To determine the priorities of the investments in accepted industries in Tehran Securities Exchange by using TOPSIS Technique

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Abstract

The purpose of this research is to prioritize the investment in accepted industries in securities exchange and the used pattern is TOPSIS. There are different indices for determining investment priority based on the requirement of every investor and individuals' viewpoints about investment. Because more investors want to obtain more profits, out of different indices, this research has considered profitability indices as an independent variable and different industries as a dependent variable. Hierarchy analysis is used to determine weight and importance of indices (financial ratios) and the final ranking of the industries is performed by using weights, average and standard deviation of financial ratios value in every industry by TOPSIS technique. This ranking has been used for accepted industries in Tehran Securities Exchange during 2009-2010. The results of this study indicate that in both 2009 and 2010, the priority of investment is for telecommunications industrial group and it means the investment in this section has more success because of a partial advantage.

Keywords*: investment priority, the ranking of accepted industries in Tehran Securities Exchange, profitability indices.*

1. Introduction

Today investment world has been developed more than before and in decision makings, more attention is paid to it. To identify investment opportunities with high yield and their priorities is an issue that today is the main discussion of allocating investment sources and specially banking with developmental properties. Investment prioritization not only provides the possibility of optimum allocation of resources, but also it reduces the stages time and costs before investing and providing justificatory study.

The complexity of investment prioritization comes from the effect of numerous quantitative and qualitative criteria in the evaluation process and the participation of several decision makers in this

process. Multi-criteria group decision making models can help a decision maker to interact this complexity (pahlevani, 2009, p.2)

Therefore in this research, it is tried to compare profitability indices in each industry so that the better industry will be identified. The multi-criteria decision making has this capability that regarding several and effective indices for identifying the financial positions of the industries, as well the involvement of all indices, it can select one industry among several industries and rank them.

The main question that arose in the minds of researchers is that which industry is the more suitable option to obtain maximum profit for investing in Exchange?

Today Securities Exchange is one of the main tools for the Guidance of capital to Productive activities. The importance of Securities Exchange in all industrial countries is so much that this activity is one of the most important indices of economic growth in these countries. Therefore it seems that the knowledge of investors about the important points and factors for selecting Securities and making investment decisions is one of the most necessary factors for permanent presence in this market. It is said well that the purpose of the logical investor is that among securities, he/she must select securities which on the one hand, if it has the same risk than other securities, it should have the highest return and the other hand it should have the lowest risk (Parastesh, 2005, p.75).Based on this, the determination of investment prioritizing in Exchange is important in order to reducing risk and increasing investment return. The current research can help investors make suitable decisions by analyzing the past and present positions of the industries

2. Literature and Background

Regarding the given matters about the ranking importance of industries, partial importance and financial ratios value (as decision making indices) are considered in this research based on AHP model. Desired indices have been selected among profitability indices. The main reason of selecting these indices is that the final purpose of the investment has been assumed to obtain profit and profitability ratios are the best criterion of evaluating profitability power. These ratios which are inferred from different financial statements like balance sheet and profit and loss statement can be good indices for ranking industries and as a result a decision making for investment regarding to the financial function of industries in studied years. These ratios include as following:1-Gross profit margin is equal to the ratio of gross profit on sales 2-net profit margin is equal to the ratio of net profit on sales.3- Also operating profit margin is equal to the ratio of Operating profit on sales. Profit margin ratio is the result of mutual reactions between three factors, sale volume, Pricing Policy and cost structure. 4- Rate of return on assets (Rate of return on investment) with the formula of the ratio of net profit to total assets. But the increment of investment volume of the company doesn't cause to increase shareholders' wealth itself. (Tehrani, 2008, p.55). 5- Rate earned on stockholders' equity is equal to net profit ratio on total equities, if they borrowed, the increment of stockholders' wealth is possible if the rate of return on investment will be more than the interest rate of these loans. 6- Earnings per share: the main reason of paying attention to Earnings per share (that is related to the main purpose of the company) is to maximize stockholders' wealth. This number is the most common financial ratio that is analyzed. Earnings per share are equal to the difference ratio of net profit and Preferred Stock Dividend on Number of Common stock outstanding (Tehrani, 2008, p57).

