T.C. GEDİZ UNIVERSITY

MBA THESIS

THE EVALUATION OF INDIVIDUAL FINANCIAL INVESTMENTS IN TERMS OF BEHAVIORAL FINANCE: A CAPITAL MARKET ANALYSIS

Gamze ÜNAL

Thesis Supervisor: Prof. Dr. Şerif ŞİMŞEK

The Department of Management

The Code of the Department: 621.01.07

The Date of Presentation: 27.05.2013

İZMİR

2013

GEDİZ UNIVERSITY THE SCHOOL OF SOCIAL SCIENCES

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GEDİZ ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ'NE
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Enstitünüz İŞLETME (MBA) İNGİLİZCE TEZLİ Anabilim Dalı 50031201 numaralı yüksek lisans öğrencisi GAMZE ÜNAL'ın hazırlayarak enstitüye teslim ettiği **The Evaluation of Individual Financial Investments in Terms of Behavioral Finance: A Capital Market Analysis** adlı tezi, tez jüri üyeleri huzurunda ..60..(altmış)... (*) dakika ile savunulmuş ve sonuçta adayın tezi hakkında, ...oybirliği..... (**) ile .....kabul..... (***) kararı verilmiştir.

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Jüri Üyesi: Yrd. Doç. Dr. Sevin GÜRARDA

“Benim manevi mirasım, bilim ve akıldır.”

Mustafa Kemal ATATÜRK

ABSTRACT

THE EVALUATION OF INDIVIDUAL FINANCIAL INVESTMENTS IN TERMS OF BEHAVIORAL FINANCE: A CAPITAL MARKET ANALYSIS

ÜNAL, Gamze

MBA in Business Administration
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The forecast ability of stock prices has long been one of the most discussed and challenging financial phenomena in both financial and academic circles. As the issue of determining stock prices have used to be understood through depending on rational facts and data, there has remained one step to reach actual prices of stocks in the efficient market. This step was a measure of the degree to which something cannot be forecasted without instinctive factors belonging to the psychological world of human. In this thesis, it is aimed to investigate the behavior of individual investors via Behavioral Finance Theory having emerged in response to difficulties faced by the traditional paradigm and as an up to date approach to financial markets.

With this aim, it is empirically tested that main behavioral concepts such as psychological prejudices, speculative bubbles or herd behavior among individual investors living in İzmir. The difference of this study from other studies is that this issue has not been conducted in Aegean Region and of course in İzmir yet. So, the evidence of main behavioral concepts mentioned above are presented in order to show that Behavioral Finance can be effectively put into use in daily life.

Keywords: Behavioral finance, market efficiency, rational facts, investor tendency, psychological prejudice, speculative bubbles, herd behavior.

ÖZ

BİREYSEL YATIRIMLARIN DAVRANIŞSAL FİNANS KONUSUNA İLİŞKİN DEĞERLENDİRİLMESİ: BİR SERMAYE PİYASASI ANALİZİ

ÜNAL, Gamze

Yüksek Lisans Tezi, İşletme Bölümü
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Hisse senedi fiyatlarının tahmin edilebilirliği finansal ve akademik çevrelerde en çok tartışılan ve ilgi çeken konulardan biri olmuştur. Hisse senedi fiyatlarını belirlemeye yönelik çalışmaların birçoğu, yatırımcıların kararlarını vermede, verilerden rasyonel bir şekilde yararlandığı fikrine dayanmasına rağmen, hisse senedi piyasasının işleyişini tam olarak anlayabilmek için hala bir adım ilerisi vardır. Bu adım; insanların yatırım kararlarında davranışsal eğilimlerini inceleyen Davranışsal Finans alanıdır. Bu çalışmada Türkiye'deki bireysel yatırımcı davranışlarının, geleneksel finans modellerinde karşılaşılan sorunlara bir cevap olarak ortaya çıkmış olan davranışsal finans alanına ilişkin incelenmesi amaçlanmaktadır.

Bu amaçla, bu tezde belli davranışsal kavramlar İzmir'de yaşayan bireysel yatırımcılar üzerinde ampirik olarak test edilecektir. Bu çalışmanın diğer benzeri çalışmalardan farkı, Ege Bölgesi'nde ve İzmir'de bu konunun henüz araştırılmamış olmasıdır. Yukarıda bahsedilen davranışsal kavramların ispatı, Davranışsal Finans konusundan gündelik hayatta etkin bir şekilde yararlanılması amacı ile bu tezde sunulacaktır.

Anahtar kelimeler: Davranışsal Finans, etkin piyasa, rasyonel varsayımlar, yatırımcı eğilimi, psikolojik önyargılar, spekülasyon, sürü davranışı.

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1. Introduction

It is not possible to establish and manage an economic system, in which the flow of information is flawless, the decisions of investors are always rational and external influences are absent. There are many internal and external factors that affect investors performing in the stock market. For this reason, the Efficient Market Hypothesis has been replaced by a new route, which is the Theory of Behavioral Finance. Decision makers are under the influence of various restrictive factors in the real life due to the limited calculating capacity of human brain, the complexity and uncertainty of the problem and proper attainment of the full information rather than rational-economic decision models.

