

Designing Index of the 30 top companies and comparing it with Indexes of Tehran Stock Exchange

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ABSTRACT

This research aims at designing a new Index based on retrieved criteria from large and valid Indexes of the world. The designed Index compares the 50 active and 30 Large corporations' Indexes of Tehran Stock Exchange regarding its efficiency and return. This research was done from 2009 to 2011. The population includes all listed companies in Tehran Stock Exchange that has been chosen by exclusion method and sorting all companies based on market value and then 100 companies were chosen as sample in a descending order. Rahavard Novin 3 Software and information banks of Tehran Stock Exchange have been used for collecting data in this research. Variables ranking for choosing corporations has been done based on experts' opinions by Analytic Hierarchy process(AHP). The results of this research show that the efficiency of stock in 30 Top corporation is significantly higher than 50 Active corporations and 30 Large corporations and also return of equity (ROE) Index in 30 Top Companies is significantly higher than 50 Active companies. There is no significant difference in Return on Assets (ROA) in 30 Top Corporations Index and 50 Active and 30 Large corporation Indexes and also there is no significant difference between Return on Equity (ROE) between 30 Top Corporations and 30Large Corporations.

KEYWORDS: Stock Exchange, Index, 30 Top Corporation, Tehran Stock Exchange Indexes, Analytic Hierarchy Process (AHP)

1. INTRODUCTION

Indexes are not only important in macroeconomic analyses, but also in decisions and investors analyses. Indexes are also applicable as an evaluating criterion of stock portfolio function. Since investors invest with specific interests in Stock Exchange, thus in most of developed Stock Exchanges, in addition to total Indexes, certain Indexes are calculated and designed for showing the behavior of a special part of market. Therefore, Indexes indicate that stock behavior which most of investors possess; in fact, investors may assess their portfolio by following Indexes movements.

There is a question for stockholders and investors that whether it is possible to concentrate on multiple factors for deciding about buying and selling stock? Whether is it possible without considering any criterion and just by guessing to reach a logical efficiency for buying and selling stock? Is it possible to rank the current companies in Stock Exchange by doing a comprehensive research on optimal criteria?

Such questions always do exist. Hence, recognizing the effective factors on investors' decisions is important. There are various expressive factors of deciding for stock and knowing them not only includes some advantages, such as risk reduction, transparency increment of required information, but also it is accompanied with liquidity increment and price discovery process improvement and capital market development for investors and the country's capital market; and it provides essential infrastructures for ranking the companies in Stock Exchange with appropriate financial reports and following that companies attempt for higher ranks.

Some of the main imperfections in Tehran Stock Exchange Indexes (except 30 large companies' Index) are to ignoring inactive and non-float stock in calculating Indexes and to not calculating the liquidity degree. Moreover, the Index of 50 active companies has not been created from its main role in displaying price behavior of impressive companies' stock on market and liquidity. The major weakness is corresponding to how to determine companies' rank to choose for mentioned Index.

With respect to existing problems in Tehran Stock Exchange Indexes, this study is to answer the following question:

How is the difference between the efficiency of the 30 top companies' Index and Tehran Stock Exchange Index?

2- RESEARCH BACKGROUND

Capital market of any country is also regarded as economic pulse of it, and exchange as the most important institution of capital market has important role in absorbing wanderer capital of the community. Investment in

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such market requires analysis of stocks and timing purchase and their sale. For this purpose, different methods and points of view such as fundamental analysis and technical analysis can be respectively enhanced. This survey has been performed with the goal of surveying profitability of fundamental analysis.

Investment is considered amongst very important issues in financial literature. Investment in a wide dimension means sacrificing today's profits for more profits in future. In this respect, investment is always important for people, companies, and governments, and they are required to decide about it.

Investment in stock exchange is one of the options that has high importance and is attractive for investment affair. Regarding the classification of stages of creating and evolution of exchange in Iran, currently Iran exchange lives in fourth stage of its life, namely compiling long term strategies and developing regional exchanges. Therefore, in order to absorb more people for investing in exchange, the attractions of this market should be evident as much as possible. One of the ways that can improve attraction of exchange market for people is a series of investment methods that facilitates choosing appropriate options for investment. Existence of such methods does not reduce the existing risk in market, but the logic governing on them justifies acceptance of existing risk in market.

Investment on stock exchange has been performed in various methods. The difference of these methods is because of difference in followers' viewpoints of each method towards the stock price trends in market. On this basis, investment methods in stocks are classified into three methods.

- 1) Technical Analysis Method.
- 2) Modern portfolio theory.
- 3) Fundamental Analysis Method.

One of the major methods of assessment that is often used by analysts is Price to EPS ratio. In fact, although nowadays discount models of dividend are more considered by investors and investment publications, analysts of stocks apply this model more than profit discount models [14]. This proportion indicates that investors instead of receiving one profit unit are willing to pay several money units. Some of the investors have found out that those companies that their growth is expected to be fast, their Price to EPS ratio will become more (fathi et al , 2012).

