IISL
India Index Services & Products Ltd.

NIFTY50 Equal Weight Index

- *Its uniqueness lies in its simplicity*

April 2017

Introduction:

For ages, investment managers have relied upon traditional methods of market capitalization weighted portfolio for asset allocation. In such investment strategies, passive fund managers simply replicate the index portfolio which is weighted based on the free float market capitalization of stocks. The theoretical underpinnings for market capitalization weighted indices as a basis for investment lie in the Efficient Market Hypothesis – which suggests that it is almost impossible to outperform the market consistently as market prices already incorporate all relevant information (whether public or private) fully, rapidly and rationally. Accordingly, the most efficient portfolio would be the entire market and a broad market capitalization index (read NIFTY 50) would represent the most optimal investment strategy. However, another school of thought raises doubts on Efficient Market Hypothesis and believes that markets may not necessarily be informationally efficient in practice and suggests that there are opportunities available to exploit pricing discrepancies (especially in relatively small companies) and thus to outsmart the market beta. In essence, these are proponents of having alternative index strategies that seek to make the index beta smarter - giving birth to smart beta strategy. One such alternative smart (yet simple) index strategy is Equal Weight Index – which simply allocates equal weight to all stocks, instead of considering economies of the firms (read market capitalization) as the sole criteria for asset allocation. India Index Services & Products Ltd (IISL), an NSE group company, today launched NIFTY50 Equal Weight Index – an equal weight variant of the flagship index NIFTY 50.

About the NIFTY50 Equal Weight Index

The NIFTY50 Equal Weight Index represents an alternative weighting index strategy to its market capitalization weighted parent index, the NIFTY 50. The index includes the same companies as its parent, however, weighted equally.

The NIFTY50 Equal Weight Index aims to measure the performance of constituents forming part of the parent index, the NIFTY 50 Index, where each company in the index shall be assigned equal weights at the time of review.

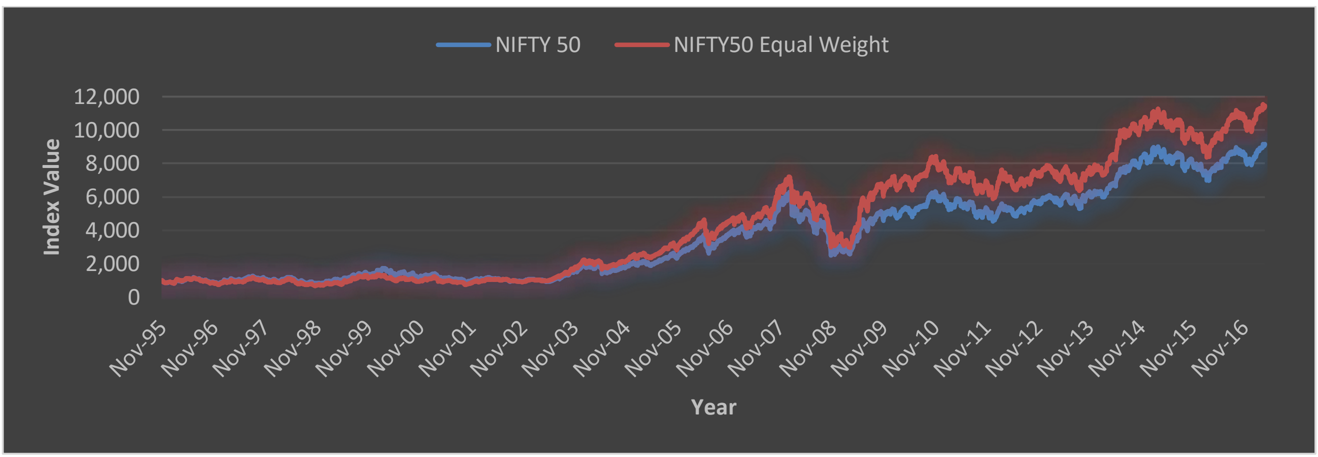
Highlights

- The index has a base date of November 03, 1995 and a base value of 1000
- All constituents forming part of the NIFTY 50 shall form part of the index
- Equal weight shall be assigned to all the companies in the index
- In case there are multiple securities (e.g. DVR) of the same company in the index, the company will be equal weighted and the securities of such company will be weighted in proportion to free float market capitalization.
- Index shall be rebalanced quarterly where weights are rebalanced back to equal
- Index shall be reconstituted semi-annually along with NIFTY 50
- Additionally, during the year, ad-hoc rebalancing and reconstitution of index may be initiated in case any of the index constituents ceases to form part of the parent index due to suspension, delisting or scheme of arrangement.

