Abstract of the Thesis

1. Introduction and Purpose of the Study
The research has presented the design of a method for the long-term investment management systematically. The traditional models, such as portfolio theory of Harry Markowitz (1952) which is based on two factors - risk and return - this model is suitable for getting gain from frequently movement of stock price in short period. It is limited to normal distribution also linear model, these limitations are not problem for short term perspective but they make problems for long term investment requirements. Unfortunately, long term hold stock management has not been studied in detail generally.

The fundamental approach analysis which is suitable for long term attitude has not any model to determine vacuum of the entry to stocks or exit of them, it can determine yes or no without determination of quantity of shares according deserve of share no distribution of its budget. This research is an attempt to fill out the vacuum in the methodology of long term investment management; it is based on sub-multi criteria decision making methodology. This approach is reasonable for the factors in a large dynamic system like the stock market that is too complex.

Portfolio's performance evaluation of traditional approaches which have appeared formulates by evaluating risk and return situation for different types of investment companies; therefore not only they are not appropriate for long run investment; because both factors are short term existence phenomena; but also each investment company has own special circumstances which need contingency factors for measuring performance evaluation. The researcher's aim is to find a scientific way for answering these requirements.

This research has used AHP method for explaining behavior of the long term investment companies. The study considered quality and quantity factors for long term investment

1- hold stocks more than one year.
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management by AHP model, this model could also study contingency situation of investment companies and it enabled contingent evaluation of investment performance. The study completed cycle from choosing appropriate stocks for buying and selling, allocate resource, determine strategy of investment and evaluate performance portfolio. Therefore The thesis proved that AHP not only is scientific method but also it is fit to be used for the explanation of behavior of long term investment companies.

2. Research Scopes

An investment company behavior depends on its management decision and management follows its expert’s opinions and experts’ ideas are based on their studies, methodological thinking and group investigation. Therefore, as mentioned the concept of behavior is adapted on reason school no cause school.

An investment company which was studied is Asset Management Companies that retain stocks for long term -more than one year- include holding investment company, types of Mutual Fund, Pension Fund, Bank investment etc; no broker or financial investor that has short term perspective.

Although the thesis has chosen stock market -secondary capital market- as a particular example, the model research can be also applied to the initial capital market as well.

3. The Main Problems of the Research

The main problems that have been considered are as follows:
1) Which share(s) of the market and how many entries of them will be appropriated?
2) Which share(s) of portfolio and how many exits of them will be appropriated?
3) Is it enough that considering risk and return for making portfolios then compared to beta of capital market formula for evaluating them?!
4) Is it correct that all types of investment companies are evaluated by the same criteria?
5) Can AHP method be used for providing decision making system in order to allocate appropriate portfolio for long term investment companies and evaluate its performance? If yes, how is it?

There are some sub questions that are important and this study would find the answers for them which are considered in the thesis.
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4. Research Assumptions

Some variables, assumptions and conditions of study on which the research have been done, are as following:
1) There is dynamic condition in the investment activities.
2) The stock market is an area of study.
3) For studying carefully, the variable under studying is transaction stocks and other securities are not considered.
4) Investment companies in this study are companies with huge capital base (funds) and they retain stocks for long period -more than one year- also they are usually owned by banking and insurance organizations or other large funds.

5. Research Hypotheses

The primary answers of research problems that have been appraised and have been tested thus reached by this study are these hypotheses as follows:
1) Determination of entry or exit to shares of companies is necessary for long term appropriate portfolio management system and it is possible by scientific multi criteria decision making instrument such as AHP method.
2) Each of investment companies has its own special circumstances, thus each group of them must be evaluated with their contingency factors.
3) Appraising risk and return and comparisons of such parameters like the beta is not desirable for evaluation long term performance of portfolio.
4) AHP method can provide a pattern for making appropriate portfolio management system and can answer to long term investment requirement.

6. Research Methodology

According to the character of the subject of each research, there is a specific method for each research, but all of scientific researches follow logical way.

