfolio which follows the ERC strategy. In Risk Parity Portfolio the weights are influenced by asset return correlations in a desirable way: Assets that have exhibited higher correlations with other asset classes will have a lower weight and those that have exhibited a lower correlation with other asset classes will have a higher weight. This characteristics of the portfolio has made it highly diversified in terms of risk.

Maillard, Roncalli, and Teïletche (2008) demonstrated that in ERC is constructed by taking the product of the allocation in a particular component *i* with its marginal risk contribution and thereby equalize risk contributions from the different components of the portfolio. The risk contribution of a component *i* is the share of total portfolio risk attributable to that component. Risk contributions have gained quiet a lot of prominence within institutional investors, under the label of "risk budgeting". Risk budgeting is the analysis of the portfolio in terms of risk contributions rather than in terms of portfolio weights. The importance of risk contribution has also been propagated by Qian (2006). They advocate that it is not solely a mere (exante) mathematical decomposition of risk, but that they have financial significance as they can be deemed good predictors of the contribution of each position to (expost) losses, especially for those of large magnitude. Equalizing risk contributions is also known as a standard practice for multi strategy hedge funds.

## Section III

**(i) Indian Scenario :** Indian smart beta market is still in the nascent phase. Reliance and Kotak Asset Management Company have ETFs based on the Nifty Value (NV) 20 Index. This index uses criteria like low price-to-earnings ratio, low price-to-book value, high return-on-capital-employed (RoCE), high dividend yield and a track record of regular dividend payment to pick stocks. Reliance AMC also offers an ETF based on the

dividend opportunities strategy which invests in stocks having high dividend yields. Second, these ETFs are still new in the market and don't have much of a track record. They have been launched on back-tested data. Obviously, AMCs launch their products in market conditions when past results are good. How they perform across market cycles in actual conditions remains to be seen (Singh, 2016).

The NV20 Index is a diversified portfolio of value companies forming a part of CNX Nifty Index. The 20 most liquid value blue chip companies listed on NSE are the constituents of NV 20. This Index has been computed historically from January 01, 2009.The NV20 Index provides exposure to eight broader sectors of the economy (NSE).

## Section IV

### Conclusion

From this paper we could conclude that smart beta offers various rules and guidelines to construct portfolios for a better investment and reaping high returns. By analyzing the various strategies involved in smart beta we may infer that maximum diversification and equal risk contribution strategies could be considered superior among all the strategies. Smart beta, even though seems to be promising is still in the nascent stage. However it is noticed that the investor community is turning towards these magic formula with the hope of achieving superior performance.

### Research Implications, Limitations of the Study, Scope for Future Research

This paper outlines various strategies which can be used by the investor to create portfolios which match his expectation and can successfully outperform the market. The major limitation of the study is that it just describes the various strategies that could be used to build portfolios, but does not provides empirical proofs to test what they propose they are capable of doing. The scope with respect to smart beta is very wide as each strategy could be empirically tested to check which is the most efficient strategy

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