In this sense, scholars studying in the field of finance have been trying to explain the abnormal conditions (anomalies) in the market that cannot be explained by traditional and modern models, through supporting them with the findings of other disciplines in the social sciences. It has been thought that people are not able to act and decide in line with a prototype stated by traditional finance models, but through behaviors that vary from person to person and do not overlap with the portrait of people drawn by traditional models in their investment and saving decisions. As a result of this fact, it may be understood that traditional economic and finance models based on a single type of human model, are not able to evaluate and interpret the current financial and economic events consisting of various human behaviors and decisions in the real life properly. Investors have been assumed to be as rational as possible in modern finance literature throughout the existence of traditional finance. The explanation of financial market operations and the development of financial instruments have been carried out under the assumption that people behave rationally in their financial investment decisions. The assumption of rational behavior of people recognizes that financial preferences match with correct mathematical facts, past mistakes are not repeated, people consist their expectancies plausibly towards new information, and appropriate decisions are given in relation to Expected Utility Theory. However, as will be referred in this study, human behavior is not based on a simple basis to the extent suggested by traditional finance, rather it may not have a logical basis and it may systematically far from rational facts.

As a result of the realization that people have no longer been thoroughly rational in their financial decisions, traditional financial models have been uncovered to be insufficient to explain financial markets and how all available information circles in this market. The constantly updated findings of social scientists have also disclosed that the amount of samples of irrational behavior and repeated errors in rational judgments. Social scientists have also tried to enrich their findings with the evidence of other social sciences in the field of sociology, psychology and other cognitive sciences. So, the fusion of insufficiency of rational approaches in Modern Finance and new findings of Social Sciences has set the stage for what is known as Behavioral Finance today. Behavioral Finance argues that people cannot always make optimal choices and irrational behaviors can be performed in investments decisions. These irrational behaviors are considered as factors that reduce the financial market efficiency.

In this study, it is aimed to investigate the behavior of individual investors via Behavioral Finance Theory having emerged in response to difficulties faced by the traditional paradigm and as an up to date approach to financial markets. In this respect, this study consists of three parts. Firstly, traditional finance theories are given. At the same time, the traditional and modern methods used in the analysis of investment are properly explained. Traditional methods are examined under three headings; respectively, fundamental analysis, technical analysis and capital structure - firm analysis. Modern methods are examined under four main headings as rational expectations theory, efficient market hypothesis, and modern portfolio theory and expected utility theory. Then, the theory, the theoretical background and comparative evaluation of behavioral finance is carried out. Non-economic factors affecting investor decisions moving under the influence of factors, anomalies, investor sentiment and herd behaviors are observed under the headings. Secondly, a survey is conducted to collect the data needed for this study. Part of the survey questionnaire is about the investor's personal information while the rest of the questionnaire is aimed toward identifying the psychological factors affecting the investment decisions of the individuals surveyed. Finally, the results and overall assessment is made through testing of psychological tendencies of individual investors with the help of survey conducted in order to reveal behavioral differences and similarities of investors operating in the stock market.

2. Theoretical Framework

2.1. The Historical Overview

The best part of the financial and economic theories is based on the assumption that available information in the market is rationally assessed by people when making investment decisions. In the light of this financial perspective, finance experienced its most productive period in terms of thought especially between 1950 and 1960 (Andrikopoulos, 2007, p.52). During this mentally effective period, finance turned to be a modern science with full of fresh ideas from a descriptive discipline. Having focused on quantitative operations, finance literature utilized the full potential of mathematical probabilistic and optimization models. Due to the new requirements of modern science, the existent theories was subjected to be refined and new theories and models were generated such as portfolio optimization theory, the capital asset pricing model and the efficient market hypothesis. All of these theories constituted the basis of empirical research period that mainly focused on Efficient Market Hypothesis testing and Asset Price Modeling (Andrikopoulos, 2007, p.53).

Recognized as the cornerstone of standard academic finance to date, EMH has been equipped with particular interest. However, it may not always be possible to get into the developing requirements of financial economics of globalized world with only an illustration of competitive market equilibrium. The existence of this controversy emerges due to the updated view points, changing thoughts and effects of globalization on the world (Buchanan and Bowman, 1995, p.156). So, the initial beliefs of many academics were subjected to be reconsidered as a result of the emergence of many anomalies in the implementation process of modern finance. This situation gave direction to a new destination that has become known today as Behavioral Finance.

Different from the initial theories, many situations that people perform irrational behaviors and experience repeated errors in financial judgments have been experimentally exhibited in the process of investment decisions according to Behavioral Finance based on psychological factors affecting people. In this

respect, Behavioral Finance is underlied by Expected Utility Theory developed by Kahneman and Tversky and published in Econometrica in 1979, serving as a bridge between psychology and finance (Prospect Theory, 1999).

In the following sections of this part, the basis and the argument of the Expected Utility Theory, and non-economic factors affecting investors will be mentioned. But, firstly the concepts of financial decisions, risk, uncertainty and traditional approaches leading financial decisions shall be given under the subheadings.