Global Landscape

Looking at the global landscape, index products on equal weight indices have been present since 2003 – with the first ETF being launched on the equal weighted version in 2003. As of now approximately USD 56 billion of asset under management (AUM) is attached to more than 100 equal weight indices with the largest ETF having an AUM of USD 13.3 Bn. Around 95% of the AUM on equal weighted strategy currently comes from products based in United States.

Equal weight index strategy outperforms traditional market capitalization based index strategy over long term horizon but lags in recent smaller time horizons

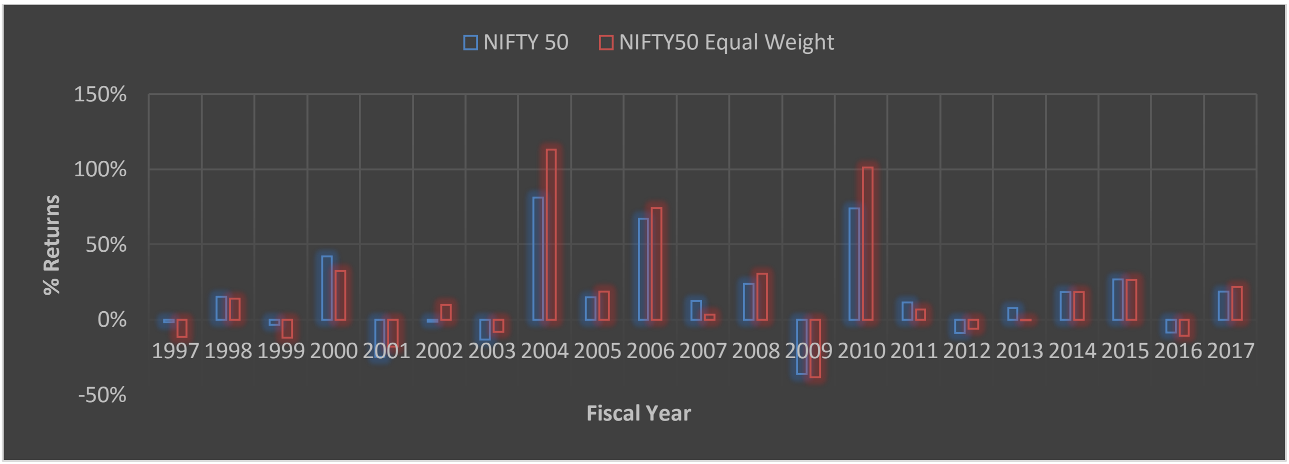


	CAGR Returns		Volatility	
Period	**NIFTY50 Equal Weight**	**NIFTY 50**	**NIFTY50 Equal Weight**	**NIFTY 50**
Since Inception	12.1%	10.9%	23.9%	24.6%
20 years	13.7%	11.9%	23.8%	24.4%
15 years	17.3%	15.0%	22.9%	23.2%
10 years	10.1%	9.2%	23.6%	23.6%
5 years	10.0%	11.6%	16.2%	15.1%
3 years	11.0%	11.0%	15.6%	14.6%
1 year	21.5%	18.5%	13.2%	12.4%
6 months#	6.4%	6.5%	13.4%	12.3%

** Data ending March 31, 2017.   # Point to Point return*

As on March 31, 2017, the NIFTY50 Equal Weight Index has outperformed its market cap weighted version (the NIFTY 50) for longer term horizons. Since inception (Nov 03, 1995), the NIFTY50 Equal Weight Index has delivered 12.1 percent per annum as compared to NIFTY 50 which has delivered 10.9 percent – thereby outperforming its parent by a good 120 basis points per annum. Similarly, for other longer time horizons of 20, 15 and 10 years, the equal weight variant has outperformed its traditional variant by 180 bps, 230 bps and 90 bps per annum respectively. The story, however, changes for more recent shorter time horizons of 5 years and 6 months where equal weighted strategy has underperformed the market cap weighted by 160 bps per annum and 10 bps respectively.

