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Evaluating the Performance of Top Companies Listed on Tehran Stock Exchange and Selecting the Optimal Investment Portfolio

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Abstract: Today, Stock Exchange is one of the most influential institutions in the economy of any country this is to a degree that researchers and experts have considered its status as a measure of the economic health of a given society. In financial markets, several tools are used to create transparency in the market. The purpose of this study is to provide a performance evaluation model and to rank the top companies listed on Tehran Stock Exchange to explain the strengths and weaknesses and to determine opportunities and threats they face so that the results of its implementation provide the possibility of analysis and review of policies and programs and improvement of the performance of companies. On the other hand, it helps investors to reconsider their past investments so that they can make decisions about new investments according to the rankings based on performance evaluation. In this study, the list of top companies, 38 companies selected based on investment criteria, listed on Tehran Stock Exchange during 2011, announced by this organization every 3 months and the information needed per share were calculated. Then with the help of a ranking model, a combination of multi-criteria decision-making and Analytic Hierarchy Process (AHP) was used to analyze the structure and determine the weights of ranking criteria and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) Method was used for ranking. Finally, concerning the priorities and aspirations of the investor, a goal programming model was used for selecting optimal investment portfolio. According to the results, the optimal investment portfolio includes shares of National Iranian Copper Industries Co, Mobile Communications Company of Iran (MCI), Chemical Industry and Fanavaran Petrochemical Co each of which have respectively 169, 244, 17 and 52 shares.

Key words: Stock Exchange, multi-criteria decision-making, AHP, TOPSIS, goal programming

INTRODUCTION

Although, Tehran Stock Exchange as one of the major institutions in the capital market of the country has nearly a four-decade history of activity, it still has not managed to get its place in the national economy. One of the fundamental problems facing the stock market, especially the stock market in Iran is lack of transparency of the market that has increased the risk, brought about non-participation of investors and thereby reduced market boom. On the other hand, today, great efforts have been made to improve financial models to solve optimization problems and to select investment portfolio and all these models are to protect investors in determining the balance between the factors influencing their selection and finally the selection of the most desirable assets in investment portfolio by considering the related points.

When a person makes a decision to invest in stocks, the first thing to face is the selection of the desired stock. In Tehran Stock Exchange, investors, especially retail investors, mostly make decisions based on unofficial and incorrect information that leads to losses and finally discourage them making them withdraw from the capital market.

Evaluation of the performance of companies and their ranking is important in the sense that, they help investors and traders of the stock to make necessary decisions on holding, selling or buying shares of various companies in due time. It is natural that investors look for stocks that perform better than other companies and in the market. Potential investors and the users of financial and non-financial information intend to distinguish superior and successful companies from non-superior and unsuccessful ones to make better decisions (Mehrani *et al*., 2004). Since, generally in evaluation and prioritizing, two or multi-criteria decision-making such as profit, cost, utility, non-utility, etc. are concerned, decision-maker faces various

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options that affect the organization's internal and external environment. In such cases to select one of the available options, multi-criteria decision-making models as one of the effective tools for decision-making, seem to be suitable (Eftekhari *et al*., 2009).

In this study, it is tried to offer the practical application of one of the comprehensive decision-making models concerning the financial decisions in the current situation to help decision-makers and investors in making good and fast decisions. This research shows a new application of multi-criteria decision-making to evaluate the performance of companies to help the investors with making investment decisions followed by the provision of appropriate portfolio. The direct result of the application of this research is ranking the firms listed on Tehran Stock Exchange. Achieving a comprehensive criterion for evaluating the performance of companies is one of the fundamental issues that must be considered in the financial research. There are many criteria and indices to evaluate the financial performance of companies but using just one of these criteria will lead to considering just one aspect of the aspects of the company's performance and ignoring the others. Using multi-criteria decision helps not only to consider different criteria and indices simultaneously but by using weighting methods, the importance of criteria is also calculated and included in decision-making.