One of the basic subjects of investment is the rate of liquidity of the assets because some of the investors may need their financial resources promptly. The speed of liquidity of stocks is related to the receipt of transaction by the investor's in the stock exchange market.

investigated the effect of block ownership on transaction activities and liquidity of shares of the company. Their results showed that the block ownership has decreased the transaction activities in comparison with dispersion ownership structure. From the literature and the empirical research results we expect a positive relationship between liquidity of stocks and institutional ownership and a negative relationship between ownership concentration and liquidity of stocks (yaghoobnezhad et al , 2011).

2-1- Introduction with stock's price Indexes and their common calculation methods

The Index word means recognition tool and Index number is a number by which the created changes are studied in an event a time interval or in two different locations; therefore it may say that the Index is a number for measuring and evaluating changes of different factors in time or locus intervals. To ensure that a stock Index shows logically the market behavior and economy's future conditions, it should consider real criteria in its formulation.

In other word, recognizing the top companies or those of superior condition, is often done based on one or some of following criteria:

- Stock liquidity robustness meaning it is highly transacted.
- Company impression degree on market or its share in market current value.
- Company status from financial ratios superiority aspect, specially profitability amount for each share

Stock price Indexes as one of the most important evaluation criteria of stock market's function are of great importance world markets. The most important reason may be that these Indexes are obtained from all stock price movements of all companies or special category of existing companies in stock market; thus, it is possible to study the direction and amount of price movements in stock market. In fact, theories development and financial innovations in recent two decades was based on essential concern to general participation of market, with growing trend to calculating and reviewing these Indexes movement procedure (Stock Exchange Organization, 1997). Measuring the market movements is useful for several reasons (Brown & Reily, 2000):

- A base for evaluating the function of investment professional managers.
- Predicting the market future movement by technical analyzers.
- Measuring the efficiency rates of market in economic studies.
- Creating and monitoring Index investment funds.
- An Index for risky assets market portfolio while calculating the assets systematic risk.

Designing and calculating the stock price Indexes is done in various methods in the capital markets of the world, that each of them has its own advantages and disadvantages. One of the most important reasons of this variety is that market's Indexes are obtained by total stock price movement of hundreds existing company in the market. The stock market's Indexes are usually categorized due to two characteristics (Tehran Stock Exchange Organization, 1997):

- 1- Weighing method
- 2- Averaging method

In weighing method, Indexes can be classified in 3 groups:

- 1- Weightless price Indexes that are resulted from the stock prices mean without applying any weight.
- 2- Price Indexes with equal weights that are resulted from the price changes of each share to its initial value.
- 3- Price Indexes with weights equal to the stock market value that is resulted from multiplying the number of shares in the current price of companies' shares.

In weighing method, Indexes could be classified in two groups:

- 1- Arithmetic mean
- 2- Geometric mean

As aforementioned, there are six possible cases for designing and calculating these Indexes that are given in table 1.

Table 1: Calculation methods of the stock market Indexes

weighting method \ Averaging method	Weightless price Index	Price Index with weights equal to the stock market value	Price Index with equal weights
	Arithmetic mean	$\sum_{i=1}^n (P_{it}/n)$	$\sum_{i=1}^n W_i (P_{it}/P_{ib})$
Geometric mean	$(\prod_{i=1}^n P_{it})^{\frac{1}{n}}$	$(\prod_{i=1}^n P_{it}/P_{in})^{\frac{1}{W_i}}$	$(\prod_{i=1}^n P_{it}/P_{ib})^{\frac{1}{n}}$

Where,

P_i = the price of share I,

T= calculation time,

N= the number of companies,

B= initial time,

W_i = ration of the stock market value of company i to total value of companies who are member of the Index and

$\sum_{i=1}^n W_i = 1$ and $0 \leq W_i \leq 1$,

π = the symbol of multiplication.

2-2 The history and calculation method of global credited Indexes

The stock price Index was first used in 1884 in the United States. At that time, the calculation method was so simple which was the arithmetic mean that the prices of selected shares were added with each other and then divided by the number of shares. This method was invented by Charles Dow that the stock price mean of eleven railway companies was calculated and was applied as prices Index in railway industry. In 1897, the number of companies increased to 20 and this calculation method had continued as the only Index calculation method until 1928 and after that another Index was designed and replaced with the other method (www.djIndexes.com).

2-2-1 Dow Jones industrial average Index

Dowjones industrial average (DIIA) Index which is one of the oldest and the most common Indexes of New York Stock Exchange includes 30 shares of large companies. It should be noted that in 1896, for the first time, the stock price Indexes of Dow Jones industrial units was calculated for the shares of 12 producing companies. In 1916, these shares increased to 20 and in 1928, to 30 shares which so far has been remained at this number (Tehrani and Nourbakhsh, 2010). In September 2000, Dow Jones Index changed its method and for calculating its own global Indexes set used free float stock based coefficients. It started with Dow Jones global Indexes because in many of these markets, a main amount of stocks were not buyable and sellable at all. This was a considerable change in Dow Jones Index that tended to free float stock methodology (Abdoh Tabrizi, 2003).

