Chapter One:
Principles and Framework of Research

Part One:
Research Principles:

Part Two:
Research Framework
Chapter I: Principles and Framework of Research

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Principles and Framework of Research

Part One:
Research Principles

1.1.1. Introduction

After general crisis in capital market of the U.S.A (1987) and its effect on the others, the common school of thought led to a sort of anarchism and chaos of ideas. Despite Statisticians, Mathematicians and Physicists, this school of anarchism believed in the unpredictability of capital market variables, therefore it can not predict regular behavior of investors.\footnote{1}{See: Refenes A., Zapranis A., Francis G. (1994), “Stock Performance Modeling Using Neural Networks, A Comparative Study with Regression Models”, Neural Networks, v.7, N.2, pp. 374-388.} This approach believed that stock price behavior was complicated and non linear\footnote{2}{Granger C. W. J., (1991) “Forecasting Stock Market Prices: Lessons for Forecasters”, Working paper, Department of Economics, University of California, San Diago.} and as a result made dominant the anarchistic, and anticipating stock market prices as foundation of investment behavior because the stock price has the function of earning of stock and investment is performed for earning. Some of supporters of this view are neural system theories, psychology and behavioral finance, non linear of econometric models and etc.

On the other hand the traditional models like the portfolio theory of Harry Markowitz (1952) not only is based on two factors –risk and return– and it is limited to normal distribution and also linear model, which are suitable for short term but also they can not perfect cycle investment and give answer to long term investment requirements. The investment decisions have become more complex; unfortunately, long term stock
Part I: Research Principles

management has been neglected in practice, education, literature and research. Regarding to game theory; not only institutional investors have to protect themselves from possible dynamic difficulties in the stock market but also have to go first through the capital market and pass from other investment groups to absorb best opportunity by comprehensive factors study dynamically.

This research fills out vacuum of studying in long term investment; it is based on sub-multi criteria decision making methodology, it is called Analytical Hierarchy Process (AHP) method. This research is going to find its new usage. The AHP method is general model for decision making, thus it would be contained in decision making for playing in the stock exchange and after that, it will be tested in the Iran stock market.

The AHP explains decision making system for any management in different fields. It is used in both individual and group decision-making by business, industry, governments and is particularly applicable to complex large-scale and multi-criteria decision problems.

This research decides to use AHP method in capital market for explaining behavior of the investment companies, so this research will strive for completing cycle from choosing appropriate shares for buying and selling, allocate resource, determine strategy of investment and evaluate performance portfolio. The thesis proves that AHP not only is scientific method but also is fit to use for explanation of behavior investment.

Behavior of production and trade firms have been explained by microeconomics studies in the goods and production resources markets but behavior of investment firms in capital market has been neglected. A body of research has developed, exploring investment professionals’ decisions to buy, sell securities and evaluated assets portfolio performance and other ring of chain cycle investment would be made by such a new comprehensive approach research.

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Chapter I: Principles and Framework of Research

1.1.2. Definition Terminology and Research Scope

The adaptation of some categories of words no need to definition such as usual physical things like window, pen and etc but theoretical words are different, they adapt on theoretical areas which are some times changed and they have got different meaning by others. Hence the meaning areas of the main words of research are determined here, it is needed for same understanding between researcher and addressers; therefore they are explained by arrangement of the title.

1.1.2.1. Behavior

There are many scientific researchers who follow science philosophers that believe they can explain human behavior such as bodies, substance and flora which have not wisdom or such as animal that live by instinct. They explain that human beings are influenced by the power of their instinct which is a personal interest (benefit) so their behavior can be explained with regard to this motivation.

But in contrast there are other ideas that believe human behavior is different from them because human beings have reasonable and free actions. They expound those multiple factor affecting the decision making special qualities and motivation items. This research is based on the behavioral finance view which explicates that investor behavior is functioning of reasonable, free and also flexible and adaptation of variable market conditions. Therefore this researcher believes that an investment company depends on its management decision and management follows its experts’ opinions and experts’ ideas are

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1- See: Robbins L., (1935), “The Nature and Significance of Economic Science”, 2nd Ed., Macmillan. Also see the other references that would be introduced in the next chapter for explain “behaviorism”.


Part I: Research Principles

formed on the basis of their studies, group investigation, advice together (common reason) and thinking methodology:
Investment company behavior $f$ (management) $\Rightarrow$ management $f$ (expert's opinions) $\Rightarrow$ expert's opinions $f$ (studies and thinking methodologically).

The behavior of investment company is shown by portfolio management; in traditional view, One of the main tasks of portfolio managers is to achieve the best possible trade-off between risk and return, it is suitable for short period; but Portfolio management is also needed for long term. Moreover, the appropriate behavior would be performed by appropriate skill, portfolio management is a dynamic decision process, whereby in this process, new options are evaluated, selected and prioritized; existing options may be accelerated, also resources are allocated and re-allocated to active options. The portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple factors considerations, the appropriate behavior depends on decision-makers.  

There are many problems which make it perhaps the most challenging decision-making faced by the modern investment options: First, portfolio management deals with future events and opportunities; there are uncertain conditions. Second, the investment environment is very dynamic, the status and prospects for stock options in the portfolio are ever changing, as new information becomes available. Also, stocks to be allocated, supply stock are limited: a decision to fund one stock may mean that must be taken away from another investor, it means that there are real game and etc; therefore the behavior investment company in capital market is complex, it must be considered by experts who must study multi exist criteria.

1.1.2.2. Investment Company

Investment Company is a private or public (limited or unlimited) company that invests the funds provided by shareholders in a diversified portfolio of securities. It makes its profits from the income and capital gains provided by these securities. The investments made are usually restricted to securities quoted on a stock exchange, but some will invest in unquoted companies.\(^1\) It gives benefit of diversification without the enormous transaction cost usually associated with it.\(^2\)

Asset Management Companies the management of the financial assets of a company in order to maximize the return on the investments, an investment service offered by some financial institutions for wealthy customers.\(^3\) There are some types of this as following:

Investment Banking or similar organizations such as insurance that mainly raise money for investing in securities. It is synonymous with the financial conglomerates which conduct a full range of investment related activities from advising clients on securities issues, acquisitions and disposals of businesses.\(^4\)

Pension Fund\(^5\) is among the biggest investors on the stock market, but they have traditionally kept a low profile in the affairs of the companies that they own. That may be changing.\(^6\) The insurance sector has been an important source of long-term funds however, the insurance companies or organization, particularly in life insurance, apart from covering risk are also committed to repayment of the principal with interest although with long maturities and thereby tend to act as investment funds.

Mutual Fund is investment products that operate on the principle of strength in numbers. They collect money from a large group of investors. Pool it together and invest it

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3- A Dictionary of Finance and Banking, Ibid. p. 17.
4- Pocket Investor -Dictionary-, (2001), Philip Ryland, p. 128.
5- A fund set up by a company or other organization to manage the savings of employees, and so on, and to pay the pension benefits to which those savings entitle them.
6- They played a big role in a number of recent cases where top management was removed, or its decisions reversed. However, they have not yet sought what some think is their rightful place on the boards of major corporations. Pocket Finance -Dictionary-, (1994),Ibid, p.148
in various securities, in line with their objectives. They are an alternative to investing directly. A more convenient alternative, yet no less rewarding. There are two types of this:

**Mutual Fund an Open-end** investment trust that continually issues new shares as it receives new capital and redeems the shares of owners who want to sell. The capital is invested in stocks and shares by the fund’s managers.

**Mutual Fund a Closed-end** a fund set up by an investment company that issues a fixed number of shares to its investors. It is a type of scheme with a fixed tenure, as opposed to the conventional no tenure open-ended schemes.

**Unit Trust** is a type of investment company which is an unmanaged portfolio of assets, usually bonds, often with a fixed life in that units of money are sold. The assets generally remain unchanged. Although redemption of units is possible, it is more likely that the trust’s sponsors will arrange a secondary market in units to avoid liquidating too much of the trust’s portfolio.