Literature review: In their study, Kashan and Rostami tried to design a comprehensive model for performance evaluation and ranking companies. Their proposed model is designed based on the balanced scorecard but it has major differences with it. In addition to the four components of the balanced scorecard, they considered two other factors including staff and management and thus extracted 422 performance indices for evaluation and ranking. In their study, they used multi-attribute decision model, TOPSIS techniques and Shannon entropy model.

Mehrani *et al*. (2004) ranked the companies listed on Tehran Stock Exchange based on fundamental financial variables. For this purpose, 153 companies were considered. Variables were a combination of financial ratios. Using TOPSIS technique, 170 companies in 13 industries were ranked and thus, the rank of each company was determined in its own industry.

Ahmadpour *et al*. (2009) in a study entitled "the use of multi-criteria decision-making models in stock selection" investigated the factors effecting stock selection in pharmaceutical companies listed on Tehran Stock Exchange using multi-attribute decision-making model. The criteria used in this study include price to earnings ratio, earnings per share, dividend per share, ratio of market value to book value, price to sales ratio, debt to capital ratio and so on. The results show that using different multi-attribute methods leads to a different ranking of competing options, so to achieve consensus and broader rating of options, the method of fusion of results is proposed as the best method.

Taghizadeh and Fazli (2011) in a study entitled "Method of Measuring the Performance of Companies Using Hybrid Approach of Analysis of Gray and Fuzzy TOPSIS," conducted in survey mode in Tehran Stock Exchange, used the combination of gray relationship analysis and fuzzy multi-criteria decision-making with financial ratios criteria as the measure of performance. Because some financial ratios have similar structure in this study, unlike other studies carried out in Iran to avoid repetitive calculations, financial ratios are clustered using gray relationships analysis and for each cluster, a financial ratio is determined as an index of financial ratios of the cluster. Then, ranking of companies based on their financial performance is carried out using TOPSIS technique of multi-criteria decision-making in a fuzzy environment.

Eshlaghi in their study entitled "Investing in the Stock Exchange (Using Multi-Criteria Decision Making Models)" ranked cement industry companies listed on Tehran Stock Exchange with the help of TOPSIS, Electre and Vikor techniques regarding financial indices and eventually with the help of Copeland technique, they did the final ranking.

Using AHP Method, Babic and Plazibat (1998) determined the weight of their criteria performance indices (return on assets, profit margin, inventory turnover, current ratio, average remuneration of workers, sales per employee, total assets turnover, return on equity the average term of debt collection and debt). Finally, using Promethee, they to ranked companies. Among the indices listed return on assets became first and return on equity got the ninth place.

Piotroske used the financial statement information to separate successful and unsuccessful companies. The study found that the companies that are strong regarding fundamental signs and have a higher ratio of book value to market price on average have higher yields. He used F index to separate successful and unsuccessful companies.

In their study, Johnson and Soenon concluded that there is a significant relationship between the rating of companies based on economic value added performance evaluation, Sharpe ratio and Jensen's alpha and financial criteria such as company size, the ratio of book value to market value, sales growth rate, capital structure, liquidity, cash conversion cycle, changes in profitability and return on assets there is a significant relationship (Eshlaghi *et al*., 2010).

Using 8 criteria (earnings per share, return on assets, return on equity, price-earnings ratio, economic value added, market value added, cash value added and cash

return on investment) and fuzzy AHP, Ness Yaklin in their study entitled "The Application of Fuzzy Multi-Criteria Decision-making in Evaluating the Performance of the Turkish Industries" determined the weight and importance of each index then using Topsis and Vikor techniques, they ranked the firms. Ranking results from both methods were identical.

