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A Hybrid Model Combining With Best Replacement Optimization Techniques And Rough Set Theory For Stock Market Prediction

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A B S T R A C T

Stock price prediction is an important task for practitioners and professional analysts. However, it is a tough problem because of the uncertainties involved in prices. It is all the times true shareholders in general get loss because of uncertain investment purposes and unsighted assets. In this paper, we propose and implement a hybrid model combining Best Replacement Optimization Techniques (BSO) and Rough Set Theory (RST) to find optimal buy and sell of a share on Nifty fifty Stock Index . Our experimental results exhibit that the recommended hybrid model has higher precision than other considered forecasting models selected for this study. We believe that findings of this paper will be useful for stock investors to make a decision about optimal buy and/or sell time on this stock market.

Introduction:

Forecast of stock prices has been regarded as one of the most challenging applications of modern time series forecasting. Thus, numerous models have been depicted to provide the investors with more precise predictions. Hybrid forecast is a well-established and well-tested approach for improving the forecasting accuracy. Therefore, the importance of hybrid forecast methods has steadily increased and it acts still on time series forecasting. In order to enhance the forecasting performance of the time series models, the hybrid model combined by the time series models and other models have been advanced many researches. In recent years, more hybrid forecasting models have been proposed. For example, Auto-regressive Integrated Moving Average (ARIMA) and Artificial Neural Networks (ANN) are applied to time series forecasting as it reduces model uncertainty which typically occurs in statistical inference and time series forecasting. Pai and Lin [3] proposed a hybrid methodology to exploit the unique strength of ARIMA models and support vector machines (SVMs) for stock prices forecasting. Armano, et al. [1] presented a new hybrid approach that integrated artificial neural network with genetic algorithms (GAs) to stock market forecast. Tsaih et al. [6] presented a hybrid artificial intelligence (AI) approach that integrated the rule-based systems technique and neural networks to S&P 500 stock index prediction. Hyun-jung Kim , Kyung-shik Shin [4] proposed the effectiveness of a hybrid approach based on the adaptive time delay neural networks (ATNNs) and the time delay neural networks (TDNNs) with the genetic algorithms (GAs) in detecting temporal patterns for stock market prediction tasks. Ching-Hseue cheng, Tai-Liang chen, Liang-Ying Wei in [3] this paper proposed a hybrid

forecasting model using multi-technical indicators to predict stock price trends. Kai Keng Ang, Chai Quek [5] used neuro-fuzzy systems and neural networks for forecasting stock price difference on artificially generated price series data.

To improve upon past forecasting models, a revised model should be able to overcome the drawbacks contained in previous models and should offer a good methodology which could be used more easily by investors. Empirically, this paper employs two types of stock databases (stock index and individual stock price) as experimental datasets. From the model verification, it is shown that the refined processes are effective in improving forecasting accuracy, and, based on the evidence, a stock analyst or investor can employ the refined processes proposed in this paper to improve their forecasting tools or models.

The rest of this paper is organized, as follows: Section 2 demonstrates the proposed model and algorithm; Section 3 evaluates the performance of the proposed model and describes the findings; and Section 4 draws conclusions and proposes recommendations for future research.

2. Proposed Forcasting Model

The Best Replacement Optimization Model with Rough Set (abbreviated as BRO-RS) is a hybrid complex data prediction algorithm is used as a best solution to solve complex stock market data in future prediction. The Hybrid Dynamic algorithm BRO-RS uses it particle to detect best fitness and Rough set to Reduce the dimension of reduct sets in Stock Market data, The BRO does not require any gradient information of the function to be optimized and uses only primitivemathematical operators. Rough set theory offers a novel approach to manage uncertainty that has been used for the discovery of data dependencies, importance of features, patterns in sample data, feature space dimensionality reduction and the classification of objects. While rough set on their own provide a powerful technique, it is often combined with other computational intelligence techniques such as neural networks, fuzzy sets, genetic algorithms, Bayesian approaches, swarm optimization and support vector machines. BRO as a new evolutionary computation technique, in which each potential solution is seen as a particle with a certain velocity flying through the problem space. The Particles find optimal regions of the complex search space through the interaction of individuals in the population.

BRO is attractive for feature selection in that particle swarms will discover best feature combinations as they fly within the subset space. Compared with other evolutionary techniques, BRO requires only primitive and simple mathematical operators. In this research, Rough set is applied to improve feature selection and data reduction. BRO is used to optimize the rough set feature reduction to effectively classify stock prices. The input Dataset is processed by using Rough set, the rough set helps to detect

reduct dataset. In Reduct sets the Swarm is used to assign a particle. It works all particles tend to fly towards better and better positions over the searching process until the swarm move to close to an optimum of the fitness function. As compared with other optimization methods, it is faster, cheaper and more efficient. In addition, there are few parameters to adjust in BRO. That's why BRO is an ideal optimization problem solver in optimization problems. BRO is well suited to solve the non-linear, non-convex, continuous, discrete, integer variable type problems. BSO is initialized with a population of random solutions. The advantages BRO is easy to implement and there are few parameters to adjust.

In BRO each particle keeps track of its coordinates in the problem space which are associated with the best solution (fitness) it has achieved so far. This value is called *pbest*. Another "best" value that is tracked by the global version of the particle swarm optimizer is the overall best value, and its location, obtained so far by any particle in the population. This location is called *gbest*. The particle swarm optimization [29] concept consists of, at each time step, changing the velocity each particle toward its *pbest* and *gbest* locations as follows. A gene with highest fitness value is taken and all possible combinations of the selected gene with the other genes are constructed. Fitness of the selected genes with different combinations is calculated. If the current particle's fitness evaluation is better than the *pbest*, then this particle becomes the current best and its position and fitness are stored. Then, the current particle's fitness is compared with population's overall previous best fitness. If the current value is better than *gbest,* then this is set to the current particle's position, with the global best fitness updated. The velocity and position of the particle is then updated. This process is carried out until the stopping criterion is met, usually a maximum number of iterations. In BRO with Rough Set the process iteration is limited with the best Fitness threshold value

Algorithms

In BRO the *Gbest* parameter is adjusted by limiting the iteration process by efficient fitness Procedures as Follows:

Best Replacement model Using Rough Set:

Input: Stock Market Data High Price, Low Price from Nifty Fifty Companies Where Set

$S = S_1 U S_2 U .... S_{50}$ (Union of 50 Subsets) Output: Fitness Function Based on Reduct Set of Rules

Begin

Swarms $x_{id,id}$ = Generate m: /* Initialize a population of particles with random positions and velocities on S dimensions*/

pbest (i) = 0; i = 1, ..., m, d = 1, ...S

Gbest = 0; Iter = 0,

For each subset of set S Identify the reduct sets by using Algorithm 1

in Rh Reduct Set (S)

{For (each particle in R)

{ While(Iter < MaxGen and Gbest < MaxFit)

{For(every particle i)

{Fitness(i) = Evaluate (i);

IF (Fitness (i) > Pbest (i))

{Pbest(i) = Fitness (i) ; $p_{id} = x_{id}$; d = 1, ..., S}

IF(Fitness(i) > Gbest(i))

{Gbest = Fitness(I); gbest=i;}

For (every particle i)

{For(every d)

*{id= w * v_{id} + c_1 * R_1 * (p_{id} - x_{id}) + c_2 * R_2 * (p_{gd} - x_{id})*

IF(v_{id} > MaxV) { v_{id} = MaxV;}

IF(v_{id} < - Max V) {v_{id} = -MaxV;}

x_{id} = x_{id} + v_{id}}

}

Iter = Iter + 1'

}

/ R_1 and R_2 are two Constant Variables in the range [0,1]*/*

Detect {gbest}

While (GF - 1)

{

*v_{id} = w * v_{id} + c_1 * R_1 * (p_{id} - x_i) + c_2 * R_2 * (p_{gd} - x_{id})}*

do

}

GF=GF + 1

End

}

PSEDOCODE: BSO With Rough Set

Step1: The Input dataset S is taken from Nifty fifty Companies,

Step2: The dataset S is used by roughset to detect reduct sets, the reduct sets is initialize as particle.

Step3: Initialize position and velocity of all the particles randomly in the N dimension space.

Step2: Evaluate the fitness value of each particle, and update the global optimum position.

Step3: According to changing of the gathering degree and the steady degree of particle swarm, determine whether all the particles are re-initialized or not.

Step4: Determine the individual best fitness value. Compare the l_p of every individual with its current fitness value. If the current fitness value is better, assign the current fitness value to l.

Step5: Determine the current best fitness value in the entire population. If the current best fitness value is better than the g, assign the current best fitness value to g_p.

Step6: For each particle, update particle velocity,

Step7: Repeat the iteration of the particle using *gbest* fitness value and limit the Iteration of the particle.

Step8: Update particle position.

Step9: Repeat Step2 - 7 until a stop criterion is satisfied or a predefined number of iterations are completed. While maximum iterations or minimum error criteria is not attained Particles'

velocities on each dimension are clamped to a maximum velocity v_{max}. If the sum of accelerations would cause the velocity on that dimension to exceed v_{ma}, which is a parameter specified by the user. Then the velocity on that dimension is limited to v_{ma}.

3. Experimental Results And Discussions

For evaluating the performance of the proposed BRO with Rough set forecasting model, the daily ICICI Company price is used in this study. In forecasting, the five technical indicators, namely the previous

day's cash market high *(x₁)*, low *(x₂)*, volume *(x₃)*, today's opening cash index *(x₄)*, and 10-days total amount weight stock price index (TAPI 10) *(x₅)*, determined by the review of domain experts and literatures (Wood, 2002; Leigh et al., 2005) are selected as the forecasting variables for predicting TAIEX closing cash index. Please refer to Wood (2002) and Leigh et al. (2005) for more details about technical indicators. The five financial time series datasets and the daily TAIEX closing cash prices in the TAIEX dataset are depicted in Figure 3 and 4, respectively. The daily data of technical indicators and cash prices from January 2, 2003 to February 27, 2006 of TAIEX cash index provided by Capital Futures Corporation, Taipei, are collected. There are totally 781 data points in the dataset. Among, the first 623 data points (79.77% of the total sample points) are used as the training sample while the remaining 158 data points (20.23% of the total sample points) are used as the testing sample

BRO with Rough set require additional parameter settings for their operation. These are given in Table 1.

Population	3145
Generation	251
C1	2
C2	2
Weight	1.4~0.4

Table 1 BSO with Rough Set parameter settings

In BSO with Rough Set, the inertia weight decreases along with the iterations, varying from 1.4 to 0.4 according to the equation (1).

$$Weight = (weight - 0.4) * (MAXITER - Iter) / MAXITER + 0.4 \qquad (1)$$

Date	Open Price	High Price	Low Price	Close Price	Total Volume	No of Trades
9/11/2014	179.1	174.2	177.3	175.2	56,91,537	49,335
9/10/2014	177.85	171.7	172.95	177	63,45,483	73,091
9/9/2014	176.7	172.75	176.05	174.15	53,81,962	40,668
9/8/2014	178.5	170.1	176.5	176.8	89,29,544	67,188
9/5/2014	176.65	164.7	166	175.45	1,72,40,111	1,18,797
9/4/2014	176	156.2	175.2	167.5	2,02,51,203	1,45,223
9/3/2014	186.9	180.5	185.65	182.9	75,97,803	53,178
9/2/2014	185.3	178.85	179.65	184.05	1,00,55,042	68,222
9/1/2014	180.6	175.45	178	179.75	98,33,749	67,952
8/28/2014	183.35	176	181.1	177.3	1,45,58,542	1,04,275

Where MAXITER is the maximum iteration (generation) and Iteration is the current iteration.

Table 2 indicates Sample Testing dataset of ICICI Company.

Parameters	High Prices		Low Prices	
Dataset	Analysis Set (Training)	Validation Set (Test)	Analysis Set (Training)	Validation Set (Test)
Total Objects	143191	3145	143191	3145
Objects Covered	3145	251	3145	251
Min Support	105.56	128.19	105.56	128.19
Max Support	2572	1170.25	2572	1170.25
Average Support	576.4903666	270.6402703	575.993815	270.6402703
Min Accuracy	0.024127521	0.001036881	0.001367952	0.002429055
Max Accuracy	0.025186772	0.002719556	0.003187446	0.003731343
Average Accuracy	0.024900086	0.002166111	0.00189906	0.002930401

Table 3 Statistical Analysis of Input Training Dataset of ICICI Company.
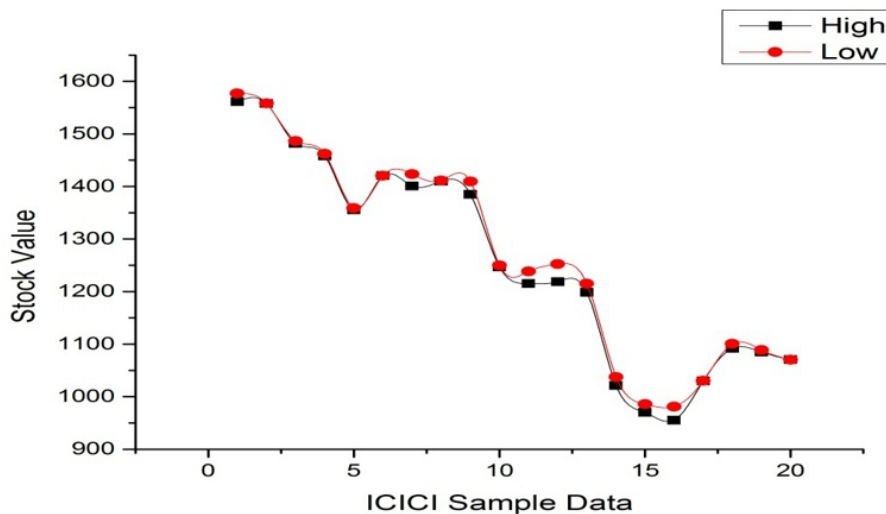
Figure 1 BRO with Rough Set Prediction of Low Price Value and High Price Value in ICICI Company.

