

# **Price Weighted Vs. Value Weighted Index: A Comparative Analysis and Impact on Index Based Portfolio Performance**

*N R Parasuraman*

Professor - Finance and Director,  
SDMIMD, Mysore  
nrparasuraman@sdmimd.ac.in

*P Janaki Ramudu*

Professor - Finance,  
School of Business, Alliance University, Bangalore  
janakiramudu.p@alliance.edu.in,  
pjanakiramudu@yahoo.co.in

## **Abstract**

*In this paper we have attempted to compute and compare the performance of price weighted index with that of value weighted index using S&P BSE SENSEX. In turn we tried analyze and see the impact on index based portfolio during the period January 2012 and September 2013. We have analyzed the data quarterly basis, half-yearly basis and yearly basis. We have used mean return, standard deviation, mean return per unit of standard deviation (as the risk adjusted return), standard deviation per unit of mean return (coefficient of variance, C.V) and correlation coefficient as the tools of analysis. Our results indicate that price weighted index based portfolio would not have outperformed value weighted index portfolio during the*

*observed period. The findings are true and valid from all angles of analysis point view. We therefore, subject to the limitations in this paper conclude that the computation mechanism does not have any impact on the performance of market portfolio. Based on coefficient of correlation, we also conclude that there existed perfect positive correlation, significant at 5% level, between the returns of price weighted and value weighted indices.*

**Keywords:** *Stock index, NIFTY, SENSEX, price weights, market weights, market capitalization, correlation*

### **Introduction**

The prime goal of any investment manager is to enhance the market value of his portfolio and maximize the wealth of his clients from time to time. While the portfolio would contain different asset classes, there can be several assets in each of asset classes. Understanding the performance of the portfolio at various intervals is an essential part of tracking its performance. Analyzing and understanding the performance of a portfolio in isolation may not make any sense, but it would be more meaningful if we do it in terms of comparison with the relevant benchmark. This is where the role of index and its computation needs recognition. Today, the best way of understanding the performance of security markets is tracking the performance of the index. It is hard to believe that there can be any investor who does not know the significance of index in understanding the movement of security markets. An index is intended to reflect the overall movement of securities in a given market.

There are three ways of index computation that emerged over a period of time. In the beginning, when the market experts tried to understand the performance of market they started with what is called “price weighted” index. This index is computed simply by dividing the sum of the security prices by the number of securities in a given index. Therefore, this is simply understood as the average scrip price in a given index. The computation of price weighted index is best understood by the following equation.

$$DJIA(t) = \sum_{i=1}^{30} \frac{P(it)}{D(adj)} \quad \text{Equation 1}$$

The equation 1 above is an example of computing price weighted index of Dow Jones Industrial Average which constitutes thirty securities at time ‘t’ (DJIA(t)). The terms “P(it)” and “D(adj)” indicate the sum of the prices of the constituent securities and the divisor. The divisor is adjusted to the stock split if any in order to ensure that the index value will be the same before and after the split. This index severely suffers from the fact that the securities with high price changes between two consecutive days will have undue impact on the index though such change may be insignificant in percentage terms. Thus, it is criticized because of its being skewed more towards highly priced securities. In order give due recognition to the traded market value of a security, value weighted index has been suggested. There was however a tradition to consider all shares of a security irrespective of some of the shares being held by the insiders, what is called full float, while computing the index. This practice has been discontinued

after the year 2003 in majority of indices across the globe and considers only the shares that are available for trading in open market, what is called free float. The free float value weighted index is computed as follows.

$$Index(t) = \frac{\sum P(t)wQ(t)}{\sum P(b)wQ(b)} \times \text{Beginning Index Value}$$

Equation 2

Where:

Index (t) = index value on day  $t$

$P(t)$  = ending prices for stocks on day  $t$

$Q(t)$  = number of outstanding or freely floating shares on day  $t$

$P(b)$  = ending prices for stocks on base day

$Q(b)$  = number of outstanding or freely floating shares on base day

As we observe in equation 2, there is an automatic adjustment for stock split in value weighted index since it is the market capitalization (number of free float shares outstanding times closing share price) that is taken into account. Thus, value weighted index is regarded as more meaningful than price weighted index in terms of understanding the overall movement of a given security market.

Apart from the above, we also have un-weighted index and style indexes. While style indices are widely computed and used, un-weighted index is seldom used across the globe. We wish not to go for in-depth analysis of these aspects as

the focus of our paper is on comparative analysis of price weighted and value weighted indices and the probable impact on index based portfolio. The paper is organized into five sections. Section one deals with the introduction, section two focuses on review of literature, section three focuses on objectives and methodology, section four focuses on results and discussions and section five provides conclusion of the paper.

### **Review of Literature**

We have attempted to trace out as many reviews as possible through all possible research data bases. The studies on the topic are very scant and we have reviewed the most relevant studies to the topic. We also arranged these reviews in chronological order to the best of our level to connect the dots.