Research objectives: The main objective of the study is to evaluate the performance of companies listed on Tehran Stock Exchange with the use of multi-criteria decision techniques and to select the optimal investment portfolio. Moreover, secondary objectives of this study are:

- Determining the criteria and performance evaluation criteria and measuring the activity of the top companies listed on Tehran Stock Exchange
- Determining the relative importance of the indices and measures of performance and measuring the activity of the top companies listed on Tehran Stock Exchange
- Providing a multi-criteria decision making model to rank the top companies listed on Tehran Stock Exchange
- Ranking the selected companies listed on Tehran Stock Exchange
- Development of a goal-programming model for capital allocation to selected companies
- Formation of optimal portfolio investment

MATERIALS AND METHODS

Regarding the objective, the present research is applied and regarding the research method, it is descriptive analytic. This is a retrospective study. Due to the reliability of financial reporting of Tehran Stock Exchange firms, these reports have been used as the main source of information for research. The reports include basic financial statements of the companies surveyed obtained from Codal website for 2011 and Tadbir Pardaz Software was used to collect indices data. In order to give weight to criteria based on expert's opinions, a questionnaire was prepared and presented to them in 2013. Ultimately, for data analysis, computer program Expert choice, Excel and QSB Software were used.

Because of the access to exchange companies' information, the place territory of this research is the more active firms on Tehran Stock Exchange which is published every 3 months. Systematic deletion sampling is the sampling method, so the selected companies have to be present in the lists published for all quarter of 2011. On the other hand for coordination among the companies, the following criteria were considered to select the sample:

- They should not be among investment firms
- Fiscal year should end on March 20 each year
- They should be traded at least 50% of working days during the year
- They have been accepted before March 21, 2010 on the Stock Exchange
- The companies should be among superior Stock Exchange companies during 2011, published every 3 months

Finally, 38 companies were studied according to Annex.

Research indices: In multiple-attribute decision-making models, the most important step is identifying indices. The indices used in this study and their calculation is as follows.

Efficiency: Return ratio is a very important factor in financial decision-making for investment. Returns are usually composed of two parts: the dividends received and gains (losses) of capital. The sum of these two components forms the total yield of securities and securities yield that is a measure for investors' decision making to invest calculated as follows:

$$r_{it} = \frac{(P_{it} - P_{it-1}) + D_{it}}{P_{it-1}}, i = 1, 2, ..., 38 \quad (1)$$

Where:

r_{it} = Rate of return of a share item of company i at t period
P_{it} = Price per share of company i at the end of period t
P_{it-1} = Price per share of firm i at the beginning of period t
D_{it} = Dividend per share of firm i in period t

Risk: In a general definition, it can be stated that "volatility of investment returns is called risk of investment." In other words, the more a return of an investment changes, the intended investment has more risk. Criterion used to measure changes in the rate of return is called standard deviation and calculated as follows:

$$\sigma = \sum_{i=1}^{n} (R_i - \overline{R})^2 P_i, i = 1, 2, ..., 38 \quad (2)$$

Where:

σ = Standard deviation (investment risk index)
R_i = Share return in ith company
$\overline{R}$ = Average rate of share return
P_i = Probability ith event

Liquidity: The liquidity of a financial product means the possibility to sell it fast. The faster and with less cost a financial product can be sold, the greater its liquidity and the less its investment risks will be.

$$\text{Current ratio} = \frac{\text{Total current liabilities}}{\text{Total current assets}} \quad (3)$$

Sharpe ratio: William Sharpe offered a composite measure of portfolio performance called return to variability ratio based on the theory of capital market of the researcher. To evaluate the performance, Sharpe used 34 mutual investment funds during the period from 1954-1963. Sharpe criterion uses benchmark index based on historical capital market as a measure of risk. The criterion is as follows:

$$RVAR = SR_p = \frac{\bar{r}_i - \bar{r}_f}{\sigma_i}, i = 1, 2, ..., 38 \quad (4)$$

Where:

$\bar{r}_i$ = Average return on stock i during the specified time period
$\bar{r}_f$ = Average risk-free rate of return during the period
σ_p = Standard deviation of stock return i during the period
$\bar{r}_i - \bar{r}_f$ = Excess return (risk premium) of stock i