The Figure 1 indicates the BRO with Rough Set Prediction of Low Value and High Value in Stock Market Data from Jan 2008 to Sep 2014. The Sample Data is used to detect GP and predict the low value and high value for ICICI Company.
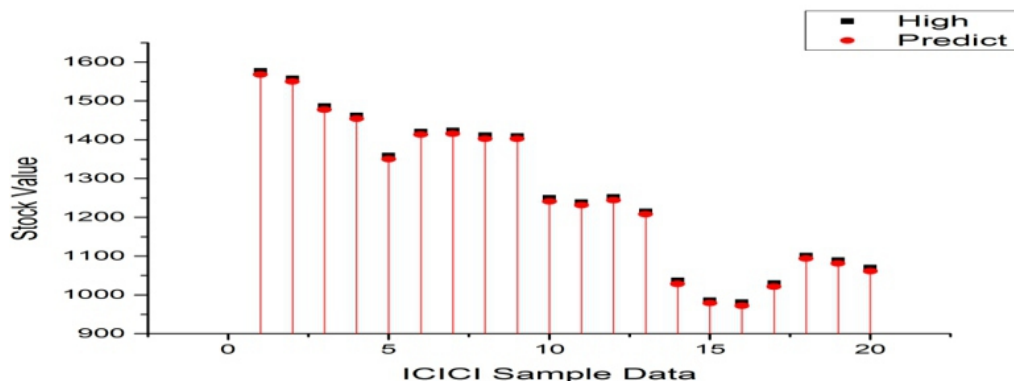
Figure 8.2 BRO with Rough Set Prediction of High Price Value in ICICI Company

The Figure 8.2 indicates the BRO with Rough Set Prediction of High Value in Stock Market Data from Jan 2008 to Sep 2014. The Sample Data is used to detect GP and predict the high value for ICICI Company.
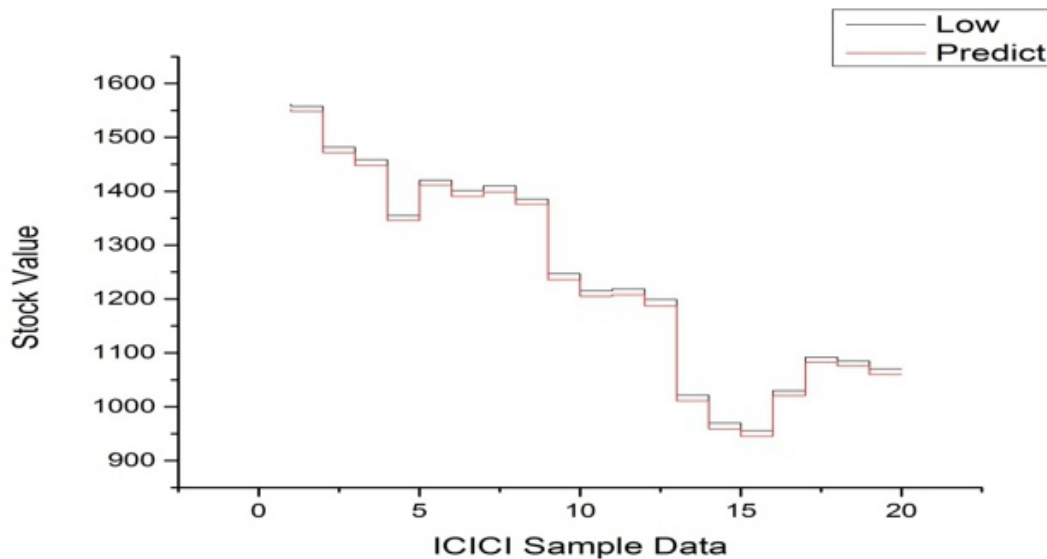

Figure 8.3 BRO with Rough Set Prediction of Low Price Value in ICICI Company

The Graph 8.3 indicates the BRO with Rough Set Prediction of Low Value in Stock Market Data from Jan 2008 to Sep 2014. The Sample Data is used to detect GP and predict the Low value for ICICI Company.

8.5 Conclusion

In this study we have investigated the basic aspect of the prediction problem of a stock market. In this chapter we have only used the Historic prices of the Index values for prediction. A new hybrid dynamic BRO and RS model is proposed to increase the prediction accuracy for both short term and long term stock market indices prediction. This new algorithm uses Rough set to detect reduct sets and enables all particles in the reduct sets using swarm to perform the global search using effective *gbest* fitness in the whole search space. The proposed model is obviously better than the standard existing model in processing the reduct set as particles, where in existing method, the particles are subjected to normal operators are capable in performing the global search. In a highly volatile market like Indian Stock Market, the performance levels of the BRO with RS, reported in the paper will be very useful. Especially, the prediction of the direction of the market with fairly high accuracy, will guide the investors and the regulators. In Future work, the proposed dynamic algorithm is used in different area of fields depending time series data for future prediction.

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Analysis Of Nifty Fifty Stocks Based On K-Means Clustering Technique For Stock Market Prediction

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A B S T R A C T

The objective of this research paper is to construct clusters of Nifty companies for better investment. In this study, is used in stock market prediction for removing the redundant and outlier data to form Clusters, as a result the prediction data is reduced.

Key Words: Stock market, Clustering Analysis, K-mean Clustering, Prediction

Introduction:

Nowadays, stock markets are an important component of the most countries' economies and play a major role in the international financial system. The stock markets are important from both the industry's point of view as well as the investor's point of view, but there are several uncertainties involved in the movement of the markets. Many factors interact in the stock market including political events, Economic Factors, and traders' expectations. Therefore, predicting market price movements is quite difficult. In response to such difficulty, clustering techniques have been introduced and applied for financial prediction.

Cluster is collection of objects with similarity between them and dissimilarity to the objects in other clusters. Clustering is an unsupervised classification process. The aim of clustering is to find structure in data set. Clustering has applications in several fields like math, multimedia, marketing, meteorology, geology, medical, etc. First time, Tryon in 1939 used this term for grouping similar objects. There are some papers within literature that used various clustering methods in the field of financial markets and showed comparison of various clustering techniques. For example, Basaltoa et al. (2005) apply a pair wise clustering approach to the analysis of the Dow Jones index companies, in order to identify similar temporal behavior of the traded stock prices. Tola et al. (2008) underlined the importance of clustering technique in the advancement of the reliability of the portfolio considering the ratio between predicted and realized risk. Chen and Huang (2009) applied cluster analysis to group the huge amount of equity mutual funds based on four evaluation indices in order to help investment decisions. In addition, they offered a fuzzy model which gives the optimal investment proportion of each cluster. Narayan et al.

(2011) examined share price clustering on twelve largest companies listed on Mexican stock exchange and pointed out that volume and risk impact price clustering negatively. Babu et al. (2012) analyzed the main clustering techniques to compare the performances and apply to 35 randomly selected stocks from a number of different sectors in India in order to be able to propose an effective method to predict the stock price movements. They indicated that the hierarchical agglomerative outperforms in terms of accuracy. D'Urso et al. (2013) handled the clustering of financial time series and proposed a new approach which combines fuzziness and GARCH models.

According to the literature reviewed, we could see that there are very few studies and researches in clustering stock market companies. In this paper, we demonstrate well known clustering technique namely K-means as well as some validity indexes to obtain the optimal number of clusters. The rest of this paper is organized as follows. Section 2 explains methodology and discuss about algorithm used in this research of research. Section 3 shows main findings. Finally, in Section 4 conclusion is presented. Some recommendation for further research will be given in the last section.

2.   Methodology

2.1.   Data Selection

The behavior of the stock prices of the company plays the important role while taking investment decision. In present study, attempt is made to find the variance of the stock market returns of CNX Nifty companies. Nifty 50 is a well diversified 50 stock index accounting for 22 sectors of the economy and it represents about 70.14% of the free float market capitalization of the stocks listed on NSE as on March 31, 2014. CNX Nifty is owned and managed by India Index Services and Products Ltd. (IISL).

The historical period of stock market data can be chosen in a wide range. The more number of training cases is used for predicting the stock. To create enough training cases, the historical period has to be long enough. On the other hand, too big historical period can diminish the accuracy of forecast due to the changing character of data (outdated patterns can make input data too noisy for neural network to extract useful information). The optimal Prediction depends on High Price, Low Price and Traded Data factors; normally, the dataset is in a range from 1000 to 12000. The number of possible training cases n_cases is calculating using formula:

$$n_{cases} = m_{no} * 360 = n\_out,$$

Where: m_{no} - total number of historical trading years; n_out - number of outputs days to predict.

2.2 K-Means Clustering Algorithm

K-means is one of the simplest unsupervised learning algorithms that solve the clustering problem. The algorithm executes in simple way by classifying a given data set through a certain number of clusters (say k clusters) fixed apriori. The basic concept is to define k centers; one for each cluster. These centers should be placed in a tricky way because of different location causes different result. So, it is better way to place them as much as possible far away from each other. In next step it takes each point belonging to a given data set and associates it to the nearest center. When no point remains, the first step is completed and an early grouping is done. Here we need to re-calculate k new centroids as bary center of the clusters obtained from the previous step. After this there are k new centroids. At this point a new binding has to be done between the same data set points and the nearest new center. A loop is generated. As a result of this loop the k centers change their location step by step until no more changes are done. Finally, this algorithm aims at minimizing an objective function knows as squared error function given by:

This algorithm aims at minimizing an objective function, a squared error function
i.e.

$$J = \sum_{j=0}^{n} \sum_{i=0}^{n} \left\| x_i^{(j)} - c_j \right\|^2 \quad (1)$$

$$\text{Where } \left\| x_i - c_j \right\|$$

is a chosen distance measure between a data point x_i and the cluster centre c_j, $\cdot |$ is an indicator of the distance of the n data points from their respective cluster centers. The algorithm to find the center for each equal pattern is composed. However, this is sometimes a reasonable criterion and gets a simple algorithm; the K-means has still a number of limitations and problems. To getting accurate results, means that to achieve this goal, given a set of objects with their attributes and grouping these objects into K cluster which the objects lying in one cluster should be as close as possible to each other, we are implementing in this study this algorithm.

2.3 Algorithm

The algorithm consists of the following steps:

(a) Place K points into the space represented by the objects that are being clustered. These points represent initial group centroids.

(b) Assign each object to the group that has the closest centroid.

©) When all objects have been assigned, recalculate the positions of the K centroids.

(d) Repeat Steps 2 and 3 until the centroids no longer move. This produces a separation of the objects into groups from which the metric to be minimized can be calculated.

Although it can be proved that the procedure will always terminate, the k-means algorithm does not necessarily find the most optimal configuration, corresponding to the global objective function minimum. The algorithm is also significantly sensitive to the initial randomly selected cluster centers. The k-means algorithm can be run multiple times to reduce this effect.

3. Results & Analysis

Stock market values keeps on changing day by day, so it is very difficult to predict the future value of the market. Although there are various techniques implemented for the prediction of stock market values, but the predicted values are not very accurate and error rate is more. Hence an efficient technique is implemented for the prediction of the stock market values using hybrid combinatorial method of clustering and classification. The dataset is taken and first clustered using K-means clustering algorithm and this clustered value into sub-clusters so that most feature vectors in each sub cluster belong to the same class. Then, for each sub cluster, we choose its centroid as the representative feature vector. Finally, we employ the representative feature vectors to predict the stock price movements.

The experimental data set is collected from NSE-NIFTY, which is a popular stock market index movement data. The information about the data sets contains names of dataset, the number of objects and number of Attributes, which are given in Table .1. In clustering stock market index data, the open, close, high, low values were treated as attributes and every day are treated as objects.

Data Set	Objects	Attributes	URL
Nifty Fifty	144315	4	http://www.nseindia.com/products/content/equities/indices/histrical_data.htm

Table .1. Dataset

Figure 1 Cluster Visualization of Nifty Fifty Input Samples

The Figure 1 indicates the Clustering of Stock Market Data from Jan 2008 to Sep 2014. The X-Axis represents the No of Sample Data and Y-Axis represents the Stock Market Value. In X-Axis 1 Unit = 100 Values and in Y-Axis 1 Unit = 200 Values
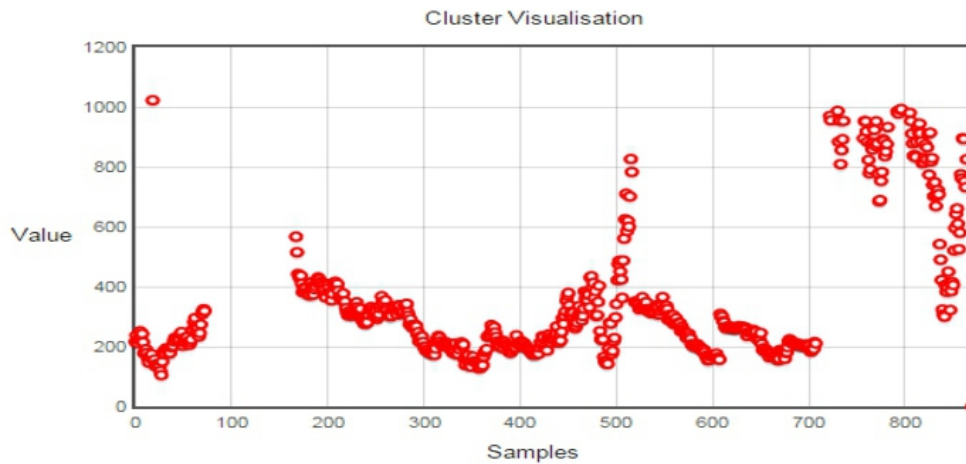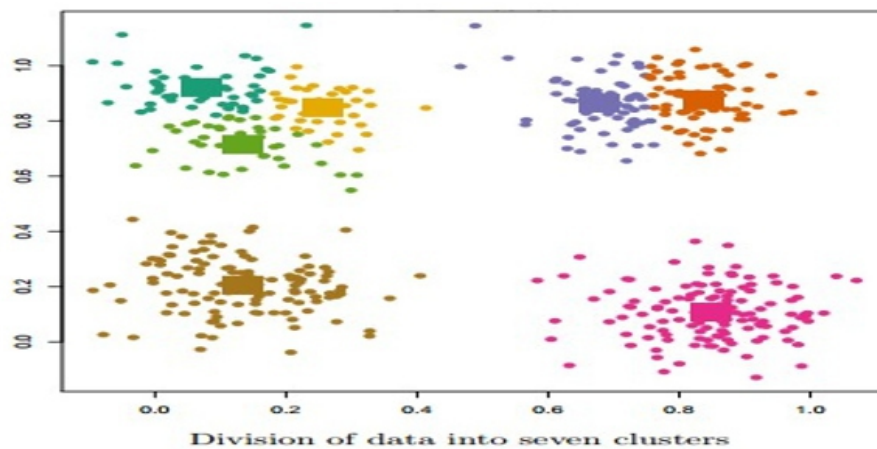