Clements, Izan and Selvanathan (2006) follow a stochastic approach to the computation of index numbers for stock prices. This approach has been followed with success in the computation of consumer price indices. The advantage here is that the whole distribution of the index is captured and is not confined to being a point estimate of the rate of inflation. The authors extend this approach to the drawing up of stock indices. In the process, one can identify “redundant” stocks which do not contribute to the overall index. These stocks could be safely ignored in the index compilation. In our paper, we have not followed computational steps which are easily understood by the investing public at large. While it may be true to argue that there are “redundant” stocks in an index, the composition

is determined by market capitalization which reflects market acceptance in many ways.

Bildik and Gulay (2006) observe that stocks which are included or excluded from the index show an abnormal volume on the first day of such inclusion and exclusion. The study looks at two indices in the Istanbul market and examines the changes in price and volume. The study looks at changes in volume and prices and examines the phenomenon of stocks coming in and out of the index. While the methodology is interesting, the study may not have application in other markets for the simple reason that Turkish markets do not have derivatives or index funds.

Cremers, Petajisto and Zitzewitz (2008) first use the Fama-French and Carhart models to check the presence of non-zero alphas in passive indices. They state that the above models place a disproportionate weight on small stocks. The authors claim that the model they use is superior and can be found to be so in terms of asset pricing tests and performance evaluation test. In our view, the model may have some superior inputs but will be difficult to monitor on a constant basis.

Nyberg and Vaihekoski (2009) demonstrate a monthly value weighted index for the Finnish market. The study covers the period from 1912 to 1970 in the first phase and a sequel index after that. To make their suggestion comprehensive the authors give details of the construction mechanism and a comparison with other indices. While the effort is certainly a good academic exercise, it cannot be built into

our study because we are looking principally at the distinction between price weighted and value weighted indices in their impact on total value and replication.

Fuller, Han and Tung (2012) use the capital market theory to explain the negative impact of noise on returns of cap-weighted portfolios. The analysis is done for different segments of the equity markets. They use a new concept to explain the phenomenon. In their own words, "To estimate the negative impact of noise on the returns of ex ante cap-weighted portfolios, we use the concept of a "perfect foresight" (PF) portfolio. The PF portfolio for any given equity segment is a buy-and-hold portfolio of all stocks in that segment with weights at the beginning of the return period set to be proportional to the market capitalization of the stocks at the end of the return period. We show that the PF portfolio will always be on the ex post efficient frontier and outperform its ex ante cap-weighted counterpart." The authors aver that the excess return of the PF portfolio will provide a good enough estimate of the maximum possible Alpha available to all investors. The authors, however, have taken an analysis with 1000 high market cap shares, which will be way higher, in our opinion, than what can be accommodated in a standard index.

Stock price movement is seen at an increased level after inclusion into the index in the paper by Clasesens and Yafeh (2012). The authors observe on the basis of data on forty developed and emerging markets that Beta values go up on inclusion into a major index. In other words, market returns are able to explain changes in stock returns to a

greater extent. In our view, part of this is not entirely unexpected. Many index replication funds would need to use the security once it is included in the index and to that extent the movement will be higher. However, the higher Beta is not conceptually easy to explain and would need to be tested on a large sample for validation.

Pylakha, Uppal and Vilkov (2012) compare the portfolios with reference to equal value, price-weighted and value-weighted indices in respect of U.S stocks. Their finding suggests that an equal weighted portfolio with monthly rebalancing outperforms the value and price weighted portfolios in terms of total mean return. Further, the better performance happens also in respect of the Sharpe ratio and certainty-equivalent return. However, the equal weigh portfolio has greater risk. In our paper we have compared only the price weighted and value weighted forms of indices. Conceptually, an equal weighted index will show different results based on the number of securities involved in the sample.

Handbury, Watanabe and Weinstein(2013) look at the impact of inflation on official indices. They seek to find how effectively the Consumer Price Index seeks to capture inflation elements. While the finding is not directly relevant for our paper, the approach can be used for the purpose of capturing predictions in respect of interest rates and inflation from stock price indices. However, with tracking errors and several external factors that contribute to the effect, the results would need to be tested over data covering several years.

Roden, Lizola and Mercado (2012) look at the interesting phenomenon of contagion between the Bolsa Mexicana market and the NYSE during the financial panic of 2008. The authors show a model giving the impact of financial events in 2008. Statistically it is seen that the Mexican bourses quickly impounded the U.S. markets during this period.

### **Objectives and Methodology of the Study**

As we stated in review of literature, the selection of securities and index computation mechanism matters a lot when we try to understand the overall movement of the market. The performance of an index then would be used as a bench mark to compare the performance of other portfolios. Our paper primarily focuses on computation mechanism and its impact on index performance and therefore attempts to:

- Compute S&P BSE Sensex using price weighted mechanism and analyze the trend from January 2010 to September 2013,
- Compare S&P BSE price weighted Sensex with that of value weighted and analyze the performance in terms of risk return relationship and
- Find out if the performance of an index based portfolio would have significantly different according to price weighted mechanism.

