Chapter Six:
Findings and Conclusions

Part One:
Interpretation of Findings

Part Two:
Conclusions and Recommendations
Chapter VI: Findings and Conclusions

Part One: Explanations of Findings

6.1.1. Introduction

The research criticizes some old portfolio management models and some models of portfolio's performance evaluation which have been based on two factors; they are suitable for short term analysis. Therefore the study has endeavored to bring up a method for fundamental approach and fill up a vacuum in the portfolio management of long term holding assets.

The traditional approach to financing is inadequate to match the risk-return profile and payback periods of infrastructure portfolio. Insurances, banks and other similar institutions which have investment company are constrained by the time profile of their own liabilities. Consequently, they are limited in their capacity to finance long gestation portfolio.

The Philosophy of Science can prove that AHP method is scientific without subject application and it shows that AHP is familiar of some schools.

6.1.2. Findings Submitted

6.1.2.1. Scientific Ontology of the AHP Method

The research revealed presuppositions of ideologies that they are covered in the mind of experts but they influence on the behavior without self-apprehension. They are discovered by the philosophy of science. By the way, explanation of the epistemology behind of the AHP is necessary.
**Behaviorism**: It is known that behavior of investment companies in the capital market is function of investment exports who work at them. Companies are conducted by their human resources. In this condition, on the behaviorism opinion, analysis and explanation of behavior of investment companies is based on rational school and it is not based on causation school, they are so much different. Behavior of human or any things that are functions of human beings have a rationalization.

**Fundamentalism** they study not only economic factors of micro and macro views but also study social factors such as capacity employment, technology, return money foreign, environment problem and so forth. When the investment company studies comprehensively to decide for investing, it applied fundamental method.

**Pluralism**: Thinking by group method and try to test conclusion of ideas and use best opinion that obtains thinking experts team is consistent pluralism.

**Instrumentalism and Realism**, AHP not only has a method for recognizing phenomenon as reality itself because it has capacity comprehensive study but also it is a tool because it is practical method. So both ideologies satisfy it. When AHP is used by approaching to Pareto principle, it has a tendency to instrumentalism because of its cause AHP is converted to constrict and get a resolution fast.

**Operationalism** idea believes theories and methods must used for application. Otherwise they would be refused. AHP model is an application model so it is agreeable for Operationalism because it is not mental method; on the contrary it is application method.

The research also revealed some scientific methodological characteristics of the AHP:

**Empiricism and Refutability** each experience theorem must have an experimental reference so it would be empirical verifiability, if it will be tested and it is not refuted and it can resist, it will be accepted during of resisting temporary. The AHP is a deserved model that is experimentation and be falsifiable. Theories that are consistent with the evidence can be used to explain and/or predict phenomena, so the AHP would be consistent with the evidence, it is testable.

**Inductive and Deductive Methods** Empiricism and Refutability models or theories can be created by mental demonstration but they must have testability and they must be able to compare with evidence, consequently they can be created by deduction logical method and inductive (posteriori) logical method. Deductive is mental inference but inductive is
empirical inference. Hidden layer of AHP model which compares criteria and options by deduction method but it was filled out and will be used, both by induction method, its data is collected from experts ideas by induction method so its conclusion depends on it. It is known each reason related to mental that is depended to deduction method but it is a general subject of all methods finally need to thinking.

Mathematical Approach AHP is a mathematical method but it is not determinism, it converts quality to quantity and makes a matrix. The AHP process is a precise method, it converts text to computable. It is mathematic logical process so its result is considerable. But is not function methods and it does not explain behavior things such as human or firms determinately like material in machine and each physical or nature’s. It notes the freedom behavior of each things that depend on human behavior.

Holistic and Quantum Sights multiple attribute (criteria) methods such as AHP are quantum method study and holistic methodology because if not restricted some affection criteria and study dynamic situation. Application and influence on real world a model must study without assumption and consider many important factors.

Open Systematic and Contingency Approaches AHP is adaptable on open systematic. It is concerned how each element fits into the environment and plays its role in real world. The contingency is comprehensive studying and considering the components and strives to understand how they perform in various dynamic circumstances.

The humanistic approach management is also consistent with AHP method; because experts participate in the management decision and in making communication.

6.1.2.2. The Research Proves Scientific Use of the AHP Method

MCDM is group thinking method for making decision on which AHP is based. Group thinking has principles that are very important because of needs to pass some cultural problems.