**Financial Investment** the purchase of assets, such as securities, works of art, bank and building-society deposits, etc., with a primary view to their financial return, either as income or capital gain. This form of financial investment represents a means of saving. The level of financial investment in an economy will be related to such factors as the rate of interest, the extent to which investments are likely to prove profitable, and the general climate of business confidence.

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2- Stock and bond mutual funds can be classified into various categories such as growth funds, balanced funds, income funds, government bond funds, junk bond funds and international funds.
4- A Dictionary of Finance and Banking, Ibid. p.66.
5- It is not as popular as the open-ends. Unlike the open-end funds, closed-end funds can not sell more shares after the initial public offering.
6- In the UK, a unit trust is the generic name for a mutual fund; but in the US, a unit trust –its full name is unit investment trust- is an unmanaged portfolio of assets.
8- Dictionary of Finance and Banking, Ibid, p.185.
Holding Investment Company a company in a group that holds shares in other companies. The combination of two or more companies under the same control for their mutual benefit, by reducing competition, saving costs by reducing overheads, capturing a larger market share, pooling technical or financial resources, cooperating on research and development, etc. There are some types of integration companies as follows:

Conglomerate Company a diverse group of companies which managed by holding company however, one of the main advantages of a conglomerate is that the risk is spread over a number of companies operating in different markets. Therefore, if one company is performing poorly it can be counterbalanced by others, which support the overall performance of the group.

Horizontal (or Lateral) Integration the businesses carry out the same stage in the production process or produce similar products or services; they are therefore competitors. In a monopoly, horizontal integration is complete, while in an oligopoly there is considerable horizontal integration.

Vertical (Backward) Integration a company obtains control of its suppliers or of the concerns that buy its products or services (forward integration).

An Asset Management Companies which retains stocks for long term -more than one year- include holding investment company, Mutual Fund, Pension Fund, Bank investment and etc, are this research’s addresser. Although they need to regulate for long-term fund sources and formulate prudential norms for such financing. To begin with, participation of pension and insurance funds also bank funds etc. can be investment appraised by their financial experts as agent of equity. These funds could also be allowed to deposit in another investment companies or mutual funds for long periods as their branch or separation for cooperation to a goal or decrease risk because when the scale increases more the marginal gain may decrease; it is function of management ability and its investment experts ability.

1- Ibid, p. 166.
3- Ibid, p. 75.
4- Ibid, p. 179.
5- Ibid.
1.1.2.3. Capital Market

The market, or realistically, the group of interrelated markets, in which capital in financial (i.e. Monetary) form is lent and borrowed or raised, on varying terms, and for varying periods. These vary from the ultra-short to long or, as in the case of Equities, non-specified periods. There are strong forces causing conditions in one set of financial markets to affect others, notably the propensity of some lenders or borrowers to switch between them as opportunities for cheaper borrowing or higher returns open up.¹

A market capital is raised by economic sectors of society such as industry, commerce and etc. government also inward and outward authorities. The money comes from private investors, insurance companies, pension funds, and banks and is usually arranged by issuing houses and merchant banks.² If an investor creates a company by providing land, facture and etc., it works in initial or primary capital market in which a new issue of securities are launched and are traded for the first time; but if the investor buys shares of companies from other shareholders, it works in secondary capital market³ and if the shares which investor has bought, these shares were exhibited in stock market; it works in stock exchange market.

Stock exchange market is an institution where stocks and shares are traded; this action is controlled by the laws of supply and demand for the sale and purchase of securities. The economic significance of a stock market results from the increased marketability resulting from a stock exchange share quotation, it can be figurative market and perform to deal by network electronic and internet system as an information communication technology market; so has no necessity physical place. For making easy explanation, the research chooses stock exchange market as purpose of analyses but some time for showing unlimited its analyses the researcher explains its subject in capital market as all. The model of research and its finding will be applied for all affiliation of capital market.


³ Secondary market comprises the buyers and sellers of shares and debentures subsequent to the original issue.
1.1.2.3.1. Stock Market Efficiency

In the Condition of market efficiency, security prices quickly and accurately reflect all the relevant information that might affect them. It assumes that stock market is sufficiently big and liquid that neither single or oligopoly investors also nor single or oligopoly companies' shares which are traded in the stock market can influence prices and in which information moves rapidly and also, in effect, at no cost. The efficient market hypotheses have three sub-hypotheses.

. Weakly efficient: stock prices reflect all information found in the record of past prices and volumes, therefore, an investor cannot come to the market by studying historical prices.

. Semi-strongly efficient: prices reflect all relevant public information. This means that an investor could not enter the market by studying.

. Strongly efficient: the market cannot be beaten by using all relevant public information and also all private information.

Evidence has shown that professional money managers have not on the average been able to beat the market.\(^1\) If investors are economical and competitive, price changes are limited, so it would be random walk investing.\(^2\) Efficiency means that the connection between unreflected information and prices is too subtle and tenuous to be easily or costly detected. The efficient market hypothesis merely implies that prices impound all available information.\(^3\)

There is stock market efficiency because portfolio managers are performing in a competitive setting which is convenient and justly work. But unless prices fluctuate, they would not reflect fair and just value; since the future is uncertain, the market is continually surprised that these conditions make reasonability investment play in efficiency stock exchange.

Such as competitive goods market stock is as commodity in stock market; substitute elastic, complementary elastic, across elastic, etc also can be analyzed. Instance some different cement shares of companies which are member unit industry if the companies

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\(^2\) Therefore randomness and irrationality (non economically) are two different matters.

have near quality technology and management E/P would be same or very near so they are substituted in contrast with building companies would be complementary related and etc. also the analysts can measure other sensitive action; for example, if a company which is sub to another company its price stock is increased by any shock, the price of mother company in proportion to its share in to that company also may increase by referring to excessive demand.

1.1.2. The Foundations of Research

Each scientific research is raised on some basic thinking for solving problem(s) and answer(s) to some basic question(s), also the researcher for doing scientific study must make appropriate theoretic condition therefore they are introduced to addressers of research.

Researchers perform their study by regarding to their experience, previous studies, and tend to an idea; in addition to the philosophy of research which is behind of study is not sub-science but it is necessary for each scientific study, without ideology the researcher can not know what are research’s problems, assumptions and hypotheses.¹ The power scientific conclusion of each study must reasonably resist against its scientific criticisms.

1.1.2.1. Research Problems

The study to recognize for choosing shares in portfolio so far have been some of them more theoretical (subjective) and inapplicability also, others were applicable that considered quantity factors and have not included quality factors; they are suitable for short period investment. Some of former models were not contingency view, so they were not to be contingently evaluated. This research uses AHP method in capital market activities to fill out these vacuums. AHP model considers quality and quantity factors for long term investing and financial planning, also it can study contingency situation of investment companies and can attempt contingency evaluated investment performance. The main problems that will be tried to consider are as follows:

1) Which share(s) of the market and how many entries of them will be appropriated?

Chapter I: Principles and Framework of Research

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 evaluated its performance? If yes, how is it?

There are some sub questions that are important and this study would find the answers for them as follows:
1-Which criteria are most important for portfolio management in the case study?
2-Which share(s) is (are) appropriate for buying?
3-How many shares are appropriate for buying?
4-Which share(s) and how many shares are appropriate for selling?
5-How can stock(s) of portfolio be appropriately substituted by stock of the market?
6-Which investment field (strategy) may be appropriate for the future?
7-Which country is appropriate for purposing investment?!
8-How can the investment experts evaluate contingency international portfolio’s Performance?

1.1.2.2. Research Assumptions

Although this research and its result could be a general-purpose, it has globalization performance but the part induction of each case study is relevant to its place. It is important because the markets in moving to develop have not basic prerequisites.

Some important variables, assumptions and conditions of study on which the research would be done, are as follows:

2- the questions which were brought up also they can bring up for outward investment consideration:
. Which company is appropriate for choosing investment in abroad?
. Which share(s) and how many shares are appropriate for selling in the foreign stock market?
. Which way can shares be appropriately replaced from portfolio to international stock market? (budget, take a loan, replace share (selling and buying), combine three ways, combine budget and replacing, combine loan and replacing, combine budget and loan, which one?)
1) There is dynamic condition in the investment activities.¹
2) The stock market is the area of studying which was defined before.
3) For the careful studying, 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 power backed funds.