We primarily want to test if the return to investors would have been different if the index was computed on the basis of price weights. Therefore we have computed price

weighted index (PWI) of Sensex. This would facilitate us to find out if any fund manager constructed his portfolio in line with market portfolio, how such portfolio would have performed according to price weighted index. This also assumes importance from the view point of trading on Sensex in terms of futures and options. In case if any fund manager had built his portfolio in line with that of market, it helps us to find out if the performance of such portfolio would have been different according to price weighted index. Therefore, the focus of our paper is primarily on portfolio manager and the discussions are from the view point of performance of portfolio. The time period of the study is from January 2010 to September 2013. While there is no specific reason as to why only this time period, we thought three and half years time is reasonably sufficient to compare the trend in both price weighted and value weighted indices. It may however be noted that we have considered the data only up to December 2012 in case of yearly analysis and comparison. The closing prices of Sensex constituent companies have been obtained from "www.capitaline.com" for the purpose of computing price weighted index. We sincerely attempted to incorporate the effect of stock splits into the divisor. Though we found a few stock splits during the observed period, we could not incorporate in divisor due to the fact that the price was not adjusted in such cases. We also have not taken the base period's price weighted index due to insufficiency of data. Though the results would suffer due to these limitations, this may not be a may not be a serious concern when we

compute percentage return of the index between any two consecutive days. BSE Sensex closing price has been considered as value weighted index (VWI).

The measures used to analyze the results are as follows: Arithmetic mean return (M.R); used for computing average percentage return of the index, standard deviation (S.D); used to measure the risk in the return, risk adjusted mean return (RAR); used to know return per unit of standard deviation, coefficient of variance; used to know the risk (S.D) per unit of mean return and Pearson's coefficient of correlation (Corr.) to know if the returns of both indices were correlated during the observed period. The analysis has been done in intervals of quarterly, half-yearly and yearly. As these tools are mostly widely used ones, we wish to avoid further discussions about computation mechanism etc. We have used linear regression analysis and analysis of variance (ANOVA) to test the following null hypotheses at 5% significance level:

$H_{0_1}$ : Correlation between the returns of price weighted index and value weighted index during January 2010 through September 2013 is not significant.

$H_{0_2}$ : The return of price weighted index did not depend on time factor during the period January 2010 through September 2013.

$H_{0_3}$ : The return of price weighted index did not depend on time factor during the period January 2010 through September 2013.

## **Results and Discussions**

As we stated earlier, we propose to carry out discussions in the order of quarterly, half-yearly and yearly results.

### **Discussions on Quarterly Based Results**

To start with, the quarterly based results are summarized in table 1. We also have depicted mean returns of both the indices in figure 1, risk adjusted mean returns of price weighted and value weighted indices in figure 2 and standard deviation per unit of mean return (coefficient of covariance i.e. C.V) of both the indices in figure 3. These figures will help us to analyze comparative performance of indices in terms risk return relationship.

Table 1 provides very comprehensive details about traditional and risk adjusted performance of price weighted and value weighted indices on quarterly basis. As we observe closely, the mean return (M.R) indicates that the performance of both the indices remained same throughout the study period. As depicted figure 1, trend lines in the quarterly based mean returns of these two indices remained almost very close throughout the period. This in turn implies that if the portfolio manager had built his portfolio in line with that of index, its performance would not have varied significantly even according to price weighted index. It is therefore understood that the computation mechanism of index could not have influenced the performance of the portfolio. As depicted in table 1,

the standard deviations in the quarterly mean returns of the both the indices were almost similar during every quarter except in the second quarter of the year 2012 in which the difference is slightly higher. This is of course in line with the difference in corresponding mean returns. Thus the risk that portfolio would have been exposed to according to price weighted index could not have been different from that of the value weighted index. Thus even in terms of risk exposure, the way the index is computed would not have been an issue according to our results. The output pertaining to risk adjusted return (i.e. mean return per unit of standard of deviation) reveals that the performance of the portfolio is not vastly different according to both the indices. As depicted in figure 2, the trend in risk adjusted mean return of price weighted and value weighted indices remained almost same during the observed period. A comparative observation between figure 1 and figure 2 reveal that the performance of the portfolio of price weighted index would not have been different from that of value weighted either on traditional or risk adjusted basis. We also have tested if risk (i.e standard deviation) per unit of mean return (coefficient of variation, C.V) could have been different according to price weighted index and the results are depicted in table 1. The results in this regard reveal that mechanism of index computation would have been slightly a concern in terms of portfolio risk. As we observe the results in table 1, there has been considerable difference between the risks per unit of mean return of both the indices in a few quarters like

first two quarters of the year 2010, quarter two of 2012 and third quarter of the year 2013. Though the mean return and its standard deviation have their own advantage and implications, risk adjusted mean return has been recognized as more appropriate way of assessing the performance of a portfolio manager. Therefore, based on return per unit of standard deviation and standard deviation per unit of mean return, we conclude that index computation mechanism would not have mattered during the most of the quarters while evaluating the performance of an index portfolio. Coefficients of variance of both indices have depicted in figure 3 and it shows almost similar trend in both during the observed period barring a few quarters like first two quarters of 2010 and third quarter of 2013. Coefficient of correlation between the quarterly mean returns of both indices has been mentioned in the last row of table 1. We observe that it is above 0.9 in every quarter except in second quarter of 2012 which is 0.72. This indicates that the returns of both the indices have moved perfectly, of course positively, together during the observed period. Therefore even according this measure the index computation mechanism would not have been a concern while assessing the risk return profile of an index based portfolio. Thus on an aggregate basis, we conclude that the performance of a portfolio built in line with that of an index would not have varied even if the index was computed on the basis of price weights.