Return percent of the operating capital: The purpose of operating capital analysis is to identify the factors contributing to the change of financial status and to increase or decrease the money needed in the current activities of the entity. Analysis of operating capital in terms of short-term creditors is of great importance. When a company has capital shortage, especially operating capital and trades more than its ability and proportion, its situation gets potentially dangerous. Financial stop arises from high debt and the final mainstay to deposit it is small, which is considered as the capital. Mentioned index is calculated as follows (Momeni and Moghadam, 2004):

$$RWC_{it} = \frac{NI_{it}}{WC_{it}} \times 100, i = 1, 2, ..., 38 \quad (5)$$

Where:

RWC_{it} = Return of working capital of firm i in year t based on percent
NI_{it} = Net profit of firm i in year t
WC_{it} = Operating capital of firm i in year t

Average term of debt collection: In classification of financial ratios, average term of collection period is of the most important activity ratios and activity ratios shows performance of managers in using asset (resources of managers). This criterion shows the performance of criteria of the profit unit in procuring funds related to credit sale. In addition, the mentioned ratio can reflect credit policy of the profit unit (Momeni and Moghadam, 2004):

$$ACP_{it} = \frac{AR_{it}}{NS_{it}} \times 360, i = 1, 2, ..., 38 \quad (6)$$

Where:

ACP_{it} = Average debt collection period of firm i in year t
AR_{it} = The average of trade receivables of firm i in the year t
NS_{it} = Net sales of firm i in year t

The percent of total cost to the sale: The importance of this ratio is its description of the company's ability to control its costs. The cost compared to firm income is an important criterion for absorbing investment by companies and subsequently increase the profitability of the company's wealth:

$$RTE_{it} = \frac{TE_{it}}{TS_{it}} \times 100, i = 1, 2, ..., 38 \quad (7)$$

Where:

RTE_{it} = The ratio of the total cost of firm i in year t
TE_{it} = Total cost of firm i in year t
TS_{it} = Total sales of company i in year t

The ratio of market value to book value: This ratio will be obtained by dividing the market value over book value of equity at the end of the period:

$$MB = StockMV/StockBV \quad (8)$$

The ratio of price to earnings per share: This ratio is the most important stock evaluation criterion that is used by investors in the market and buyers of shares prefer the use of this measure to any other factor when buying shares. The ratio reflects the status quo, potential growth, market values and the company's earnings. This ratio is calculated as follows:

$$\frac{P}{E_{it}} = \frac{PPS_{it}}{EPS_{it}} \times 100, i = 1, 2, ..., 38 \quad (9)$$

Where:

P/E_{it} = The ratio of price to earnings per share of firm i in year t
PPS_{it} = Price per share of firm i in year t
EPS_{it} = Earnings per share of firm i in year t

RESULTS AND DISCUSSION

Data analysis: In this study, to achieve the important indices of factors affecting the companies' performance evaluation and selection of criteria that are more functional, going to different universities and in-person reference to the organization of regional exchange of Isfahan and other ways of communication including calls, email and professional social networking and opinions of

respected professors, experts, analysts and investors in the stock were used. On the other hand, by studying the articles related to the topic of ranking and evaluating the performance of companies as well as articles and writings on separating successful companies from unsuccessful ones, selecting the best stocks by investors, use of multi-criteria decision-making, multi-attribute models and so on, the best and most widely used criteria and indices that can be used to find the optimum portfolio are collected.

Finally, their sum is the degree of prioritizing the criteria and in this study due to many indices and the lack of efficiency of the study, nine more important indices, also used more in Iran has been used. Liquidity is the percent of return on sales, Sharpe ratio, net profit margin, risk, the ratio of market value to book value and the ratio of total expenses to sales, earnings per share and return are the indices that have been used in this study and prepared according to Table 1.

Determining the relative importance of investment criteria using AHP: Table 2 pairwise comparison matrix of criteria affecting performance evaluation of the company include return, risk, liquidity, Sharpe ratio, percent of return on sales, the ratio of market value to book value, net profit margin, total costs to sales ratio and earnings per share that after data collection, their geometric mean has been put on the table. For weighting and generalizing specialists' opinion in financial ratios used in this study, AHP Method was used. Weighing is mainly determined by experts who carry out pairwise comparisons two by two between indices.