AHP is based on Delphi approach, the objective of Delphi applications is the reliable and creative exploration of ideas or the production of suitable information for decision making, and it is used to elicit the opinion of experts.

The research showed that Pareto principle can support AHP by principal of “80/20 rule”, and answer to important criticism that tells multi-criteria consideration is very difficult and
Part I: Explanations of Findings

it is not applicable. "80/20 rule" has become ubiquitous in the many activities especially business practices. It is usually used to suggest that a small part of something is of greater importance or is responsible for most of the results.

AHP and ANN, The research makes conjunction between AHP and artificial neural network (ANN) and success to cover limitation of each other and make a strong model.

The models and methods as instrument of AHP method the experts when decide to fill out the squares of AHP they not only need to some method for convert some quality factors to computable factors, but also they need some methods or models as instrument for account and rich to accuracy index for each criterion.

This research determined the feasibility and practicality of using AHP as a scientific decision method for the institutes’ investors as the steps which bring up briefly in following form:

\[
\begin{align*}
AHP supported: \\
\text{MCDM and Delphi method,} \\
\text{Pareto Principle, Neural} \\
\text{thinking artificial system} \\
\text{support AHP} \\
\text{Some schools, science philosophies} \\
\text{and some methodologies,} \\
\text{approaches support AHP} \\
\Rightarrow \text{AHP Process is} \\
\text{scientifically created}
\end{align*}
\]

\[
\begin{align*}
AHP Process: \\
\text{AHP Decision making:} \\
\text{Neural artificial} \\
\text{Comparing preferences} \\
\text{matrices system} \\
\Rightarrow \text{Output} \\
\Rightarrow \text{Priority *} \\
\text{Guidance}
\end{align*}
\]

* Priority Guidance = “Portfolio Management and Itself Evaluated”

6.1.2.3. Making Hybrid Model

The research proposes specific methodology to aid in designing a portfolio of long term investment management over playing multiple factors in the stock market.

The microeconomics studies behavior of various firms but investments firms are absent in them, the major subject in this case is how can one make best portfolio? Some theories answer this question usually in the financial management and investment subjects introduce them such as Marqowize; But these theories determine best portfolio in short term for getting gain from frequent movement of stock price. They make decision by considering two factors –risk and return– In addition consideration of risk and return and cooperation
with beta of stock exchange market is not enough for evaluation portfolio performance which is made by long term perspective.

Many of investment companies belong to bank and insurance organization which want to keep shares for medium term – about one year – and long term – more than one year –. Therefore these theories can not explain behavior of these types of companies. This explanation needs to consider multi factors which have role to choose a share. The best model must account quantity and quality factors. These models also must be scientific and suitable on its subject in practice. This research introduces AHP and makes it strong by joining it with ANN. The selected method must be able to overcome the difficulty accurately simulating the details of functioning of real world in a reasonable manner, the research model is based on hybrid models.

The hybrid model of the AHP can analyze exchange market without any condition of hypothesis because it relies on experts’ ideas and idea relies on open thinking, experience and studies; therefore conjunction of AHP with the ANN make a system that has no need of the efficient markets hypothesis or others, it can work in the any circumstances and for any security allocation, the research studied stock because it wanted less complexity otherwise AHP can be used for any circumstances of capital market – in or out of stock exchange – and any securities.

Many researchers have theoretically and practically determined how to make optimum portfolio on sample complexity for short run. Formulas based on risk and return trade off have been presented. However, little is known on how these formulas perform and compare with each other in practice. To our knowledge, controlled experimental results using these formulas, and comparing of their behavior, have not so far been presented. Moreover the long term view in portfolio management appeals many criteria consideration including quality and quantity; this view has not been studied yet well, this research is a contribution to filling up this gap, explanation of a circle system providing portfolio and evaluated performance for holding.

The technical analysis uses only historical data (past prices, volume of trading, volatility, etc.) to determine the movement in the price of some financial asset, fundamental is an appropriate approach for long term investment analysis but it has not a model decision, the model of this research fill up this vacuum. The study made a system for
long term assets portfolio management, which includes choosing, selling and replace assets, allocation resources also determining entry and exit of shares, in addition to evaluation performance.

6.1.2.4. The Main Findings of the Research

The important findings of the research bring up the list as follows:

. The research revealed presupposition ideologies that they cover in the mind of experts but they influence on the behavior without self-apprehension. They are discovered by the philosophy of science. By the way, explanation of the epistemology behind the AHP is necessary.