Figure 2 K Means Clusters of Nifty Fifty Input Sample

The Figure 2 indicates the Clustering of Stock Market Data from Jan 2008 to Sep 2014. The Sample Data is clustered into 7 clusters based on the value k in $k - Means$ Algorithm.
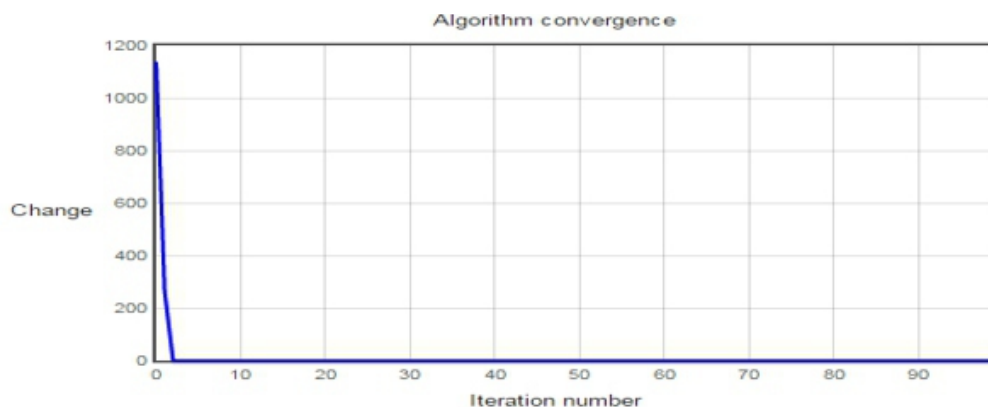

Figure 3 Convergence of Nifty Fifty Input Sample by K-Means Clusters

The Figure 3 indicates the Convergence after Clustering of Stock Market Data Nifty Fifty data from Jan 2008 to Sep 2014with respect to the 7 Clusters by K-Means Algorithm.

Attribute (Predictors)	Cluster						
	1	2	3	4	5	6	7
Open Price	5649	13560.25	3205	9995	16785.9	10	14560
High Price	5161.1	13560.25	1925	8590	16399.75	10	9850
Low Price	5540.05	13560.25	3200	9990	16399.75	10	9850
Close Price	5238.35	13560.25	2481.6	8882.7	16490.85	10	14107.5

Table 2 Performance of K-Means based on Nifty Fifty Index

Iteration	Number of Cases in each Cluster						
	1	2	3	4	5	6	7
1	1416.37	923.33	1552.3	1552.3	1872.001	997.76	2460.37
2	1094.21	365.97	266.39	486	272.021	37.724	1218.17
3	707.825	483.84	217.77	1313.2	0	33.368	677.614
4	523.036	193.39	184.6	1852.4	0	27.905	450.204
5	504.491	193.39	192.47	1106.9	0	24.064	316.658
6	367.078	184.1	183.73	2420.3	0	25.905	312.298
7	395.47	434.39	177.99	2263.5	0	26.901	578.365
8	374.645	305.63	176.74	1072.4	0	27.983	304.805
9	248.344	0	153.96	581.52	0	27.723	270.517
10	198.261	0	129.12	475.28	0	27.533	518.683

Table 3 Iteration Samples in Clustering by K-Means Algorithm

The goal of stock market data clustering algorithm to market data and showed the results (Table .2) based on the stock market index. The clustering algorithms were successfully applied to cluster stock market data comprising into K-means clustering.

4. Conclusion

The K-means approach is to perform clustering to form the number of specified clusters as far as possible. The k-means method first selects a set of n points called cluster seeds as a first guess of the means of the clusters. Each observation is assigned to the nearest seed to form a set of temporary clusters. The seeds are then replaced by the cluster means, the points are reassigned, and the process continues until no further changes occur in the clusters. The K-means approach is based on Centroid approach which means assigning points to closest clusters. The K- means Centroid Method is used in Stock market Prediction for removing the redundant and outlier data to form Clusters, as a result the prediction data is reduced.

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Mutual Fund Industry In Developed Countries

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A B S T R A C T

Scholars of commerce and management are uncertain of the origins of mutual funds; some cite the closed-end investment companies launched in the Netherlands in 1822 by King William First as the first mutual funds, while others point to a Dutch merchant named Adriaan van Ketwich whose investment trust created in 1774 may have given the king the idea.

In my view idea of mutual fund is dates back to 1822. Mutual fund industry really captured the public attention in the year 1980 and in the year 1990 when mutual fund investment hit record heights and investors saw incredible returns all over the world. The idea of pooling assets for investment purposes has been around for long time. In this research paper we will study this important investment vehicle, from its beginning in the Netherland in the 18th century to its present status as a growing international industry with fund holdings accounting for trillions of dollars in the U.S.A.

With the 1980s and '90s came bull market mania and previously obscure fund managers became superstars; Max Heine, Michael Price and Peter Lynch, the mutual fund industry's top gunslingers, became household names and money poured into the retail investment industry at a stunning pace. More recently, the burst of the tech bubble and a spate of scandals involving big names in the industry took much of the shine off of the industry's reputation. Shady dealings at major fund companies demonstrated that mutual funds aren't always benign investments managed by folks who have their shareholders' best interests in mind.

In the year 2013 a research study was conducted by Morningstar about the eight largest U.S.A. mutual funds. According to him almost all of these funds come in different shares classes, each with their own fee structure, and are ranked by assets under management.

Introduction:

In present economic world mutual fund industry has emerged as a dominant financial intermediary in developed countries' capital markets1. Historians are uncertain about the origins of investment funds. The idea of pooling money dates back to 18222, when group of people of Belgium started a company to finance investments in national industries in the name of "Societe Generale de Belgique", to use the concept of risk sharing. This company purchased securities from a wide range of companies and practiced the concept of mutual fund for risk diversification. The word 'mutual' denoted something to be

done collectively by group of persons with the common objective of having mutual faith and understanding among themselves. Fund was used in monetary terms, to collect some money from the members for a common objective like earning profit with joint efforts.

In 1822, King William I of Netherlands came up with a close-end fund. In 1860, this phenomenon spread to England. In 1868, the Foreign and Colonial Government Trust of London was formed, which was the real pioneer to spread risk of investors over a large number of securities and was considered as the Mecca of modern mutual funds. In 1873, Robert Fleming, established 'The Scottish American Trust'. In nineteenth century many British investment trusts invested in American stocks, the first American investment trust was close-end Boston Personal Property Trust established in 1893. In U. K., the accepting houses emerged as a major force in the business of investment management.

In America mutual fund is based on concept of Unit Trust of Britain. In this country mutual fund has come a long way science 21th March 1924 when first fund, "Massachusetts Investment Trust" for the professors of Harvard University and offered shares to the public in 1926; but it was Sherman L. Adams, the father of modern mutual fund schemes, along with Charles Learoyd and Ashton Carr established a modest portfolio of 45 common stocks worth USD 50, 0003. The crash of stock markets in 1929 led to the demise of many close-end funds. By the end of the year 1930 about 920 mutual funds were registered in U.S.A., and most of them were close ended. The enactment Advisors Act 1933, Investment Company Act 1940 and Investment Advisors Act 1940, led to the revival of mutual funds in U.S.A. The worth of securities owned by U.S.A. funds was USD 2.5 billion in the year 1950. Due to hues amount of securities owned by mutual fund, accepting houses started rapidly to build up their skills and knowledge to deal with.

In Canada, "The Canadian Investment Fund" was the first to be registered in 1932, followed by Commonwealth International Corporation Ltd., and "Corporate Investors Ltd.

After the World War II, there had been a phenomenal growth in the mutual fund industry all over the world. Mutual funds in Japan are called "Investment Trust", but their working is different from investment trusts of U.K., and U.S.A. The growth and progress of mutual fund industry in U.S.A., was a spontaneous response to market development; on the other hand Japanese investment trusts were thought-out action established to fulfill the need of changed government policy. The mutual fund industry in Japan dates back to 1937. But an investment trust modeled on the unit trust of U.K., was started only from 1941. The investment trust were registered according to Securities Investment Law of 1051 having three important characteristics; such as contractual nature, open-end and flexibility.

Before the year 1960, U.S.A., provident fund professional investment authorities were abhorrent of investing in equity shares as these are of India today. From the year 1980 due to higher return on mutual funds employees (through IRA accounts) shifted to equity option for their retirement benefits. On the other hand in Japan we observe a sixty percent decrease in Nikkei from 40,000 to 16,000 due to Japanese retail investors' aversion to equity shares. In Japan individual and institutional investors became more sensitive to the true value of money due to high rate of inflation and higher interest rate. In Japan shifting of funds started towards non-intermediation, the result was increase in mutual funds. In U.S.A., number of mutual funds increased from 70 in the year 1940 to more than 3,000 at the end of the year 1989. The assets of mutual fund industry in U.S.A., increased from USD 44 billion in 1980 to 1 trillion in the year 1989. The ultimate result was that in U.S.A., hundreds of mutual funds, both open-end and close-end were started and concept of mutual funds, spread over to many countries of Europe, Far East, Latin America and Canada.

The retail investments in US mutual funds were very low due to flatness of market from 1966 to 1982. The amount of securities owned by U.S.A., mutual funds increased from 60 billion USD to100 billion USD during the period 1960 to 1983. From the beginning of 1990 investors have poured over half a trillion dollars into stock and bonds of mutual funds. In the year 1990 mutual fund industry of U.S.A., constituted 2,362 mutual funds having 39,614 thousands of investors; holding 570.8 billion USD of assets. By the end of 1994 American investors embraced mutual funds in U.S.A., making mutual fund industry as second largest financial institution after the banking sector holding assets worth 2161.4 billion USD. In the year 1995, U.K., equity category had the highest number of account holders i.e. 11,86,3654.

It was observed that popularity of mutual funds among retail investors was again driven due to changes in retirement funds investment norms where the employees were permitted to choose asset allocation between equities and debt. In the end of the year 1995, the European community issued a directive to coordinate laws, regulations and administrative provisions regarding mutual fund operations. These directives were popularly known as "Undertakings for Collective Investment in Transferable Securities". These directives established a common regulatory scheme for investment policies, public disclosure, structure of fund and regulation to encourage the progress of mutual funds all over the world, which led the momentum in many nations of Asia-Pacific region with a big bang, including Hong Kong, Singapore, Korea and Thailand.

Mutual fund industry in its present shape is a twentieth century phenomenon. In this century mutual funds emerged as the most important investment vehicle for household investment in the capital market

by investing in a wide portfolio of stocks so as to minimize risk. At the end of March 2003, the wealth of worldwide mutual fund stood at 11.2 trillion USD, on the other hand wealth of equity funds contributed for 35 percent only. At the same period i.e. March 2003, number of mutual funds in whole the world stood at 53,150 having 42 percent wealth of capital market5. It was also observed that there was robust growth in mutual fund industry until global financial crisis of 2008. The funds were withdrawn from International Funds in the year 2008 and also from domestic funds. To reduce the effect of financial crisis of 2008 Federal Reserve Bank of USA started many special credit and liquidity programs during that period. The result was that composition of flow changed considerably in the year 2009.

Long-term funds had net inflows of 730 billion USD in the year 2009 as compared to net outflows of 401 billion USD in the year 20086. In the year 2009 money market funds had net outflows of 444 billion USD as compared to net inflows of 636 billion USD in the previous year i.e. 2008. In the year 2009 investors added 390 billion USD in net new cash to equity, bonds and hybrid funds. Investment of funds in foreign companies registered better growth in comparison to domestic equity funds7. The major reasons were secular and demographic factors that appear to have tempered inflows into equity funds likely have served to boost flows into bond funds. The result was investors added 376 billion USD in the year 2009 to their bond fund holdings. In this period index funds continued to remain popular among investors. Despite above major gains, domestic equity funds experienced a net outflow of 39 billion USD in the year 2009.

The composition of Worldwide Investment Fund Asset at the end of 2011 was 39 percent was held in equity funds, share of Bond Funds was 20 percent and share of Balanced / Mixed Funds was 10 percent, Money Market Fund Assets represent 23 percent of the world wide total. This information is given in following table:

Table Showing Composition of Worldwide Investment Fund Assets in the year 2011

Name of Fund	Percentage
Equity	39
Money Market	23
Bonds	20
Balanced-mixed	10
Other/ Unclassified	8

The composition of worldwide Investment funds at the end of 2012 were classified on the basis of type of funds where 40 percent were equity funds, 22 percent were balanced/ mixed funds, 19 percent were bond funds and 5 percent were money market funds. This shows that money market funds were not popular as equity funds. These facts are shown in following table:

Table Showing Composition of Worldwide Investment Fund Assets in the year 2012

Name of Fund	Percentage
Equity	40
Money Market	5
Bonds	19
Balanced-mixed	22
Other/ Unclassified	14

The worldwide distribution of investment fund assets for the year ended 2013 revealed that United States and Europe held the largest share in the world market i.e. 48.5 percent and 31.4 percent respectively. Australia, Brazil, Japan, Canada and China follow in this ranking, the marked share of Europe reached 37.8 percent (including non- UCITS assets) and that of the United States 44.0 percent; with 118 Trillion USD in assets. The U.S.A. mutual fund industry remained the largest in the world at the year –end 2013. Total net assets increased 750 billion USD from the level at year ended 2012, reflecting the continued rise in stock prices in 2013, the investor demand for mutual funds declined further in 2013 with net withdrawals from all types of mutual funds amounting to 287 billion USD investor demand for certain types of mutual funds appeared to be driven   by the interest rate environment and the tepid pace of the economic recovery. In 2013, money market funds continued substantial outflows and equity funds saw net withdrawals for the third consecutive year. While the inflow to bond funds slowed appreciably from their record high in 2012.