1.1.2.3. Research Hypotheses

The primary replies of research problems that would be appraised and would be tasted thus may be reached by this study are these hypotheses as follows:
1) Each of investment companies has special situation and commission, thus each of groups of them must be evaluated with their contingency factors.
2) Appraising risk and return and are compared with beta of capital market for evaluation performance of portfolio is not deserved.
3) 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.
4) AHP method can provide a pattern for making appropriate portfolio management system and can answer to long term investment requirement.²

1.1.2.4. The Scientific Way of Research

For moving from the starting research to destination research there is a suitable scientific way; it is included methodology consideration, appraisal model and resources study. They are introduced as follows:

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¹- There is a dynamic relation among labor, commodity, money and capital markets. Even if the market is not transparent, necessary information could be gathered by negotiation and etc. Also International investment is possible.

²- The sub questions which were brought up following of main research problems are long term investment requirement; they also can convert to sub hypotheses which are relinquished here.
Chapter I: Principles and Framework of Research

1.1.2.4.1. Research Methodology

According to subject characters of each research, there is a specific method for each research,¹ but all of scientific researches follow logical way.

This study is based on induction and syllogism method. But Study on portfolio management is done more by syllogism and performance appraisal of investment companies is done more by induction method. Also the method of this research is a combination of a library study for research foundations and a survey study method is used for applying foundations.²

For example, in the survey study, questionnaires would be divided in experts of some Iranian types investment companies, such as: Horizontal integration, vertical integration and conglomerate investment companies. The data information which would be gathered by this way would be used by research model.

The research method is a kind of fundamental and structural also contingency behavioral and the research is affected from quantum and pluralism views, instrumentalism and realism sights of epistemology of methodologies study. They will be introduced in the next chapter. Each finding of research would be empirical and refutable but they would be very strong because they would be based on scientific reasons.

1.1.2.4.2. Model of Research

The model of research is sub Multi Criteria Decision Making (MCDM); it is Analytical Hierarchy Process which will be introduced in the future. It is also same matrix algebra process that is filled out its squares by criteria which have been converted to numbers by asking to subject experts.

After collecting questionnaires and performed survey and asking to subject experts, the resolution would be provided; therefore AHP system will be made by that resolution for decision making in portfolio management; after than, performance evaluation of types of investment companies will also be done by AHP system.

²- It is obvious that the researcher also made many discuses among the many high-level investment experts.
Part I: Research Principles

1.1.2.4.3. The Explanation Types of Resources of Research

Some of research references are about recognizing ontology of AHP model for proofing that it is scientific model and explaining principle of its suitable performance in research case. In this line there is also a survey resource by asking the investment experts.

Other references are in sub financial management in particular portfolio management and the subjects of its relationship. Some of them would be used for supporting thesis and some of them would be referred for critiquing by thesis opinion.

There are some tributary subjects such as strategy planning and contingency management that both would be brought out for completing branch studies to obtain findings of research. The researcher will strive more to make completing system of management long term portfolio process by best thinking on observations and those resources.

1.1.3. Literature Background of Research Subject

The research wants to explain literature background of its main subject only here because there are some other subjects in research scheme which their literature backgrounds would be brought up later at each point.

1.1.3.1. What is Scope of Research Subject?

Portfolio management is the main subject of research, portfolio management is a dynamic decision process; the securities are evaluated, prioritized and selected by method which is realistic and easy to use. The portfolio manager makes balance between risk and reward and searches some profitable investment and chooses best opportunities. Each new asset is settled in portfolio by realistic analysis. The main goal of portfolio manager is to optimally allocate own investments among different assets.

Portfolio management decomposes the investment decision process in the following stages 1) Security analysis to determine the relevant criteria of the investment opportunities and dynamically analysis assets preference 2) to delineate the set of efficient basket of assets and analyze them 3) Portfolio performance evaluation, and 4) feedback, portfolio reformation and making up-to-date components.
Chapter I: Principles and Framework of Research

Portfolio traditional theories attempt to answer, in part: a) Why does investor to hold a diversified number of risky assets and how can investors make optimal diversified securities? b) What determines the proportions investors should hold in each risky asset, regarding to each level expected return of asset? c) What determines the expected equilibrium return on an individual risky security in the market? d) How can investor measure the risk premium on an asset and hence its ‘correct’ risk adjusted rate of return? Portfolio traditional theory answered to these questions by portfolio analysis quantifies how to optimally make the trade-off between risk and expected return.

But this approach is convenient for short run portfolio management, where as this research would argue important questions for long term portfolio management. Philosophy of stock management is not only to try to absorb maximum gain and risk aversion. However it may control goods market; it also may secure a special market needed so that the stockholders like to work on; also it wants to establish itself length of times.

1.1.3.2. Portfolio Management Background and Literature

There are many findings in case of portfolio management but some of them are chosen which the researcher can show for its history and growing and bring up some sub-subject that are related and family with it. In addition, as already stated some background and literature for each important subject of some research chapters would introduce later for settling of the subject chapters.

Basic Securities Analysis: Benjamin Graham and David L.Dodd in 1934 wrote a book about securities analysis. It was introduced as basic securities analysis. They explained a factor importance on choosing shares. It was ability of institutions earning in the future.

Also in the 1950s, National Association of Investors Corporation, suggested a method of investment, the title was “Stock Section Guide” It described five historical factors, Including: A-Sell & earning B-Price & earning C- performance of management D-expected risk and earning E-potential earning of investment.

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Part I: Research Principles

In addition, expected utility theory also brought up which Maker decision would decide from some risk options regarding to expected utility.¹

Portfolio Theory of Harry Markowitz (1952) is based on mean-variance and utility maximization theory. He categorized companies, introduced expected rate of return, introduced market beta and Portfolio theory to reduce systematic risk of a portfolio of equities.² Calculating expected return and standard deviation for two assets; also demonstrate that combining the two equally weighted assets into a portfolio, results in a portfolio standard deviation and coefficient of variation that is lower than the standard deviation and coefficient of variation for either of the two assets held in isolation.³ Therefore this demonstration faces a problem; randomly selected values for portfolio inputs will not always result in the most impressive portfolio outcome, so demonstration doesn’t always work well!

The optimal portfolio selection was offered by Tobin (1958) who produced the idea of the efficient portfolio; it assumed that information of stock can be held by all investors on the market.⁴ The efficient portfolio guarantees the optimal gathering of assets with assumption that there is not transactions cost, it offers the lowest exposure to risk for the highest return which is determined by the risk-free rate of return available on the market. He also explained liquidity preference as behavior towards risk. The optimal portfolio is found at the point of tangency between the efficient frontier and a utility indifference curve.

CAMP, William Sharp (1963) introduced a one-variable function to equity valuation in the form of Capital Asset Pricing Model (CAPM). This model was based on two main


assumptions. First was rational behavior of market participants (as Fama and Bernstein) and second assumption was risk-reward trade-off relationship of any equity.\footnote{1}

**Some Stock Ratios:** Asset among the several alternatives based on the Sharpe’s ratio (SR); the expected return on the relevant asset divided by the standard deviation of its return.\footnote{2} If there are two stocks, A and B. The Sharpe’s rule suggests to choose A, if SRA>SRB and choose B, if SRA<SRB, where SRA is the Sharpe’s ratio of stock A and SRB is the Sharpe’s ratio of stock B.\footnote{3}

But the traditional Sharpe’s rule cannot deal with a non-zero correlation asset with the existing portfolio. To solve this problem, Dowd proposes the following idea: instead of considering the Sharpe’s ratio applied to each stock on its own, consider a new stock position relative to the existing portfolio that the investor holds.\footnote{4} There are other ratios that have been introduced in the appendix (1) of the present research.