. The research showed that Pareto principle can support AHP by principal of “80/20 rule”, and answer an important criticism that tells multi criteria consideration is very difficult and it is not applicable. “80/20 rule” has become ubiquitous in the many activities specially business practices. It is usually used to suggest that a small part of something is of greater importance or is responsible for most of the results.

. The initial stages in process of the research model can determine most important criteria for portfolio management in the case study or each other same case by contingency view and survey method.

. The model of 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 is appropriate\(^1\) for buying; or vice versa, it determined which company is preferred for selling and how many exit of its stocks is appropriate.

. The research model showed that it can determine strategy of investment in making portfolio; it shows which investment field may be appropriate for the future according to environment scanning and study variable circumstances.

. 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

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1- The research has used “appropriate” word because there is not single way to organize assets, to making optimum, or to make best decisions about them.
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.

The AHP could also analyze external investment and it determined how to choose best option in outward and showed which country is appropriate for purposing investment. It showed which share(s) and how many shares are appropriate for buying or selling in the foreign stock market; and also determined how the investment experts can evaluate contingency international portfolio's performance.

The research could determine by which method shares can be appropriately substituted from portfolio to stock market or vice versa. Also it could determine how it can allocate kind of resources such as cash, loan, and replacement from portfolio to stock market or mix of them. It could determine which way can shares be appropriately replaced from portfolio to domestic or external stock market? (budget, take a loan, replace shares (selling and buying), combine three ways, combine budget and replacing, combine loan and replacing, combine budget and loan, and etc.

Many speculators continue to make buy and sell decisions based on historical data; but AHP suggests that 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.

The research made conjunction between AHP and artificial neural network (ANN) and brought success to cover limitation of each other and make a strong model for long term perspective of portfolio management.
Chapter Six:
Findings and Conclusions

Part Two:
Interpretations of Conclusions

6.2.1. Introduction

The research presents the design of a method for assets portfolio management which is based on long term approach systematically. The research answered the important questions that have not been solved yet. 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 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 assets portfolio management. They refer to multi dimension which can only be understood by multi-criteria decision making. According to chapters two and three, the model of research is scientific and suitable for the topic of research and it is applicable model.

With regard to making the long term portfolio, many factors have role, therefore for evaluating it must also be considered; and it is reasonable that each type of investment companies would be tested by contingency specific items. The model of research has some features which enable it to evaluate the long term portfolio by contingency specific criteria so the resolution of the hybrid model of research is a contingency judgment.

As the supply analysis is different from the demand analysis in macroeconomics, the analysis from distribution resources of investment company (Markowitz) is different from
Part II: Interpretation of Conclusions

stock market capacity (research model); two attitudes of methods make different portfolio so the research answered its initial questions, solved problems of topic and has determined its hypotheses by different way of traditional approach.

Making decisions of many speculators based on historical data; but AHP is a method that can cover data about future, independent of background. It does not mean that AHP is irrelative of historical information but it means that it also can get judgments about future by environmental scanning and recognize opportunities and threats.

6.2.2. Conclusions

This study reveals 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 AHP model has some characteristics which enable it to do the long term portfolio management by contingency specific criteria, so the resolution of AHP is a contingency judgment.

It is known that risk and return naturally are short term exist so they are suitable for short term analysis and decision making; but in long term condition any things is changeable therefore the research suggests ANN systems as artificial thinking in comparing stage of AHP for analysis of long period holding stock management.

Conjunction of AHP and ANN make a method which breaks down complex decisions involving multiple issues to provide a better analyzing of the main factors guiding the decision. It is useful when deciding between largely different types of considerations. In addition, it provides a logical structure for analyzing complex weighting issues in capital market.

The stages of process are brought up as follows briefly:
Definition problems and goals => choose methodology => data collection => data analysis of artificial intelligence => conclusion and contemporary decision => produce to other experts, criticisms and reconciliation => final resolution and execution => evaluation => feedback.