If we have n index there is an, n (n-1)/2 pairwise comparisons are made. Therefore, in this study where there are nine indices, 36 pairwise comparisons should be performed. For this purpose, a questionnaire was designed in which to show the relative importance of one element to another, a scale of 1-9 (hour numbers) was used that is one shows "equal importance," three "relatively preferred ", five "high preference," seven "very high preference" and nine "extraordinary preference." For pairwise comparisons to be made, all matrix results called pairwise comparison matrix are placed a (n×n) matrix. Pairwise comparison matrix can be seen in Table 2.

In the next phase, we obtain the normalized matrix and finally we calculate the weight of each index. Table 3 focuses on this subject.

Table 1: Research evaluation criteria

Symbols	Criteria
Q1	Return
Q2	Risk
Q3	Liquidity
Q4	Sharpe ratio
Q5	Percent of return on operational capital
Q6	Market value to book value
Q7	P/E ratio
Q8	Percent of the total cost to sale
Q9	The average debt collection period

Table 2: Comparison of pairwise evaluation indices in expert choice

Criteria	Return	Risk	Liquidity	Sharpe ratio	Percent of return on operating capital	Market value ratio to book value	P/E ratio	Total cost ratio to sale	Average period of collecting debt
Return	1	0.344	0.277	0.290	0.290	0.374	0.359	0.350	1.578
Risk	2.902	1	0.388	0.673	0.869	0.700	0.700	1.170	1.532
Liquidity	3.610	2.575	1	2.962	3.058	3.058	2.353	3.465	1.645
Sharpe ratio	3.446	1.486	0.338	1	0.806	1.668	1.919	3.022	1.699
Percent of return on operating capital	3.446	1.150	0.327	1.240	1	3.503	3.203	3.203	1.899
Market value ratio to book value	2.674	1.426	0.327	0.599	0.285	1	0.983	1.104	1.876
P/E ratio	2.785	1.426	0.425	0.521	0.312	1.017	1	1.738	1.799
Total cost ratio to sale	2.853	0.855	0.288	0.331	0.312	0.906	0.575	1	1.955
Average period of collecting debt	0.634	0.653	0.608	0.588	0.526	0.533	0.556	0.511	1

Table 3: Normalized matrix and values of priority to the criteria

Criteria	Return	Risk	Liquidity	Sharpe ratio	Percent of return on operating capital	Market value ratio to book value	Ratio	Total cost ratio to sale	Average period of collecting debt	Weight
Return	0.040	0.030	0.070	0.035	0.039	0.029	0.031	0.022	0.105	0.044
Risk	0.124	0.092	0.097	0.082	0.116	0.055	0.060	0.075	0.102	0.089
Liquidity	0.150	0.236	0.251	0.361	0.410	0.240	0.202	0.223	0.110	0.242
Sharpe ratio	0.147	0.136	0.085	0.122	0.108	0.131	0.165	0.194	0.113	0.133
Percent of return on operating capital	0.147	0.105	0.082	0.151	0.134	0.275	0.275	0.206	0.127	0.167
Market value ratio to book value	0.114	0.130	0.082	0.073	0.038	0.078	0.084	0.071	0.125	0.088
Ratio	0.119	0.130	0.107	0.063	0.042	0.080	0.086	0.112	0.120	0.095
Total cost ratio to sale	0.122	0.078	0.072	0.040	0.042	0.071	0.049	0.064	0.130	0.074
Average period of collecting debt	0.027	0.060	0.153	0.072	0.070	0.042	0.048	0.033	0.067	0.063

As can be seen, liquidity indices with relative weight of 0.242 has the most importance and return with relative weight of 0.044 has the least importance. Relative priority of vector elements that reflects the weight of each criterion in order of priority is as follows in Table 4. To calculate the rate of incompatibility following steps were taken in order. Calculating the Weighted Sum Vector (WSV) is given in Table 5. Calculating the Compatibility Vector (CV) is given in Table 6. Calculating the amount λ_{max}:

$$\lambda_{max} = \frac{\Sigma cv}{n} = \frac{86.436}{9} = 9.604$$

Calculating Compatibility Index (CI):

$$CI = \frac{\lambda_{max}\text{-}n}{n\text{-}1} = \frac{9.604\text{-}9}{8} = 0.0755$$

Calculating Ratio compatibility (CR):

$$CR = \frac{CI}{RI} = \frac{0.0755}{1.45} = 0.052$$

As compatibility rate has been <0.1, pairwise comparisons of criteria affecting evaluation of the performance of companies is compatible.