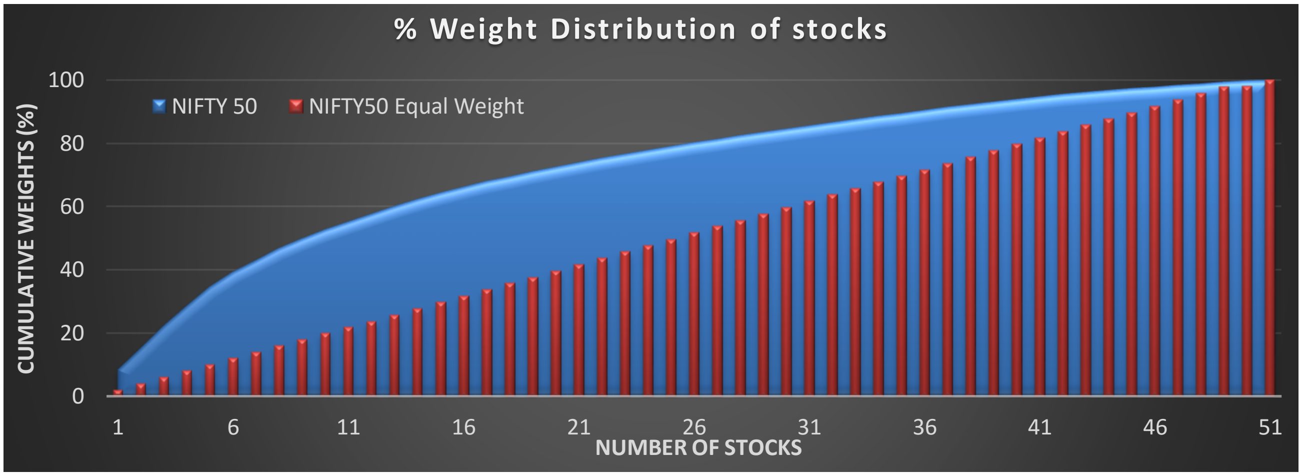
Both the strategies have had the same stocks at every point in time, the only difference being the allocation of weights to each of those stocks. In the equal weight index strategy, all stocks are treated equally and hence smaller firms are held is same proportion as the larger ones (hence there is no valuation or size bias). While the weights for all stocks are equal, weights for relatively small stocks are still high compared to their weights in market cap weight index strategies – which could be a reason for the equal weight index to outperform. Smaller capitalization stocks are typically less researched and less tracked and hence have more opportunities of being undervalued and thus tend to outperform as and when such pricing discrepancies are identified and corrected – and when such stocks outperform, having higher weights to such stocks in an index strategy (read equal weight index) pulls the index return up - outshining other index strategies.



On a (fiscal) year on year basis, however, the performance of equal weight index strategy is more balanced. Of the 21 complete fiscal years since inception (from 1996 to 2017), the equal weight index strategy has outperformed its market cap weighted variant for only slightly over half the number of years (11 to be precise). This serves as a reminder that much celebrated equal weighted strategy may not consistently outshine other strategies.