**NPV,** the investment experts know about net present value (NPV), it is the application of discount factors, based on a required rate of return to each year’s investment cash flow, but the difference between the present value of inflows and the present value of outflows, at a given discount rate. If the NPV is positive, the opportunity will be worth investing in, otherwise not.\footnote{5}

**Efficient Market and Random Walk;** The efficient markets hypothesis, popularly known as the Random Walk Theory,\footnote{6} In 1965, Eugene Fama and Peter Bernstein knowing

\begin{footnotes}
\footnote{2}{Sharpe W. F., (1963), “A Simplified Model for Portfolio Analysis”, Ibid, 9, pp. 277-293.}
\footnote{6}{Random walk theory argues about stock prices move, for whatever reason, without any memory of historical movements which the movements therefore follow no pattern.}
\end{footnotes}
that stock price forecasting is not possible, introduced two theories as: efficient market and random walk. They based their theories on two principal assumptions that; market participants behave rationally and they have up-to-date information. This is the proposition that current stock prices fully reflect available information about the value of the firm, therefore according to using this information there is no way to earn profits more than the market over all. As result, in an efficient market, on the average, competition will cause the full effects of new information on intrinsic values to be reflected "instantaneously" in actual prices.

**Equilibrium in a Capital Asset Market theorem** and **Rational Expected and Macroeconomic Factors Consideration**, both influenced on asset portfolio analysis methods.

**Arbitrage Theory;** Arbitrage can be defined as simultaneously buying long and selling short the similar way assets in an effort to profit from unrealistic price differentials. S.A. Ross introduced arbitrage pricing model in 1976. His model was multi variable and non-linear. Ross seeks to overcome the shortcomings of the CAMP. It was a novel and different approach to determining asset prices and the expected return on stocks, but it does not specify the number of factors nor their identity by means of statistical procedures.

**The Capital Market Line (CML)** is an attainable capital allocation line and the market portfolio is an efficient portfolio. All portfolios based on public information plot on the Security Market Line (SML). Deviations from the SML take part only if the portfolio manager has private information. Appropriate deviations indicate managerial return/risk take off skills.

Chapter I: Principles and Framework of Research

The risk premium on individual assets will be proportional to the risk premium on the market and the beta -The sensitivity of a stock's returns to fluctuations in returns on the market portfolio is known as beta (β)² of the securities-. The efficient set of risky assets can be combined with risk of less borrowing and lending. In this case, a skilled investor will choose to get the portfolio of risky assets represented by the market portfolio. Then with borrowing or lending, the investor selects a point along the CML.

Capital Structure Theories; The capital structure theories such as Grossman and Hart (1982)³, Jensen (1986)⁴, Stulz (1990)⁵, and Hart and Moore (1995)⁶ have focused the role of debt in reducing conflicts between management and stockholders. Debt increases efficiency because it prevents managers from financing unprofitable investment. Simultaneously, debt also causes to search some profitable investment and catch best asset. These theories have relied on self-interested managers to implement the appropriate financing decisions. The opportunities capital structure theories are a sub financial engineering for making best allocation of financial resources. The engineering capital structure, considers efficient of comparing financial costs and benefits opportunities of assets.

Value-at-Risk (VaR); in middle and late of 1990s, following several major financial cases, the risk management became a major focus of research and researches on “Value-at-


2- Beta is the slope of the regression line of the individual stock returns on the market portfolio returns: Ri = α + β × Rm (• Intuitively, β measures the amount of market risk in an asset relative to the risk of a well diversified portfolio. • Stocks with β > 1 are particularly sensitive to market fluctuations. • Stocks with β < 1 are not so sensitive to market fluctuations. • The average β of all stocks is 1.


Risk (VaR)” receive much interest. The Value-at-Risk Jorion (1997) and many other measures of risks such as Artzner et al. (1997), Sornette (1998), Artzner et al. (1999), Bouchaud et al. (1998), and etc, have been developed to account for the larger moves allowed by non-Gaussian distributions and non-linear correlations but they mainly allow for the assessment of down-side risks. But these contributions are still not well incorporated into the whole picture of the dynamic investment and risk management for the decision-making.

Psychology Behavioral Finance, during 1990s the trend prices, assets rewards and etc regression studies had a tendency to individual psychology behavior of stock market players. The analysis of player behavior in stock market that the analysis of investors and stock of companies both are illustrated by this approach.

Exponentially Weighted Moving Average (EWMA), Techniques and Generalized Autoregressive Conditional Heteroscedastic (GARCH) models: They are more successful at forecasting future volatility than those that do not weight the historic data.


Chapter I: Principles and Framework of Research

Comparative studies\(^1\) suggested that the EWMA and GARCH models are equally successful. However, a researcher has shown that GARCH forecasts are slower to react to changes in volatility compared to EWMA techniques.\(^2\) This would seem to imply that EWMA techniques might be preferable to GARCH models in estimating the parameters required for portfolio optimization from historical data.

Neural Network models,\(^3\) Campbell and Viceira (2002) argued that the optimal portfolio of long-term investors may be quite different from that of short-term investors. The long-horizon analysis assigns a far more important role of bonds in the optimal portfolio.\(^4\) Neural network's ability to predict future trends of Stock Market Indices was tested. Accuracy was compared against a traditional forecasting method, multiple linear regression analysis. The probability of the model's forecast being correct was calculated using conditional probabilities. While only briefly discussing neural network theory, the feasibility and practicality of using neural networks as a forecasting method for the investors has been determined.

Heuristic Optimization Techniques to Portfolio Selection; Heuristic approaches proved useful in situations where the classical optimization methods fail to work efficiently,\(^5\) also heuristic optimization techniques to portfolio selection which was called Threshold Accepting, to portfolio choice problems.\(^6\) Heuristic optimization techniques like


simulated annealing\(^1\) and genetic algorithms\(^2\) are used with increasing success in a variety of disciplines. "The reason for their success is that they are relatively easy to implement and that the cost of computing power is no longer a matter of concern"\(^3\). These methods also were provided in accordance with risk-return trade off by value at risk and expected shortfall view.

**Multi-attribute Portfolio Investment Decision Approach:** The notion to multi-attribute portfolio investment decision approach dates back to Smith suggestion but by focusing on individual no institutional investors.\(^4\) Of course, there are many models of the portfolio selection in terms of multi-criteria decision making but the most of them focus on quantity factors without doing scientific justice on other factors regarding to comprehensive scientific theories. In this way can see Arthur and Ghandforoush,\(^5\) also O’Leary,\(^6\) in addition, the applicability of multiple goal programming to the portfolio problem was recognized by this view in the \((E, \sigma^2)\) context such as Lee and Lerro\(^7\) or Lee and Chesser.\(^8\)

There are many findings and attempting to develop financial management to allocate assets in portfolio and related it as instrument such as: **Stochastic Programming.**\(^9\)

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Chapter 1: Principles and Framework of Research

Resembling Method of Average, Variance-Covariance Matrix of Return, but it is not possible to explain all literature in a research, the aim of background of literature review here is recognition mainly of its growth to show the exact situation of research among them.

From 2003 till so far, more studies have tested non linear models the same logarithm nap Arian methods, and they are also using Artificial Neural System and Econometrics models such as ARIMA, VARMA and MGARCH models. On the other hand, the experts yet tried considering quality factors, therefore they refer to some important methods in the multiple criteria decision making (MCDM), its techniques are included: ELECTRE, TOPSIS and AHP method that the due course would be introduced.

This research will use AHP method that able to explain quality and quantity factors; also, it considers non linear behavior investors and capable to considering any factors that affect shares moving and it is contingency or advisability method.

Scope of financial studies of stock decision making have been started and focused in the periods which were briefly shown by table which was presented at the page IV of abstract of the thesis.


2- Autoregressive Integrated Moving Average.

3- Vector Autoregressive Moving Average.

4- Multivariate Generalized Auto-Regressive Conditional Heteroscedastic.

5- Elimination and Choice Translation Reality English

6- Technique for Order Preference by Similarity to Ideal Solution
Chapter One:
Principles and Framework of Research

Part Two:
Research Framework

1.2.1. Purpose and Application of Research
Motivation and value of application of the study commonly are necessary to be explained. The requirements of long term hold shares management by investment companies and role of these companies in the capital market would be expounded here, also situation of capital market among the other markets would be noticed, because it illuminates the influence of large investment companies in the other markets indirectly.