And by another form also can briefly show as under:
Chapter VI: Finding and Conclusions

<table>
<thead>
<tr>
<th>INPUT</th>
<th>PROCEDURE</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information (Data)</td>
<td>Modeling process = calculation and comparing each other as neural system (Data analysis)</td>
<td>Recommendation (Result)</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>Exploitation</td>
</tr>
</tbody>
</table>

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

The research proposed new methodology for building portfolios; it has evidently proved to be effective on real data of companies in stock market. It is tried to adding up it here. Before the age of computers, investment managers traded stocks and other securities on intuition. As the level of investing and trading securities grew, the proficient investors searched for tools and methods that would increase their gains while best situation; also from the beginning of time, it has been managers’ common goal to make their management easier, on time and appropriate for subject. Therefore the thesis has suggested a method for the said in the stock investment decision. It is a combination of AHP and artificial neural network (ANN). It was applied to the making appropriate of a system for the allocating assets among the stocks of the Iran’s stock exchange.

The study introduced a part of AHP which is in hidden layer. This part works same on artificial neural network system of intelligence which do compare preferences to each other temporarily. It displays a method for incorporating and processing analysis qualitative and quantities input and have the additional advantage of formalizing machine thinking by comparing preferences with regard to criteria, hidden layer of AHP as neural network aspires to imitate human intelligence in its totality. It resembles the brain in two respects. Knowledge is acquired by the network through a thinking process and interneuron connection strengths known as synaptic weights are used to store the knowledge.

The stock market conditions are changed in a nonlinear pattern by in and out market factors that neural networks of AHP are more appropriate to model these changes. The advantage of using a nonlinear approach is to model the financial system more accurately than linear techniques. Merge neural network as a hidden layer of AHP is a technology that improves AHP performance on a particular task for decision making in choosing best stock, it is the research idea. The feed forward neural network is used for nonlinear
Part II: Interpretation of Conclusions

transformations (mapping) of a multidimensional input variable.\(^1\) Most of feed forward neural networks are organized in layers; Input layer $\Rightarrow$ Hidden layer $\Rightarrow$ Output layer.

The activation function used in the hidden layer was sigmoid. The neural system in hidden layer mechanism of AHP must rate each company as a company which may be safe and profitable investment by comparing criteria for each. A hidden layer only needs to be given data related to the goal. The data might consist of some important economic variables criteria, the accuracy of them exactly can make more efficiently and improve decision-making.

According to tables (4.1.1) and (4.1.2), and also figure (4.1.2) in chapter four which is about hierarchal weights criteria value in the case study, the main result of research that introduces a heuristic hybrid model as a scientific instrument for long term hold assets management that is a contingency analyzing dynamical method. it has comparing thinking algorithm which is shown by a constructing networks system whose complexity in terms of relevant criteria of mentioned assets management; it is observed in these experiments as indicated in figure (6.2.1).

\(^1\) In theory, any input-output mapping should be possible if neural network has enough neurons in hidden layers (size of output layer is set by the number of outputs required).
Figure (6.2.1): The Hidden Layer(s) of the Analytical Hierarchy Process as Artificial Intelligence System.

Choosing the appropriate stock of company as goal

Output Layer


Artificial neural network system in the second hidden layer of AHP

Bourse Criteria  Finance Criteria  Operational Criteria  Economic Criteria

Artificial neural network system in the first hidden layer of AHP

1  2  3  4  5  6  7  8

Input Layer

1, 2…8: sub-criteria that need to be determined their weights as the data input of AHP matrices process.

First and second layers are comparing action thinking as the artificial neural network of man-made intelligent system.

The alternatives are phenomena that are given as the first input of AHP matrices process.

Many mutual funds are now picked using new method and idea for their portfolio management with respect to real world conditions and capable to count real important effective factors dynamically. The hybrid method –AHP and NN– is appropriate candidate of financial analysis in capital market in particular for long term view in portfolio management. Neural network training is an art which is often used in the decision making
process. Neural network as artificial intelligence method has become very important in analyzing stock market,\(^1\) and making hold long period portfolio decision.

Artificial neural networks are used in conjunction with AHP as an analysis system that qualitative comparative analysis of methodology can be efficiently used in stock markets. It applications give valuable support to making investment decisions, the researcher emphasized the integration of AHP with other methods such as artificial neural networks of intelligence as one of the best solutions for improving the limitations in portfolio management.

The research shows that the "AHP" is a neural network which allows investors to obtain results similar by a heuristic choice of descriptors, but in a more rigorous, principled and reliable method. The research described a neural-network-based aid to the financial analysis of companies, which is used for portfolio management with a view to long-term investments management. The system is in actual routine use within a difficult financial work. It has specific features, especially as far as input selection is concerned.