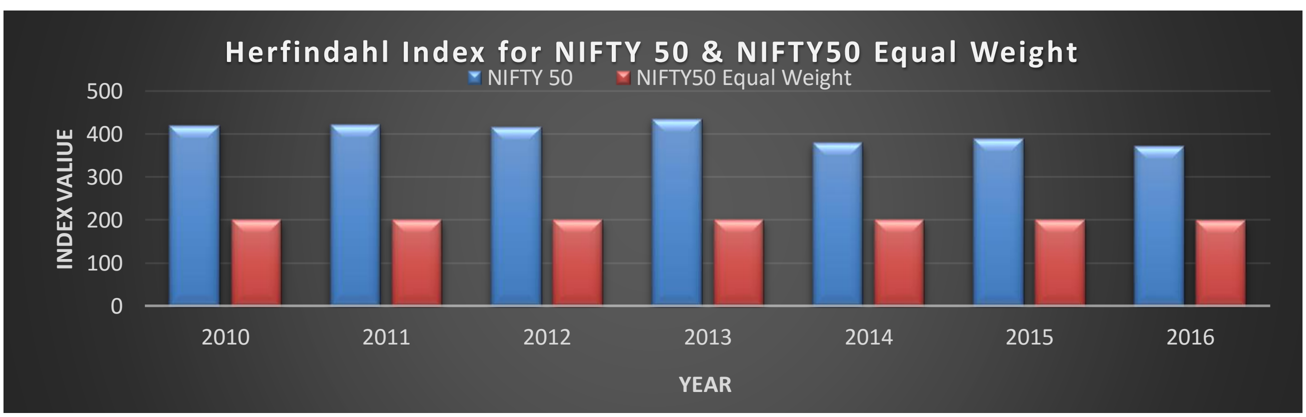
Equal weight index benefits from better diversification due to lower stock concentration risk as compared to parent index.

One of the major benefits of equal weight index strategy is better diversification by avoiding concentration of portfolio in few big stocks. The table below shows the cumulative weights of top 'n' companies for both the index strategies.



Data as on March 31, 2017

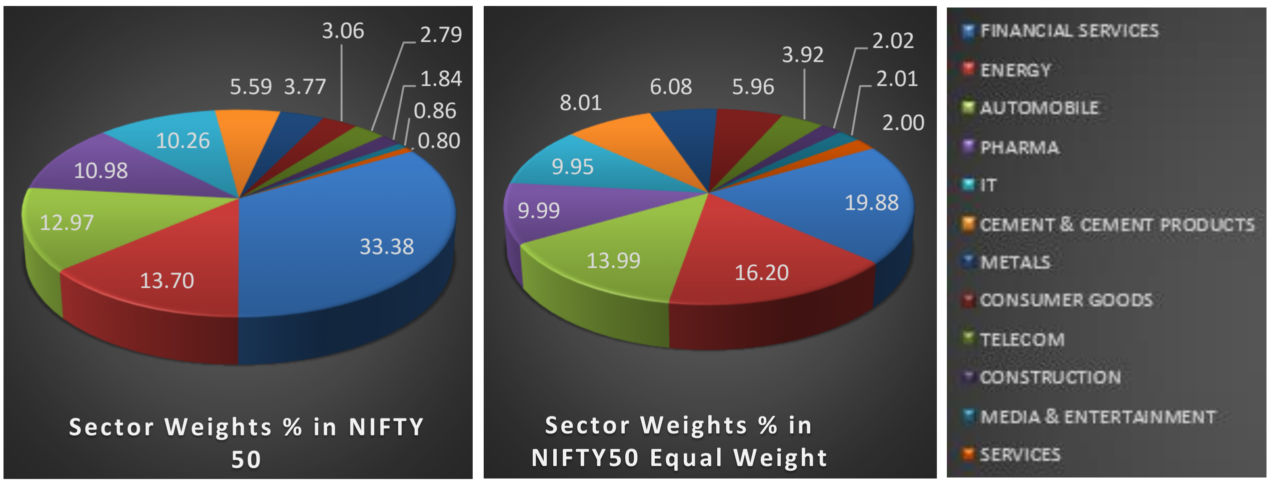
As on March 31, 2017, in NIFTY 50 Index – the parent index, top 10 stocks claim around 52.8 percent of the weights by free float market capitalization, implying that remaining 47.2 percent weight is distributed across 41 stocks in the index. The bottom 10 companies (tail) in the index owns only 5.33 percent weight in the index. Equal weight index strategy removes this skew in weight by assigning equal weight to all the companies (with top 10 and bottom 10 companies claiming 20 percent weight each) and hence all the companies are reasonably and fairly represented in the index irrespective of their size.