Following table shows net flows to mutual funds in Billions of dollars from the years from 1996 to 2013. This table further revealed that the mutual fund industry had a net cash inflow of 416 billion USD in the year 2013.

Table showing Net Flows to Mutual Funds in Billions of Dollars

Years	Net Flows
1996	321
1997	375
1998	477
1999	363
2000	388
2001	504
2002	75
2003	-48
2004	53
2005	254
2006	472
2007	878
2008	412
2009	-149
2010	-297
2011	135
2012	374
2013	416

Following table presents the worldwide number of mutual funds at the year end from the period 2004 to 2013. It was observed that the total number of mutual funds worldwide increased from 55,523 in the year 2004 to 74,434 in the year 2013. Europe had highest number of mutual funds where as Africa had lowest number of mutual funds. In the year 2013 Europe had 36,142 mutual funds as against 942 mutual funds in Africa. It can also be observed that mutual funds have decreased in number in America in the year 2005and decreased in Europe in the year 2009 in comparison to previous year.

It is observed that U.S.A. had the world's largest mutual fund market and represent highest worldwide total net assets at the end of 31st march 2014. It was interesting to observe that the U.S.A. mutual fund market – with 14.9 trillion USD in assets under management at the end of 31st march 2014 – remained the largest in the world, accounting for 47 percent of the 31.7 trillion USD in mutual fund assets worldwide. Equity funds made up 47 percent of U.S. A. mutual fund assets at the end of 31st march 2014.

Domestic equity funds (those that invested primarily in shares of U.S.A. corporations) held 34 percent of total industry assets. World equity funds (those that invest primarily in foreign corporations) accounted for another 13 percent. Money market funds account for 25 percent of U.S. A. mutual fund assets. Bund funds (22percent) and hybrid funds (6 percent) held the remainder of total U.S. A. mutual funds. At the end of 31st march 2014about 652 sponsors managed mutual fund assets in U.S.A. In whole the world asset management sector had brand value of 68,219 million USD, which is 9 percent of total brand value of the brands at the end of 31st march 2014.

Worldwide Growth of Mutual funds in Numbers from the year 2004 to 2013

Years	Americas	Europe	Asia and Pacific	Africa	Total
2004	14,063	29,306	11,617	537	55,523
2005	13,763	30,060	12,427	617	56,867
2006	14,475	33,151	13,479	750	61,855
2007	15,460	35,210	14,847	831	66348
2008	16,459	36,780	14,909	884	69,032
2009	16,954	34,899	14,795	905	67,553
2010	18,019	35,292	15,265	943	69,519
2011	18,138	35,350	16,340	954	70,782
2012	19,742	35,697	16,482	930	72,851
2013	20,057	36,142	17,293	942	74,434

Loss of Brand Value due to Asset Management Sector

It is observed that brand value lost due to asset management sector of the global banks was 28 percent. It was also seen that brands were also unable to replicate their stellar performance. The major important events over the world in mutual fund history are summarized as follows:

Major important Events over the world in Mutual Fund History

In the year 1774 a Dutch merchant and broker namely Adriaan Van Ketwich invites subscriptions from investors to form a trust in the name of "The Eendragt Maakt Magt", with the aim of providing investment in diversifications opportunities to such investors having limited means. Ketwich probably theorized that diversification would increase the appeal of investments to smaller investors with minimum capital. The name of Ketwich's fund, Eendragt Maakt Magt, translates to "unity creates strength".

An investment trust launched in Switzerland in 1849.

In the year 1868 In London "The Foreign and Colonial Government Trust", is formed as is precursor to the "U.S.A. investment fund model". This trust provides facility of moderate means to investors having the same advantages as having largest capitalists at that time.

In the year 1880 a similar vehicles created in Scotland.

In the year 1890 pooling resources and spreading risk using closed-end investments soon took root in Great Britain and France, making its way to the United States.

The Boston Personal Property Trust, formed in 1893, was the first closed-end fund in the U.S.A.

The creation of the Alexander Fund in Philadelphia in 1907 was an important step in the evolution toward what we know as the modern mutual fund. The Alexander Fund featured semi-annual issues and allowed investors to make withdrawals on demand.

In the year 1924 first mutual fund was formed in Boston by Massachusetts named Massachusetts Investors' Trust. The fund went public in 1928, eventually spawning the mutual fund firm known today as MFS Investment Management. State Street Investors' Trust was the custodian of the Massachusetts Investors' Trust. Later, State Street Investors started its own fund in 1924 with Richard Paine, Richard Saltonstall and Paul Cabot at the helm. Saltonstall was also affiliated with Scudder, Stevens and Clark, an outfit that would launch the first no-load fund in 1928. A momentous year in the history of the mutual fund, 1928 also saw the launch of the Wellington Fund, which was the first mutual fund to include stocks and bonds, as opposed to direct merchant bank style of investments in business and trade.

By 1929, there were 19 open-ended mutual funds competing with nearly 700 closed-end funds. With

the stock market crash of 1929, the dynamic began to change as highly-leveraged closed-end funds were wiped out and small open-end funds managed to survive.

Government regulators also began to take notice of the fledgling mutual fund industry. In the year 1933 Securities Act of 1933 come into force to regulates the registration and offering of new securities, including mutual fund and closed end fund shares to the public.

In the year 1934 the Securities Exchange Act of 1934 came into force; it authorizes the Securities and Exchange Commission to establish fair and equitable securities markets. According to provisions of this act for safeguards and protect investors; mutual funds were required to register with the SEC and to provide disclosure in the form of a prospectus.

In the year 1936 provisions relating to taxation on mutual funds and their shareholders were made In the Revenue Act.

In the year 1940 the Investment Companies Act came into force, setting the structure and regulatory framework for registered investment companies. The forerunner to the National Association of Investment Companies (NAIC) is also formed. NAIC was working as the investment company institute. This act of 1940 put in place additional regulations that required more disclosures and sought to minimize conflicts of interest.

In the year 1942 Closed-end funds were also covered by Revenue Act of 1936.

In the year 1944 the National Association of Investment Companies (NAIC) also started to collect statistics relating to investment companies.

At the beginning of the 1950s, the number of open-end funds topped 100. In 1954, the financial markets overcame their 1929 peak, and the mutual fund industry began to grow in earnest, adding some 50 new funds over the course of the decade.

In the year 1951 total number of mutual funds surpasses 100 and the number of shareholders accounts exceeds one million for the first time in the history of mutual funds.

In first time in the year 1954 Households' net purchases of fund shares exceed those of corporate stock. National Association of Investment Companies (NAIC) initiates a nationwide public information

program emphasizing the role of investors in the U.S.A., economy and also explaining the concept of investment companies.

In the year 1955 first U.S.A. based international mutual fund was came into force.

The 1960s saw the rise of aggressive growth funds, with more than 100 new funds established and billions of dollars in new asset inflows.

In the year 1961 first tax-free unit investment trust is started in U.S.A. In this year National Association of Investment Companies (NAIC) changes its name to The Investment Company Institute (ICI) and welcomes fund advisers and underwriters as members.

In the year 1962 provisions are made in the Self-employed Individuals Tax Retirement Act to create savings opportunities (Keogh Plans) for self-employed individuals.

Until the bear market of 1969 cooled the public appetite for mutual funds. Money flowed out of mutual funds as quickly as investors could redeem their shares, but the industry's growth later resumed.

The year 1970s also saw the rise of the no-load fund. This new way of doing business had an enormous impact on the way mutual funds were sold and would make a major contribution to the industry's success.

In the year 1971 Money Market Funds are introduced in U.S.A. In 1971, William Fouse and John McQuown of Wells Fargo Bank established the first index fund, a concept that John Bogle would use as a foundation on which to build The Vanguard Group, a mutual fund powerhouse renowned for low-cost index funds.

In the year 1974 provision was made for Individual Retirement Account (ITA) in Employees Retirement Income Security Act (ERISA) for such workers who are not covered by Employer – sponsored Retirement Plans.

In the year 1976 first Retail Index Fund was offered in the name of Municipal Bond Funds by making provision in Tax Reform Act.

In the year 1978 a new section 401(k) was added in Revenue Act for Retirement Plans and Simplified

Employee Pensions (SEPs).

With the 1980s and '90s came bull market mania and previously obscure fund managers became superstars; Max Heine, Michael Price and Peter Lynch, the mutual fund industry's top gunslingers, became household names and money poured into the retail investment industry at a stunning pace. More recently, the burst of the tech bubble and a spate of scandals involving big names in the industry took much of the shine off of the industry's reputation. Shady dealings at major fund companies demonstrated that mutual funds aren't always benign investments managed by folks who have their shareholders' best interests in mind.

In the year 1981 some important provisions were made in Economic Recovery Tax Act for smooth implementation of section 401(k) for "universal" Individual Retirement Account (ITA) for every worker.

In 1986 a provision was made in Tax Reform Act for Individual Retirement Account (ITA).

In 1987 Investment Company Institute (ICI) gave permission to Closed –end Funds as member.

In the year 1989 Mutual Fund Assets were increased more than 1 trillion in U.S.A.

In the year 1993 the first Exchange-traded Fund (ETE) shares were issued in U.S.A.

In the year 1996 a change was made in National Securities Markets Improvement Act (NSMIA) for more rational system of state and federal regulation providing exclusive jurisdiction for registering and regulating mutual funds, exchange listed securities and larger advisers. States retain their antifraud authority and responsibility for regulating non-exchange listed offerings and smaller advisers.
In the same year a provision was also made in Small Business Job Protection Act called "Simple Plan" for employees of small business houses.

In the year 1997 a provision was done in Taxpayer Relief Act for Roth IRA and abolishes restrictions on portfolio management which are disadvantages for shareholders in U.S.A.

In the year 1998 the SEC made reform in disclosure relating to mutual funds, encompassing "plain English", fund profiles and improved risk disclosure.

In 1999 Financial Services Regulations were modernizes and enhances financial privacy through making changes in Gramm-Leach_Bliley Act.

In the year 2001 significant changes were made in Tax Relief Reconciliation Act (EGTRRA) for explanation of retirement savings opportunities for millions of working Americans and for increasing economic growth of America.

In the year 2003 an amendment was made in Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) for full benefits of lower tax rates on dividends and capital gains to mutual fund shareholders.

In the year 2006 changes were done in Pension Protection Act (PPA) and Tax Increase Prevention and Reconciliation Act for incentive to investors (young and old) to save more in tax-deferred and taxable investment accounts.

In the year 2008 reserve of Primary Funds fails to maintain 1.00 NAV, becoming the second money market fund in 25 years to "break a dollar".

In this year Securities and Exchange Commission (SEC) adopts "Summary Prospectus Rule".

In the year 2009 money market fund assets hit 3.92 trillion USD at their highest level.

In this year a task force of senior industry executives called "Money Market Working Group" submits its report to ICI Board. The Board approved Working Group's report issue orders for immediate implementation of new regulatory and oversight standards for money market funds.

In the year 2010 Securities and Exchange Commission (SEC) follows new rules and amendments to regulations governing money market funds. In Jones v. Harris case, U.S.A. Supreme Court unanimously upholds the Gartenberg standard under which courts have long considered claims of excessive fund advisory fees.

In this year Regulated Investment Company Modernization Act streamlines and updates Technical Tax Rules, benefiting shareholders by making funds more efficient.

In the year 2013 a research study was conducted by Morningstar about the eight largest U.S.A. mutual

funds. According to him almost all of these funds come in different shares classes, each with their own fee structure, and are ranked by assets under management. He pointed out the pros and cons of both active and passive funds, while simultaneously suggesting real alternatives. Some important findings of his research are:

1. Pimco Total Return (PTTAX)

It is the biggest mutual fund of the whole world. It is a bond fund managed by the famous Bill Gross. Its assets are 263 billion USD on 31st March 2013. Mr. Gross has quite a reputation in the fixed income world, and for good reason—his long-term track record is very good. He made some poor market calls in 2011, namely shortening the fund's duration and reducing Treasury exposure. As a result, he missed out on the drop in interest rates which drove a solid rally in the latter half of the year. Only time will tell how frequent these slip ups occur. The net annual expense ratio for A shares is 0.85% (with a 3.75% front end load) and 1.60% for C shares, although some of the other classes have lower fees. The institutional shares, for instance, cost about 0.46% per year.

Pros: (i) Solid long-term track record.

(ii) Capable management team with extensive experience in fixed income.

Cons: (i) The portfolio's duration is now a little longer than we would like.

(ii) While it hasn't created major issues so far, the significant assets base could limit its ability to move in and out of the best investments.

(iii) Depending on the share class, this fund can be expensive.

It's hard to argue with exposure here. Following the 2011 slip up, Gross increased duration and benefitted from falling rates in 2012, and has since reduced duration again. So despite its large size this fund remains relatively nimble. In the end, it may depend on what share class is purchased. Each holds a different set of fees, and paying anything over 1% annually is hard to justify for a bond fund, especially considering the existence of cheaper ETF alternatives.

2. Vanguard Total Stock Market Index Fund (VTSMX)

It is the second biggest mutual fund of the whole world. Its assets are 190 billion USD on 31st March 2013. Rather than mimic the S&P 500, this fund provides capitalization weighted exposure to the entire US equity universe across all sizes and styles. As a passively managed index fund it does not attempt to outperform the market. It comes in two shares classes: Investor shares and Admiral shares. There is a $3,000 minimum on the former and a $10,000 minimum on the latter if opening a new account. The net

annual expense ratios are 0.17% and 0.05% respectively.

Pros: (i) Very inexpensive relative to actively managed stock funds, as well as other passively managed index funds.

(ii) It provides more exposure to mid and small cap companies than funds tracking the S&P 500.