1.2.1.1. Why the Researcher Chose this Topic and What is his Motivation?
The researcher was working in the largest Iranian investment companies,¹ when the manager referred a case stock for analyzing to buying or selling, the manager expected the researcher to propose an idea about it being appropriate or not? But the researcher believed that it is not enough, the volume of stock must also be determined. For instance, the researcher wanted to answer yes, it is appropriate for buying but no more than twenty percent or selling from portfolio but not at all and etc.

During working on this, the researcher faced some other important problems which were about long term investment; but traditional approach could not answer them, such as another problem that is about portfolio’s performance evaluation; traditional approaches which offer the idea by evaluating trade off risk and return; it is not appropriate for long run

¹- Social security investment company (SSIC).
Part II: Research Framework

investment. There were other problems that have come in the research problems. Then these problems are about any investment companies which hold stocks for more than one year; therefore researcher's motivation is directed towards finding way to the solution of these requirements.

Behavior of firms which produce goods or services have being explained in the microeconomics subjects. In this case, maximization profits are considered, also in this field it is tried to expound their optimization behavior in the goods markets. These firms have input and output in goods markets; they practice in kind of conditions market that is as near competition or near monopoly.

Investment companies also have input and output, they act in the capital market and practice in the kind of conditions capital market that is near efficient or inefficient as those in the goods market but as its contingency. They sell and buy shares so they need that their optimization behavior are explained.

1.2.1.2. The Long Term Investment Companies Requirements

Investment companies analyze different securities by determining the relevant criteria of the investment opportunities. It must give dynamically analysis assets preference. Its experts must also delineate the set of efficient basket of stocks; and its portfolio performance must be evaluated by contingency view because long term holding stock is different from short term also the filed of each long term investment is different therefore it is not correct that all types are compared to each another. After analyzing itself, recording to error or changing condition of investment environment, its experts must do portfolio reformation and making up-to-date components.

They must determine strategy investment and recognize which investment field may be appropriate for the future. And do dynamically seek which country is appropriate for outward investment. They also necessarily need volume determination of company shares for dealing so it must know dynamically which share(s) and how many shares are appropriate for buying or selling. In addition they want to know how to allocate resource, which option to exert as shares are appropriately replaced from portfolio to stock market; budget, take a loan, replace shares, or combine these options differently.

25
They want to play best for investing in market and do appropriate role in its environment and get opportunities fast reasonability that need a cycle system for providing these requirements; this research does its best to provide cycle system from mechanism of management portfolio securities dynamically till it is contingency evaluated performance.

1.2.1.3. The Role of Investment Companies in the Capital Market

The investment companies have large shares and important roles in capital market so explanation of behavior of these companies will help to establish and make balance in stock market.

In stock market of Iran, all investment companies which are also traded for their stock in market have about 25% of market value but the holding companies have about 13%;\(^1\) of course there are some investment companies which play in stock market but their stock aren’t traded in market, for example, Social security investment company has about 11% of market value alone; therefore both holding companies may have 25% of market value and with short run investment companies more than 40%. Also there are other companies that invest in market but they have also other activity; this research is useful for them, and all non individual (institute investment) have more than 50% market value.

When the investment companies have large share in stock market, it goes without explaining that they can control crisis and make improvement therefore determination of best way for portfolio stock management can affect to drive on boom and also to make economic equilibrium and cause to increase inflow proposal.

1.2.1.4. Capital Market and its Situation in the Other Markets

There are relationships among four main markets. They are monetary, labor, goods and capital markets. They have affiliations with one another. Investment companies would be affected on variation of capital market and other markets that are dependent on it and vice versa, so each occurring in the micro area will be able to vary macro space. It is environment and area which investment companies are working in.

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\(^1\) See: website; www.irbourse.com
When culture of saving change to growth and interest rate of bank is decreased, and NNP\(^1\) is being increased also security of macroeconomic is acceptable, the individual and institutional investment players come toward to stock market investing. Institutional investment can play proficiently and do their role very well because they have skill investment management and they have large financial scale. In the many of macroeconomic texts there are explanations of related kind of markets.

If it is started by investment and inflow input to stock market, its influence to increase capacity of capital formation, it increases capacity of employment and all increase production and national income, when productions are increased the inflation would decrease and both affect on increasing exports and working financial capital and velocity of money also would be increased and etc. this cycle is briefly illustrated as follows:

\[
\ldots \, S \uparrow \rightarrow I \uparrow \rightarrow L \uparrow \rightarrow Y \uparrow \rightarrow P^o \downarrow \rightarrow X \uparrow \rightarrow V \uparrow \rightarrow \ldots
\]

I= Investment (also K= capital formation), it belongs to capital market
L= Labor, it belongs to labor market
Y= Production (also income), it belongs to commodity market
P\(^o\)= Inflation rate, it belongs to money market
S= Saving, it also belongs to money market
X= Export, it also belongs to international market
V= Velocity of money

Behavior of helping the investment companies -which have large share in capital market- make guaranty regulation capital market that can also affect on other markets such as labor, goods and money markets and finally leads to elevate higher macroeconomic.

### 1.2.2. Literature of Portfolio Selection

There are some literatures tending to making assets portfolio which brings up as follows:

#### 1.2.2.1. Charting Technique

Charting technique was born by technical approach; it is an art of predicting future price movements of stock and other securities by looking at past price movements. Technical

\(^1\)- Net National Production.
analysts use a variety of charting techniques.\textsuperscript{1} The technical analysis has come from the image that stock prices move in trends which are fixed by the attitudes of market participators towards an analysis is to recognize trend conditions at an early stage and to maintain an investment situation until the weight of the evidence indicates that the trend has been broken; since it is based on the idea that the price is a reflection of mass the crowd psychology in action.\textsuperscript{2} Stock market data are recorded on graph trend for interest stocks and the data are scrutinized in search of repetitive patterns.

The basic mental premises of this approach are relied on some credence: a) market value of security is determined largely by the forces of interaction of supply and demand of securities. B) The factors governing the demand and supply may themselves be both rational and irrational. C) Security prices tend to move in trends that persist for an appreciable length of time, despite minor fluctuations in the market. D) Changes in the pattern or trend of security prices take place on account of changes in the demand and supply of the securities. E) Shifts in supply and demand, no matter why they occur, can be detected sooner or later in charts of market transactions. F) The future prices can be determined by the past prices of securities; therefore some chart patterns tend to repeat themselves.\textsuperscript{3}

It is assumed that market values of securities are driven by criteria which have more to do with the psychology of a market’s participants than with changes in underlying economic values. So peak of sinus trend stock prices is looked for in order to sell and lower axis -bottom- for buying. The technical analysis is to identify regularities in the time series of prices by extracting nonlinear patterns from market players’ news data. Lo and MacKinlay have shown that past prices may be performed to anticipate future rewards to

\textsuperscript{1} The most popular ones seem to be the Dow theory, bar and line charts, the point and figure chart, the moving average line, and the relative strength line. See: Francis J. C., Taylor R. W., (2004), “Investment”, Tata MaGraw-Hill Publishing, pp.200-209.


Part II: Research Framework

some degree,¹ actually technical analysts try to take granted dynamically by buying and selling stock at looking sinus form, it is fit for short term stock holding.

1.2.2.2. Financial Study

The same experts believe that firms’ environment is same at all but each firm’s situation is different from what firms’ legal reports shows it; the most insight sources of information about most firms is their own financial statements. They include the balance sheet, the income and expense statement, cash flow statement data and the report of management panel. The experts try to find the virtual financial firms’ situation by gathering information and making ratios and indices. They analyze vertical financial statements by making some specific ratios and comment on horizontal financial statements trend and analyze horizontal ratios. They are useful in assessing the financial condition of firms.