On the one hand by considering several financial ratios as evaluation criteria, using multi-criteria decision making technique is considered. These techniques have more reliability and are applicable for all kinds of

decision makings. Decision models were used widely in the previous research but have been used rarely for evaluating and ranking by using financial ratios (the basic factor for the determination of company value) (gholizadeh, 2004). Some performed researches, related to this investigation include: in 2001, Cai and Wu studied financial evaluation. In the first stage, they studied first financial evaluation system by using hierarchical analysis process and classified them into 4 groups by studying 13 financial indices. Then in the second stage, they gave a model by using Data Envelopment Analysis that its output identifies Efficient units (Cai & Wu, 2001). Chou and liang combined Fuzzy set theories, hierarchical analysis and Concepts of Entropy and used the given model to evaluate the Shipping Companies (Chou & liang, 2001). In 2005, Tolga et al studied operational system selection problem by using fuzzy substitution analysis and fuzzy hierarchical analysis. In this study, economic and non-economic aspects were selected and considered operational systems ranking (Tolga et al, 2005). Wang evaluated the financial performance of Taiwan airlines by Fuzzy- TOPSIS method. After exploiting financial statements, he classified them by using Grey Relation Analysis. Then he selected an index from each cluster as a decision criterion and used multi-criteria fuzzy decision method to evaluate financial performance (Wang, 2008). Samaras evaluated the shares of available companies in Athens Securities Exchange by using a multi-criteria method and according to decision support systems.This method is based on Fundamental Analysis Ratio Method and uses U.T.E.STAR Method to classify shares from best to worst and consider the risk ability of investor. This system that has been designed for real and unreal investors, used a large amount of related information and executed them in real conditions of the world so that always data will be updated (Samaras, 2008). Also in 2004 in Iran, Momeni and Najafi evaluated the economic performance of the accepted companies in Tehran Exchange by using the model. In this investigation, 9 financial indices were weighted as evaluation criteria by using Entropy method. Then 170 companies in 13 separate industries were ranked by using TOPSIS technique. Therefore each company was identified in its special industry (Momeni & Najafi, 2004). In 2007, Khosravani evaluated the accepted companies in Tehran Exchange. In this investigation, six profitability indices were weighted as evaluation criteria by using Entropy method. Then industries and companies were ranked by using TOPSIS Technique (Khosravani, 2007). Weighting indices was done by Entropy method to determine the partial advantage of different industries in Khouzestan Province, the indices of this research are interest rate, employment rate, fixed investment rate and Exports rate and finally they prioritized options by using TOPSIS method (Kiani et al, 2012). Amiri and his Colleagues used Reference tools to evidence, documents, interviews with Experts and specially questionnaire and TOPSIS technique to rank the effective financial factors in Tehran Securities Exchange (Amiri et al, 2008).

3. Methodology

In this research, an inductive deductive method has been used. Regarding the nature of the research and variables, this research is an application one from Structural viewpoint and a comparative- analytical one from methodology viewpoint. In order to increasing the Reliability of results, sampling didn't perform among statistical society members, and all observations were studied. Therefore society and statistical sample are equal. In data description part, the data of this research include 37 industries in 2010 and 2009, in the literature part of the investigation, the library method has been used and for determining weights, experts' polls and finally field method and the questionnaire have been used. Regarding financial statements and by using relations and accounting formulas, some financial ratios that have been used as an index, are calculated for all industries in mentioned years. Hierarchical analysis questionnaire that

includes the comparison of the indices (financial ratios) was replied by some experts by using the spectrum 1-9 that was stated by a watch. Therefore as well comparing a financial ratio with other ratios, different individuals' viewpoints about ranking industries are considered. After performing Paired comparisons of financial ratios by decision-making experts, the weights of the indices (financial ratios) are calculated. And then regarding these weights and by using TOPSIS method, industries were ranked in 2009 & 2010. Therefore each index is involved in decision-making based on its weight.

4. Findings

Regarding the method of investigation, first the weights of criteria are determined then the industries are ranked. Therefore obtained results and findings can be given in two parts, weighting criteria and ranking options.

1- To make indices hierarchically and obtaining their weight**.**

Table 1: The results of the implementation of AHP method.