*Table 1: Quarterly Performance results of Price Weighted and Value Weighted Indices*

Measure!	Index!	2010				2011				2012				2013		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
M.R(%)	PWI	0.00	0.00	0.17	0.06	-0.11	-0.06	-0.18	-0.08	0.23	0.09	0.09	0.07	-0.09	0.05	0.06
	VWI	0.00	0.00	0.20	0.04	-0.08	-0.05	-0.21	-0.09	0.19	0.01	0.12	0.06	-0.05	0.05	0.01
SD	PWI	1.01	1.01	0.75	1.10	1.35	1.08	1.35	1.37	1.22	1.37	0.76	0.61	0.70	1.06	1.27
	VWI	0.98	0.98	0.71	1.09	1.34	1.05	1.39	1.50	1.15	0.99	0.81	0.65	0.69	1.12	1.50
RAR	PWI	0.00	-0.07	0.23	0.05	-0.09	-0.06	-0.13	-0.06	0.18	0.06	0.11	0.11	-0.12	0.05	0.04
	VWI	0.00	0.02	0.28	0.04	-0.06	-0.04	-0.15	-0.06	0.17	0.01	0.15	0.09	-0.07	0.05	0.01
CV	PWI	257.07	257.07	4.27	18.57	-11.74	-17.49	-7.73	-17.40	5.43	16.05	8.85	8.96	-8.06	19.55	22.64
	VWI	567.99	567.99	3.63	27.46	-17.42	-23.18	-6.78	-16.01	6.00	137.99	6.71	10.94	-14.53	21.25	153.92
Corr. (PWI,VWI)		0.96	0.96	0.93	0.93	0.98	0.97	0.98	0.98	0.94	0.71	0.93	0.94	0.92	0.95	0.96

Source: Computed by authors.

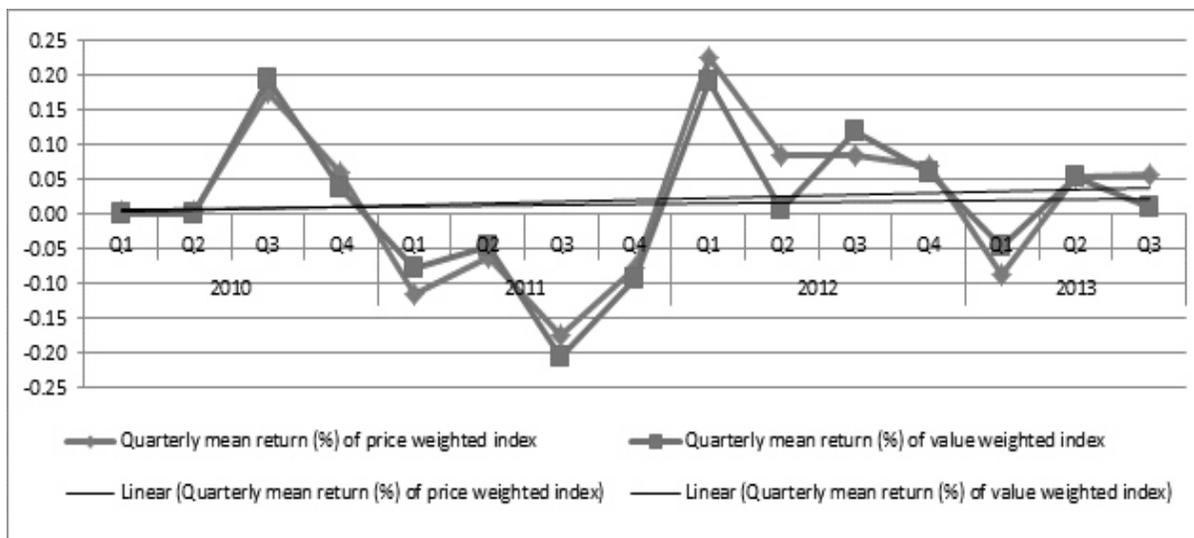


Figure 1: Quarterly Based Mean Return and trend line of price weighted and value weighted indices.