Prioritizing options with TOPSIS Method: The information required to calculate the criteria were extracted from documents information on Tehran Stock Exchange and to calculate them, Excel Software is used. In Table 7, relative proximity of each option to the ideal solution is shown. At this stage, companies were ranked in terms of indices, so that as the relative distance between decision-making options are larger and the closer one, they are more important and have superior priority and ranking.

Formation of optimal portfolio investment: According to the Table 7 values, one can conclude that Esfahan Oil Refining and Persian Gulf Petrochemical Industries and National Copper Industry ranked from first to third, respectively. So far, the main problem of the study that is ranking and identifying indices of investment research has been answered. Nevertheless, in fact in decision-making situations, the investor faces limitations such as available funding for investment and or limitations of this kind. On the other hand, to invest, they consider some goals. To solve this problem in terms of constraints and objectives (goals) by creating a mathematical model with the aim of minimizing the weighted sum of adverse deviations as well as the possible defining the possible limits, we solved the new issue by operational research software QSB.

Determining the weights of goals: Weights of second to fifth goals, according to ideas extracted from experts. The weight of first goal (ranking points for companies) and the sixth goal (consuming the whole budget) has been set by re-surveying of experts.

Determining the ideal level of investment criteria: The value of the intended goal of the investment was determined hypothetically for an investor as set out in the Table 9.

The results of solving ideal programming model and determining the investment portfolio: The ultimate goal programming model will be as follows in Fig. 1. Where Xj variable shows the value of the share purchased from Aj company. Optimal solution of the problem with the help of WinQSB Software is as follows in Table 10. In Table 10, zero purchase is not shown. It should be noted that all adverse deviations have been made zero:

Table 4: Relative priority of vector elements

Priority	Symbols	Index	Weight
1	Q3	Liquidity	0.242
2	Q7	P/E ratio	0.167
3	Q4	Sharpe ratio	0.133
4	Q5	Percent of return on operating capital	0.095
5	Q2	Risk	0.089
6	Q6	Market value ratio to book value	0.088
7	Q8	Total cost ratio to sale	0.074
8	Q9	Average period of collecting debt	0.063
9	Q1	Return	0.044

Table 5: Calculation of (WSV)

Criteria	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	×	Weight	=	WSV
Q1	1	0.344	0.277	0.290	0.290	0.374	0.359	0.350	1.578		0.044		0.421
Q2	2.902	1	0.388	0.673	0.869	0.700	0.700	1.170	1.532		0.089		0.856
Q3	3.610	2.575	1	2.962	3.058	3.058	2.353	3.465	1.645		0.242		2.387
Q4	3.446	1.486	0.338	1	0.806	1.668	1.919	3.022	1.699		0.133		1.293
Q5	3.446	1.150	0.327	1.240	1	3.503	3.203	3.203	1.899		0.167		1.634
Q6	2.674	1.426	0.327	0.599	0.285	1	0.983	1.104	1.876		0.088		0.832
Q7	2.785	1.426	0.425	0.521	0.312	1.017	1	1.738	1.799		0.095		0.900
Q8	2.853	0.855	0.288	0.331	0.312	0.906	0.575	1	1.955		0.074		0.699
Q9	0.634	0.653	0.608	0.588	0.526	0.533	0.556	0.511	1		0.063		0.599