Weight	0.358697	0.217779	0.1278	0.103907	0.101823	0.089995
Index	Operating profit	net profit	Return on assets	Earnings per share	share	Gross profit
rank	1	2	3	4	5	6

2. Solving problem by using TOPSIS pattern

In this part, we obtained the average and standard deviation of every index for each industry and exerted determined weights on indices in the first part. It is necessary to mention because the sum of determined weights must be equal to one, therefore a second of each weight has been allocated to average and a second to standard deviation. Then by using TOPSIS software and weighted profitability indices, 37 industries have been prioritized. The priority has been shown as a table respectively in 2009 and 2010.

rank	Name Industry	CL_i
1	Telecommunications	0.553209866
2	industrial multidisciplinary companies	0.390803714
3	radio and TV manufacturing	0.317240791
4	dense buildings	0.302871196
5	paper products	0.192400419
6	basic metals	0.191356359
7	furniture and artifacts	0.184174924
8	Computer	0.173662825
9	petroleum products	0.157938215
10	machineries and electronic devices	0.157565511
11	cement - lime & ypsum	0.145336001
12	material and Pharmaceutical products	0.140135732
13	metal ores mining	0.135011801
14	medical instruments &measurements	0.134981135
15	Payment tanned leather	0.125719226
16	Engineering Services	0.124538004
17	chemical products	0.11633113
18	Automobiles and Parts Manufacturing	0.111638245
19	Sugar	0.109675573
20	Food and beverage	0.108178301
21	rubber and plastics	0.107108392
22	Textiles	0.106651815
23	nonmetallic ore products	0.106317954
24	mining other mines	0.101118835
25	Transportation	0.10107532
26	Coal mining	0.098584252
27	tile and ceramics	0.096543462
28	wood products	0.096199601
29	other financial intermediation	0.096085998
30	machineries and equipments	0.091149058
31	an insurance	0.087723854
32	metal products manufacturing	0.087507102
33	Investments	0.085683302
34	Banks	0.084847986
35	Publications	0.083602048
36	other transportation tools	0.07516517
37	industrial contraction	0.058184343

Table 2: ranking for industries in yaer2009.

rank	Name Industry	CL_i
1	telecommunications	0.54623005
2	industrial multidisciplinary companies	0.457062195
3	radio and TV manufacturing	0.251167103
4	dense buildings	0.250270929
5	metal ores mining	0.239073252
6	rubber and plastics	0.232040702
7	machineries and equipments	0.206877436
8	cement - lime & ypsum	0.197227412
9	material and Pharmaceutical products	0.196616658
10	Computer	0.188938569
11	furniture and artifacts	0.185145783
12	Engineering Services	0.184189049
13	basic metals	0.179840036
14	machineries and electronic devices	0.178804252
15	Coal mining	0.178449197
16	petroleum products	0.17670104
17	chemical products	0.176408171
18	other financial intermediation	0.169022676
19	metal products manufacturing	0.166442494
20	Food and beverage	0.164832815
21	wood products	0.163252114
22	investments	0.163023926
23	mining other mines	0.161675851
24	sugar	0.1593549
25	tile and ceramics	0.157887237
26	nonmetallic ore products	0.157723803
27	textiles	0.15757704
28	paper products	0.156762798
29	publications	0.156331847
30	an insurance	0.155729796
31	Payment tanned leather	0.155681505
32	transportation	0.155113266
33	Automobiles and Parts Manufacturing	0.154181043
34	banks	0.151816546
35	other transportation tools	0.142250562
36	industrial contraction	0.139491867
37	medical instruments &	0.129304907

Table3: ranking for industries in yaer2010.

Conclusions

The current study has been focused on the survey of the accepted industries in Tehran Securities Exchange and during it 6 profitability indices have been studied. The given approach is based on hierarchy analysis and TOPSIS. The weight of decision making indices of calculation and industries based on these weights, value of indices and approaching the ideal solutions (TOPSIS) were ranked by the experts for comparing indices and based on the given model.

The obtained results show that:

In the classification of industries in 2010, telecommunications industry was selected as a better option and this implies that investing in this section has more success because of partial advantage. The industry of industrial multidisciplinary companies is in second rank and Radio & TV manufacturing industry and communication tools are in the next ranks. In the classification of industries in 1388, telecommunications industry was in higher rank and respectively the industry of industrial multidisciplinary companies and Radio & TV manufacturing and communication tools were in next ranks. The results show that regarding the place and the importance of Securities Exchange in investment, the investment should be seen with a targeted view and owners must be guided toward investment for obtaining desirable results and yield. Toward optimum options for investment in Tehran Securities Exchange, it is suggested some industries which are in the first orders of ranking, will try to protect their positions and places and also the lack of partial advantage and obtaining lower ranks in some industries are serious warnings for Exchange authorities and specially managers and shareholders so that they try to focus on the improvement and promotion of their places and the reduction of their distances with first ranks.

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