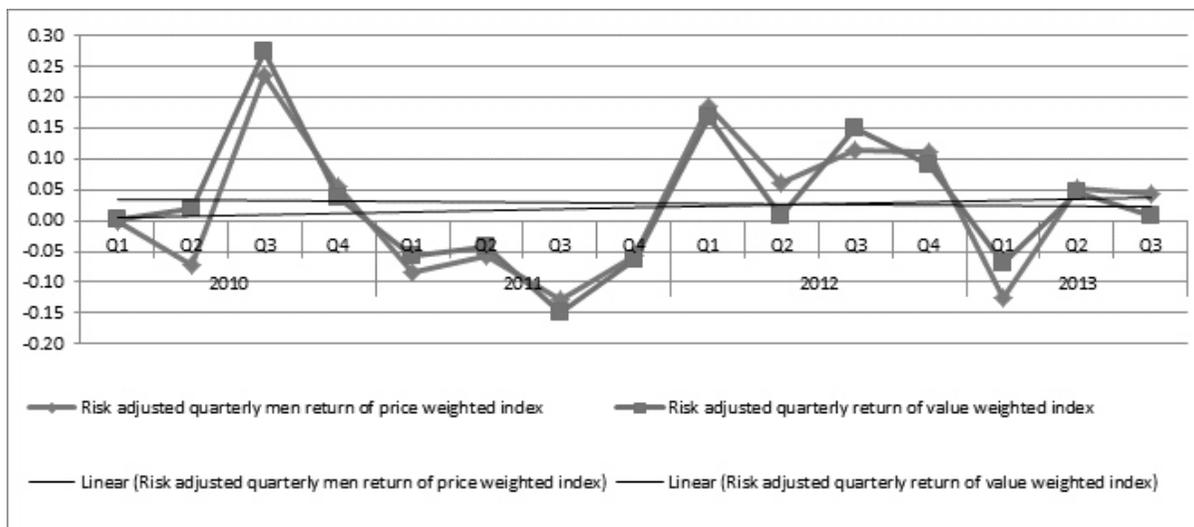


Figure 2: Quarterly based risk adjusted quarterly mean return (%) of price weighted and value weighted indices.

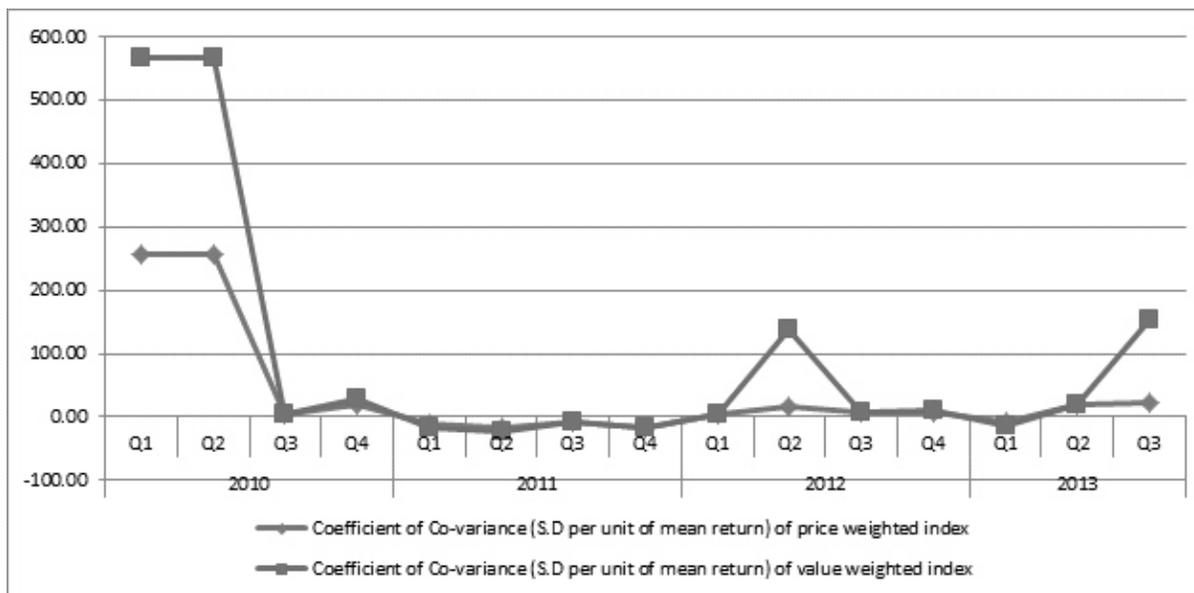


Figure 3: Coefficient of co-variance (quarterly based S.D per unit of mean return) of value weighted index

## **Discussions on Half Yearly Based Results**

The results pertaining to half-yearly analysis are depicted in table 2. As in the case of quarterly basis, the mean returns of both the indices on half-yearly basis also moved together during the observed period with an exception in H1 of the years 2010 and 2013 in which the difference was slightly higher while compared to that of the rest. Even standard deviation in mean returns also reveals that the risk involved in the portfolio has been almost the same. However, risk per unit of mean return, i.e. coefficient of variance, reveals somewhat slightly varying results. The standard deviation per unit of mean return in this case was highly different in most of the times during the study period. Thus, the risk exposure of an index based portfolio would have been different on half yearly basis if the index was computed on price weight basis. But again if we focus on the risk adjusted return, we understand that performance of the portfolio of price weighted index would not have been different from that of value weighted throughout except in first half of 2010 in which there was very minor difference. The trend in figures 4 and 5 indicate that there was similarity in the performance of both the indices. A comparative observation between these two figures also reveals that the performance in terms of both simple mean return and risk adjusted mean return of price weighted index would not have different from that of value weighted index. However standard deviation per unit of half yearly mean return (i.e. C.V) reveals that risk exposure of price weighted index would was higher in the first half of 2010 and 2013. But barring this exception, the output reveals that

even according to coefficient of variance the performance of price weighted index would not have been different from that of value weighted. Correlation of coefficient in the last column of table 2 indicates that half-yearly mean returns of both the indices were highly positively correlated revealing that the performance is not a matter of concern. Thus based on the output presented in table 2, figures 4, 5 and 6 we conclude that performance of an index based portfolio would not have been different even if the index had been computed on the basis of price weights. This means that computation mechanism is not a matter of concern in the performance of a portfolio built in line the market.