2.1.1. The Definition of Finance

Finance stands for obtaining the funds required for a business and using of these funds in an effective way on the purpose of that business by investing them in efficient assets in order to maximize the financial value of that business and the capital invested by its shareholders. It is not possible to avoid uncertainty when it comes to take decisions about future. Uncertainty brings with risk. People engaged with finance should take the expected rate of return and risk into consideration when investment is the case (Yükçü, Durukan, Özkol, 1999, p.1). So, there are financial analysis performed within the scope of determined models in order to make the state of risk and uncertainty be estimated in advance.

The aim of the science of finance is to deal with value determination and the increase of value. The question of "What is valuable?" is frequently asked and the answer of this question is tried to be found in finance. Finance also deals with how the best, the most current, accurate and consistent decisions should be taken (Okka, 2005, p.6).

In order to achieve the objectives of finance mentioned above, there have been a variety of financial analysis and methods developed by scientists in the field of science of finance for many years.

2.1.2. The Concept and the Scope of Finance

All the decisions taken for future definitely have a financial extent. In this context, as finance can be described as the process of obtaining of all required resources from the most appropriate place, at the most suitable conditions, investing these resources in the optimal fields of investment and controlling the result of these investments; and the decisions intended for this process can be regarded as financial decisions (Tufan, 2006, p. 11).

Financial decision in terms of enterprises is the maximization of the market value of the business and the benefits of shareholders of that business. Almost all of financial decisions to be taken for this purpose can determine the risk, the profitability and income flows of the business (Türko, 1999, p. 14).

The common ground of investment decisions in fixed capital and investment decisions in financial market instruments is the establishment of relationship between the present value of expected future cash flows and the present value of the investment. Therefore, when deciding for the investments to be made, the present value of expected cash flows and cash outflows are calculated and compared. This is called as discounting and discount rate is used in calculations. The interest rate named as discount rate is usually set by market actors and shaped according to economic expectations. This fact suggests respectively environmental, sociological, psychological and anthropological factors by which market actors are affected. Thus, financial decisions are not only affected by economical and political variabilities, but by sociological and psychological variabilities (Tufan, 2006, p. 12).

2.1.3. The Concepts of Financial Decision, Risk and Uncertainty

Under this subheading, the concepts of financial decision, uncertainty and risk are separately defined and the difference between uncertainty and risk is introduced.

2.1.3.1. The Concept of Financial Decision

All financial decisions about future have surely a financial size. In this context, as finance can be defined as the process in which the most appropriate resources are obtained in the most appropriate circumstances, transferred into the most appropriate investments and the outcome is controlled in the most appropriate conditions, decisions to be taken on to finance can be defined as financial decisions (Türko, 1999, p.14).

Financial decisions can be classified as individual decisions and corporate decisions. For both individual and corporate financial decisions, there are two ways as funding resources from either money or capital market and transferring existing resources to investment opportunities. Through which alternatives and criteria, to which investment areas and how produced or acquired funds The issue of produced or acquired funds under which alternatives and criteria, to which investment areas and how to be allocated constitutes the area of financial decision making process.

2.1.3.2. The Concepts of Risk and Uncertainty

As the problem of making a choice between multiple options, financial decision-making is a prudential action. The forecast ability of future is not always possible that reveals the concept of risk and uncertainty. The concepts of risk and uncertainty vary in terms of qualifications of meanings they contain. While the concept of risk carries a negative meaning, the uncertainty including the concept of risk does not contain neither positive nor negative connotation. Uncertainty can only be turned into risk as long as conditions and situations in the future are identified and all probabilities are calculated. The concept of risk can be defined as an uncertainty as a result of an economic loss or an uncertainty of occurrence of an undesirable event. Economically speaking, risk refers to a measurable uncertainty (Öçal & Çolak, 1999, p.205).

From an epistemological view, there are three states as certainty, risk and uncertainty for any problem of investment decision (Taha, 1989, p. 106). For the

condition of certainty, all options related to decision (dependent variable), the value of options determining the results of variables (independent variable), and the relations between them are exactly known. The problem of decision under certainty conditions can be easily solved with respect to minimization or maximization of objective function. For decision-making under risk conditions, while all dependent variables are known, independent variables and the value of relations between them depend on probability. In the case of uncertainty, on the other hand, while all dependent variables are unknown, at least the value of one of the independent variables cannot be identified (Taha, 1989, p.107).

2.2. Traditional and Modern Methods Used in Investment Analysis

2.2.1. Traditional Methods Used in Investment Analysis

While finance is known as Modern Finance Theory in the literature, today it is known as Traditional Finance Approach. There are three basic dynamics of Modern Finance in the field of investment (Haugen, 2004, p. 11):

- In line with the targeted and expected return, it is possible to create a portfolio of stocks with the lowest potential risk. The techniques of the creation of the portfolio are called as the investment tool.

- Assuming that everyone prefers the same investment tool, then what happens? If all the portfolios are collected together to create a market index, the risk of expected return of this portfolio will be at the lowest level. This assumption is based on the idea that the investment tool is globally preferred by everyone and referred as the Capital Asset Pricing Model. And this is called as “theorem”.