Some of weaknesses of this Index are:

- 1- Only a few number of large companies' shares are considered that is a very small representative of the United States' very large financial market and its weighing method is not appropriate too. To put in another

word, 30 considered large companies, which are leader of their own industry, in calculating Index give tiny and imperfect image of the market price behavior, in the top case.

2- The most important disadvantage is due to price weighing method in Index calculation because it is supposed that the investor buys a share of each company's stock with equal probability. While in real world, it is very likely for the investor to buy the stock which they expect to be more profitable for, and not to behave as above method.

3- The other weakness is Index movement affectability from those companies whose Indexes price is high. Since Dow Jones industrial Index is the summation of 30 large companies' stocks price divided by a number which is adjusted as needed, it is highly influenced by the stock price changes with more market value because the stocks whose market value is more, have more effect on the Index. While, stocks with less market value without considering the other market transactions variables play a little role for the Index.

Although these imperfections, this Index has been still invasively applied. The most common Index of Japan stock market, Nikkei 225, is calculated in the same way as Dow Jones Index. Some of disadvantages of these two Indexes are that both Indexes consider only price changes and do not represent the efficiency rate for they do not take into account the division earning in their calculation (Sharpe, 1999).

Dow Jones Index calculation formula is (www.Djia.com):

$$I_t = I_0 \times \frac{AP_t}{AP_0}$$

I_t = Index value in day t ,

I_0 = Index value in day 0 (initial day),

AP_t = price average in day t ,

AP_0 = price average in day 0 (initial day)

2-2-2 Standard And Poors Index

One of the other Indexes calculate in credited markets is the set of Standard and Poors Indexes which were being published from 1940 to 1957 daily and weekly.

In order to calculate the standard And Poors Indexes set, both registered companies' stocks in New York Stock Exchange and the companies' stock outside the United States Stock Exchange were used.

Standard And Poors Indexes are primarily calculated based on weighing method for the market current value. Among the existing Indexes of standard And Poors, Index s&p500 is the most credited and the most famous Index of this set. This Index denotes the market price of the top 500 companies from the point of stock current value in New York Stock Exchange. The market value of a company in this Index like other market value Indexes by multiplying the price by the number of companies' published shares. The initial period of this Index is 1941-1943 and the initial value of this period was considered 10. This Index has been the representative of the stock changes for about 500 companies since 1957. Furthermore, standard And Poors calculates an Index for 400 producing company, an Index for 20 transportation companies and an Index for 40 financial services and public facilities (Botshekan, 2003). Standard And Poors has determined five criteria for reviewing eligible companies and evaluates them due to these criteria as described below:

- Liquidity robustness
- Free float stock
- Fundamental analysis
- The market value
- Department representative

This Index formula is like the other market value Indexes and is calculated as (www.s&p500.com)

$$Index = \frac{MV}{D}$$

Here, MV is the companies' market value which is obtained by:

$$MV = \sum_{i=1}^n P_i Q_i F_i$$

where, P_i is the stock price of company i , Q_i is the number of published shares of company i , F_i is the stock float coefficient of company i and D is the Index adjustment coefficient.

Adjustment coefficient is an arbitrary number but it is related to initial value of the Index in calculating the Index and retains the Index comparison capability during the time and is reference of changes due to all balances of this Index.

In table 2, the companies' events and their effect on adjuster is shown (Botshekan, 2003).

Table 2: effective proceedings to modify adjuster in S&P Indexes

Effective company's events on the Index	Balancer modification
Decomposing the shares	No
Publishing the shares	Yes
Redeeming the shares	Yes
Companies displacement	Yes
Priority supply	Yes

2-2-3 Financial Times and London Stock Exchange's Indexes (FTSE)

From December 30, 1983, financial Times newspaper and London Stock Exchange have provided and published commonly an Index. FTSE Indexes are the most common Indexes in the Stock Exchange. The general procedure of selecting eligible companies is (www.FTSE.com):

1- All companies are ranked based on market value (number of published shares* price of each share* free float stock rate)

2- Companies liquidity should have turnover at least for 0.5 percent of companies' free float stock after considering the stock float rate for a month and at least for 10 out of 12 reviewing months.

3- Companies belonging to the Index are selected according to the Index type, like FTSE 100.

The Index number for all Indexes is calculated as:

$$Index = \frac{\sum_{i=1}^n P_i Q_i F_i}{D}$$

where, Pi is the stock price of company i, Qi is the number of published shares of company i, Fi is the stock float coefficient of company i (0 ≤ Fi ≤ 1) and D is the adjuster which is modified to control effective company events (like capital increment) on the Index for specific cases (Botshekan, 2003).