Cons: (i) The fund is market cap weighted, so while it provides exposure to mid and small it remains heavily concentrated in large cap.

(ii) Capitalization-weighted indexes suffer from an inherent bias toward "hot" segments of the market, and often feature concentrated economic sector bets.

Vanguard is well known for keeping investor costs low. And this fund's broad exposure to US equities make it a prime candidate for a core domestic holding, particularly within qualified retirement plans that cannot invest in ETFs. It has ETF alternative. ETF alternative means Vanguard Total Stock Market ETF (VII). Its expense ratio is almost as low as the Admiral shares at 0.06% and there is no minimum investment. Given this is a market cap weighted fund concentrated primarily in large firms. Two more low cost alternatives are also available useful to small and mid through supplemental ETF. These are Vanguard Mid-Cap ETF (VO) and Vanguard Small Cap ETF (VB).

3. American Funds Growth Fund of America (AGTHX)

The most popular of the American Funds offerings is the Growth Fund of America. Its assets are $115 billion on 31st March 2013. It is an actively managed fund, which according to American Funds' website, invests at least 65% of assets in common stocks, of which up to 25% can be international. The net annual expense ratios for A shares and C shares is 0.68% (plus a 5.75% front end load) and 1.46%, respectively.

Pros: (i) 10-year performance for A shares relative to the S&P 500 (using SPY as a proxy) is strong, but investors should always be aware of survivorship bias when considering long term records of mutual funds.

(ii) American Funds has a reputation for attracting talented managers and analysts.

(iii) Fairly good sector exposure.

Cons: (i) Very expensive.

(ii) Shorter-term performance is less than spectacular with both A shares and C shares trailing SPY on a one-, three-, and five-year basis.

(iii) High asset base could limit investment options.

(iv) American Funds in general are suffering from a massive outflow of assets. By definition, these causes forced selling and create a performance headwind.

Despite American Funds' reputation, it is extraordinarily difficult to justify paying such high fees given underperformance relative to low cost index ETFs like the SPDR S&P 500 ETF (SPY). More importantly, a closer comparison based on the fund's style and size characteristics is the Vanguard Growth ETF (VUG), which tracks the Russell 1000 Growth Index. While the ETF hasn't been around long enough to perform a ten-year comparison, it significantly outperformed A shares and C shares on a one-, three-, and five- year basis (as of 6/30/2012). The Growth Fund of America has a foreign component which makes a direct comparison to US equities inaccurate and foreign has done worse than domestic in recent years. But even if we created a 75/25 blend (the maximum the fund is allowed to invest in foreign) of VUG and VEU (Vanguard FTSE All World ex-US ETF) we would have still handily beat this fund over the same one-, three-, and five-year basis. All of this makes a strong case for ETFs and if it's in a qualified retirement plan with limited investment options, a lower cost index fund is likely a better bet.

4. Vanguard 500 Index Investor Fund (VFINX)

Vanguard 500 Index Investor Fund stands at fourth place having assets of $111 billion. Passive index fund tracks the S&P 500, meaning it is primarily invested in large cap stocks. Like the Vanguard Total Stock Market Fund, it comes in two share classes: Investor shares and Admiral shares. Net annual expense ratios are 0.17% and 0.05%, respectively.

Pros: (i) Very inexpensive relative to actively managed stock funds, as well as other passively managed index funds.

(ii) Low portfolio turnover of only 4% provides greater tax efficiency.

Cons: (i) The fund is market cap weighted, and given it tracks the S&P 500 there is minimal exposure to mid and small cap companies.

(ii) Capitalization weighted indexes suffer from an inherent bias toward "hot" segments of the market, and often feature concentrated economic sector bets.

This is a solid choice for core domestic equity exposure. But given its concentration in large cap, it is wise to add supplemental mid and small cap exposure. Vanguard also offers a cheap ETF alternative i.e. Vanguard S&P 500 ETF VOO. While volume isn't as high as the SPDR S&P 500 ETF (SPY), it carries a

lower net annual expense ratio at 0.05%. There is also an institutional version of this fund, the Vanguard Institutional Index (VINIX), which charges a meager 0.04% annually.

5. Vanguard Total Bond Market Index (VBMFX)

Vanguard Total Bond Market Index is fifth largest mutual fund of USA having assets worth $111 billion on 31st March 2013. It comes in Investor and Admiral shares, with annual expense ratios of 0.22% and 0.10%, respectively. This is a passively managed fixed income fund that attempts to track the Barclays Capital U.S. Aggregate Float Adjusted Index—a broad value weighted index of dollar denominated investment grade bonds. The primary holdings are US Treasuries, corporate bonds, and agency mortgage-backed securities. According to the prospectus, the fund maintains a dollar-weighted average maturity range of 5 to 10 years.

Pros: (i) It provides broad exposure to multiple areas of the fixed income market.

(ii) It is inexpensive.

Cons: (i) We believe maturity and duration are a bit long given the current interest rate environment.

(ii) No exposure to inflation-protected bonds.

(iii) Almost no international exposure.

This fund is cheap and it also has a low cost ETF brother: Vanguard Total Bound MarketcETF (BND). Its broad fixed income exposure makes it a good candidate for a core fixed income holding, but it's not without drawbacks. It could be improved with the addition of inflation-protected and international bonds. Moreover, its weighted average maturity of over 7 years, and duration of 5 years, means there's a sizeable amount of interest rate risk. We would suggest a shorter maturity/duration profile to protect against a potential jump in rates.

6. American Funds Euro Pacific Growth (AEPGX)

The Euro Pacific Growth fund comes at sixth position in USA having assets of $94 billion on 31st March 2013. This is a growth-oriented fund that, according to the prospectus, normally invests at least 80% of assets in European and Pacific Basin securities. According to Morningstar.com, the fund had over 20% of its equity weight in Emerging Markets. It comes in many share classes. The A shares carry a 5.75% front end load and 0.84% annual expense ratio, while the C shares annual expense ratio comes in at 1.62%.

Pros: (i) Good regional exposure spanning both developed and emerging markets.

(ii) American Funds has a reputation for attracting talented managers and analysts.

(iii) With over 300 equity holdings, the fund is broadly diversified.

Cons: (i) It is very expensive.

(ii) The fund is heavily concentrated in large cap stocks with minimal exposure to small and mid.

(iii) American Funds in general are suffering from a massive outflow of assets. By definition, this cause forced selling and creates a performance headwind.

This is an expensive mutual fund which may not be worth the price given mixed performance figures. A close comparison based on the fund's makeup is the MSCI All Country World ex USA Index. The A shares bested this index over most time periods (one-, three-, five-, and ten-year). But when factoring in the 5.75% sales load, the fund underperformed on a one- and three-year basis, and was only slightly ahead of the index on a ten-year basis through 6/30/2012. It's also important to keep in mind these figures exclude the impact of taxes on distributions and sales of fund shares, a very real headwind. In other words, this is another example where a lower cost, more efficient ETF like VEU (Vanguard FTSE All- World ex-US) could make more sense. But if our international choices are limited, we could do worse.

7. Fidelity Contra Fund (FCNTX) Assets:

With one showing in the top ten is Fidelity's Contra fund. This is another large growth fund having assets worth $81 billion on 13st March 2013. But, its focus is primarily on the US, with over 88% of assets in domestic equities through mid-2012, according to Fidelity.com. The remainder is in foreign developed markets and cash, with a small weight in emerging markets. There is no front end load, and total annual expenses are approximately 0.81%.

Pros: (i) 10-year performance is very strong, but investors should always be aware of survivorship bias when considering long term records of mutual funds.

(ii) Offers some diversification into foreign stocks.

Cons: (i) Significant sector bets with almost half of portfolio allocated to Technology and Consumer Cyclical stocks.

(ii) Almost no exposure to small cap or value stocks.

With a 0.81% expense ratio and no front end load, this mutual fund isn't excessively expensive. Performance is another story. A direct comparison is difficult given the small foreign component, but

based on its size and style characteristics, the Vanguard Growth ETF (VUG) would be the closest match, which tracks the Russell 1000 Growth index. Despite strong ten-year results, the Contra fund underperformed VUG on a one- and three-year basis, and was about even on a five-year basis (as of 6/30/2012). And again, this does not account for taxes which would result in even lower performance. This fund's concentrated bets don't seem worth the risk given these performance figures. We would suggest a combination of lower cost ETFs to better diversify across size, styles, and regions.

8. American Funds Capital Income Builder (CAIBX)

The Capital Income Builder comes in at number eight having assets of $76 billion on 31st March 2013. This fund seeks higher yielding securities to provide investors with an income stream. According to American Funds' website, it can invest in up to 50% internationally and normally has at least 90% invested in income-producing assets. As of mid-2012, it had approximately 33% in domestic equities, 37% in international equities, and 21% in fixed income, according to Morningstar.com. While there are multiple classes of this fund, A shares carry a 0.61% annual expense ratio and a 5.75% front end load. C shares come with no load, but a 1.43% annual expense ratio.

Conclusion

Despite the 2003 mutual fund scandals and the global financial crisis of 2008-2009, the story of the mutual fund is far from over. In fact, the industry is still growing. In the U.S. alone there are more than 10,000 mutual funds, and if one accounts for all share classes of similar funds, fund holdings are measured in the trillions of dollars. Despite the launch of separate accounts, exchange-traded funds and other competing products, the mutual fund industry remains healthy and fund ownership continues to grow.

With the 1980s and '90s came bull market mania and previously obscure fund managers became superstars; Max Heine, Michael Price and Peter Lynch, the mutual fund industry's top gunslingers, became household names and money poured into the retail investment industry at a stunning pace. More recently, the burst of the tech bubble and a spate of scandals involving big names in the industry took much of the shine off of the industry's reputation. Shady dealings at major fund companies demonstrated that mutual funds aren't always benign investments managed by folks who have their shareholders' best interests in mind.

The research study conducted by Morningstar in 2013 about the eight largest U.S.A. mutual funds shows that almost all of these funds come in different shares classes, each with their own fee structure, and are ranked by assets under management. He pointed out the pros and cons of both active and passive

funds, while simultaneously suggesting real alternatives.

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A Study To Analyze The Advantages And Challenges Of It Portfolio Management

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A B S T R A C T

As investors have portfolios of financial investments to address their multiple investment objectives, firms now also have portfolios of information technology (IT) investments for their convenience. IT portfolio management is the application of systematic management to large classes of items managed by enterprise Information Technology (IT) capabilities. Examples of IT portfolios would be planned initiatives, projects, and ongoing IT services. The promise of IT portfolio management is the quantification of previously informal IT efforts, enabling measurement and objective evaluation of investment scenarios. An IT portfolio demonstrates the relationships among current and planned investments. The purpose of the IT portfolio is to manage investments in IT as one would manage a portfolio of investments of assets such as real estate or financial instruments (e.g., a stock portfolio). The portfolio enhances the ability of key decision-makers to assess the probable impact of investments on an agency's programs and infrastructure, as well as on the overall state IT infrastructure. The purpose of this Research paper is to understand the advantages of IT portfolio management and also to show some light on the drawbacks of the same and analyze the acceptability of this upcoming new concept in the market.

Keywords : Information technology ,portfolio management , policy , balanced scorecard , project portfolio .

Introduction:

IT portfolio management is the application of systematic management to large classes of items managed by enterprise Information Technology (IT) capabilities. Examples of IT portfolios would be planned initiatives, projects, and ongoing IT services (such as application support). The promise of IT portfolio management is the quantification of previously informal IT efforts, enabling measurement and objective evaluation of investment scenarios.

Companies that actively and effectively manage their IT investments through the use of IT portfolio management have been found to derive measurable value from IT investments (Maizlish & Handler 2005). This is consistent with the stream of IT business value literature that suggests the strategic value of IT is rooted in its ability to enable complementary organisational investments (e.g. Brynjolfsson & Hitt 2000). Organisations that are able to position their IT investments as strategic assets would be able to harness the value of those assets and potentially create a sustainable competitive advantage.

This drive to maximize return on technology spending has been one of the reasons fuelling the increasing prominence of portfolio management (Broadbent, Weill & Clair 1999; Cooper 1998; Cooper et al. 1999; Weill & Aral 2006; Weill & Olson 1989; Weill & Ross 2004).

Portfolio management has its roots in the field of financial management. Financial managers or controllers had long been enjoying the ability to maximize the returns of an array of investments with the assistance of quantitative techniques.

By using approaches proposed by the Modern Portfolio Theory (Markowitz 1952), they are able to obtain the optimal investment portfolio which will yield the highest returns for the specified risk tolerance of their organisations. However, it was suggested that Markowitz's Modern Portfolio Theory (MPT) and other financial portfolio theories do not work for IT investments which are usually illiquid in nature (Kersten & Verhoef 2003).

Accordingly, we define IT Portfolio Management (ITPM) as follows:

IT Portfolio Management is the combination of tools and methods used to measure, control, andincrease the return on both individual IT investments and on an aggregate enterprise level in a desirable manner that meets the organisation's business objectives without exceeding available resources or violating other constraints.

History

The first mention of the portfolio concept as related to IT was from Richard Nolan in 1973: "investments in developing computer applications can be thought of as a portfolio of computer applications.] Further mention is found in Gibson and Nolan's Managing the Four Stages of EDP Growth in 1973. Gibson and Nolan proposed that IT advances in observable stages driven by four "growth processes" of which the Applications Portfolio was key. Their concepts were operationalized at Nolan, Norton & Co. with measures of application coverage of business functions, applications functional and technical qualities, applications age and spending.

McFarlan proposed a different portfolio management approach to IT assets and investments. Further contributions have been made by Weill and Broadbent, Aitken, Kaplan, and Benson, Bugnitz, and Walton The ITIL version 2 Business Perspective and Application Management volumes and the ITIL v3 Service Strategy volume also cover it in depth.

Various vendors have offerings explicitly branded as "IT Portfolio Management" solutions. ISACA's

Val IT framework is perhaps the first attempt at standardization of IT portfolio management principles. In peer-reviewed research, Christopher Verhoef has found that IT portfolios statistically behave more akin to biological populations than financial portfolios. Verhoef was general chair of the first convening of the new IEEE conference, "IEEE Equity," March 2007, which focuses on "quantitative methods for measuring, predicting, and understanding the relationship between IT and value."