The Herfindahl Index is a commonly used measure of concentration (calculated as the sum of squares of percent weight of each stock in a portfolio). Lower the value, more diversified is the portfolio in question. Over the years, NIFTY 50 witnessed Herfindahl value ranging between 370 and 435 whereas NIFTY50 Equal Weight Index displays lower stock concentration with Herfindahl value of ~200 across years. Having equal weights to all companies in the index comes at its own cost – which has been explained in detail in this paper below.

Equal weight strategy also benefits from different (read diversified) sector exposure as compared to market cap based index

The NIFTY50 Equal Weight Index also exhibits different sector exposures as compared to its parent – with the latter having sector weightings skewed towards stocks with large market capitalization since the weight of each sector in the index at any time is dependent on the market capitalization of the stocks in that sector relative to the market cap of the entire index. NIFTY50 Equal Weight Index has sector weights that are determined only by the number of stocks in each sector. The below table shows the sector exposure of the two indices.



**Data ending March 31, 2017.*

As on March 31, 2017, in NIFTY 50 (the parent index), top 3 sectors claim around 60 percent index weight with financial services sector claiming 33.38 percent, energy sector claiming 13.7 percent and information technology sector claiming 13 percent. In comparison, in case of the equal weight index strategy, these 3 sectors put together claim around 50 percent weight, with financial services sector (with 10 companies) claiming 19.9 percent, energy sector (with 8 companies) claiming 16.2 percent and information technology sector (with 8 companies) claiming 14 percent. In NIFTY 50, the sector weights are dependent on the market capitalization of the stocks in the index, however, in the NIFTY50 Equal Weight Index, the sector weights are determined by only the number of stocks in each sector – irrespective of those stocks being big or small. The NIFTY50 Equal Weight index strategy, thus, shall be overweight (relative to the NIFTY 50) in sectors that contain stocks that, on an average, are smaller than the average stock in the NIFTY 50 and similarly will be underweight in sectors with stocks larger than average stock.

The below table shows the average weight of each sector and their return contribution in the two index strategies for the past 10 calendar years

Contribution Analysis for last 10 (2007-16) calendar years				
	Average Weight		Return Contribution	
Sector	**NIFTY 50**	**NIFTY50 Equal Weight**	**NIFTY 50**	**NIFTY50 Equal Weight**
FINANCIAL SERVICES	**25.4**	**16.1**	34%	25%
ENERGY	18.1	18.2	18%	20%
IT	13.7	8.9	11%	10%
CONSUMER GOODS	**9.0**	**5.1**	14%	9%
AUTOMOBILE	**7.1**	**9.9**	10%	18%

CONSTRUCTION	5.9	4.0	6%	4%
METALS	**5.6**	**10.6**	0%	6%
TELECOM	4.6	5.1	-1%	-3%
PHARMA	**4.4**	**8.3**	4%	9%
CEMENT & CEMENT PRODUCTS	**3.1**	**7.4**	1%	4%
INDUSTRIAL MANUFACTURING	2.7	5.1	1%	4%
MEDIA & ENTERTAINMENT	0.3	1.0	0%	-1%
SERVICES	0.1	0.3	0%	0%