2-2-4 Tokyo Stock Exchange Index (Topix)

Until 1969, the Index computed for Tokyo stock called Nikkei Average that was calculated based on 225 companies exactly the same as Dow Jones method. Since 1969 a new Index having four characteristics (comprehensive, adjusted, easily accessible and the most proper criteria) was utilized. Topix is calculated similarly to New York Stock Exchange's Index and FTSE 100 based on adjusted mean. This Index has the capability of being adjusted as necessary. Topix was calculated based on 130 companies' stock given in table 3. It should be mentioned that presently, in addition to Topix, Nikkie Index is also published by Japan financial newspaper (Nihon Kizay Shimbon). For the reason that the Index is adjusted with respect to the market value, it determines the price trend in table 3 by means of changes in the market values. Before July 1969, that is the time of creation of Topix, this Stock Exchange had been calculating the stock price mean due to Dow Jones formula and it is:

$$Index = \frac{\sum_{i=1}^{225} P_i}{N}$$

where, Pi is the stock price of company i and N is the number of companies which is 225.

As stated previously, after Topix creation on July the first, 1969, Tokyo Stock Exchange put aside the Index calculation based on Dow Jones formula and replaced it with a new Index. Tokyo Stock Exchange brought these reasons for this replacement:

- 1- Getting mistaken this mean with prices real mean,
- 2- Weightless calculated mean,
- 3- Constant number of shares since 1949.

Therefore, the following equation was replaced:

$$Index = \frac{MV_{T1}}{MV_{T0}} \times MV_{T0}$$

where, MV_{T0} is the market value on the initial day and MV_{T1} is the market current value. In addition to the main Index including all listed common stocks in the table 3, Tokyo Stock Exchange calculates and publishes sub-Indexes for 28 industries and three Indexes for large, medium and small companies. Moreover, it calculates the price total Index for the table 4 including all listed common stocks in it similarly.

2-3 Iran's stock price Index history

Calculating and publishing the stock price Index is new and young in Iran. For the first time, English Keyhan newspaper calculated and published a weekly Index for the stock price mean. This Index showed the stock price changes of 10 banks and 10 industrial companies from December 1976 to early 1978 (Mohammadi, 1997).

Tehran Stock Exchange reconsidered the stock price Index from the first of 1990 and according to existing technical possibilities published three Indexes:

- 1- The stock price Index of listed companies in Stock Exchange,
- 2- The stock price total Index due to different industries,

3- The stock price total Index existing in Stock Exchange.

2-4 Main Indexes of Tehran Stock Exchange

In this section, Tehran Stock Exchange Indexes are introduced.

2-4-1 Stock price total Index

The stock price Index in Tehran Stock Exchange is an Index of arithmetic mean with weights equal to the market value of companies stock and is recognized as an international name TEPIX¹. This Index expresses the price general trend of all companies in Stock Exchange and shows the prices changes with respect to initial year. If a company's symbol is closed or is not transacted for a while, its latest transaction price is taken into account in the Index. Initial time of this Index is considered 21/03/1990 and its initial number is considered 100. General formulation for this Index in Tehran Stock Exchange, the same as the other world's Stock Exchange, is calculated by Laspears equation:

$$TEPIX_T = \frac{\lambda \sum_{i=1}^n C_i P_{iT}}{\sum_{i=1}^n C_i P_{ib}} \Rightarrow \frac{\text{the corresponding day total value of accepted companies published stock}}{\text{the total initial value of accepted companies published stock}},$$

where, n is the number of existing stock constituting the Index- the number of listed companies until the end of August, 2003 was 348 companies-, C_i is the number of published stocks by company i, P_{iT} is the stock price of company i at time T, P_{ib} is the stock price of company i at initial time-21/03/1990- and λ is adjustment coefficient which is used for obtaining the Index number equal to 100 at initial time. On the other hand, modifying the Index to next changes of companies and their stock changes are also observable in this coefficient.

Generally, this Index was designed in a way that shows dealt stock price movements with respect to offer and demand function in Stock Exchange. Thus, the stock price Index in Tehran Stock Exchange is always adjusted after:

- 1- Companies' capital increase from stockholders liquid earnings and demands,
- 2- listed companies increase or decrease in Stock Exchange.

2-4-2 Index of 50 more active companies

In Tehran Stock Exchange, to design and calculate the Index, 50 more active companies or the top companies are identified and selected by following criteria:

- 1- Amount of trade in Stock Exchange:
 - a) the number of traded shares
 - b) the value of traded shares
- 2- the periodicity of trade stocks in Stock Exchange:
 - a) the number of exchanging days
 - b) exchanging times
- 3- variables of effectiveness degree on market:
 - a) average number of published stocks
 - b) current value mean of company's stock in the studying period

As it is obvious, in identifying more active companies of Tehran Stock Exchange, liquidity criterion is of the highest importance. Also, variables of effectiveness degree beside active variables in Stock Exchange display a more real image of companies' activity ratio especially the degree of turnover of their stocks. Comparing and ranking the activity of accepted companies in Stock Exchange is performed based on aforementioned criteria and by means of harmonic mean:

$$M_J = \frac{N}{\sum_{i=1}^n \left(\frac{1}{I_T}\right)},$$

where, M_J is company i of all active companies in Stock Exchange, N is the number of 6-tuple variables- N=6- and $\sum_{i=1}^n \left(\frac{1}{I_T}\right)$ is variable i of 6-tuple variables set.