In this case, if all available information in the market reflects to the prices of all common stocks, then what happens? This, in turn, reveals the Efficient Market Hypothesis. According to one of the claim of this hypothesis, the prices of common stocks quickly react to new information explained in the market. However, this is not true at all. Since stock prices gradually give over-reaction. However, investors tend to over react to new information instantly. This leads to a

considerable delay. So, this situation makes created common stock portfolios have higher returns with lower risk than any index.

Traditional finance theories and models are fundamental finance theories and models in the traditional finance literature which assume that people are rational and which are applied in their own theoretical framework without taking the uncertainties about future and psychological variability of people and their effects on investment analysis into account.

The general investment policy of traditional investors is to invest in securities which transformation rate of the money is high and non-payment rate is low in particular. In their investment decision, investors aim to get high return. Therefore, they aim to ensure financial stability through taking the rate of risk, the rate of liquidity and earning rate of their portfolio (Kondak, 1999, p. 28).

2.2.1.1. The Analysis of Capital Structure and the Market Value of Firm

Every company tries to find the optimum capital structure that will maximize its market value and minimize its cost of capital. In other words, reaching to the highest market value with the least capital is the main goal of every company. When the real marginal cost of various resources is equal to each other, it means that company has reached its optimal capital structure.

The approaches developed to respond to what the effect of the capital structure change of the firm, the debt/equity ratio change (financial leverage factor), will be on the cost of capital and value of the firm are as followings:

- Net Income Approach
- Net Operating Income Approach
- The Traditional Approach
- Modigliani – Miller Approach

2.2.1.1.1. Net Income Approach

Net income approach can be regarded as the approach that includes the effect of leverage factor excessively to the financial assessment of a firm. According to this approach, a firm has the opportunity to reduce the cost of capital, to increase the market value of the firm through changing its capital structure (the degree of leverage factor of the firm) (Akgüç, 1998, p. 485). For this approach:

Capitalization Rate = Net Operating Income / Market Value

$$k_o = \frac{NOI}{MV}$$

NOI: Net Operating Income

MV: Market Value

The firm market value equation is:

$$MV = \frac{NOI}{k_o} = \frac{I}{k_b} + \frac{NI}{k_e}$$

I: Interests

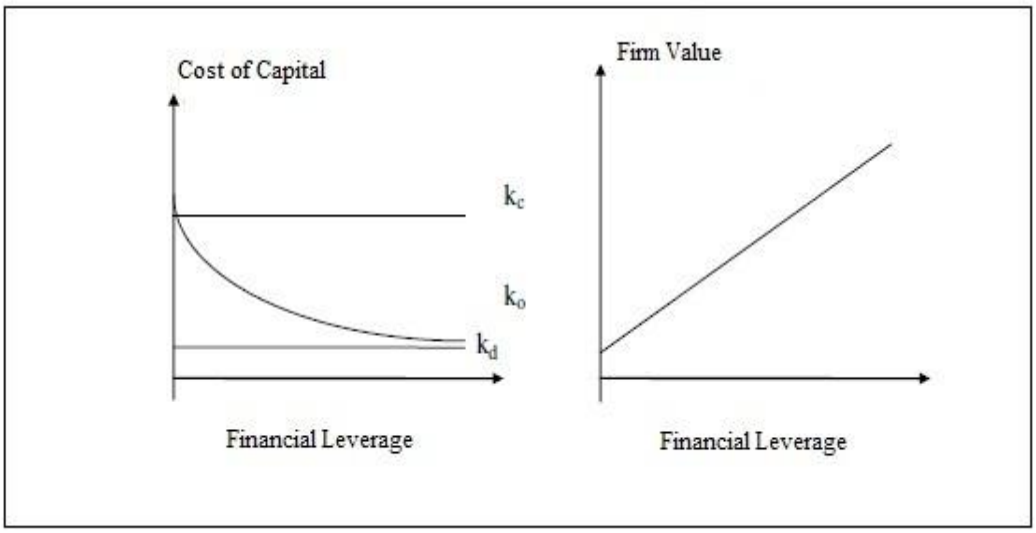
NI: Net Income

k_o: The capitalization rate

k_b: The capitalization rate of income flows of the lenders

k_e: The capitalization rate of income flows of the shareholders

The relationships between “liability / equity” ratio and “cost of capital / market value” in net income approach, is shown in the following diagrams:



Graph 1.1.: Capital Structure in Net Income Approach and Firm Value

As the graphs show, according to net income approach, a firm has the opportunity to continuously reduce the average cost of capital or raise the firm value (market value) by borrowing, or with more accurate words, by increasing the sum of liability/equity or liability/asset ratios. Net income approach is based on two critical assumptions. These are: (i) the cost of equity capital is higher than the cost of debt, and (ii) the equity capitalization rate and the cost of liability remain constant for various capital structures of the firm.