Overview

Debates exist on the best way to measure value of IT investment. As pointed out by Jeffery and Leliveld, companies have spent billions of dollars on IT investments and yet the headlines of mis-spent money are not uncommon. Nicholas Carr (2003) has caused significant controversy in IT industry and academia by positioning IT as an expense similar to utilities such as electricity. IT portfolio management started with a project-centric bias, but is evolving to include steady-state portfolio entries such as infrastructure and application maintenance. IT budgets tend not to track these efforts at a sufficient level of granularity for effective financial tracking.

The concept is analogous to financial portfolio management, but there are significant differences. Financial portfolio assets typically have consistent measurement information (enabling accurate and objective comparisons), and this is at the base of the concept's usefulness in application to IT. However, achieving such universality of measurement is going to take considerable effort in the IT industry (see, for example, Val IT). IT investments are not liquid, like stocks and bonds (although investment portfolios may also include illiquid assets), and are measured using both financial and non-financial yardsticks (for example, a balanced scorecard approach); a purely financial view is not sufficient. Finally, assets in an IT portfolio have a functional relationship to the organization, such as an inventory management system for logistics or a human resources system for tracking employees' time. This is analogous to a vertically integrated company which may own an oil field, a refinery, and retail gas stations.

IT portfolio management is distinct from IT financial management in that it has an explicitly directive, strategic goal in determining what to continue investing in versus what to divest from. At its most mature, IT portfolio management is accomplished through the creation of three portfolios:

• **Application Portfolio -** anagement of this portfolio focuses on comparing spending on established systems based upon their relative value to the organization. The comparison can be based upon the level of contribution in terms of IT investment's profitability. Additionally, this comparison can also be based upon the non-tangible factors such as organizations' level of experience with a certain

technology, users' familiarity with the applications and infrastructure, and external forces such as emergence of new technologies and obsolescence of old ones.

- **Infrastructure Portfolio -** This For an organization's information technology, infrastructure management (IM) is the management of essential operation components, such as policies, processes, equipment, data, human resources, and external contacts, for overall effectiveness. Infrastructure management is sometimes divided into categories of systems management, network management, and storage management. The ability of organizations to exploit IT infrastructure, operations and management sourcing/service solutions not only depends on the availability, cost and effectiveness of applications and services, but also with coming to terms with solution providers, and managing the entire sourcing process. In the rush to reduce costs, increase IT quality and increase competitiveness by way of selective IT sourcing and services, many organizations do not consider the management side of the equation. The predictable result of this neglect is overpayment, cost overruns, unmet expectations and outright failure.

- **Project Portfolio -** This type of portfolio management specially addresses the issues with spending on the development of innovative capabilities in terms of potential ROI, reducing investment overlaps in situations where reorganization or acquisition occurs, or complying with legal or regulatory mandates. The management issues with project-oriented portfolio management can be judged by criteria such as ROI, strategic alignment, data cleanliness, maintenance savings, suitability of resulting solution and the relative value of new investments to replace these projects.

Information Technology portfolio management as a systematic discipline is more applicable to larger IT organizations; in smaller organizations its concerns might be generalized into IT planning and governance as a whole.

Figure 1
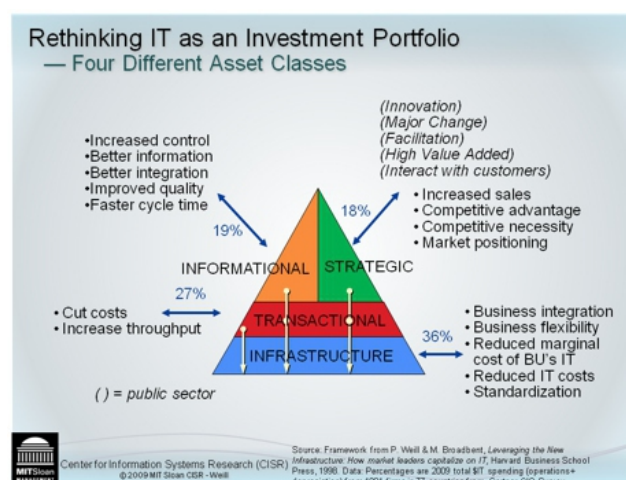
Implementing it Portfolio Management

Jeffery and Leliveld (2004) have pointed out a number of hurdles and success factors that CIOs might face while attempting to implement IT portfolio management approach. To overcome these hurdles, simple methods such as proposed by Pisello (2001) can be used.

-Plan-

-          -

-          -

build   retire

-          -

-      -

Maintain
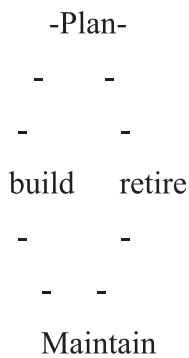
Other implementation methods include

(1) **Risk profile analysis -** means to figure out what needs to be measured and what risks are associated with it.

(2) **Decide on the Diversification of projects**, infrastructure and technologies (it is an important tool that IT portfolio management provides to judge the level of investments on the basis of how investments should be made in various elements of the portfolio),

(3) **Continuous Alignment with business goals -** means highest levels of organizations should have a buy-in in the portfolio) and

(4) **Continuous Improvement** for lessons learned and investment adjustments.

Maizlish and Handler (2007) provide a proven step-by-step methodology for applying IT portfolio management that has eight stages. In today's fast-paced world, waterfall approaches to delivering anything are proving to be less and less effective. Nonetheless, the eight stages are:

1. Developing an IT portfolio management game plan
2. Planning the IT portfolio
3. Creating the IT portfolio
4. Assessing the IT portfolio

5. Balancing the IT portfolio

6. Communicating the IT portfolio

7. Developing and evolving IT portfolio governance and organization

8. Assessing IT portfolio management process execution

There is no single best way to implement IT portfolio approach and therefore variety of approaches can applied. Obviously the methods are not set in stone and will need altering depending upon the individual circumstances of different organizations.

Difference Between Projects, Programs And Portfolios

A project is managed with a clear end date in mind, and according to a set scope and budget. It has a single easily definable tangible output. E.g. a list of deliverables, a new system or an improved process. A program is a collection of two or more projects sharing a common goal.Program managers control dependencies and allocate resources across projects.

A portfolio is a group of related initiatives, projects and/or programs that attain wide reaching benefits and impact.

Freeware And Open Source Tools

MappIT is a free tool used to map and analyze IT Portfolio assets (systems, business processes, infrastructure, people, skills, roles, organization, spending...) and their lifecycle. It was launched in its first version in February 2012.

Relationship to other IT disciplines

IT portfolio management is an enabling technique for the objectives of IT Governance. It is related to both IT Service Management and Enterprise Architecture, and might even be seen as a bridge between the two. ITIL v3 calls for Service Portfolio Management which appears to be functionally equivalent.

Benefits Of IT Portfolio Management

Jeffery and Leliveld (2004) have listed several benefits of applying IT portfolio management approach for IT investments. They argue that agility of portfolio management is its biggest advantage over investment approaches and methods. Other benefits include central oversight of budget, risk management, strategic alignment of IT investments, demand and investment management along with standardization of investment procedure, rules and plans.

Conclusion

By framing IT investment decision-making as a strategic organizational decision, we have presented a framework to understand the impacts of IT Portfolio Management. The IT Portfolio Management Maturity Model, which was constructed as an index, aims to assist managers in identifying areas for improvement when they review their organization's ITPM practices. It can also serve as a benchmarking tool for organizations to assess their ITPM maturity relative to their competitors in aneffort to recalibrate their IT governance mechanisms. Research in IT Portfolio Management is currently very limited and hence presents immense opportunities for IS researchers to advance our knowledge in this area. Our proposed research model can contribute empirical evidence to improve our understanding of this important IS management topic. Results will certainly contribute significantly towards the stream of IT business value literature. In addition, ample work can be pursued to extend our framework by identifying other outcomes of ITPM that can influence the complex IT investment decision-making process, and taking on a wider strategic view by examining the effects of ITPM on relative competitive advantage, differentiation towards competitors, innovative character, and process flexibility.

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Capital Structure Analysis
A Case Study Of Indian Tobacco Company (itc)

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A B S T R A C T

This study established a need to showcase the capital structure performance through EBIT analysis. In this paper an attempt is made to analyze the capital structure of ITC during the period to 2001-13, so as to figure out the determinants that affect the capital structure decisions of the company and to study the impact of capital structure decisions on profitability of the company. Researchers tried to examine the formation of capital structure of ITC and the positive and negative impacts associated with higher and lower amount of debt which has been observed during the period of the study. The financial parameters of ITC reflects that apart from the bladdering capital charges, which took sharp rise in 2008 due recessionary conditions in FMCG industry, the moderate rate of gross margin have been a major player to its profits. The increasing level of debts in the position statement and a diminishing net worth have taken its debt-equity ratio to an unfeasible limits in some years but at an all ITC is a profit making and less levered company in FMCG industry.

Keywords: Capital structure, Leverage, ITC, EPS, Tax Shield. Introduction

Capital structure or capital mix is an important measure to control the overall cost of capital and to improve the earnings of the company. It is most likely referring to the firm's debt-equity ratio which provides information to the investors how risky a company is. Various financial sector reforms like reduction in interest rates were introduced by government which directly or indirectly influences capital structure of the firms. At present financing capital structure is a crucial financial decision for every company. At the time of promotion companies have to decide about the composition of capital structure, then at the time when funds have to be raised for finance and investment again this complicated decision acted as a hurdle. With an objective to study the capital structure, its determinants and impact of capital structure decisions on performance of ITC, we will start with the shareholding pattern of ITC as on 31st December 2013.

Share holding patterns of ITC on 31st Dec, 2013:

Category	Percentage
Institutional Investors	53.94
Non Institutional Shareholdings	45.8
GDR	0.26

Source: http://www.itcportal.com/about-itc/shareholder-value/annual-reports/itc-annual-report-2013/pdf/ITC-Shareholder-Info.pdf
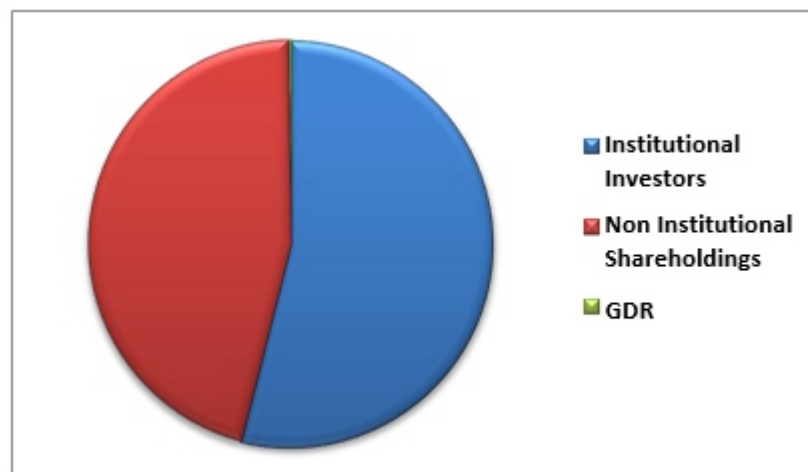
Fig 1

Importance of the study: Many profitable companies fail every year due to mismanaged capital structure. Now a day's corporations have full opportunities to restructure their capital structure so as to get maximum leverage from the debt equity mix by adding value to the shareholders. The present study attempts to find out the impact of debt equity mix for future profitability of the company.

Problem Area: An attempt has been made to evaluate the performance of INDIAN TOBACCO COMPANY (ITC) through Capital Structure Analysis during the period of study from to 2001-13. The main problem areas of the study are:

1. Calculation of value of firm.

2. Analysis of existing capital structure.

3. Evaluation of Performance through capital structure.

Objectives of the study:

The followings are the objectives of the study of "Capital Structure analysis of "INDIAN TOBACCO COMPANY":-

1) To study the existing capital structure maintained by the company.
2) To study the influence of various determinants on capital structure.
3) To examine the performance of firm with respect to capital structure.

Meaning of capital structure

Capital structure of a firm represents the mix of securities that a firm has to sell in order to finance its assets (generally fixed assets). It is a significant financial decision as it affects the shareholders risk and return, consequently the market value of shares. A firm has various options regarding the combination of various sources to finance its investment activities. The firm may opt for all-equity firm (having no borrowed funds) or equity-preference firm (having no borrowed funds), any of the numerous possibilities of combination of equity, preference shares and borrowed funds. Theoretically speaking, a judicious use of debt and equity in capital structure can maximize the value of the firm. But how this ideal debt equity mix is determined? The issue has been examined by several scholars and several theories and various approaches have been suggested to analyze the capital structure and its determinants.

The study by Modigliani and Miller (1958), Modigliani and Miller (1963) are generally perceived as milestones among capital structure studies. They construct the role of taxes, market value of firm and cost of capital in capital structure decisions. Likewise, Jensen and Meckling (1976) and Myers (1977) introduced bankruptcy and financial distress costs and agency costs, respectively. These concepts are considered as the basics of trade-off theory. According to this theory, any increase in debt level causes an increase in bankruptcy, financial distress and agency costs, and hence decreases the firm value. Thus an optimal capital structure may be acquired by establishing equilibrium between tax advantage and financial distress and bankruptcy costs of debt. In order to establish this equilibrium, firms should seek debt levels at which the costs of possible financial distress offset the tax advantages of additional debt.

Determinants of capital structure:

Profitability

The static trade-off hypothesis pleads for the low level of debt capital of risky firms (Myers,1984). The higher profitability of the firms implies higher debt capacity and less risky to debt holders. So,

according to this theory profitability and leverage/capital structure have negative relation. On the other hand, Pecking order theory suggests that a profitable firm is more likely to finance through internal sources rather than external sources. A negative relation between profitability and leverage was found by Bevan and Danbolt (1999), Panday (2001), Rao (2003), Deesomsak et al. (2004), Song (2005), Huang and Song (2006), Kim and Berger (2008) and Awan et al. (2011). However, according to trade off theory some people found positive relationship between profitability and capital structure. Following Titman and Wessels (1988), Rajan and zingales (1995), and Supanvanij (2006). Only few studies show the evidence in favor of static trade-off theory.