*Table 2: Half Yearly Performance Results of Price Weighted and Value Weighted Indices*

Measure↓	Index↓	2010		2011		2012		2013
		H1	H2	H1	H2	H1	H2	H1
M.R (%)	PWI	-0.05	0.12	-0.09	-0.13	0.16	0.08	-0.02
	VWI	0.01	0.12	-0.06	-0.15	0.10	0.09	0.00
S.D	PWI	1.21	0.94	1.22	1.35	1.29	0.69	0.89
	VWI	1.09	0.92	1.20	1.44	1.08	0.73	0.93
RAR	PWI	-0.04	0.13	-0.07	-0.09	0.12	0.11	-0.02
	VWI	0.01	0.13	-0.05	-0.10	0.09	0.12	0.00
C.V	PWI	-24.52	7.97	-13.78	-10.59	8.30	8.91	-57.55
	VWI	87.12	7.77	-19.62	-9.54	10.72	8.10	308.66
Corr. (PWI,VWI)		0.73	0.93	0.98	0.98	0.82	0.97	0.94

Source: Computed by the authors.

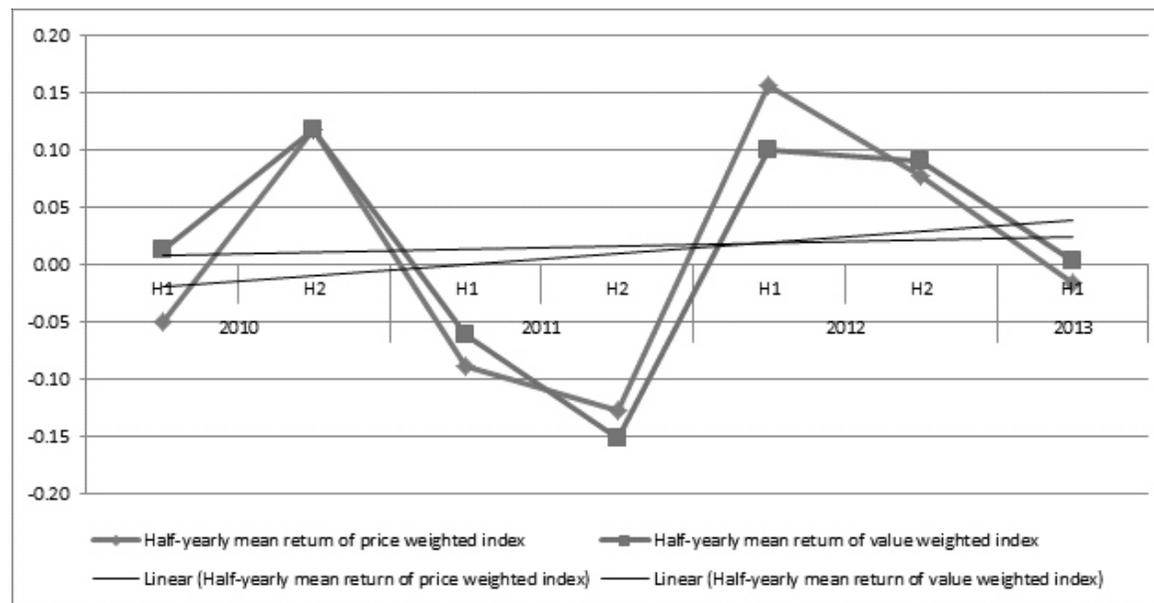


Figure 4: Half-Yearly Mean Return and Trend Line of Price Weighted and Value Weighted Indices.

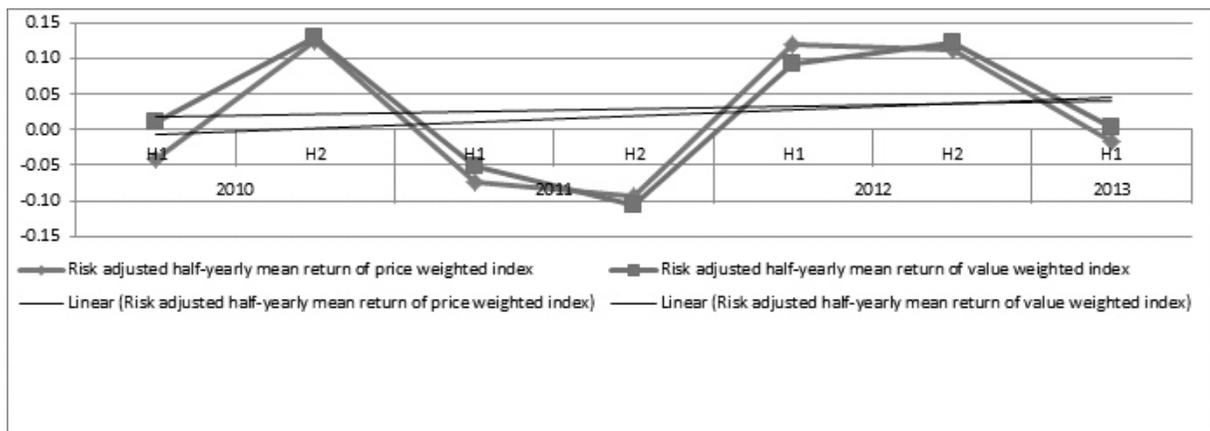


Figure 5: Half-Yearly risk adjusted return and trend line of price weighted and value weighted indices.