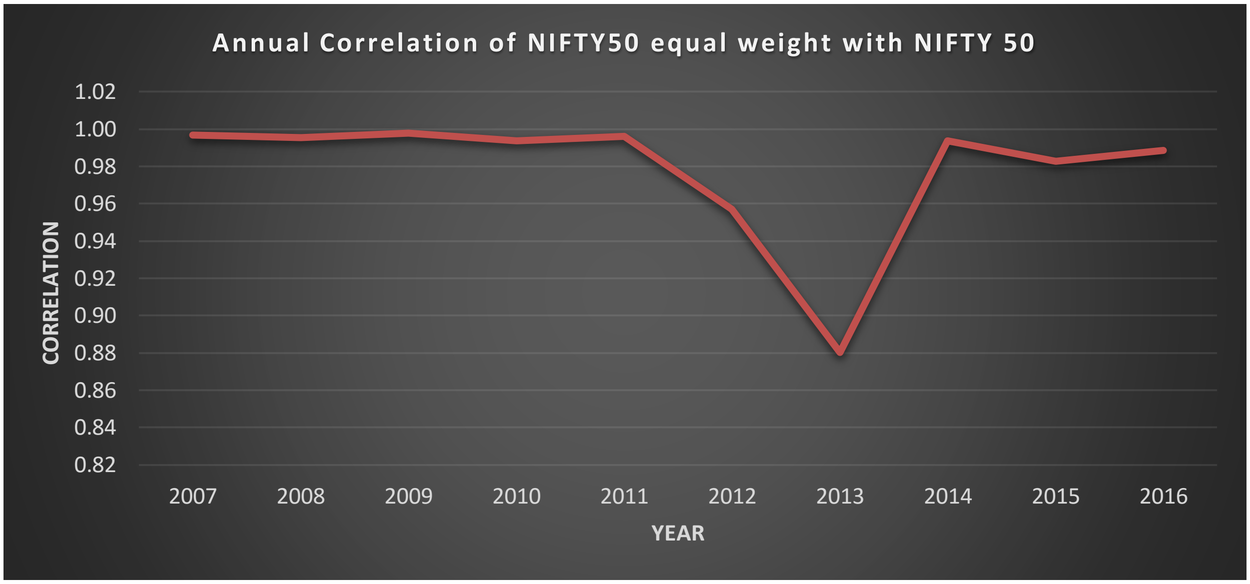
It can be observed that the weights and return contribution in case of the equal weight index strategy is relatively more spread-out (diversified) across sectors as compared to market cap based index strategy. For instance, with significantly underweight on financial services, consumer goods and significantly over-weight on automobiles, metals, pharma and cement sectors, the equal weight index strategy witnesses different return contributions from these sectors as compared to the NIFTY 50.

The impact of sector diversification usually gets amplified during periods of market stress or market recovery. The table below shows weights and return contribution in the 2 indices for two such periods - the US sub-prime crisis in 2008 and the post crisis recovery in 2009.

	2008 calendar (Sub Prime Crisis)				2009 Calendar year (Recovery)			
	Avg. Weight		Return Contribution		Avg. Weight		Return Contribution	
Sectors	NIFTY50 EWI	NIFTY 50	NIFTY50 EWI	NIFTY 50	NIFTY50 EWI	NIFTY 50	NIFTY50 EWI	NIFTY 50
AUTOMOBILE	8.5	3.7	-4.2	-2.3	8.0	3.9	11.9	5.4
CEMENT & CEMENT PRODUCTS	6.0	2.7	-4.1	-2.1	6.3	2.8	4.0	1.9
CONSTRUCTION	5.5	8.3	-5.6	-7.2	6.0	7.8	6.8	7.0
CONSUMER GOODS	4.0	6.2	0.0	-0.5	4.0	7.9	1.0	2.3
ENERGY	20.0	24.6	-8.8	-14.8	21.0	24.3	14.4	18.5
FINANCIAL SERVICES	10.0	19.5	-3.6	-11.1	13.3	22.5	12.5	17.1
INDUSTRIAL MANUFACTURING	8.0	5.0	-6.2	-3.8	8.0	4.5	7.5	3.4
IT	10.0	11.4	-5.8	-5.5	8.3	10.7	8.9	10.4
MEDIA & ENTERTAINMENT	2.0	0.5	-1.3	-0.3	2.0	0.5	-0.5	-0.1
METALS	10.0	6.7	-9.4	-6.5	10.7	5.5	15.0	7.4
PHARMA	8.0	3.1	-1.2	-0.7	6.0	2.5	4.5	1.2
TELECOM	8.0	8.3	-4.2	-3.9	7.7	7.5	0.3	0.0

As can be seen in the table, during US sub-prime crisis in 2008, the equal weight index strategy witnessed relatively better return contribution from sectors like energy and financial services (which underperformed during this period) by underweighting on them. Similarly, during the post crisis market recovery in 2009, the NIFTY50 Equal Weight Index was positively impacted by overweighting on automobile, industrial manufacturing, metal and pharmaceutical sectors (which performed relatively well during this period) that resulted in better return contribution even from smaller stocks during market recovery.