This Index was calculated by arithmetic mean method, that is weighted arithmetic mean Index since 21/03/1998, and simple arithmetic mean, that is simple arithmetic mean Index since 23/10/1992, and based on current value of 50 selected companies' stocks and its initial number was considered 100 (Raee & Pouyanfar, 2010).

2-4-3 Price and Cash return Index

According to considerable affectedness of price movement from allocated dividend per share, price and cash return Index was calculated.

¹ - Tehran Price Index

Price and cash return Index or total earning Index has been calculated and published since April 1998 with the symbol TEDPIX¹ in Tehran Stock Exchange. The changes of this Index represents total efficiency of Stock Exchange and is affected by price and paid cash return changes. This Index contains all listed companies in Stock Exchange and its weighing and calculation method is like the price total Index and the only difference between them is in their modification method, and is calculated as:

$$TEPTX_T = \frac{\sum_{i=1}^n P_{iT} q_{iT}}{RD_T} \times 100,$$

where, P_{iT} is company i 's price at time T , q_{iT} is the number of published shares of company i at time T and RD_T is the initial price Index and cash return at time T that at origin time it was taken $\sum P_{i0} q_{i0}$ (Raee & Pouyanfar, 2010).

2-4-4 Cash return Index

Cash return Index published with the symbol TEDIX² expresses the general level of companies paid cash return and it is obtained by dividing initial total price to initial price and liquid efficiency Index:

$$TEDIX_T = \frac{D_T}{RD_T} \times 1653/80,$$

where, D_T is initial total price Index and RD_T is initial price and cash return Index (Ahmadpour et al. 2007).

2-4-5 Index of 30 large companies "TEFIX30"³

This Index is calculated as a weighted mean and based on free float stock and it measures the function of 30 listed large companies in Tehran Stock Exchange. It was designed to exhibit general trend of listed Stock Exchange in Tehran's Stock Exchange and it includes 30 companies' stocks selected from 100 large companies with high transaction value. This Index is an appropriate Index for designing Index-based tools, such as funds and consequent tools, and also is a proper tool for asset management. Choosing companies was done due to market value and liquidity criteria. Therefore, 100 listed large companies were listed decreasingly according to market value, and among them 30 companies of following conditions were selected as stocks subset of the Index:

- 1- At least three months has passed since they have been accepted and transacted.
- 2- Their monthly transacted value during 6 months ending to review date is more than % 25 of monthly transacted value mean of 100 large companies during 6 months ending to that date; for stocks which it has passed less than 6 months since their admission, this period changes to 3/4 of the period when the share was admitted.
- 3- Their float percentage is not less than %10.

30 large companies' Index is obtained as a weighted mean in accordance of the number of free float stocks and by dividing adjusted float market value to initial value:

$$Index = \frac{[\sum_{i=1}^n x_i \times NoS_i \times adj_i \times ff_i]}{b \times adj_2} \times 1000,$$

where, N is the number of existing stocks in Index set (30), x_i is the price determined as a weighted mean, NoS_i is the number of company's published shares, ff_i is free float coefficient, b is initial Index, adj_2 is initial adjusted coefficient of the Index, and adj_1 is adjusted coefficient which was taken 1; reference date of initial date is 23/08/2010 and Index value at that time was 1000; this Index was calculated published every 800 seconds (Tehran Stock Exchange Organization, 2010).

3- Research hypotheses

- 1- Stock efficiency of the 30 top companies' Index differs from that of 50 more active companies.
- 2- Stock efficiency of the 30 top companies' Index differs from that of 30 large companies.
- 3- Return on equity (ROE) of the 30 top companies' Index differs from that of 50 more active companies.
- 4- ROE of the 30 top companies' Index differs from that of 30 large companies.
- 5- Return on assets (ROA) of the 30 top companies' Index differs from that of 50 more active companies.

¹ - Tehran Dividend Price Index

² - Tehran Dividend Index

³ -Tehran Free float Index

6- ROA of the 30 top companies' Index differs from that of 30 large companies.

4- Research methodologies

4-1 Research method

This study is a descriptive-analogous method with applied purpose. Present research belongs to descriptive studies of accounting field. Additionally, it has utilized an inductive reasoning and is in the group of field-library studies by using historical information as back-event (that is using past information).

4-2 Research's variables and their operational definitions

1- Market value

Market value is calculated by multiplying each share price of company by total number of that company's share. In this study, first, all Stock Exchange companies had been ordered due to the highest to the lowest value, then, the first 100 companies were selected and others were omitted that is like FTSE100 Index.

2- Earning per share

To calculate this variable following formula was used:

$$EPS = \frac{N_{PL}}{N}$$

where, N_{PL} is Net profit and loss and N is the number of shares.

Companies with positive earning per share were given 1 and those with negative earn per share were given zero and then, the latter were omitted.

3- Free float stock percentage

Free float stock is calculated by multiplying float coefficient by stock summation of publisher non-management stockholders at the end of financial period which free float stock was calculated for that period

Float coefficient: it is resulted from dividing the number of days of published financial period in which share exchanges in usual market is more than 0.0001 of the number of published stock by half of exchanging days of that period; this coefficient number is at most 1 (Tehran Stock Exchange Organization, 2010).