This study is based on inductive and deductive methods. Study of many references and thinking about them were actually based on deductive method and performance appraisal of investment companies was done more by induction method. Therefore, the method of this
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research is a combination of a library study for research foundations and a survey study method is used for applying the model of research.

For example, in the survey study, questionnaires have been divided among the experts of some Iranian type investment companies. The data information which has been gathered by this way has been used in the research model. The findings of research would be empirical and refutable but they have been very strong because they have been based on scientific reasons.

The model of research is sub Multi Criteria Decision Making (MCDM); it is Analytical Hierarchy Process (AHP). It used matrix algebra to fill out squares by criteria which have been converted to numbers by the feedback from experts.

After collecting questionnaires and performed survey and asking experts, the resolutions have been provided; therefore AHP system has been made by that resolutions for decision making in portfolio management; after than, performance evaluation of types of investment companies has also been done by AHP system and conjunction with artificial neural network (ANN) model as completing and part of it.

7. Brief Background of Research Topic Relevant

Financial studies of stock decision making have been started and focused on periods which are shown as follows:

<table>
<thead>
<tr>
<th>Decade</th>
<th>Scope focus financial studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>Modern portfolio management</td>
</tr>
<tr>
<td>1960</td>
<td>CAPM and Equilibrium in a Capital Asset Market</td>
</tr>
<tr>
<td>1970</td>
<td>Rational expected application, Arbitrage and Efficient Capital Markets</td>
</tr>
<tr>
<td>1980</td>
<td>Technical view studies on estimation of prices fluctuations by econometric</td>
</tr>
<tr>
<td>1990</td>
<td>Explanation of investors behavior by according to behavioral psychology finance and neural network methods</td>
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<tr>
<td>2000</td>
<td>Econometrics models such as ARIMA, VARMA, and MGARCH models; and MCDM techniques</td>
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As is said, the modern portfolio management is suitable for short term because it is based on two factors. Behavioral psychology finance and neural network methods that are fit for long term holding stock management; unfortunately they have been used for forecasting.

2- Capital Asset Pricing Model.
3- Autoregressive Integrated Moving Average.
4- Vector Autoregressive Moving Average.
5- Multivariate generalized autoregressive conditional heteroscedastic.
price stock movement. Although the econometrics models are multivariable but could not consider quality factors.

8. Limitations of the Research
Apart from the limitation of the tool that has been used, the study was limited by some other causes and factors such as the following:
1. The results of analytical hierarchy process are based on the average ability of respondents who are investment experts in Iran capital market.
2. Some of investment companies did not fill out research questionnaire. Following up the matter, the researcher could solve problem by refer to same others but if they cooperated, the research had some more significant supporters.
3. The Iran stock market is very young, so its industrial categories have been changed every short times, so comparing periods would be faced to problem, also there is not comprehensive information; for instance, the beta of market has not been not measured yet!
4. The manager of investment companies believes that strategy planning growth is a secret company. But, the researcher has tried to consider in the second part of chapter four to fill out the AHP matrix in an oral discussion through survey method.

9. Chapter Scheme
The chapters of the thesis are organized as follows:

Chapter One: Principles and Framework of Research
After explaining problems, assumptions, hypotheses, methodology and limitation as principles of the research; the role of investment companies in the capital Market, capital market and its situation in the other markets, literature of portfolio selection including charting technique, financial Study, fundamental approach, portfolio diversification analysis and other methods of assets selection, explicates as the framework of research; the said literatures were criticized and it was proponed that AHP method can answer to the details of requirements of long term stock management. It could determine “which”, “where”, “why”, “how do and how many”, “when,” and etc. the assets must be bought, sold.
or replace from portfolio elements and out of it, according to contingency funds management; each institutional investment must answer to these questions for itself.

Chapter Two: Scientific Ontology and Scientific Use of the AHP Method

The suitable method must be able to overcome the difficulty accurately simulating the details of functioning of real world in a reasonable, it also must be scientific and fit to topic; the research model of this thesis is supported by philosophy of science which has proved that it is fit to long term work in portfolio management.