To further understand the differential nature of sector exposures between the 2 index strategies, the below table shows the correlation of returns of the 2 index strategies across years.



Despite having same constituents, the equal weight version and market cap weighted version sometimes behave differently. Since inception, correlation between NIFTY50 Equal Weight Index and NIFTY 50 stands at a staggering 0.9969, but if we look at annual correlation, we can observe that the correlation dropped to 0.88 in 2013. Lower correlation during this year was due to the difference in weights and performance of three specific sectors in the index - cement, energy and IT. During calendar year 2013, the NIFTY 50 Equal Weight Index underperformed the NIFTY 50 index by ~5%. This underperformance is largely attributed to difference in exposure to these 3 sectors and their performance contribution to the 2 indices. The equal weight index strategy, for instance, was relatively overweight (during this year) on underperforming sectors like cement and energy and was relatively underweight on outperforming sector like IT. This differential sector allocation in the equal weight index strategy dragged its return and correction (with its parent index) down. This illustrates that both the index strategies may behave differently under different market scenarios and performance of one doesn't indicate performance of the other - irrespective of having the same stocks.

Equal weight index strategy tends to have a higher stock weight turnover and higher liquidity constraints during portfolio rebalancing – making replication relatively more cumbersome.

The NIFTY50 Equal Weight Index is rebalanced on a quarterly basis – where stocks are reset to equal weights, as weights may have drifted due to price movements. This quarterly reset in weights leads to higher turnover due as frequent rebalancing resulting in increased cost of replication - as the fund tracking the index would also have to rebalance the portfolio on a quarterly basis.

The below table shows the one-way annualized percent turnover in the two index strategies for the recent 3 years. This shows the percent change in the index portfolio during the year and is calculated as half of [percent of stocks excluded from the index plus percent of stocks included into the index plus absolute change in aggregate weight of remaining stocks]

One way total annual turnover (%)		
Period	**NIFTY50 Equal Weight**	**NIFTY 50**
2013-2014	24.61	4.02
2014-2015	29.51	4.19
2015-2016	26.50	4.15

As can be observed, NIFTY50 Equal Weight Index annual turnover ranges between 24.61% to 29.51 percent in comparison to ~4 percent in case of the parent index. The higher turnover in the equal weighted index strategy can be attribute to frequent reset of weights. While both the indices are reconstituted semi-annually, the NIFTY50 Equal Weight Index is rebalanced on a quarterly basis - where weights of stocks which have outperformed are lowered and those of stocks which have underperformed are increased (in order to achieve equal weights). Such weight resets don't happen in market capitalization based NIFTY 50 index which results in lower stock weight turnover.

Another concern regarding equal weight index strategy may be capacity and liquidity constraint. Since all constituents are held at equal weights regardless of their market capitalization, an investment product (read ETFs or index funds) tied to the index will have relatively large holdings in the relatively small stocks in the index. This aspect may produce liquidity pressures at rebalancing as the fund manager may have to buy equal value of all stocks – large or small capitalization. However, deeper investigation shows that this concern is true only in theory.

Below table shows the ratio of stock exposure in the index (assuming a portfolio size of Rs 1000 crs) to the average of daily trading value for each stock. The table only summarizes this information for top 5 stocks for each of the 2 index strategies.

Percent of Daily Market Liquidity required to create a portfolio of Rs. 1000 Cr.			
Category	**Symbol**	**NIFTY50 Equal Weight**	**NIFTY 50**
5 stocks in NIFTY 50 with highest ratio	HDFCBANK	6.5%	28.0%
	ITC	7.3%	25.6%
	HDFC	6.0%	21.3%
	KOTAKBANK	13.2%	20.0%
	HINDUNILVR	20.1%	19.3%
5 stocks in NIFTY50 Equal Weight with highest ratio	BOSCHLTD	59.0%	17.9%
	TATAPOWER	57.9%	13.8%
	ACC	45.8%	8.0%
	AMBUJACEM	42.5%	10.7%
	WIPRO	33.3%	15.9%

Based on 6 month daily average data ending Mar 31, 2017.