This variable is calculate the same as Switzerland SPI Index, based on that, it is 1 for companies with at least %20 free float stock and zero for companies with free float less than %20. Finally, companies receiving zero were omitted.

4- Liquidity degree

To calculate this variable, following formula related to S&P Index has been used:

$$Liquidity\ degree = \frac{AV_s}{N_s}$$

where, AV_s is average transacted stock per month, N_s is the number of published stock and accessible to public (total number of stocks). AV_s is obtained from:

$$AV_s = \frac{NS_a}{ND_t}$$

where, NS_a is the number of exchanged stocks per month and ND_t is the number of working day of Tehran Stock Exchange.

All remained companies were ordered due to liquidity degree decreasingly.

5- The number of months of activity in Stock Exchange

Companies who have been admitted and have had activity for at least 6 months were given 1 and those who have been admitted and with activity for less than 6 months activity were given zero. Then, those with number zero were omitted. At last, among remained companies, after passing previous steps, the first 30 companies as the top ones were selected and for designing the Index and were reordered increasingly for ranking based on market value and final composition of Index was determined.

6- Return on equity (ROE)

This variable is calculated as:

$$ROE = \frac{OI}{TE} \times 100$$

where, OI is operational income and TE is total equity.

This variable was calculated at end of each 6-month period; for example, for the period from 23/09/2009 to 20/03/2010 the calculation date was considered 20/03/2010.

7- Efficiency of stock

Following formula was used to calculate this variable:

$$RETURN = \frac{(P_{T1} - P_{T0}) + DPS + BS + P}{P_{T0} + (1000 \times CI)} \times 100$$

where, P_{T0} is initial price, P_{T1} is day price, DPS is liquid earn, BS is bonus stock, P is priority and CI is capital increase percentage from incomes.

This variable was calculated for 6 month periods; for example, for the period from 23/09/2009 to 20/03/2010, total 6month period was considered to calculate this variable.

8- Return on assets (ROA)

To calculate this variable following formula was used:

$$ROA = \frac{OI}{TA} \times 100,$$

where, OI is operational income and TA is total assets.

This variable was calculated at the end of each 6 month period; for instance, for the period from 23/09/2009 to 20/03/2010, the calculation date was considered 20/03/2010.

4-3 Index design steps of the 30 top companies (TETIX30)¹

1- Selecting companies is done with accordance to market value and liquidity criteria. Thereafter, at first, all admitted companies in Tehran Stock Exchange were ordered decreasingly by their value, then the first 100 companies were chosen and others were omitted which is like FTSE100 Index, and among them 30 companies also having following conditions were selected as stock subset of the Index:

- 2- Companies should not make loss or earning per share of them not be negative.
- 3- Float stock percentage is not less than %20.
- 4- Companies are of high liquidity degree.
- 5- At least 6 months has passed since their admission and exchanges in Tehran Stock Exchange.
- 6- After doing these steps, among remained companies, the first 30 ones were selected as the top stock were reordered due to market value decreasingly.

To design this Index at the end of each 6 month period, all above steps were performed and the Index composition was determined.

4-4 Prioritizing variables by analytical hierarchy process (AHP)²

Since analytical hierarchy process calculates and presents logical adaptation of used inferences in determining priorities, in this research, by studying library references and papers for designing new Index, some criteria were recognized (earn per share, free float stock percentage, liquidity degree, number of months of activity in Stock Exchange). Then, these criteria were given to the experts of broker companies located in Tehran and Mashhad and research and development and management departments of admitting companies in Tehran Stock Exchange which their ultimate result was obtained by Expert Choice software:

- 1- Earning per share (EPS)= 0.4348,
- 2- Free float stock percentage= 0.2666,
- 3- Liquidity degree= 0.1633,
- 4- The number of months of activity in Stock Exchange= 0.1354.

5- Research findings

5-1 Statistical Description of variables

In descriptive analysis, a researcher describes collected data of research by means of tables and descriptive statistics Indexes, such as central and dispersion Indexes. It aides to much to describe data clearly. Results of data descriptive analysis are given in table 3.

Table 3: Descriptive analysis results of research data

Variable	Number of observations	Mean	Standard deviation	minimum	maximum
ROE of 30 large companies	120	0/264	27/58	-1/55	0/731
ROE of the 30 top companies	120	0/290	16/53	-0/164	0/731
ROE of 50 active companies	200	0/231	15/93	-0/624	0/685
Efficiency of the 30 large companies	120	0/132	12/86	-0/131	0/482
Efficiency of the 30 top companies	120	0/182	21/22	-0/409	0/853
Efficiency of 50 active companies	200	0/101	12/75	-0/187	0/587
ROA of 30 large companies	120	0/135	11/26	-0/094	0/468
ROA of the 30 top companies	120	0/122	9/29	-0/079	0/388
ROA of 50 active companies	200	0/111	9/24	-0/081	0/443

In designing the Index of the 30 top companies, to select companies due to their earning, earning per predicted share was taken into account. However, for some companies (Maaden Roy Iran, Meli Sorb & Roy, Kalsimin), although their positive earning per predicted share in quarterly financial statements, their annual financial statements of earning per real share were reported negative.