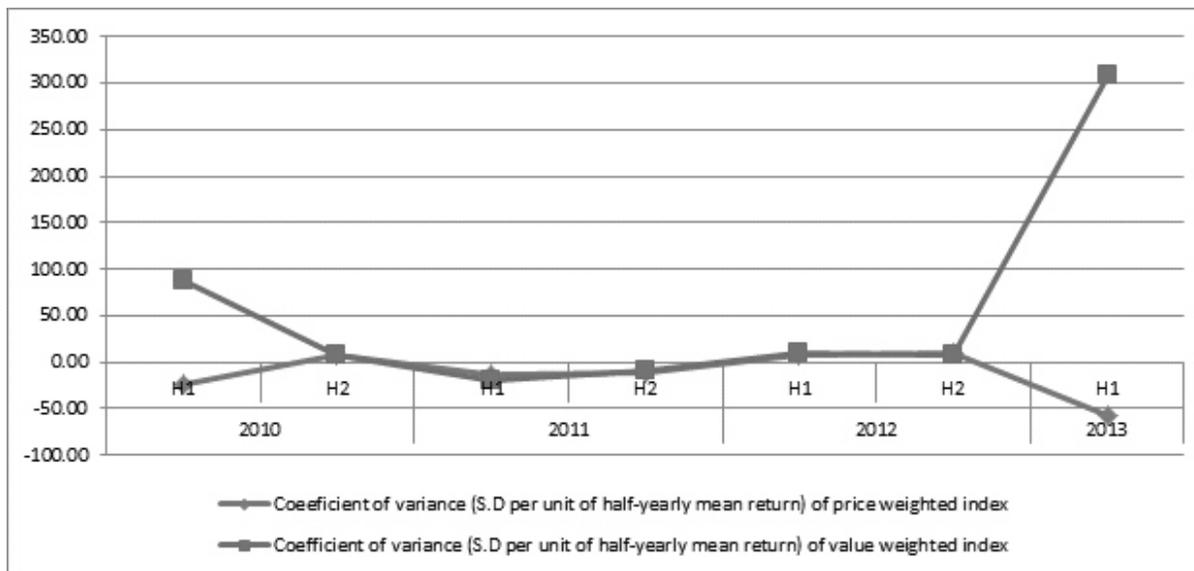


Figure 6: Coefficient of co-variance (half-yearly based S.D per unit of mean return) of value weighted index

### **Discussions on Yearly Based Results**

The results pertaining to yearly based performance of price weighted and value weighted indices are depicted in table 3. We have avoided graphical representation of the data as the number of observation is only three and also due to space constraint. However it is easy to notice the variation and trend in three observations. Like in the case of quarterly and half-yearly performance, the results in table 3 indicate that yearly mean return of price weighted index did not vary from that of value weighted index. Even the risk exposure, as measured by standard deviation of the two indices has been found to be same during three years. Mean return per unit of standard deviation also indicates that the risk adjusted performance of price weighted index would not have been different from that of value weighted index. However risk in terms of standard deviation per unit of yearly mean return of price weighted index is found to be more than that of value weighted in the year 2010. This in turn indicates that if the index was computed on price weight basis, an index portfolio would have been exposed to more risk. This observation, however, is in only one year and during the rest of the years the risk exposure of both the indices is found to be the same. Like in the case of earlier analysis, even in case of yearly basis, the coefficient of correlation between the returns of price weighted and value weighted indices is found be very highly positive in all the three years. That way coefficient of correlation also indicates that the mean return of price weighted index would have moved almost exactly in line that of value weighted. Thus, based the output and analysis of yearly

results from all angles of risk-return relationship, we conclude that performance of a portfolio built in line with that of an index would have been the same even if the index was computed according to the weights based on price.

*Table 3: Yearly performance results of Price Weighted and Value Weighted Indices*

Measure↓	Index↓	2010	2011	2012
M.R (%)	PWI	0.04	-0.11	0.12
	VWI	0.07	-0.11	0.10
S.D	PWI	1.08	1.28	1.04
	VWI	1.01	1.32	0.92
RAR	PWI	0.03	-0.08	0.11
	VWI	0.07	-0.08	0.10
C.V	PWI	29.65	-11.89	8.87
	VWI	15.04	-12.49	9.65
Corr. (PWI,VWI)		0.81	0.98	0.85

Source: Computed by the authors.

### **Regression and Analysis of Variance (ANOVA) Results**

We have run simple regression between the returns of price weighted and value weighted indices on yearly basis and

on an overall basis, i.e. January 2010 through September 2013 and the results are summarized in table 4. Tables 5 and 6 contain the summary results of analysis of variance (ANOVA) between the time factor and the return of price weighted and value weighted indices from January 2010 through September 2013. As revealed by R square (also known as coefficient of determination) the relationship between the returns of both the indices has been largely explained in every year and on an overall basis (2010 through 2013). Such relationship in every year and on an overall basis has also been found to be significant as revealed by significance F. Thus as significance F is less than 0.05 in table 4, we reject  $H_{0_1}$  and conclude that the correlation between the returns of price weighted and value weighted indices is significant. Thus based on regression analysis also we conclude that the performance of an index based portfolio would not have been different even if the index was computed on the basis of price weights. As we stated earlier we also tried to find out if the return of an index depended on time factor during the study period. As significance F in table 5 is greater than 0.05 we accept  $H_{0_2}$  and conclude that the return of price weighted index did not depend on time factor between January 2010 and September 2013. We also accept  $H_{0_3}$  as the significance F in table 6 is greater than 0.05 and conclude that the return of value weighted index did not depend on time factor between January 2010 and September 2013.