Table 6: Calculating CV vector

Criteria	Elements of weight set vector	÷	Elements of relative priority vector	=	CV
Return	0.421		0.044		9.568
Risk	0.856		0.089		9.618
Liquidity	2.387		0.242		9.863
Sharpe ratio	1.293		0.133		9.722
Percent of return on operating capital	1.634		0.167		9.784
Market value ratio to book value	0.832		0.088		9.454
Average period of collecting debt	0.900		0.095		9.473
Total cost ratio to sale	0.699		0.074		9.446
Ratio P/E	0.599		0.063		9.508

Table 7: Relative proximity and rank of each company

Rows	Company name	Distance of the option to negative ideal	Distance of the option to positive ideal	Relative proximity (CL_i)	Ranks
A1	Persian Gulf Petrochemical Industries	0.196	0.240	0.450	2
A2	Foolad Khuzestan	0.095	0.240	0.284	16
A3	Isfahan Oil Refinery	0.229	0.139	0.623	1
A4	Bandar Abbas Oil Refining	0.107	0.227	0.320	8
A5	Mobarakeh Steel	0.097	0.237	0.290	12
A6	National Iranian Copper Industries	0.120	0.228	0.346	3
A7	Parsian Oil and Gas Development Corp	0.094	0.238	0.283	17
A8	Iran Communications	0.083	0.231	0.265	22
A9	Mellat Bank	0.094	0.229	0.252	27
A10	Pasargad Bank	0.093	0.225	0.277	18
A11	Iran Transfo	0.085	0.240	0.277	19
A12	MCI	0.095	0.248	0.323	5
A13	Pardis Petrochemical College	0.072	0.254	0.222	36
A14	Golgohar Industrial minerals	0.074	0.241	0.236	31
A15	Chadormalu Industrial and minerals	0.070	0.254	0.215	38
A16	Tejarat Bank	0.072	0.258	0.219	37
A17	Shiraz Petrochemical	0.074	0.252	0.227	34
A18	Iran Khodro	0.079	0.248	0.242	29
A19	Tabriz Oil Refining	0.087	0.228	0.277	20
A20	Iran Chemical Industries	0.085	0.251	0.291	10
A21	Shazand Petrochemical	0.084	0.245	0.333	4
A22	Saipa	0.077	0.261	0.228	33
A23	Khark Petrochemical	0.094	0.244	0.291	11
A24	Behshahr Industrial Development Corp.	0.098	0.242	0.288	14

Table 8: Weight of goals

Rows	Goal	Goal weight
1	High ranking points	0.460
2	Liquidity	0.244
3	Sharpe Ratio	0.133
4	Return	0.044
5	Risk	0.089
6	Using all budget	0.032

Table 9: The value of ideal level of investment criteria

Criterion	High point of TOPSIS	Liquidity	Sharpe ratio	Risk	Return	Using the whole budget
Ideal level of investor criterion	0.03	0.11	0.13	0.08	0.15	10000000

Table 10: The optimal share purchase

Company code	Company name	Optimal share purchase
A_6	National Iranian Copper Industries	169
A_{12}	Mobile Communications Company of Iran (MCI)	244
A_{20}	Iran chemical industries	17
A_{26}	Fanavaran Petrochemical	52

- The goal of high points of TOPSIS has 49.945 positive deviations
- The goal of liquidity has 55.4005 positive deviations.
- The goal of Sharpe ratio has 11.9459 positive deviations
- The goal of risk has 0.0681 negative deviation
- The ideal of efficiency has 14.2499 positive deviation
- The ideal of using all funds is fully realized and all investment funds amounted to 10,000,000 Riyals has been absorbed

The results of model solution indicate the competition of goals and decision-making criteria. By change of the research field of each criterion at the level of decision-making for the value of goals Table 9 as well as weight and priority criteria changes, the realization of each criteria changes. This study shows that by goal planning, one can determine the optimal amount of companies share purchase for any decision-maker with any kind of desire and comment on the importance and acceptable levels of corporate performance evaluation.