The AHP is purposeful, regulatory data, verdict elements, analysis process, assessment results, and final conclusion. The research revealed that AHP is based on some scientific methods such as Delphi method; it is used to elicit the opinion of experts. The decision making environment to which the model is applicable is democratic rather than totalitarian.

On the eve of AHP is a kind of MCDM, to inform multi criteria, consideration and utilization of multivariate certainly would be difficult and need a long time so it would have opportunity cost so the research suggested to refer Pareto principle the name of which is “20-80 rule”, it has suggested a small part of something (20%) is of greater importance or is responsible for most of the results (80%).

The research has revealed that the epistemology behind the AHP analysis are instrumentalism and realism, behaviorism, pluralism, fundamentalism, and Operationalism and also showed that there are some scientific methodological characteristics like empiricism and refutability, induction (posteriori) method, mathematical, holistic and quantum sights and so on.

Chapter Three: Explanation of the AHP Method Process

The AHP method process was explained in this chapter that brings up very contraction as followed by arrangement: making an expert’s team, getting judgments about elements of criteria questionnaire by determine marks (1-10) for ranking, make matrix pairwise comparison for each criterion and option, making matrix normalization that enables to compare some different criteria, and doing some account mathematic process which provides priority options. Finally measuring consistency is necessary that shows the
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experts' preferences were consistent or not; also it can do sensitivity analysis that measures effecting of any criterion changing on the priority.

Chapter Four: Testing of Research Model on the Case Study

The average votes of questionnaire survey about this question: which ones of criteria are most important? According to Pareto principle among 29 criteria, 8 criteria were revealed that are most important with different weights; they are as following:

1. Current price on Real price (Pt/Pr ratio)
2. Rate of expected return for future (five years)
3. Expected kind of unsystematic risk
4. Domestic demand of product for future (five years) and globalization situation (making partnership foreign Co. jointly and external demand ...)
5. Company situation compares with substitute goods producers (competitors) or monopoly situation.
6. The Condition of main inputs material preparedness.
7. Net value present of total assets (and investment)
8. Operational profit on the selling, also vertical analysis of income statement.

After determining most important criteria for choosing and holding stocks for the long term also for selling by same view and to reveal weights of them, the AHP process was done and the research proved that AHP is able to answer the significant questions in the practice; they bring up as follows:

1-Which stock(s) is (are) appropriate for buying?
2-How many stocks are appropriate for buying?
3-Which stock (s) and how many stocks are appropriate for selling?
4-How can stock(s) of portfolio be appropriately substituted by stock of the market?

Contingency strategy planning for making strategic portfolio was expounded by AHP method so it answered to this question: 5-Which investment field may be appropriate for the future (strategy of investment)? Therefore the research made a system for holding investment management and tried to complete its system by next chapter.
Chapter Five: The Completion of the Research Model System

Portfolio's requirements for international investment are also answered by AHP method. These questions have scope of international portfolio:

6- Which industrial (field) strategy is appropriate for outward investment?
7- Which company is appropriate for choosing investment abroad?
8- Which share(s) and how many shares are appropriate for selling in the foreign stock market?

The research criticized traditional views in portfolio's performance which measure it by risk and return trade off only and answer this question: 9- Is it appropriate that different types of investment companies are evaluated on the same criteria? And suggested multi-criteria in portfolio's performance and measured it by AHP with contingency idea. Therefore the system of long term stock management and evaluation of it is completed by model of research.

Chapter Six: Findings and Conclusions

Findings:
At the beginning, the study supported the model of research by philosophy of science and proved that not only it is scientific model but also it is match for long term hold assets management. Then in the main way of study, the research has solved important problems and questions, it not only determined which company is preferred for buying but also determined how many of its stocks are appropriate. Or as vice versa, it determined which company is preferred for selling and how many exit of its stocks are appropriate.

The research could determine how can choose the best way to stocks are appropriately replaced from portfolio to stock market. Also it could determine how it can allocate kind of resources such as cash, loan, replace from portfolio to stock market or mix of them.

The research model showed that it can determine strategy of investment in making portfolio. Also it analyzed external investment and it determined how to choose best option in outward.