The balance sheet presents an accounting figure of all the assets of a company which are external funds, it shows liabilities and equity of stockholders or net worth also represents how the assets have been used. The income and expense statement which also is profit and loss statement represents the profits or losses from the operations of company over the accounting period. The cash flow statement shows how the financial management has performed cycle funds and making clear quality of cash touring. The report of management panel not only completes those statements but also shows the future planning which the analysts can notice to its future situation, what is the economic order of company position; is it improving or not?

The sort of financial indices as the calculation of ratios evaluate the financial performance and monitor position of company among the same field operation of others. As instance some financial ratios that are used for analyzing are; return on equity², net profit margin³, debts of long term on assets, … and check trend of them, for example past five years and estimate five future years by input financial data to econometrics also


²- Or net income on assets.

³- Net income on sales or profit on services (sales).
Chapter I: principles and Framework of Research

making some indices such as the Dupont framework for analyzing equity returns\(^1\) and growth\(^2\) and etc. They are elicited from balance sheet statement, and also profit and loss statement.

In developed countries with sophisticated capital markets such as Saudi Arabia had asked the user groups to explain their attitudes towards annual financial reports and the usage of these reports in supporting their investment decisions. Evidences showed that investors use financial annual reports in about the main way, but they rely more on information obtained directly from the companies,\(^3\) and do not consult intermediary sources of corporate information in order to make informed decisions.\(^4\) Financial analysis exposure shows real financial firm position; therefore the investors can reliably invest by opening their eyes in stocks which investors want to maintain for long term.

1.2.2.3. Fundamental Approach

A fundamental approach considers the past financial company performance, the study variables macroeconomic which are company related, and the industry to which a company belongs. Fundamental analysis also looks at some important financial and non-financial ratios to be analyzed, value based ratio analysis, discounted, economic profit and other tools to study comprehensively.\(^5\)

Fundamental analysis moves from the analysis of company data, industry conditions, and its macro environmental, in this way it uses some models and invites some methods to

\(^1\) It is: (total asset turnover) \(\times\) (financial leverage ratio) \(\times\) (net profit margin).

\(^2\) Growth rate = (retention rate which is (net income – total cash dividends) on net income) \(\times\) (return of equity); the various equivalent ways that the ROE and growth rate ratios can be accounted highlights the manner in which different financial variables can either add or minus from the growth of a common value of stock.


corporate and refer to financial statements,\(^1\) for exploring real data. Data exploring consists of the extraction of interesting novel information from real-position databases.\(^2\) The data do not belong to a specific method, instance financial statements do not belong to financial analysis method only, and the former professional experts propose a genetic programming framework for induction of both classification and generalized rules from kind of databases.\(^3\)

Fundamental approach can apply some methods as instrument such as econometrics' methods because it is an approach so it is not true that fundamentals-based models fail to explain the past adequately, or predict the future reliably.\(^4\) This approach also does technological study and considers company production capabilities and appraisal of human resources and personnel. Fundamental analysis appeals primarily to long-term investors.

### 1.2.2.4. Portfolio Diversification Analysis

The portfolio theory is reflex of investor behavior that is foundation subject of the research so it is introduced by a detailed explanation. Portfolio theory discusses how investors can choose candidate assets and optimal level of position sizes for investment, achieve the possible maximum revenue and reduce the risk to the minimum level. Portfolio analysis is related to return-variance analysis;\(^5\) so it has been known as the mean-variance or Markowitz paradigm which is widely used in applications involving short run investment portfolios.\(^6\) Mean-variance theory assumes that among portfolios with the same standard

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31
deviation, the one with the greatest expected value is the most efficient. Efficient in the sense that for a specified level of expected return, the corresponding risk is minimized; alternatively, for a given level of risk, it yields the highest expected return. Portfolio analysis showed how rational investors could build optimal portfolios under conditions of uncertainty by using statistical measures for expectation and variance of return.

The process of selecting a portfolio mostly is done into two steps. The first step starts with observation and experience and ends with beliefs about the future performances of available securities. In the second, make the relevant those beliefs with the choice of portfolio. The making portfolio is passed from two stages; the first stage is to calculate the expected return and standard deviation for two individual assets. The second stage is to demonstrate that combining the two equally weighted assets into a portfolio, results in a portfolio standard deviation and coefficient of variation that is lower than the standard deviation and coefficient of variation for either of the two assets held in isolation. Randomly selected values for portfolio inputs will not always result in the most impressive portfolio outcome. The short term portfolio mechanism can answer important questions which are brought as under.

How do investors choose securities to construct an optimal portfolio? After constructing the optimal portfolio, how can investors adjust portfolio, by acquiring for example a new stock(s) into the portfolio, dis-investing a stock(s) from the portfolio? Should investors adjust the portfolio based on risk/return? These are the practical questions facing the short run investors. They must know how to choose securities contingent on real situation in order to achieve the maximum revenue and reduce the risk to the minimum level within the


investor’s budget constraint; but view of these questions as said are appropriate for short period inherently so portfolio theory can answer these questions regarding this point. How to perform the process of selecting candidate securities for investment? Then constructing a portfolio, and monitoring its risk, would be adjusted in the portfolio. The portfolio theory mechanism is based on Markowitz’s explanation view as follows:

Risk is in variance of the returns of a stock; there are two types of risks. Market risk; it is macroeconomic risk that affects the overall stock market (each to a greater or lesser extent); also called systematic or non-diversifiable risk. Asset-specific risk; it is risk that affects an individual company or asset; it is also called unsystematic or diversifiable risk. Therefore Total risk = market risk + asset-specific risk. Asset-specific risk can be diversified. With many stocks in a portfolio, the positive and negative effects of company-specific events tend to cancel each other, and so the change in the value of the overall portfolio is relatively small. Asset-specific risk would be gone down by portfolio way because unique risks tend to cancel each other out. Market risk can not be diversified; thus the market risk cannot be reduced. Market risk affects all securities in the portfolio in the same way.

The goal of a portfolio analysis is to determine system of portfolio decisions that maximizes investor’s expected utility function or, contemporary to minimize the risk exposure under various constraints like budget constraints, investment bound constraints, and regulation restrictions.

There is an alternative approximation method for multi-period dynamic portfolio selection; it is the hybrid simulation tree model. In this model, the underlying uncertainty is explained as a simulation tree and, similar to the option tree model; different conditional decisions are allowed to be made for different portfolios of sample paths which exhibit

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1- Market risk: Market risk arises from the existence of economy-wide fluctuations that affects all businesses. Market risk explains why financial securities tend to move together, so that even well-diversified portfolios still are exposed to economy-wide shocks. Since asset-specific risk can be diversified away, the relevant risk and expected returns of a security depend on market risk.

2- Diversification: Spreading an investment across several assets to reduce some of the risk. Principle of diversification: variability of multiple assets held together less than the variability of typical stock.

similar performance characteristics. It was formulated as a large-scale linear programming problem, in which the compromise between describing the accuracy of the underlying uncertainty and making conditional decisions could be well handled within a single framework. Such a model is much more general than the conventional scenario tree model and simulation path model, and is expected to be a promising method with various applications.

### 1.2.2.5. Other Methods of Assets Selection

The other models that do selection assets mostly are as a instrument for the approaches which were introduced, for instance; Forecast behavior methods such as branches of econometrics regressions, there are many models under econometric method like exponentially weighted moving average (EWMA) and generalized autoregressive conditional heteroscedastic (GARCH) and etc. They are more successful at forecasting future volatility. Near boundless effort is expended in analyzing time series consisting of market and company metrics to predict future outcomes in order to achieve above average returns.

Multiple regression analysis is the process of finding the least squares anticipation equation, testing the adequacy of the model, and conducting tests about estimating the values of the model parameters. Regression models have been traditionally used to model the changes in the stock markets. However, these models can predict linear patterns better. The stock market returns change in a nonlinear pattern so many experts have been searching other methods such as MCDM or neural networks are more appropriate to model these changes.

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1- By adopting a fixed-quantity policy.