Firm Size

Firm size is found to be a positive determinant of capital structure as indicated in Bevan and Danbolt (1999). The large firms are more diversified and can easily access capital markets (Baral 2004). They are also expected to incur lower direct costs in issuing debt or equity. Thus larger firms are expected to employ higher amount of debt than smaller firms. It is argued that smaller firms would have less long-term debt and more short term debt because of shareholders-lenders conflict (Panday 2001). But the empirical evidence is mixed. A large number of researchers find a significant positive relationship between firm size and debt ratio. (Panday 2001; Frank and Goyal, 2003; Rao, 2003; Kurshev and Strebulaev ,2005; Song, 2005; Huang and Song ,2006; Karadeniz et al., 2009.) But results of some empirical studies do not corroborate with this theoretical relation. The size of a firm can affect the leverage of the firm negatively. Rajan and Zingales (1995) stated that the effect of size on equilibrium leverage is more ambiguous. Larger firms tend to be more diversified and fail less often. Size (computed as the logarithm of net sales) may be an inverse proxy for the probability of bankruptcy (Awan et al., 2011).

Risk

According to Agency and bankruptcy cost theories, higher risk increases the probability of financial distress. It predicts a negative relationship between capital structure and risk. However, it is to be considered that for a negative relationship between risk and capital structure, bankruptcy costs should be quite large. Further, Pandey (2001) argued that correlation of risk is positive with long term debt ratio and negative with short term debt-ratio, Rao (2003) found that risk component was not given importance due to protected markets during pre-liberalization period but estimated coefficients of risk are negative during post-liberalization period. However, Hsia (1981), based on the contingent claims nature of equities, combines the Option Pricing Model (OPM) the CAPM (Capital Asset Pricing Model) and the Modigliani – Miller theorems to show that as the variance of the value of the firm's assets increases, the systematic risk of equity decreases. So the business risk is expected to be positively

related with leverage. The companies with high leverage in China tend to make riskier investment (Huang and Song, 2006).

Growth Opportunities:

Agency cost theory and pecking order theory explain that growth opportunities are negatively related with capital structure i.e. both have contradictory relationship because firms with high intangible growth opportunities do not want to commit themselves to debt servicing as their revenues may not be available when needed. Hence growth opportunities are negatively related with long-term debt level (Jenson and Meckling, 1976). This theoretical result is backed by the empirical studies carried out by Huang and Song, (2006). But some empirical studies show that growth opportunities have positive relation with capital structure due to higher demand for funds. (Bevan and Danbolt, 1999; Panday, 2001; Rao, 2003; Baral,2004; and Awan et al.,2011

Tangibility of Assets

Tangibility of assets is the relationship between fixed assets and total assets. According to agency cost theory, the conflict between lenders and shareholders create incentives for shareholders to invest in the suboptimal way, ultimately lenders take actions to protect themselves by requiring tangible assets as collateral. Firms with tangible assets that can be used as collateral are expected to issue high level of debt because they can borrow on favorable terms, suggesting a positive relationship between tangibility and capital structure. This was found in Bevan and Danbolt (1999) based upon book value of gearing; Panday (2001); Rao (2003); Song (2005) (based on total debt ratio and long term debt ratio), Huang and Song 2006 (long term debt ratio) and Awan et al. (2011). However if tangible assets lower information asymmetries, equity issue will be relatively less costly, lowering leverage ratios. Hence, there is a negative relation between tangibility and leverage. This line of analysis was conducted by some prominent scholars (Bevan and Danbolt 1999) on the basis of market-to-book ratio and level of profitability(Panday, 2001; Song ,2005) ;on the basis of short term debt ratio (Huang and Sung, 2006) and the reason may be non-debt part of total liability.

Non debt tax shields

The tax deduction for depreciation and investment tax credits is called Non-debt tax shields (NDTS). All the tax based theories suggest that the major benefit of using debt financing is corporate tax deduction. According to Modigilani and Miller (1958), interest tax shields create strong incentives for firms to increase leverage. But also the size of non debt related corporate tax shields like tax deductions for depreciation and investment tax credits may affect leverage. Indeed De Angelo and Masulis (1980) argued that firms can use other non-interest item such as depreciation, tax credit and Pension funds to

reduce corporate tax payments. Therefore firms that have higher non debt tax shields are likely to use less debt. In fact, the empirical evidence is mixed. For example Sheony and Koch (1996) find negative relationship between leverage and non debt tax shield, Drobetz and Fix (2003) also have the same opinion, Rao and Jijo (2003) and Huang and Song (2006) also argue that leverage and Non debt tax shields (NDTS) are negatively correlated. While Gardner and Trcunka (1992) find a positive one, and Song (2005) said that non debt tax shield has a positive effect on short term debt ratio, while it is negatively correlated with long term debt ratio.

Dividend payout ratio

Dividend policy of a firm and capital structure continue to be the topics of great interest in the academic literature. The bankruptcy cost theory pleads for adverse relation between the dividend payout ratio and debt level in capital structure. The low dividend payout ratio means increase in the equity for debt capital and low probability of going into liquidation but the pecking order theory shows the positive relation between debt level and dividend payout ratio, because management prefers the internal financing to external one. A link between dividend policy and capital structure has not been investigated upon adequately in many countries except in Greece and US, where Eriotis and Vasiliou (2003) investigated the association between dividend policy and debt ratio in Greece. The study found a significant relation between dividend policy and capital structure. On the other hand in US, Frank and Goyal (2003) found that dividends are a more significant factor for mature firms than they are for younger firms. De Angelo et al. (2004) observed significant correlation between dividend payment decision and the capital structure. But the negative impact of capital structure on dividend payment is supported by Higgins (1972) and Mccabe (1979) who find that the companies who have a past of higher leverage normally pay lower dividend to avoid the higher cost of rising external capital for the company. Rozeff (1982) also supported them and hypothesized that if a firm has higher operating and financial leverage, other things remaining same, the firm will choose lower dividend payout policy to lower its costs of external financing.

Capital Structure and Value of Firm:

Earnings of the firm depict its value and the earnings of the firm directly depend upon its investment decision. Value of the firm is dependent on two important factors i.e. the operating profits of the firm and its cost of capital. The operating profit of the firm i.e. the EBIT is divided among three stakeholders

(i) The debenture holders who receive their share in the form of interest.

(ii) The government, who receive its share in the form of taxes.

(iii) The shareholders who receive the residual.

So, the EBIT is a collection, which is to be divided among the three petitioners. The investment decisions of the firm measure the size of the EBIT collection while the capital structure determines the way it is to be shaved. Value of the firm is the summation of its value to the debenture holders and to its shareholders and is determined by the amount of EBIT going to be divided in them respectively. The value of the firm can be increased by increasing the amount of EBIT through a prudent investment decision and the value can be decreased when capital structure mix was in risk. Hence the earnings available for the stakeholders in the form of EBIT can directly be influenced by capital structure of the firm. On the other hand an optimal capital structure can raise the volume of EPS for a given level of EBIT. EPS have the direct connection with the market value of the share and hence can affect value of the firm. WACC depends upon the proportion of different sources of funds in capital structure and it can be changed by changing the proportion of financing mix. So a firm can easily change its WACC by changing the capital mix and thus affect the value of the firm. Finally it can be said that value of the firm and cost of capital have negative relation with each other. If cost of capital is within control limits at a given level of earnings, the value of the firm can be increased.

Research Methodology:

Period and Area of Study: Capital structure of INDIAN TOBACCO COMPANY (ITC) for the past thirteen financial years from 2001-02 to 2012-13 has been analyzed. The area of the study is as follows:

➢ **Analysis of determinants of capital structure:**

Cost of capital Tax
advantage
Debt service capacity of the firm
Leverage effect
Trading on equity Stability
of earnings

Cost of Capital and Value of Firm Analysis Sample Design:

In this study, the sample of 13 financial years from 2001-2013 is taken from Annual accounts of ITC. Secondary data has been used in this research study, which are balance sheets and their related schedules of the past financial years from 2001 to 2013 of ITC. For last year data has been analyzes up to 31st December 2013.

Tools of Analysis:

To assess the significance of "Capital structure analysis" of Indian Tobacco Company (ITC) during the study period of 2001 to 2013, the following tools of analysis have been used :-

I. Ratio analysis.

II. Bar Chart.

III. Pie Chart.

Limitations of the study:

The study is limited to thirteen financial years from 2001-13 performance of ITC.

Analysis & Interpretation:

ITC has used only two avenues to finance its assets and working capital, which are equity share capital and debt capital.

a) Equity Share Capital: ITC is authorized to issue equity shares of Rs. 1000 crores but the company has an issued and paid up equity capital of Rs. 801.55 crores. The equity share capital of the company in the year 2001-02 was Rs. 300 crores. The company issued further equity shares in the year 2006-07 and reached the equity capital balance of Rs.500 crores after which the company has not issued any more share till the year 2009-10. The net worth of the company is increasing over the years. This is because of the profits earned by the company from the year by year. The net worth of the company is calculated and represented by the following diagram:

NET WORTH = Equity share capital + Reserves and surpluses − (Deferred Revenue expenditure + Debit balance of P/L Account + Miscellaneous expenditures not written off, if any)

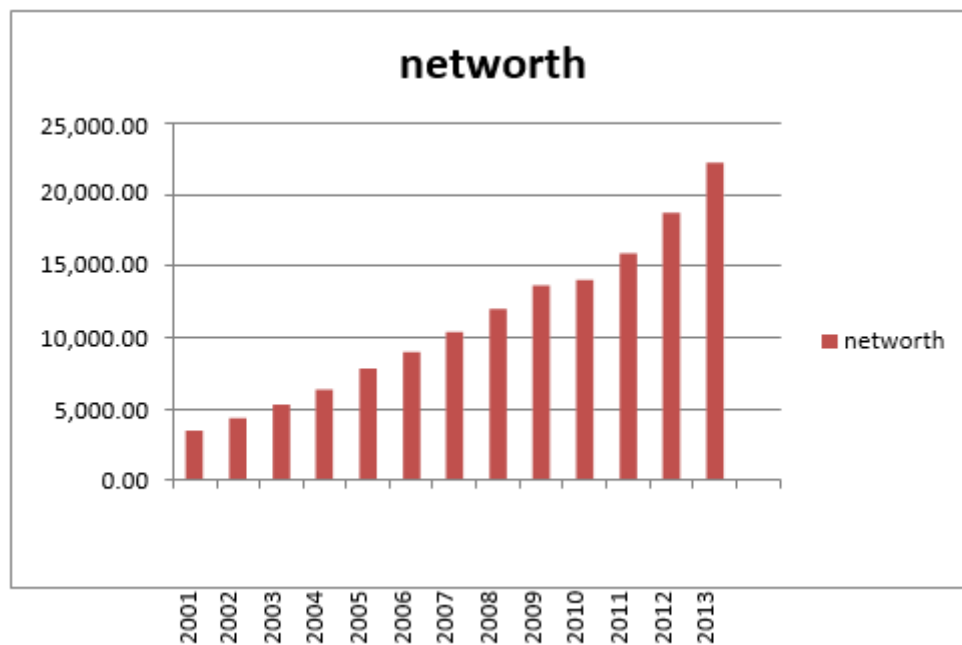| Years	Net worth(crores)
2001	3471.06
2002	4351.48
2003	5303.99
2004	6349.22
2005	7835.71
2006	9002.31
2007	10380
2006	12001.55
2009	13679.99
2010	14009.99
2011	15899.93
2012	18738.84
2013	22235.1

Table 2

Fig 2

The net worth of ITC is increasing from 2001-13. This is a good sign for the company. This is because of the profits made by the company and all the debit balances of P&L Account are written off.

a) Debt Capital: The debt capital of the ITC consist both secured and unsecured loans. The amounts of loans taken from secured sources were much more than unsecured ones till the year 2002. This was because the company went a huge modification program in the year 2001-02 and required a huge capital. Availing unsecured loans for the company was not possible till 2002. But after 2002 the amounts of unsecured loans were more than double the amount of secured loan. This was a good sign for the company. The sources of debt for the company are mentioned below:

❖ Term loan from banks/ Financial Institutions
❖ Working capital borrowings from banks
❖ Public deposits (also includes loans from retired employees)
❖ Foreign Loans
❖ Government of India

DEBT Capital

Years	Debt capital(crores)
2001	858.94
2002	284.54
2003	116.98
2004	120.85
2005	245.36
2006	119.73
2007	200.88
2006	214.43
2009	177.55
2010	107.71
2011	88.52
2012	79.09
2013	66.4

Table 3
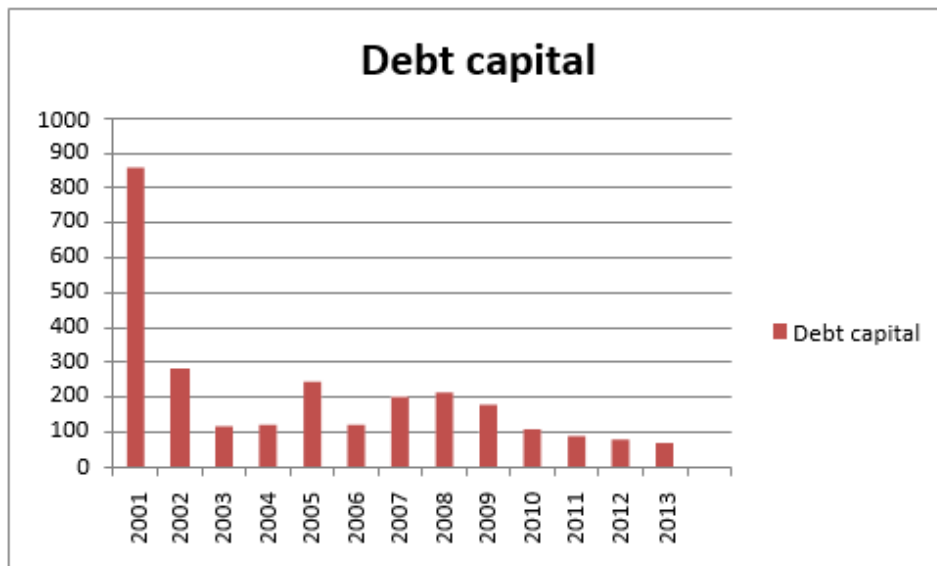
Fig 3

The above table and figure represents that the debt capital of the ITC is at decreasing trend. The company was is more dependent upon internal financing as compared to external financing. So the debt capital of the company has decreased subsequently from 2001 to 2013.