However, the validity of the assumptions in this approach can be discussed. As the interest payments of the firm increase, the liquidity risk will also increase. As long as the firm runs up debts, firm shareholders will expect higher profitability to compensate for the increased risk. That is, k_b and k_e rates will increase. The heavy debt burden may prevent firm from entering profitable investment areas. Therefore, it is a controversial issue that firm value may upgrade by constantly borrowing (Akgüç, 1998, p. 487- 488).

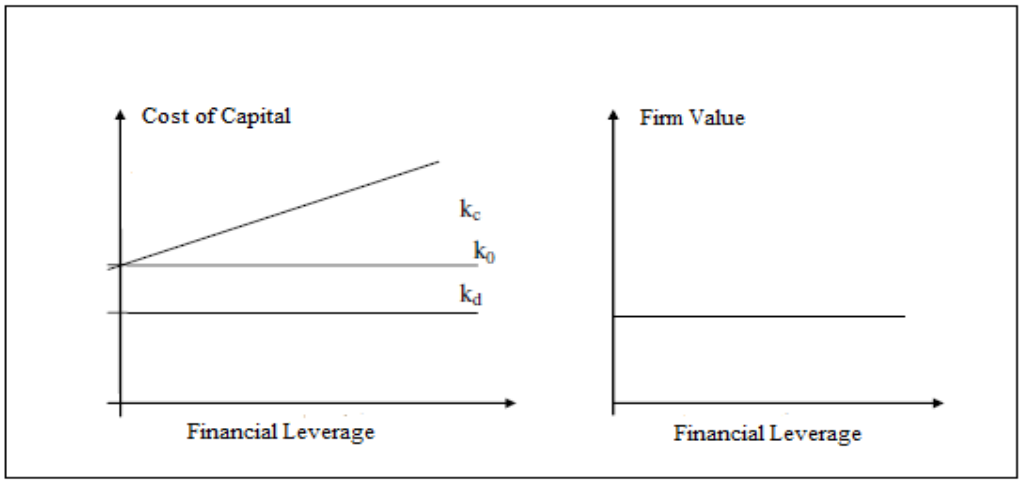
2.2.1.1.2. Net Operating Income Approach

The capitalization of the net operating income of the firm with a fixed capitalization rate (k_o) reveals the market value of the firm for net operating income approach. In this approach, the capitalization rate for the firm (average cost of capital), is assumed to be constant for all capital structures. As a result of this natural assumption, it is advocated that changes in the capital structure of a firm can have no effect on the market value of the firm and average ost of capital (Akgüç, 1998, p. 489). This approach suggests that the cost of capital and stock prices of a firm is not related to debt/ equity ratio, that is, the degree of financial leverage used by the firm. In other words, to what extent the firm prefers the way of borrowing to finance itself, the value of the stocks will not be affected from this fact (Türko, 1999, p. 498).

The market value of the firm in this approach: $MV = \frac{O}{k_o}$

O : Net Operating Income, k_o : The capitalization rate

In this approach, a firm's benefiting from large amount of financial leverage (its using debt) may increase the profits and dividends of the firm, but in parallel, the cost of equity increases in the same extent. Even if the firm's applying for higher rates of debt increases its profits, the bankruptcy risk of the firm increases in the same way.



Graph 1.2.: The Capital Structure and Market Value of the Firm in the Net Operating Income Approach

k_o: Weighted Cost of Capital, k_c : The cost of equity, k_c : The cost of debt

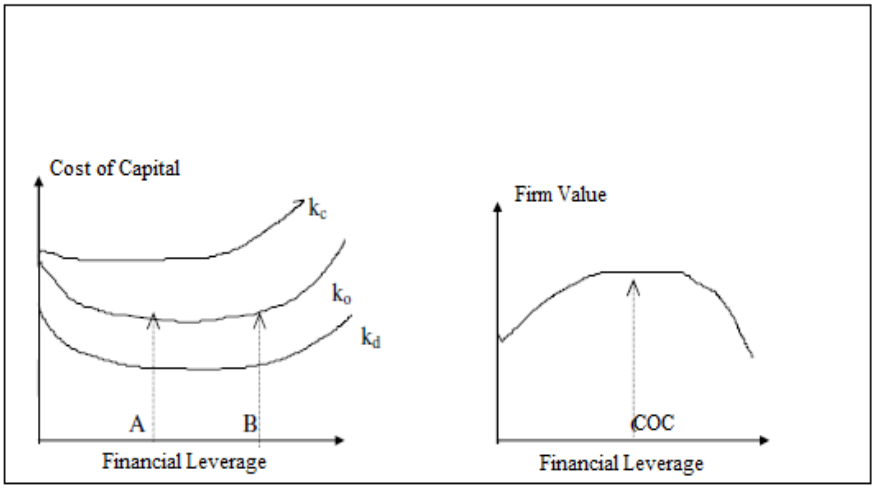
1st figure shows the relationship between capital structure of the firm and the cost of capital. The cost of capital, as can be seen at the graph, is not affected by the increase in the use of financial leverage. As the firm applies for more debt, the cost of equity increases as much as the additional earnings ratio. This emerges as a result of the fact that the cost of capital does not change. 2nd figure points that the stock prices of the firm will not change, since the cost of capital cannot change with the use of debt.