The choice of the relevant inputs, which is a crucial step in the design and the run of the neural network making appropriate long term keep assets portfolio, according to Pareto principle and Delphi survey the inputs have been provided in ways that have been explained in filling out elements of AHP matrices. Before buying stocks from market or selling stocks from own portfolio, the experts of portfolio management perform a financial analysis of the given companies in order to assess their aim.

A preliminary analysis, and discussions among the experts, led to the conclusion that the determination effective factors include quality -that are converted to computable- and quantity which were based essentially on the ratios of the past years or on the forecast future condition. The first step of the design of the portfolio management aid is the determination of effective factors (criteria) by approach to Delphi questionnaire or other method that do refer to experts opinions. With respect to the criteria weights, the inputs would be ranked in order of pairwise comparing action into AHP process as a neural network system.

Chapter VI: Finding and Conclusions

An artificial neural network has been applied to wide various problems, resources optimization and many financial areas.¹ Such as AHP contingency testing that if there is incontinency among weights, the weights are changed to modify the incontinency term; also network system in hidden layer uses the input data set by comparing each criterion to produce its own appropriate output, if there is error term, it is reasonable that the weights are changed by logical way to reduce the error term.² Weights in artificial neurons are adjusted during a thinking procedure. Various algorithms were developed, but only a few are suitable for multi-dimension analysis.

Although neural network theory grew out of Artificial Intelligence research but they are close relative. Designing machines with cognitive ability is necessary. Although the research used excel software for illuminating process but a hidden layer in AHP as a neural network system needs a computer program which thinks in a manner similar to the human brain. The artificial neuron was developed in an effort to model the human neuron. Inputs enter the neuron and are multiplied by their respective synaptic. They are processed by an activation function. The activation function dampens or bounds the neuron's output.³

The potential use of ANNs as an instrument for anticipating stock market has been marketed at increasing levels in recent years. Published research providing a step by step explanation of input data identification through network architecture design and finally output analysis is somewhat sparse, however. Ward and Sherald (1995),⁴ Dhar and Stein (1996),⁵ mention to varying degree that ANNs have the capability to forecast financial markets. Smolensky, Mozer, and Rumelhart (1996) connected time series analysis and NN

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Part II: Interpretation of Conclusions

prediction system.\textsuperscript{1} Lowe (1994) focused on portfolio optimization and short term equity forecasting.\textsuperscript{2}

The research describes the methodology by which neural networks can be used indirectly in the middle of analytical hierarchy process to determine buy and sell points for financial commodities long term view traded on a stock exchange. It is interested in determining how the long term return achieved by some trading stocks compares with the buy or replaces stocks and hold return in long period, no one technique or method has been successful enough to consistently "beat the stock market".

The large investor searched for tools and methods that would increase their gains while minimizing their risk in terms of establishing for long period where as return and risk are short term phenomena. They know that fundamental analysis and MCDM methodology are appropriate for that but it is not detailed way; therefore the research has introduced a heuristic hybrid method in this case. Connecting AHP and ANN makes a method that is able to enter types of data and thinking nonlinear mappings between criteria and options. It is a lead on human group brains.

The ability of artificial intelligence and its neural networks to discover nonlinear relationships in input data makes them ideal hidden layer for AHP modeling; it is suitable on nonlinear dynamic systems such as the stock market. The researcher demonstrated how AHP has been used as a neural network to analyze the nonlinear dynamic of stock market and making an appropriate portfolio. The research model can adapt itself on systems that can generate complex behavior. The researcher is firmly convinced that this research model can make its tasks easy and solve such problems of research.

The ANN is sub part of AHP and it is inherent of the AHP in research mind. The researcher has presented the design of a system assessing of the long term Investments management. It was shown that the combination of "AHP" and "ANN" methods allows investment experts to obtain appropriate result.

\textsuperscript{1} Smolensky P., Mozer M. C., and Rumelhart David E., (1996), "Mathematical Perspectives on Neural Networks", Lawrence Erlbaum Associates, Mahwah, New Jersey.

Chapter VI: Finding and Conclusions

The research made a bridge between gap from a multi-criteria decision making—which is based on group thinking—and artificial neural network perspective which is based on nature system thinking. Therefore, the thesis improved both methods. Of course the main method of research was AHP but the comparing process of AHP was connected to artificial intelligent system or neural network method as an additional mechanism into a part of AHP that will allow experts to handle possibility of the improvement used for portfolio management approach in terms of dynamic adaptation.