Table-4: Impact of various factors on choice of capital structure:

year	Equity (E)	Debt (D)	Interest (I)	Net worth (crores)	PAT(crores)	Cost of debt (Kd%)	Cost of equity (Ke%)	WACC(Ko%)
2001	245.41	858.94	101.37	3471.06	1,006.26	0.11801756	0.289899915	0.156213
2002	245.41	284.54	77.71	4351.48	1,189.72	0.27310747	0.27340583	0.273246
2003	247.51	116.98	40.25	5303.99	1,371.35	0.34407591	0.258550638	0.285999
2004	247.68	120.85	34.18	6349.22	1,592.85	0.28282995	0.250873336	0.261353
2005	248.22	245.36	50.8	7835.71	2,191.40	0.20704271	0.279668339	0.243566
2006	375.52	119.73	21.1	9002.31	2,235.35	0.17622985	0.24830849	0.230883
2007	376.22	200.88	16.04	10380	2,699.97	0.07984867	0.260112717	0.197365
2006	376.86	214.43	24.61	12001.55	3,120.10	0.11476939	0.259974753	0.207316
2009	377.44	177.55	47.65	13679.99	3,263.59	0.26837511	0.238566695	0.248103
2010	381.82	107.71	90.28	14009.99	4,061.00	0.83817659	0.289864589	0.410508
2011	773.81	88.52	68.38	15899.93	4,987.61	0.7724808	0.313687545	0.360784
2012	781.84	79.09	77.92	18738.84	6,162.37	0.98520673	0.328855468	0.389152
2013	790.18	66.4	86.47	22235.1	7,418.39	1.30225904	0.333634209	0.40872

Notes: (WACC (Ko) is calculated as (D/(D+E))Kd + (E/(D+E))Ke)

The above table shows that Kd is increasing till the year 2002-03 but was decreased subsequently from the year 2003 to 2006. This is because of the debt swapping and debt repayments in the year 2003. The company has been able to decrease its interest expense there by reducing the cost of debt. The Ke of ITC was very high in the year 2001 as the company was making profits and the net worth was increasing but subsequently cost of equity reduced and is 0.23 in all the years from 2009 because the company had suffered from losses in these years and no profits were available for equity shareholders. The company had made a profit of Rs. 4,987.61 crores in the year 2011 writing off all its previous losses and debit balance of profit and loss account. The WACC of the company is fluctuating over years. It is very high in the years from 2010 because of huge losses. This led to an increase in debt capital and analysis of the Table-4 reveals that cost of debt for the company is higher than the cost of equity. The introduction of more debt capital is increasing the WACC because of the high cost of debt. The WACC of the company is decreasing from the year 2013 because the company is towards way of profitability.

The cost of debt (Kd), cost of equity (Ke) and WACC (Ko) is represented in the following figure:

Fig 4
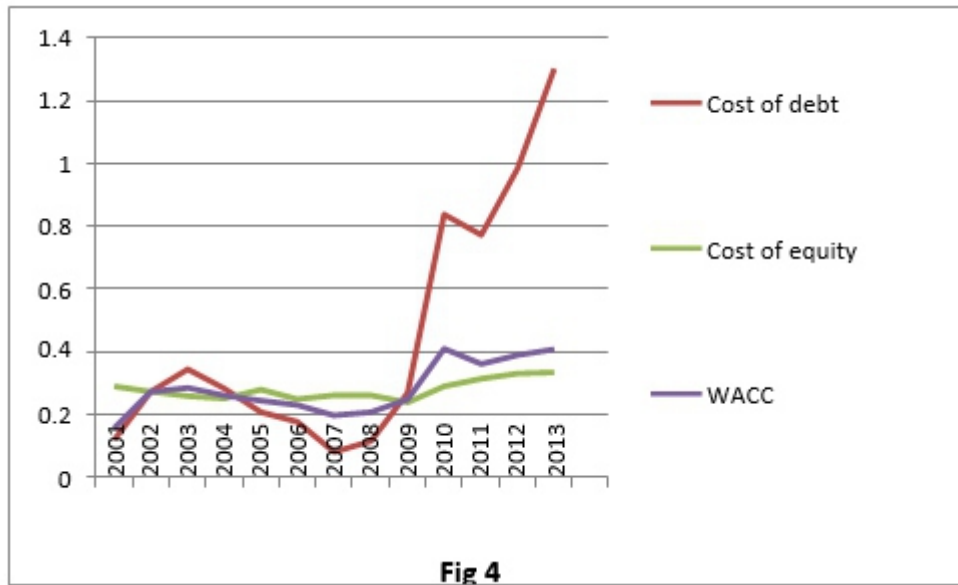
After analyzing the debt ratio of ITC, it has been concluded that debt forms more than 70% of the total capital employed by the firm. It has also reached to 90% in the year 2013 which indicated that the firm has used more debt capital in their capital structure. Analysis of the debt equity ratio revealed that the debt component is very high as compared to equity. The ratio is always more than 2 and sometimes it is also more than 5. It means company is highly leveraged. No doubt company gained many economies but side by side company have to bear more risky. High profitability due to high leverage is a sign of risk.

Years	Interest	PAT	Int. Tax Shield ((1-Tax)Interest)
2001	101.37	1,006.26	65.8905
2002	77.71	1,189.72	50.5115
2003	40.25	1,371.35	26.1625
2004	34.18	1,592.85	22.217
2005	50.8	2,191.40	33.02
2006	21.1	2,235.35	13.715
2007	16.04	2,699.97	10.426
2006	24.61	3,120.10	15.9965
2009	47.65	3,263.59	30.9725
2010	90.28	4,061.00	58.682
2011	68.38	4,987.61	44.447
2012	77.92	6,162.37	50.648
2013	86.47	7,418.39	56.2055

(Corporate tax for ITC is taken as 35%)

The above table shows that company was paying tax on regular basis from year after year. But we can

Debt capacity of the firm: The debt capacity or debt servicing capacity of the company can be determined by calculating the interest coverage ratio.

$$\textit{Interest coverage ratio (ICR)} = \frac{\text{Operating Profit (EBIT)}}{\text{Interest Expenses}}$$

Years	EBIT	INTEREST	ICR (EBIT/INTEREST)
2001	1,677.21	101.37	16.54543
2002	1,850.12	77.71	23.808
2003	2,086.41	40.25	51.83627
2004	2,357.49	34.18	68.97279
2005	3,073.89	50.8	60.50965
2006	3,259.23	21.1	154.4659
2007	3,936.21	16.04	245.3996
2006	4,527.19	24.61	183.9573
2009	4,798.82	47.65	100.7098
2010	6,068.66	90.28	67.22043
2011	7,336.54	68.38	107.2907
2012	8,975.45	77.92	115.188
2013	10,770.65	86.47	124.5594

Table 6

The interest coverage ratio of ITC is more than satisfactory in all the years from 2001 to 2013. The ratio should be at least 3 times for comfortable service of debt but here the ratio is much more than the rule of thumb in all the years. This is because of the company is very efficient in managing debt and have enough profits for the payment of debenture interest.

Trading on equity

Trading on equity is a situation in which the company used an adequate amount of debt along with equity and preference share capital which will result in enhancing earnings available for equity shareholders. Return on investment (ROI) should be greater than the cost of debt to harvest the benefit of trading on equity.

$$\text{ROI} = \text{PAT/Total Assets}$$

$$\text{TOTAL ASSETS} = \text{TOATL FIXED ASEETS} + \text{TOATL CURRENT ASSETS}$$

Years	PAT	TOTAL ASSETS	ROI	COST OF DEBT
2001	1,006.26	4,330.00	0.232393	0.118017557
2002	1,189.72	4,636.02	0.256625	0.273107472
2003	1,371.35	5,420.97	0.252971	0.34407591
2004	1,592.85	6,470.07	0.246187	0.282829954
2005	2,191.40	8,081.07	0.271177	0.207042713
2006	2,235.35	9,122.04	0.245049	0.17622985
2007	2,699.97	10,580.88	0.255174	0.079848666
2006	3,120.10	12,215.98	0.255411	0.114769389
2009	3,263.59	13,857.54	0.23551	0.268375106
2010	4,061.00	14,117.70	0.287653	0.838176585
2011	4,987.61	15,988.45	0.311951	0.772480795
2012	6,162.37	18,817.93	0.327473	0.985206727
2013	7,418.39	22,301.50	0.332641	1.302259036

Table 7

While comparing return on investment and cost of debt, it is observed that in the year 2001, 2005-2008 and in 2013 ROI is more than cost of debt it means high sales realization and better productivity write off accumulated losses. But in 2002-04 and 2009-13 ROI does not support trading on equity because cost of debt is more than returns on investment due to this equity shareholder are at loss.

Leverage Effects:

The leverage effect of the company can be pinpointed by calculating following two ratios:

Debt Ratio	Debt/ (Debt + Net worth)
Debt Equity Ratio	Debt/ Net Worth

Leverage Effects

Years	DEBT	NETWORTH	DEBT+NW	DEBT RATIO	DEBT EQUITY RATIO
2001	858.94	3471.06	4330	0.19837	0.247458
2002	284.54	4351.48	4636.02	0.061376	0.065389
2003	116.98	5303.99	5420.97	0.021579	0.022055
2004	120.85	6349.22	6470.07	0.018678	0.019034
2005	245.36	7835.71	8081.07	0.030362	0.031313
2006	119.73	9002.31	9122.04	0.013125	0.0133
2007	200.88	10380	10580.88	0.018985	0.019353
2006	214.43	12001.55	12215.98	0.017553	0.017867
2009	177.55	13679.99	13857.54	0.012813	0.012979
2010	107.71	14009.99	14117.7	0.007629	0.007688
2011	88.52	15899.93	15988.45	0.005536	0.005567
2012	79.09	18738.84	18817.93	0.004203	0.004221
2013	66.4	22235.1	22301.5	0.002977	0.002986

Table 8
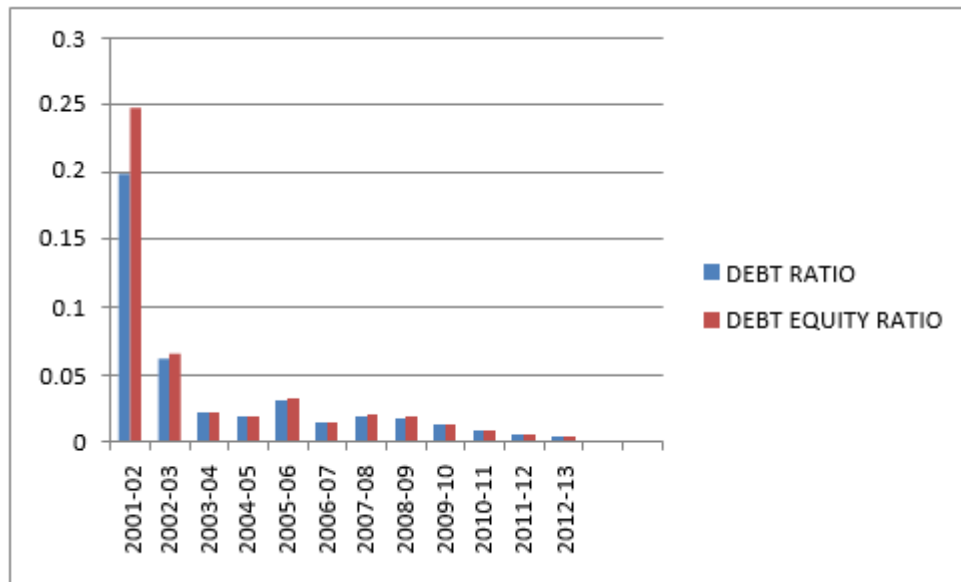
After analyzing the debt ratio of ITC, it is picture clear debt ratio is more in 2001-02 it means company have more preference for debt in 2001-02 as compared to other years. With the passage of time company is more dependent upon equity as compared to debt that means company is less levered and playing at its safe side. Due to this many of the investors in India and outside India likes to invest in ITC because this company is shareholders friendly. As far as debt equity ratio is concerned the above analysis have same viewpoint. The rule of thumb for debt equity ratio is 2:1 but in every year it is less than 1. This shows debt component is far less than equity in capital structure.

Findings And Conclusion

Financial statements analysis of Indian Tobacco Company (ITC) concluded that company has enough profits to bear the burden of cost of debt. No doubt in some years company was more dependent upon debt as compared to equity but as a whole ITC is a very profitable company. Another observation from the above analysis is that in the years 2002-2004 and 2009-2013 ROI does not support trading on equity because cost of debt is more than returns on investment due to this equity shareholder have to suffer loss. This is not a good sign of investors. The net worth of ITC is increasing from 2001-13. This is a good sign for the company. This is because of the profits made by the company and all the debit balances of P/L Account are written off.

Debt capital of the ITC is at decreasing trend. The company was is more dependent upon internal financing as compared to external financing. So the debt capital of the company has decreased subsequently from 2001 to 2013. The WACC of the company is fluctuating over years. It is very high in the years from 2010 because of huge losses. This led to an increase in debt capital and it's an indication of trading on equity. The rule of thumb for debt equity ratio is 2:1 but in every year it is less than 1. This shows debt component is far less than equity in capital structure. Ultimately we can say that ITC less

levered company from the point of view of debt. The value of the company increased over years because of the fruitful investment decisions of the company that are reflected from the increasing trend of EBIT.

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