Part II: Research Framework

Artificial neural network is a simulation of brain’s cognitive process. Neural network originated as a model of how the human brain works. Artificial neural network methods have been being used to solve numerous micro and macro economizing problems and operations and also it has been used for some different subjects’ analysis. Input of neural network can absorb various data and function. They are as instruments for fundamental or some other investment portfolio studies; Neural network’s ability to predict future trends. This system is different from traditional forecasting method such as multiple linear regression analysis. It can also calculate conditional probabilities dynamically. It is a new methodology to aid in designing a portfolio of investment over multiple stock markets. A neural network is a computer program that design appropriate patterns.

As a technology, it improves its performance on solving complex subjects in multi factors nonlinear dynamically. It is used to predict the possible outcome for a particular task. Its process involves two phases known as the training phase and the testing phase or prediction. Simultaneous equations regression models are a kind of artificial neural networks model which can prove to be better predictors by spatial information condition in the stock market changes, the stocks changes in market are input alive and artificial its thinking system works dynamically so that its output would be contingency come out.

There are many methods as stock choice tools and portfolio selection which has been seen they are known as a method selection approach but they are instrument, the researcher brought up two of them as example however they are not under stock selection approach directly such as “Heuristic optimization techniques to portfolio selection” that can be as a


method of portfolio diversification analysis, it were introduced by part one in literature; also MCDM methods that are affiliated to fundamental approach specifically which will be introduced in the next chapter. Therefore the instrument methods of main kinds of portfolio selection are not completely introduced here; some of them are only mentioned as instance for making comprehensive explanation.

It is knows that there are more studies examining the way that various investor groups are making their investment decisions, especially in less developed countries with a moderately sophisticated capital market. But most of them have followed industrial countries pattern studies of which some more important have been introduced here and some of them which are new scientific works, there is not any internationally available information because information communication technology has been facing culture problems and other barriers yet.

1.2.3. Main Limitations, Criticisms and Evaluation of The Portfolio Management Methods:

The surveys gives evidence that individual investors depend more on media and noise of the stock exchange market,\(^1\) whereas the professional institutional investments tend more to fundamental and financial analyses and after that they also use technical chart analysis as a tool and less on portfolio analysis.\(^2\) Fundamental and financial analyses are mostly used by some groups investment companies, while the brokerage and individual investors consider them as less important but technical and regressions analyses trends are more interesting among brokers while those are less popular among all other user investment groups.\(^3\)

Fundamental and financial analyses are considered as the most important approach in the long-term, while technical analysis becomes more favorable in the short-term. Similarly, portfolio or risk and return trade off analysis earns more reputation in the short-

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1- This is an indication that factors such as noise in the market, newspapers/media and instinct/experience can drive investors to wrong decisions.


Part II: Research Framework

term, but still ranks in the last position. Many studies paid attention on professional investors in sophisticated stock markets have been revealed this adding up, such as US researchers include Frankel and Froot, Carter and Van Auken, and the UK studies: Grinyer, Russell and Walker, Taylor and Allen, Collison, Grinyer and Russell, they are from west countries and in Hong Kong and China from east, like as Lui and Mole, Wong and Cheung, and many other survey researches in the other countries.

The fundamental, technical, and diversification portfolio are used in the most of the sophisticated financial markets. Investment professionals try to perform contingency by different practices in various stock markets dynamically and regarding to their task try to use different methods for market forecasting in various time horizons. Investment holdings tend on fundamental approach for making portfolio, retain stocks and up-to-date their stock portfolio.


9 - It is known that financial analysis also is affiliated fundamental consideration.
Chapter I: principles and Framework of Research

Charting analysis believes that the future movement of price would be same historical movement, but it is not appropriate light to show future way because the condition movement way would be changed dynamically by many environmental factors also by wise human beings and human's technology.

Technical analysis has not received the same level of academic scrutiny and acceptance such as fundamental or modern portfolio analysis. Among some circles, technical analysis is known as "voodoo finance"; therefore technical analysis is not stock scientific selection, it can not explain why the selected stocks are in preference to others scientifically, it may well be an effective means for extracting useful information from market prices.

Markowitz's portfolio theory cannot be used to the dynamic investment and dis-investment problem. The Markowitz model relies on a static and closed investment problem. It cannot be applied in the dynamic setting by the existing open portfolio's assets in real world of capital market. In addition, it does not keep track of the Value-at-Risk for the portfolio; hence it not only could not solve the asset investment and risk management problem in practice but also it can not answer to long term investment requirements.

1- One of the main obstacles is the highly subjective nature of technical analysis the presence of geometric shapes in historical price charts is often in the eyes of the beholder.

2- Suppose that some candidate securities are given and a portfolio optimization has been made from this given assets portfolio. The next stage is to obtain new stock or dis-invest existing stocks dynamically to construct the appropriate investment portfolio. This is a dynamic improvement to the making appropriate short period portfolio. The risk management focuses on "Value-at-Risk (VaR)" Even some contributions such as "Value-at-Risk (VaR)" and other same approaches are still not well incorporated into the whole embodiment of the decision-making dynamic for investment and risk management. (See: Linsmeir T. J., Pearson N. D., (1996), "Risk Measurement: An Introduction to Value-at-Risk", Working Paper, University of Illinois at Urbana-Champaign. Linsmeir T. J., Pearson N. D., (2000), "Value-at-Risk", Financial Analysts Journal, 56(2), pp. 47-67).


Part II:  

**Research Framework**

The error of mean-variance estimation in the Markowitz model decreases efficiency of securities portfolio distribution. Because actual portfolio returns are not normally distributed,¹ then variance is not the appropriate risk measure for a portfolio; therefore it cannot be performed to the dynamic setting as an open investment case and can not solve disinvestment subject. Therefore Markowitz model depends on static and closed investment case.²

Markowitz and Tobin also other bilateral factors approach regarding to mean-variance problem, Imposing bilateral factors makes limitation in practice; it makes framework limitations on the criteria of the investor’s preferences. Variance as a risk measuring may miss its link with an investor’s preference; Information concerning mean variance is not always sufficient criterion for distributing of security and portfolio returns. Regarding this problem, the multi-dimensional aspects have been perceived by behavior investor analysis.³

The AHP method investigation will be used as the multi-dimensional approach to give the explanation of behavior of investor in this study.

There are other problems about dimensional methods such as using “exponentially weighted moving average”; it is not without problem, its estimation tends to complication procedure.⁴ The values of the parameter results depend on time period and the trend analyzed.⁵ However, two time-weighed return schemes are as tool to estimate future portfolio components.⁶ However, when it has been appraised in the stock market the results

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6- The first is a form of the Fisher distributed lag model* and the second the ‘half-life’ weighting scheme.** The distributed lag approach*** assigns weights to the data at time period t by the value wt = t / ΣT, where T is the number of observations over which the portfolio inputs are to be estimated and where the sum of the weights equals one.****
Chapter I: **Principles and Framework of Research**

...tend to disappointment; because optimization performance depends on estimation risk which is elicited from variance. **But the mean-variances portfolio components are unstable.** On the other hand risk measuring is elicited from historical data; it is poor indicator of future volatility, so it makes error in its estimation because the future condition would be not necessarily backward. A risk and return estimation scheme that gives greater weight to the most recent data would seem desirable therefore it is appropriate for short period time that conditions are a little variable in strong efficiency market.

By another view, supervisors of each stock market try to go toward efficient market by doing many policies but in the real world can not reach to conditions of efficient capital market perfectly; therefore any model which depends on efficient condition can not make its expected result. Portfolio management that set on considering risk and return is suitable for short term so requirements of risk/return trade off will be provided in the existing efficient market. If there is not one of assumptions or overall absent one important condition of efficient market, those theory will confront to problems because behavior of many large companies would have effect on capital market which these changes will enable to vary efficient conditions; for instance by making oligopoly, jointing as a cartel or etc. policies in play stock exchange. Therefore formal definition of Fama “Market Efficiency” that is into three categories namely, weak form, semi strong form and strong form, the last form there has most difficulty.

\[ T_h : 1 \leq 78 \]


4- Lee S. L. and Stevenson, S., (2000), Ibid.
Part II: Research Framework

The investment decision is a complex one; it has been revealed that investors are not only concerned about risk and return when buying shares since there are other parameters to take in to consideration. But it is known that many papers have been devoted to consider portfolio by making decision on study situation of risk and return.