The results of the net operating income approach in terms of funding decisions can be summarized as follows: Firstly, the real cost of debt and the real cost of equity is equal to each other in term of the firm. The cost of debt is made up of two parts; interests and hidden costs. The hidden cost of debt is that as long as the firm uses debt, the cost of equity increases. Therefore, it is not possible to reduce the weighted average cost of capital by increasing the use of debt of the firm. Secondly, there is no single optimal capital structure and capital composition for the firm. Every capital structure may be considered as optimal, since there is no possibility to upgrade firm value through reducing cost of capital with changed capital structure (Türko, 1999, p. 502).

2.2.1.1.3. Traditional Approach

According to Traditional Approach related to the assessment of the firm and the cost of capital of the firm, there is only one optimal capital structure for a firm and by taking advantage of leverage factor the firm can decrease the cost of capital and increase its market value. In the traditional approach, the cost of equity in the firm is higher than the cost of liability (foreign resource). Participation in the firm's capital is more risky than lending; so shareholders of the firm expect to meet more profit over the normal interest rate to compensate the risk they faced. While debt interests are written as expenses to deduct from tax base for the provision of tax savings, there is no such as possibility for dividends distributed to the shareholders of the firm; as a result, the cost of equity is usually higher than the cost of liability (foreign resource). In this case, the firm can decrease the average cost of capital by changing the capital structure and taking the advantage of relatively more foreign resources.

As in the net operating income approach, the traditional approach foresees that as the risk of financing increases, the cost of equity financing will increase; however, it accepts that the effects of use of foreign resources to some extent on the decrease of the average cost of capital cannot be completely possible with the ascension of the cost of equity (Akgüç, 1998, p. 491-492).



Graph 1.3.: Capital Structure and Firm Value in Traditional Approach (Türko, 1999, p. 506-508)

k_o : Weighted cost of capital k_c : The cost of equity k_d : The cost of debt

1st figure at the Graph 1.3, the cost of weighted capital of the firm, k_o, is dish-shaped. The cost of equity is higher than the cost of debt. That is, from the point of firm, the cost of equity of the firm is higher than the cost of debt of the firm.2nd figure at the Graph 1.3, there is only one cost of optimal capital (COC) and at this point the real marginal cost of equity is equal to the real marginal cost of foreign resources. If the firm continues to use foreign resources after reaching the cost of optimal capital, the average cost of capital will rise and the market value of the firm will decrease due to the ascension of the cost of foreign resources and the cost of equity.

According to this approach, there is an optimal debt-equity composition which minimizes the average cost of capital and businesses try to maintain and perform this composition in the long term. This approach stands between net income and net operating income approaches and is such a reconciliation of these two approaches mentioned above (Bolak, 1998, p. 253).

2.2.1.1.4. Modigliani – Miller Approach

Developed by Franco Modigliani and Merton H. Miller, this approach is the same as net operating income approach. According to this approach, it is not possible that cost of capital and firm value may be affected through changing capital structure. Regardless of the degree of financial leverage, the cost of capital cannot change. For this approach, the manner of the use of profit has no importance in terms of firm value. What is important is the power of the firm to earn. The investment decision is the most important factor affecting firm value. Assumptions based on Modigliani and Miller approach are as follows (Türko, 1998, p. 510):

- There is exact competition and rational behaviors in the capital market.
- The expected value for the probability distribution of the operating income in future periods is the same as the probability distribution of current operating income.
- The business risk of firms is the same belonging to each risk category.
- Tax is not paid over income.

Based on these mentioned assumptions, Modigliani and Miller reach these three results (Akgüç, 1998, p. 496) :

i. The market value and cost of capital of a firm is completely independent from its capital structure.
ii. If financing risk of the firm increases due to getting into debt, the cost of equity also increases.
iii. Discount rate used in taking investment decisions or the minimum rate of return foreseen for investment decisions is completely independent from the form of financing.

To sum, according to Modigliani and Miller, firms having the same net operating profit have the same market value included in the same risk category. A firm cannot raise its market value through altering its capital structure and composition of resources compared to another firm which has the same net

operating profit included in the same risk category. In other words, the opportunity of investing in more favorable stocks in terms of investors through selling less favorable stocks in their portfolios prevents the difference in the market values of the firms having the same net operating profit included in the same risk category (Akgüç, 1998, p. 498).

2.2.1.2. Fundamental Analysis

Fundamental analysis is a research method for finding the value of stocks that is the closest to real value in certain market conditions. This method is based on the determination of the real value of stocks through fundamental subjects such as general economic factors affecting the prices of the stocks, sector issues, the conditions of competition, the company's financial structure, productivity, profitability, liquidity, financial structure, distribution channels, management skills and export opportunities and the analysis of these subjects revealing how these fundamental subjects affect the prices of the stocks (Karaşin, 1986, p. 3).