Hence, AHP methodology has been developed by neural network for finding out the best candidate stock alternative from a set of candidate stocks. AHP application of research selected best possible stocks alternative from a group of candidate. The appropriate results have been gotten by the pair-wise comparison neural network of AHP matrices step which compared some interested factors of experts’ idea of investment companies in Iran’s capital market.\(^1\) Therefore the study could solve fifth problem of research and also the third and the fourth hypotheses of research have been approved.

The research demonstrates the results of AHP and ANN as hybrid approach to optimization holding stock management is a fair combination method that has been proposed. It improved performance of AHP and ANN. It introduced the improving AHP and has shown utilization facilities provided by combination with ANN for the inward stock investment, foreign exchange trading, financial strategic planning and etc. Notable improvements in ANN design and the application of AHP method are demonstrated by the examination of several example systems. The results of the AHP model would be as precise as data input of it.

According to many authors, ANN methodology underestimates the design of ANN architecture (topology), and methods of testing, evaluating and implementing the ANN;\(^2\) there is an idea that has said ANN has not work in stock market well but it is notable here that ANN is an art and it can be designed by so many algorithm and the structure which

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1- The factors were both cardinal and ordinal factors.
limited them can be adapted on real world of subject;¹ such as technical (chart) analyses that can be made by so many architecture but for each condition of moving stock, only limited of them are appropriate in short period. However, none of charts formations analysis has proved to be the consistently correct tool for the long period analysis.

The model of research has been analyzed better than traditional methods with less error for long hold stock in portfolio. AHP and ANN architecture as a unit model has revealed the appropriate performance with the ultimate goal of bettering its returns. Its applications give valuable support to making investment decisions, but do not specify the amount of expected price and expected profit. However, there is no "recipe" that matches certain methodologies with certain problems without certain efficient criteria and given justice weight to them; but ANN can be efficiently used in the AHP with robust criteria and weight of them.

Therefore, hybrid method of AHP and ANN is efficiency methods in the area of stock market and it is one of the best solutions for improving the limitations. Since the types of ANN are relatively robust methods and still not adequately examined, they open up many possibilities for combining their methods with new technologies, this research suggests an appropriate kind of them. Then the researcher 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). It is rooted in economic theory, management and organizational theories; also it is based on mathematical, philosophical, and empirical methodologies.

The researcher determined how portfolio of long term stocks retain should be made. In addition, the study answered its questions and solved problems of the research and determined that the hypotheses of research are accurate statements. Conjunction AHP and ANN environment inspires innovative ways of thinking experts of investment company about making the best way to solve problems and catch organization goals in the capital market.

6.2.3. Suggestions and Recommendations

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 purposes the integration of AHP with other methods such as neural networks of artificial intelligence as one of the best solutions for improving the limitations in portfolio management. It is clear from the model accuracy data that AHP system as a neural networks can accurately analyze assets of markets if given the proper weights upon which to compare action.

The recognition of intellectual property as an intellectual asset is paramount to choose strategic planning so it depends on quality of experts. Moving price of company not only is function frequently of market but also is function of experts’ decision managing such as the ship on frequency of the sea and captain.

Strategic dynamic planning needs strategic dynamic thinking. To establish a culture of innovation among experts is an important criterion. Making best portfolio of shares need best portfolio of experts thinking for long-term. Analogizing once again to other business investments, diversification is essential to the long-term value of an intellectual property portfolio. The best dynamic shares portfolio is made by best dynamic strategy planning and it is made by best portfolio of dynamic strategic thinking because cause and effect are familiar and have mutual relationship.

The management that wants 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.

Experts as well as managers of companies need ways of performing affairs therefore they must have freedom to show good ideas; but there is a wrong custom that sometimes experts
want to act upon it, before they think on it; the investment companies must make a MCDM environment.

6.2.4. Guidelines for Further Researches

The researcher’s endeavor is to break up the barriers of background theories and go through to new avenues in new areas and look for models which are practical and scientific. It is suggested to bring forward other models which can be considered as various multi-factor include quantity and quality, liner and nonlinear behavior such as artificial neural system, Elimination Et (and) Choice Translating Reality evaluation method (ELECTRE), Techniques 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, to use some models and methods as instruments of AHP and join it with some models and methods as complement of analytical hierarchy process. Since AHP is a relatively new method and still not adequately examined in the stock exchange market, they open up many possibilities for combining this method with others so as to cover its limitations.

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2- English translation from the French original.