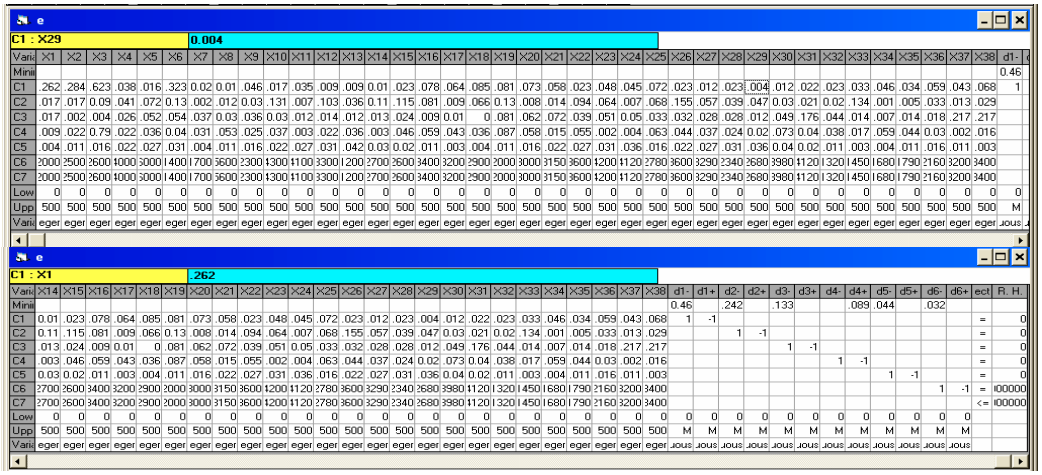

Fig. 1: Solving GP with the help of QSB Model

CONCLUSION

Decision by considering several criteria each of which has a special place is made only possible with the use of multi-criteria decision making models. In these methods, different indices appropriate to the type of ranking are used. Therefore, by determining appropriate indices to evaluate performance and multi-criteria decision making methods, weights of the importance of companies are obtained. Then, according to the requirements and goals of the investment, along with considering the importance of companies, the amount of investment in each can be determined. Selecting optimal stock portfolio is of the goals of portfolio management. To select the optimal portfolio in this study at first with the help of AHP and TOPSIS, the selected companies were prioritized. Then, the goals of the investor were collected through personal interviews with the investors at the Stock Exchange as well as referring to various books and articles. The objective function was identified to minimize the adverse deviations. At the end, of all this information was entered into the computer program QSB and the optimal shares portfolio was determined based on the objectives and goals of the investor. Optimal shares portfolio was formed based on the constraints and goals of the investor including budgetary constraints and the number of shares that must be purchased.

REFERENCES

Ahmadpour, A. A. Shirazi, M. Razavi and Z. Amiri, 2009. Multiple attribute decision making model in stock selection (pharmaceutical companies listed on Tehran Stock Exchange). Q. Stock Exch., 5: 38-45.

Babic, Z. and N. Plazibat, 1998. Ranking of enterprises based on multicriterial analysis. Int. J. Prod. Econ., 56: 29-35.

Eftekhari, R., V. Tehrani, A. Verazini and A. Ibrahim, 2009. Evaluation and prioritizing free trade zones in Iran by using MADM. Q. Lecturer Hum., 3: 168-144.

Eshlaghi, A.T., E. Rahnamay, F. Roodposhti and K. Abdolvand, 2010. Using a combination of techniques DEA-TOSIS to provide an approach to evaluate several of the companies listed on Tehran Stock Exchange. Acc., 4: 105-119.

Mehrani, S., K. Mehrani and G. Karami, 2004. The use of financial and non-financial historical information to distinguish successful companies from unsuccessful. Rev. Acc. Auditing, 38: 77-92.

Momeni, M. and A.N. Moghadam, 2004. Assessment of the economic performance of listed companies in Tehran Stock Exchange using TOPSIS. Q. Econ. Rev., 3: 55-75.

Taghizadeh, R. and S. Fazli, 2011. The method of measuring the performance of companies using hybrid approach analysis of gray and fuzzy TOPSIS. Outlook Ind. Manage., 2: 143-145.