*Table 4: Summary Statistics of Regression Analysis Between the Returns of Price Weighted and Value Weighted Indices*

<b>Statistic</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2010-2013</b>
Multiple 'R'	0.81	0.98	0.85	0.90
R Square	0.66	0.96	0.72	0.82
Adjusted R Square	0.66	0.95	0.72	0.82
Standard Error	0.63	0.27	0.55	0.48
Significance F	0.00	0.00	0.00	0.00

*Table 5: ANOVA Results of Time Factor and Return of Price Weighted Index (January 2010 through September 2013)*

	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F</b>	<b>Significance F</b>
Regression	1	0.56	0.56	0.45	0.50
Residual	935	1172.81	1.25		
Total	936	1173.37			
	<b>Coefficients</b>	<b>Standard Error</b>	<b>t Stat</b>	<b>P-value</b>	<b>Lower 95%</b>
Intercept	-0.028	0.073	-0.385	0.700	-0.172
X Variable 1 (time factor)	0.000	0.000	0.671	0.503	0.000

*Table 6: ANOVA Results of Time Factor and Return of Value Weighted Index (January 2010 through September 2013)*

	df	SS	MS	F	Significance F
Regression	1	0.04	0.04	0.03	0.86
Residual	935	1146.78	1.23		
Total	936	1146.81			
	Coefficients	Standard Error	t Stat	P-value	Lower 95%
Intercept	0.01	0.07	0.07	0.94	-0.14
X Variable 1(time factor)	0.00	0.00	0.18	0.86	0.00

### **Conclusion**

Performance of a stock market is best understood in terms of the performance of its index. Most of the portfolio managers, retail and institutional investors primarily keep a track of the movement of an index in order to know the overall performance of a given security market. Apart from various fundamental factors, selection of stocks and computation mechanism would play a role in the performance of an index. This in particular is the most important factor in case of a market with huge number of securities being listed and traded. There has been a tradition to compute the index on the basis of price weights across the globe but eventually the focus has been shifted

to value weighted mechanism. In this paper we tried to find out if the computation mechanism would have a matter of concern in the performance of the market. We have carried out this study to know if the price weighted index could have any significant impact on index based portfolio. Our analysis from all angles point of view reveals that even if the index was computed on the basis of price weights, the performance would have remained almost the same. Coefficient of correlation, Coefficient of determination and analysis of variance reveal that the performance of price weighted index would have been almost the same like that of value weighted. We therefore conclude that a manager's index based portfolio performance need not be a function of index computation mechanism. We opine that this study has contributed its own to the body of knowledge to the field. We also sincerely acknowledge the fact that our study is not the end by itself but a beginning to understanding the relationship between index computation mechanism and index based portfolio. We therefore invite the initiative to take our study further for more value adds to the field.

### **References**

- Bildik, R., & Gülay, G. (2008). The effects of changes in index composition on stock prices and volume: Evidence from the Istanbul stock exchange. *International Review of Financial Analysis*, 17(1), 178-197.
- Brown and Reilly, Analysis of Investments and Management of Portfolios, South-western cengage

Learning, International Student Edition.

Claessens, S., & Yafeh, Y. (2013). Comovement of newly added stocks with national market indices: Evidence from around the world. *Review of Finance*, 17(1), 203-227.

Clements, K. W., Izan, I. H., & Selvanathan, E. A. (2006). Stochastic index numbers: a review. *International Statistical Review*, 74(2), 235-270.

Cremers, M., Petajisto, A., & Zitzewitz, E. (2008). When Benchmark Indices Have Alpha: Problems with Capitalization-and Price-Weighted Portfolios\_Greenbackd.htm

Fuller, R. J., Han, B., & Tung, Y. (2012). Estimating the Negative Impact of " Noise" on the Returns of Cap-Weighted Portfolios in Various Segments of the Equity Markets. *Journal of Investment Management*, 10(3), 49.

Handbury Jessie, Tsutomu Watanabe, David E Weinstein (2013). How much do officie price indexes tell us about inflation?, Working Paper 19504

<http://www.nber.org/papers/w19504> (seen on 29th October, 2013)

Nyberg, P., & Vaihekoski, M. (2010). A new value-weighted total return index for the Finnish stock market. *Research in international business and finance*, 24(3), 267-283.

Pylakha Yuliya, Raman Uppal, Grigory Vilkov (2012). Why

Does an Equal-Weighted Portfolio Outperform Value- and Price-Weighted Portfolios?, October 2012, Electronic copy available at: <http://ssrn.com/abstract=1787045>

Roden, P. F. (2012). Contagion between the Bolsa Mexicana De Valores and NYSE during the credit crunch – financial panic of 2008. *Journal of International Business Research*, 59. 5