6- As quoted in “reward to volatility ratio” by Treynor, as quoted in “reward to variability ratio” by Sharpe also as quoted in “differential return measure” by Jensen and etc.
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The research revealed that the evaluation of different types of investment company must be different not only short term performance was based on different grounds than long term but also there are different types of the long term investment that include: horizontal (or lateral) integration, vertical (backward) integration, both by different fields and conglomerate company; therefore it proved that it is not correct that types of investment companies are evaluated on the same criteria.

Many speculators continue to make buy and sell decisions based on historical data; but the study suggested that in the AHP and ANN as a one system, the judgments about future are more important than past data. This does not mean that historical information is irrelevant; but what it means is that environmental scanning of the future will give better results about so long.

Conclusions:

According to minor and major logical findings of the research, it has been shown that there are various factors that have effect on behavior investment company which are quantity and quality factors. Therefore the scientific method for explaining behavior that must be excluding of all types' factors; otherwise it would be defective in the explanation.

The behavior investment companies are function of behavior of their experts and they don’t think on two dimensions –risk and return– for holding long run management stocks. Thus the research showed that they must refer to multi dimension which can only be understood by multi-criteria decision making.

This study has revealed scientific AHP process as a neural artificial comparing preferences system. A system for assets portfolio management by long term approach, includes choosing, selling and replacing assets, allocation resources also determining the entry and exit of shares, in addition to evaluation performance. The study propound that AHP model has some characters which enable it to do the long term portfolio management by contingency specific criteria, so the resolution of AHP is a contingency judgment.

As the supply analysis is different from the demand analysis in macroeconomic, the analysis from distribution resources of investment company (Markowitz) is different from stock market capacity (research model); two sights make different portfolio so the research
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answered its initial questions, solved problems of topic and has determined its hypotheses by different way of traditional approach.

The Main Suggestions of the Research:
The research has suggested AHP method for the choice of long term hold investment management over different fields and also stocks over different markets, and has evaluated its portfolio by multiple factors that must be contingency considered.

The researcher purposed the integration of AHP with other methods such as neural networks of artificial intelligence as a comparing part in AHP which is one of the best solutions for improving the limitations of portfolio management in long term perspective. It is clear from the model accuracy data that AHP system as a neural networks can accurately analysis assets of markets if given the proper weights upon which to comparing action.
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Figure (0.1): Conjunction of Analytical Hierarchy Process and Artificial Neural Network System as Research Model.

Input Layer

Goal: it is the choice of best stock.
Input Layer: It is criteria judgments action which it chooses criteria such as profitability, technology situation, inputs demands condition and etc, then determination their weights as input of AHP matrices process.
Hidden Layer: It is a comparing thinking that is a neural network system as artificial intelligence.
Output Layer: Alternative C is a resolution which has been chosen as appropriate stock, it is goal of system.

Therefore the research determined how portfolio of long term stocks retain should be made; an entry/exit (i.e. Buy or sell) decision can then be made on the basis of the research suggestion (AHP system).
Addenda to chapter six

10. Recommendations and Guidelines for further researches

The management that want to use AHP model or each of sub MCD methodology must be out of traditional management and refer to scientific management that its decision is based on scientific studies of experts; therefore the investment companies must absorb scientific experts.

Members of group that does consulting must be experienced and at the same level of knowledge. Management must be decentralized and pay more attention to experts’ opinions and encourage them for group participation.

Break up fence of background theories and then go to new area of software thinking and studying which are practical and scientific. Suggest to bring up other models which can consider various multi factors include quantity and quality, liner and nonlinear behavior such as artificial neural system, Elimination Et (and) Choice Translating Reality evaluation method (ELECTRE), Technique for order by similarity to ideal solution (TOPSIS), Preference Ranking Organization Method for Enrichment Evaluations-Geometrical Analysis for Interactive Aid (PROMETHEE-GAIA), and fuzzy approach with each, and after that to compare evaluation performance of application of these models. Another suggestion is, using some models and methods as instruments of AHP and joins it with some model and method as complement of analytical hierarchy process.

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7- English translation from the French original.