While fundamental analysis approach mostly takes macro variables such as general economics and sector studies as a more objective and medium-and-long term analysis method, it is actually based on numbers of financial statements. As frequently perceived as an alternative or technical analysis, the difference of fundamental analysis is that: In fundamental analysis approach, each stock belonging to each firm has a “real value” that can be calculated in various ways through financial statements of the firms. If this real value of the stock is higher than the stock market price, the stock is needed to be bought. Because, according to fundamental analysis approach, the market value of the stock, sooner or later, will approximate to the actual value. On the other hand, there is no such a real value in technical analysis approach. The only value is “market price”. For this reason, it is sufficient to examine price and volume graphs of trading.

Fundamental analysis is performed in two levels as macro (country basis) and micro (company basis). While economics and industry analysis appear in macro analysis, in micro analysis firm analysis phases take parts (Yükçü, Durukan, Özkol; 1999, p. 1027-1028).

In order to make a good fundamental analysis, firstly economy and then sector and the firm is assessed. The other name of this kind of analysis is Top-Down Analysis. In some cases, the analysis may start from the firm (Down-Top Analysis). However, such a situation is rare since it only happens at times in which the situation of the firm is extremely important (Karan, 2001, p. 435).

2.2.1.2.1. Economic Analysis

The starting point of investment analysis is macro economic analysis. The analysis of economy in a healthy way and predictions for future determine the direction of personal investment. The development of a healthy economy would lead to an increase in the performance of the firms, so stock investors may expect higher returns. In addition, positive developments may result in a decline of prices of bonds and bills. On the other hand, economic recession may cause a decline in stock prices and increase in interest rates through reducing profits of the firm.

Economic analysts develop some models predicting for the future through closely monitoring a wide variety of indicators such as government decisions, the policies of Central Bank, emissions, inflation expectations, interest rates and exchange rates (Karan, 2001, p. 435-436).

Another issue as important as economic factors is non-economic social political factors. The importance of these factors is that they create either optimism or pessimism, instead of directly relating to stock market or not. Elections, military coups, government crisis, anarchy and terrorism, strikes and wars create pessimism and uneasiness (Yükçü, Durukan, Özkol; 1999, p. 1030).

Elections have always affected general conjuncture. As a result of the elections, coalition uncertainties and government crisis create a “wait-and-see” behavior, so lack of demand in the market (Karslı, 1994, p. 431).

In summary, economic analysis is the phase in which the implementation of the planned investment idea is economically analyzed to learn whether it is rational, efficient and profitable or not (Civan, 2004, p. 222).

2.2.1.2.2. Sector (Industry) Analysis

Sector (industry) analysis is the second phase of the economic analysis. In this stage, by investing sector in which the firm operates, the future of the sector (industry) is discussed (Karan, 2001, p. 454). Industry analysis creates a framework for business analysis; in other words, the performance of an industry is a good indicator of the performance of enterprises included in that industry.

Industries are affected by the general economic situation in different ways. While some sectors show growth in the same pace with the rate of the economic growth, some of them show faster or slower growth. The growth of a company depends on the growth of the branch of the industry; namely, the growth of the company is in parallel with the growth of the industry in which it operates. It is possible to analyze industries in three groups according to the degree of impression of economic fluctuations:

- Growing sectors (industries)
- Seasonal sectors (industries)
- Defensive sectors (industries)

Growing sectors (industries) are the industries of intensive technological progress and inventions such as computers, electronics, and telecommunications. This type of industries is included in the arms of ever-growing businesses without affecting economic conjuncture.

Seasonal sectors (industries) are the industries showing fluctuations in parallel with the economic conjuncture. Investing in this type of industries may be profitable in economically development periods, but risky in times of recession.

Defensive sectors (industries) are the industries which may not be affected or may be less affected by economic conjuncture. It may be said that the risk of investing in stock belonging to this type of industries is very little (Yükçü, Durukan, Özkol; 1999, p. 1031-1032).

Investor should do research about the issues such as the trend of the prices in the sector, the growth rate of the industry, technological developments, competition conditions; after determining the type and stage of the industry in which he is interested.

At the end of the industry (sector) analysis, the investor will have determined whether the sector in which he intended to invest is eligible for investment. Next phase is to analyze the firm or partnership which stock will be invested in the sector (industry) (Bolak, 2001, p. 191-192).

2.2.1.2.3. Firm (Partnership) Analysis

After obtaining the estimates about general economy and related industry, the next stage is the firm analysis in order to determine the future returns of the stock. Firm analysis consists of the examination of quantitative magnitudes such as the qualifications of the product and technology used by the firm, firm management, legal status, financial status and the risk of the firm (Bolak, 2001, p. 191-192).

Firm analysis contains the examination of qualitative and quantitative factors related to business. At this stage, the abilities of management team, the growth potential of the firm and the changes in the financial situation are assessed (Başoğlu, 2001, p. 471-473).

As a result of the examination of the underlying data, there may be a judgment about the productivity and risk of the investment to be made. After that, the past performance of the firm is taken into consideration in order to make quantitative predictions for future performance of the firm. The main source of such a quantitative examination is financial statements and ratio analysis. This kinds of ratios that can be used for this aim are liquidity and profitability ratios (Yükçü, Durukan, Özkol; 1999, p. 1033).