¹-Tehran Top Index
²- Analytic Hierarchy Process

5-2 Hypotheses test

5-2-1 The first hypothesis test results

For the first hypothesis test, following statistical hypothesis was used:

H1: efficiency of stock of the 30 top companies' Index differs from that of 50 more active companies Index.

$$\left\{ \begin{array}{l} H_0 : \mu_1 = \mu_2 \\ H_1 : \mu_1 \neq \mu_2 \end{array} \right\}$$

Table 4: test results of the first hypothesis

Two groups mean		U Mann-Witney Test	
50 more active companies	The 30 top companies	Significance level (P-Value)	Statistic (Z)
0/146	0/185	0/000	-3/671

Z- Mann Witny statistic is equal -3.671 and its significance level is zero is lower than acceptable error level which shows a significant difference between two groups means. Also, results show that the efficiency mean of the 30 top companies is more than that of 50 more active companies.

5-2-2 The second hypothesis test results

Following hypothesis was considered for the second hypothesis test:

H1: efficiency of stock of the 30 top companies' Index differs from that of 30 large companies Index.

Table 5: test results of the second hypothesis

Two groups mean		Variance equality test for two groups (Levin test)		Mean equality test for two groups (independent t-test)	
The 30 top companies	30 large companies	Statistic (F)	significance (P-Value)	Statistic (t)	Significance level (P-Value)
0/182	0/132	15/111	0/000	2/182	0/030

Statistic F is 15.111 and its significance level is zero which is lower than the accepted error level. Therefore, variances equality hypothesis is not admitted. Hence, independent t-student with adjusted freedom degree was used. Statistic t is 2.182 and its significance level is 0.030 which shows that there is significant difference among means of two groups. Therefore, it cannot reject H1 at confidence level %95. Moreover, results show that the mean of stock efficiency of the 30 top companies is more than that of 30 large companies.

5-2-3 The third hypothesis results

Here is the statistical hypothesis of the third hypothesis test:

H1: ROE of the 30 top companies' Index differs from that of 50 more active companies Index.

Table 6: Test results of the third hypothesis

Two groups mean		Variance equality test for two groups (Levin test)		Mean equality test for two groups (independent t-test)	
The 30 top companies	50 more active companies	Statistic (F)	significance (P-Valu)	Statistic (t)	Significance level (P-Value)
0/290	0/231	1/690	0/194	3/177	0/002

Statistic F is 1.690 and its significance level is 0.194 which is higher than accepted error level. Therefore, the hypothesis of variances equality of two groups is rejected. The significance level of statistic t by supposing equal variances of two groups is 0.002 and is lower than accepted error level (%5) which shows significant difference between two groups' means. As a result, H1 cannot be rejected at confidence level %95. Furthermore, results show that ROE mean of the 30 top companies is more than that of 50 more active companies.

5-2-4 The forth hypothesis test results

For the forth hypothesis test, following hypothesis is given:

H1: ROE of the 30 top companies' Index differs from that of 30 large companies Index.

Table 7: Test results of the forth hypothesis

Two groups mean		Variance equality test for two groups (Levin test)		Mean equality test for two groups (independent t-test)	
The 30 top companies	30 large companies	Statistic (F)	Significance level (P-Value)	Statistic (t)	Significance level (P-Valu)
0/290	0/264	0/389	0/534	0/881	0/379

Statistic F is 0.389 and its significance level, 0.534, is higher than accepted error level. Therefore, the hypothesis of equal variances of two groups is not rejected. The significance level of statistic t with supposing equal variances of two groups, 0.379, is higher than accepted error level (%5) which shows there no significant difference between two Indexes means. H1 cannot be accepted at confidence level %95. In addition, results show that ROE mean of the 30 top companies is not significantly higher than that of 30 large companies.

5-2-5 The fifth hypothesis test results

Following statistical hypothesis is considered for the fifth hypothesis test:

H1: ROA of the 30 top companies' Index differs from that of 50 more active companies Index.

Table 8: test results of the fifth hypothesis

Two groups mean		U mann- witney test	
The 30 top companies	50 more active companies	Statistic (Z)	Significance level (P-Value)
0/167	0/156	-1/096	0/273

Z mann- Witny statistic is -1.096 and its significance level, 0.273, is higher than accepted error level. Therefore, there isn't any significant difference between means of two groups. Results show that H1 cannot be accepted at confidence level %95. Also, ROA mean of the 30 top companies is not significantly higher than that of 50 more active companies.

5-2-6 The sixth hypothesis test results

Following statistical hypothesis is considered for the sixth hypothesis test:

H1: ROA of the 30 top companies' Index differs from that of 30 large companies Index.