There are multiple factors which affect on stock value so the best selection model is the model that can account multi-factors but mostly of models rely on risk and return. Some of the factors listed for example:
- Size of company affect on determining of returns.
- Comparing earning and stock price by P/E.
- Less information companies and unclear companies that give more gain.
- The effect of attention and news on the behavior of investors.
- Behavior Investor is affected by psychology of decision makers.
- Self attribution bias also is an obtrusive factor that makes error for traditional models.
- The age of investment decision maker is the effective factor of the asset allocation.

Potter introduced six criteria: dividends, rapid growth, investment for saving purposes, quick profits through trading, professional investment management, and long-term growth.

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Chapter I: principles and Framework of Research

Nagy and Obenberger provided a listing of 34 variables that influence shareholders’ perception in 500 companies, showed evidence to a mix of financial and non-financial variables.¹

There are many factors, specific quality factors also that are significantly effective factors that the researcher brings up them in the questionnaire of research.² Bilateral factors methods are imperfect for explanation long term behavior, they are used for a special investment companies which have short term anticipation and do not stand on more shares for long term. They like to get capital gain from the spiral movement of stock prices. However, there are other investment companies which have long term anticipation, they stand on more shares for long term. They need specific models, such as microeconomic texts that explain short term firm actions different than long term.

1.2.4. Relation of the AHP Method with Assets Selection Approaches

The AHP is an instrument for comprehensive portfolio management, the quality and accuracy the AHP’s contain and its results depend on how is it filled out and it is used. The AHP would answer to details of requirements of long term stock management. It can 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 these questions for itself.

The AHP is sub MCDM, all kinds of decision making are applied to choose one or more alternatives from a list of options that can solve management’s problem. According to the entity of institutional investment the aim of the MCDM algorithms is to maximize the positive consequences and minimize the negative ones.


2- See: appendix 4.
Part II: Research Framework

The AHP’s elements are needed to support by many scientific instruments, models and methods for filling out accuracy components of AHP’s matrixes therefore econometrics models, financial indices and other methods are as instrument for determining criteria and filling them out and getting analogical conclusion.

Many of the multi-dimensional aspects in portfolio selection literature consider quantity factors which are not comprehensive consideration because those can not be made computable the qualities factors so they have been omitted but they are effective factor on behavior of institutional investors. This research believes that according to task of companies, groups of investment companies must construct long term assets portfolio so they need to study multi contingency factors and they can be evaluated also by multi-criteria including quality and quantity criteria; so this research tries to introduce a way for choosing appropriate assets of portfolio and is contingency evaluated; the research shows these factors that have consistency all together by specific testing.

Fundamental approach as evidences of many studies is appropriate for long term maintenance assets of portfolio but this approach needs a model for making itself as an appropriate instrument which can obtain quality and quantity factors comprehensively. Therefore this research suggests AHP method as model. It has these characters that can answer long run investment requirements. The researcher believes that AHP as MCDM which work similar neural network system is a comparative preference mechanism that is a heuristic appropriate way for explaining the long term holding stock management by contingency. Each investment company considers the different factors from effective factors. Because each investor has a different position, condition and aim but the method and model can be one unit. The AHP would get over to explain behavior of long term investment companies according to its contingency.

1.2.5. Qualifications of the Research

Many different researches involve with, more or less, some restrictions of research, therefore this one is not an exception. Although the findings of the research are universal way for holding long term assets portfolio working which don’t depend on quality and

Chapter I:  

principles and Framework of Research

position of case study but the researcher for revealing application of AHP method in topic went through the case study. Limitations must not cause negative effect significantly on the research conclusions. In contrast, advantages of research help to support for making powerful research contents.

The research obtains reliable data analyzing. The addressers must not suffer and not be doubt, from limitations of study due to the nature of research environment such as developing Iranian administrative and stock market culture. However, utmost care is taken to obtain the objectivity in the study within the permissible restrictions.

Most researchers bring up limitations of their researches only; they may be affected by surrounding scientific society’s habits however the addressers not only need to know about limitation of study but also they need to know contrivances, factors of research as positive condition which formed the research well. Although the quality of thesis is discovered from the quality of research but any addresser likes to know who and how thesis has been provided because they want to examine or practice it, therefore they need to know limitations, assumptions and facilities of research for making the same condition again for themselves for testing findings of research or perform them. The research addressers are categorized into two segments, the investment experts who want to apply findings of research as using and others who are researchers that want to develop their own study. The findings must insist in front of criticisms and show its feasibility and reliability; the power of findings must not be failed easy and soon, they must be active when its atmosphere and topic are active in capital market conditions.

Therefore, negative qualification (limitations) and positive qualification (advantages) that have been incurred over the research can be outlined in the following:

1.2.5.1. Limitations of the Research

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 referring to same others but if they cooperated, the research had some more significant supporters.
3. The Iran stock market is very young so categories of its industries are being changed every short periods, so comparing periods would face problems also there is not comprehensive information; Instance, the beta of market has not been measured yet!

4. The management of investment companies believes that strategy planning is a secret way growth therefore part two of chapter four has been made by assumption ranking in criteria of choosing strategy but the researcher tried to provide necessary information by verbal survey asking seriously.

5. Some presuppositions and assumptions of research also some time can be counted as limitation by some researches, for instance that the research considered stock in capital market so not covering all securities is counted as limitation; however the model can be applied for all securities.

1.2.5.2. Advantages of the Research Conditions

1. According to the researcher’s experience in largest investment company in Iran, best investment experts have been chosen proficiently as respondents. They were of the same level in knowledge and experience so no need to adjust replies.

2. Regarding the researcher’s expansive experience that has been obtained in stock exchange market¹, and on other hand the research guide has very expensive studies and experience in financial and stock market in India; the elements of questionnaire have been applicability provided; it is important because some of the same type of questionnaires were theoretically provided but that is far from application in the real word.

3. Corresponding to teaching economics subjects at good university in Iran, specific research methodology, science philosophy and epistemology all in economics,² the researcher tries to do appropriate research procedure in title. In addition, the guide of

¹- The researcher passed ten years in work in industry sector in financial planning and capital market analysis.

²- The researcher was teacher for three years full time and three years part time also during of all jobs was doing research on some projects and some of these have been published in I.R. of Iran.
research also has supervised very well\textsuperscript{1} that makes assurance for research's addressers in order to rely confidently on the research's findings.

4. The research's model has a consistency testing that control accuracy components of AHP matrixes which have been elicited from replies of questionnaire respondents.

5. The experts' preferences have been converted from ordinary (computable) to cardinal (ranking) by comparing other alternatives in the AHP method, because investors' preferences are not computable inherently. The components of group alternatives ranking or bundle criteria ranking have been compared by making n.k AHP's matrix that provides multi dimension analysis on two vectors dimension. Multi-dimension analysis is a computable ranking that nearly performs in real world. But two dimension and Multi dimension quality form don't adapt on real market activity parameters.

If any investment experts want to do research model as method for perform portfolio management cycle, they must choose professional experts as panel of respondents.\textsuperscript{2}

1.2.6. Summary and Chapter conclusion

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 includes charting technique, financial Study, fundamental approach, portfolio diversification analysis and other methods of assets selection, explicates the framework of research; the said literatures are criticized and suggests AHP method that answers to details of requirements of long term stock management. It can determine "which", "where", "why", "how do and how many", "when," and etc. the assets must be bought, sold or replaced from

\textsuperscript{1} The research guide has 27 years experience in financial market specific in India, he has published more than fifty articles, research projects and books. He is a member of National Insurance Academy faculty also is a member of macro financial planning panel in Indian public sector.

\textsuperscript{2} The fourth and fifth advantages would come automatically, as they are domestic advantages of AHP model.
portfolio elements and out of it, according to contingency funds management; each institutional investment must answer to these questions for itself.

In fact, it is tried to prepare the mind of research addressers to absorb subject and introduce research opinion. The researcher has determined scope of research; it has stated its important application and role of research. Foundations of Research and research planning have been explained.