As can be seen, a fund with a size of Rs 1000 crs replicating NIFTY 50 can be created in 1 day, say, by buying 28 percent of the daily traded value of HDFC Bank, 25.6 percent of ITC, 21.3 percent in HDFC and so on. Similarly, a fund with an identical size replicating NIFTY50 Equal Weight Index would have to buy only around 6-7 percent of daily traded value of such stocks. On the other extreme, for replicating stocks like Bosch Ltd, Tata Power, ACC, Ambuja Cement and Wipro, the fund replicating NIFTY 50 index would have to buy in the range of 8-18 percent of the daily traded value of each stock, however a fund replicating NIFTY50 Equal Weight Index would have to buy as high as 33-59 percent of the daily traded value of each stock. While such a portfolio could still be created in 1 day, the cost of replicating such index in 1 day could be higher due to the low trading value of such small stocks.

Why we think an equal weight index strategy is uniquely attractive?

- Market cap weighting can result in a large part of the portfolio concentrated in a few securities which may not be desirable from the perspective of concentration risk. Equal weight index strategy, on the other hand, has lower concentration of individual stocks and thus better diversification.
- Equal Weight index strategy has more diversified sector exposure thereby limiting systematic risk in any particular sector.
- Equal weight strategy is factor-indifferent and unbiased. It randomizes factor mispricing, and is thus an attractive index strategy option for proponents of the theory that the market is not necessarily efficient and thus, at times, misprices factors. Such mispricing may give the equal weight index strategy opportunities to outperform at times.
- Equal weighting takes advantage of inefficient markets since equal weight strategy is not affected by the over-optimism in certain stocks and over-pessimism in others. Such inefficiencies has helped equal weight index strategy to outshine traditional market cap based index strategies.
- Equal weight index strategy witnesses higher turnover due to frequent rebalancing and also higher liquidity constraints due to relatively high weight to small companies which may be difficult to buy especially for bigger funds – these are practical challenges that may, however, make the replication of such index strategies somewhat cumbersome.
- Over a longer term investment horizon, the equal weighted index strategy has significantly outperformed its market capitalization based counterpart.

Signing off…

The bottom-line is that each index strategy has its unique strengths and limitation. There can seldom be a single investment strategy that would outshine other strategies consistently in all market conditions. If we believe markets are informationally efficient and thus beating the market is difficult in long run, then traditional market capitalization based index strategies are expected to outperform others. However, if we believe that markets may not necessarily be informationally efficient in practice and that there are opportunities available to exploit pricing discrepancies (especially in relatively small companies) then alternative index strategies like 'equal weight' may outsmart the traditional index strategies. Equal weight index strategy is a simple yet smart investment idea. This simple approach tends to generate higher returns with lower concentration risk than traditional market capitalization based index strategies over long run – which could also be the reason for popularity of equal weight index strategy funds globally. Investors need to additionally realize that equal weighting index strategy creates a different set of risk factor exposures leading to high turnover and relatively high exposure to small stocks - thus putting the equal weight index strategy into a different risk-return profile as compared to traditional market capitalization based index strategies. However, as investors realize that turnover associated with equal weight index strategy is comparable to active managers' turnover and that it results in better stock and sector diversification of the portfolio, we expect equal weight index strategy to also gain traction in India.

For information on Index methodology and factsheet, please visit us at www.nseindia.com

About India Index Services & Products Ltd. (IISL):

India Index Services & Products Ltd. (IISL), a NSE group company, was setup in May 1998 to provide a variety of indices and index related services for the capital markets. IISL is India's first specialized company focused upon the index as a core product. IISL maintains more than 100 equity indices comprising broad-based benchmark indices, sectoral indices and customized indices. IISL also maintains fixed income indices based on Government of India bonds. Many investment and risk management products based on IISL indices have been developed in the recent past, within India and abroad. These include index based derivatives traded on NSE, Singapore Exchange Ltd. (SGX), Chicago Mercantile Exchange Inc. (CME) and Osaka Exchange Inc. (OSE) and a number of index funds and exchange traded funds. The flagship 'Nifty 50' index is widely tracked and traded as the benchmark for Indian Capital Markets.

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