Table 9: test results of the sixth hypothesis

Two groups mean		Variance equality test for two groups (Levin test)		Mean equality test for two groups (independent t-test)	
The 30 top companies	30 large companies	Statistic (F)	Significance level (P-Valu)	Statistic (t)	Significance level (P-Value)
0/122	0/135	1/352	0/246	-0/984	0/326

Statistic F is 1.352 and its significance level, 0.246, is higher than accepted error level. Thereafter, the hypothesis of equal variances of two groups is not rejected. The significance level of statistic t with supposing equal variances of two groups, 0.326, is more than accepted error level (%5) which show that there no significant difference between two Indexes' means. Therefore, H1 cannot be accepted at confidence level %95. Also, results show that ROA mean of the 30 top companies is not significantly higher than that of 30 large companies.

5-3 Index calculation method of the 30 top companies

To calculate this Index, following formula was used:

$$I_t = I_0 \times \frac{AP_1}{AP_0}$$

where, I_t is Index value in day 1, I_0 is Index value in day 0 (initial day), AP_1 is average price in day 1 and AP_0 is average price in day 0 (initial day).

Since this study compares 3 Indexes (the 30 top companies, 30 large companies, 50 more active companies), aforementioned method was used to calculate all three Indexes. Thus, the initial date of all Indexes was considered 23/09/2009 and its value equal to 100.

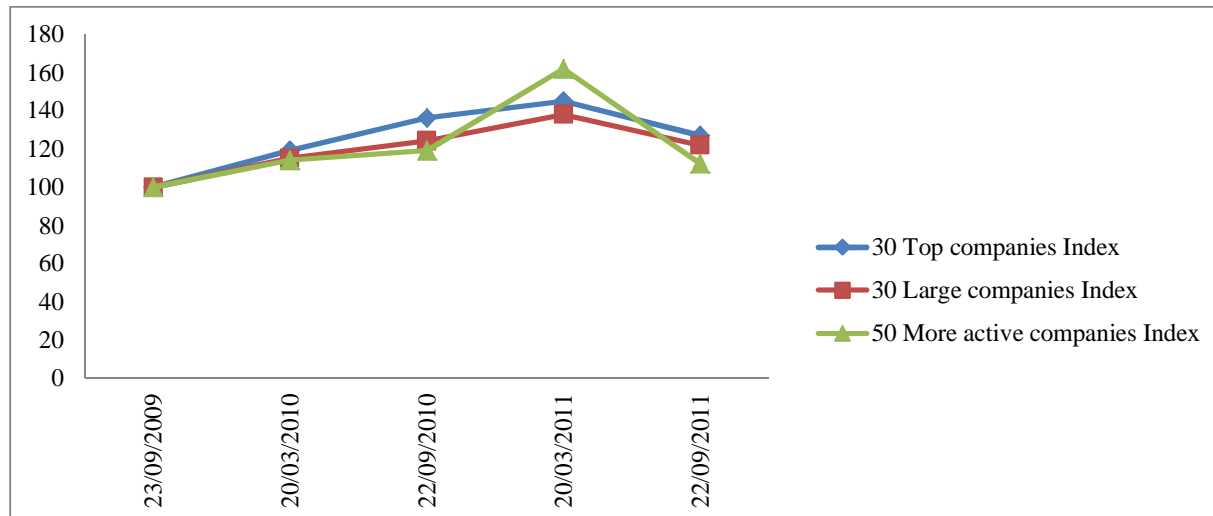


Fig1. Movement trend graph of the 30 top companies' Index and Indexes of 30 large companies and 50 more active companies in Stock Exchange (from 23/09/2009 to 22/09/2011)

6- Conclusion and suggestions

In this research, according to the importance of Indexes in expressing investors' expectations in capital market and showing the macro directions of various economic parts of the country, a comparative study was done on calculation method and the technique of selecting companies belonging to Index in the world and Iran. Due to studies, it is suggested that:

- 1- To represent real price changes of stock market in calculating Indexes of Tehran Stock Exchange, stock float rate was taken into account (except for 30 large countries) like other credible Stock Exchange in the world.
- 2- In order to show exchanged stock price oscillation in Tehran Stock Exchange, like other credible Stock Exchange, liquidity degree of companies' stock was considered.
- 3- The way of selecting companies was modified for membership in the Index of 50 more active companies; that is criteria like stock liquidity, priority of financial ratios specially earning per share and free float stock were considered.
- 4- Admitted companies were not used in calculating the Index immediately after the first exchange on their shares. Rather, they passed an expect time, for instance at least 6 months, because these companies have drastic oscillations in their stock price which are not real oscillations. After this time, more real oscillations and changes appeared in their stock price and could be used in Index calculation.
- 5- According to characteristics of the 30 top companies' Index, this Index has more real representation of price expectations and changes in Tehran Stock Exchange. So, investors can utilize it to study market behavior, to decide for investment and to do financial monitoring.
- 6- Since the efficiency of the 30 top companies' Index is more than that of Tehran Stock Exchange, therefore, it is demanded from investors and Tehran Stock Exchange pay special attention to such criteria as earning per share, free float stock, stock liquidity and duration of companies activity in Stock Exchange.

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