2.2.1.2.4. Valuation Methods

In fundamental analysis, after making investigations about economy, sector (industry) and the firm, the various valuation methods take place related to identify the real value of the stocks. The main ones of these methods are examined under next subheadings.

2.2.1.2.4.1. Accounting Value or Liquidation Value Approach

This valuation method is important for businesses that are in the state of liquidation and bankruptcy, since it does not take expected cash inflows and outflows into account.

2.2.1.2.4.2. Price / Earnings Approach

Price / Earnings Ratio is the simplest method among stock evaluation approaches. By this method, investor or analyst firstly estimates the net profit per stock, and then calculates the actual value of the stock through multiplying the value of net profit per stock with price / earnings ratio actualized in the stock market.

2.2.1.2.4.3. Market Value / Book Value Approach

The market value on the basis of stock and book value of the businesses are always different. Since book value does not take other factors except from accounting. The market value almost always stands a certain amount above or below book value. So it shows a certain trend or ratios close to each other. The actual value of the shares of the business may be reached through benefiting from an average ratio of "market value / book value" actualized in the stock market.

2.2.1.2.4.4. Regression Models

Regression models are used to obtain data through linking the statistical estimation techniques and the factors affecting the value of the stocks, especially in the relationships of dependent-independent variables. In this method, it is tried to determine the actual value of the stock in relation to expected value of

dependent and independent variables; through accepting the price of the stock or the ratio of price / net profit per share as dependent variable and the profits affecting this price, the dividends, the prices of the previous periods, the interest rate o the market, money supply as independent variables (Karaşin, 1986, p. 29).

2.2.1.2.4.5. Dividends Method

Dividend method assumes that the expected dividend of a share throughout an infinite period will be equal to the present value of this share. According to this method developed by Myron Gordon, the value of a stock for an investor is equal to the amount of yearly cash income that is earned by having this stock; in other words to the present value of dividends (Bolak, 1998, p. 183).

The logic of dividends method is that the stock to be held for an infinite period can only provide dividends as cash inflows. However, this method brings with the problem of determination of an appropriate discount rate for the stock. Discount rate is usually defined as an acceptable rate of return by the investor. In practice, this rate is found by adding a risk factor to the interest rate of government bonds and treasury bills (Yükçü, Durukan, Özkol, 1999; p. 1036).

2.2.1.3. Technical Analysis

Technical analysis is to examine the prices of securities and the movements and trend of trading volume (Parasız, 1999, p. 586). Technical analysis is a kind of analysis that aims to manifest general course of stock prices and stock market through the use of a particular market data. Here, the market data is stock market indices or information about trading volume and price of stocks. Technical analysts try to predict what the future prices of the stock will be through basing on market data in the past. In order to use technical analysis in the estimation of stock prices, following assumptions should be accepted (Dağlı, 2000, p. 301):

1. The market price of the stock can only occur with the mutual effect of supply and demand related to the stock itself.

2. Supply and demand for the stock is shaped by many factors some of which are rational and others of which are irrational.

3. Stock prices act in line with a certain trend lasting for a long time, when small fluctuations are ignored in the stock market.

4. The cuts in the trend occur as a result of the shifts in supply and demand.

5. The shifts in supply and demand, sooner or later, can be detected by means of graphics in which market data are marked, without looking at why they arise.

6. Price movements are repeated in many graphs throughout the time.

Technical analysts propound that technical analysis is superior to fundamental analysis in the estimation of stock prices. In fundamental analysis, the actual value of the stock is tried to be calculated by using various methods and this calculated value is compared with the market price to make investment decisions. According to technical analysts, it is difficult to calculate the real value of the stock by fundamental analysis and it is not possible to find accurate and reliable information to make the assessments of fundamental analysis. Technical analysts always suspect the data of financial statements on which fundamental analysis substantially based. In addition, it is assumed that the market price of a stock will rise to the real value, when investing in a less valued share in fundamental analysis. However, this assumption can only be possible when all investors in the market evaluate their investments according to fundamental analysis; in fact, less valued stocks whose value remained below the market price should be firstly preferred to invest and then their value can be upgraded. Without dealing with these troubles and by means of various tools, technical analysts try to guess the future prices of the stock through utilizing supply and demand of the stocks in the past (Dağlı, 2000, p. 302).

According to technical analysts, the stock market has a unique way of life, independent from investment value of common stocks, and fundamental analysis does not take “investor feelings” into account as the most important determinants of the market (Karaşin, 1986, p. 81).

2.2.1.3.1. The Philosophy and Fundamental Principles of Technical Analysis

The philosophy and fundamental principles of technical analysis are as followings (Levy, 1966, p. 83):

1. The market value of a security can only be determined by supply and demand for that security. The price of a security, or goods or services can only be determined by supply and demand for them. If supply is greater than demand, prices will fall; but if supply is less than demand, prices will rise. What is important for technical analysts is to determine the moment of change of supply - demand balance rather than due to which cause supply -demand balance changes

2. Supply and demand determining the market price is under the influence of spiritual and psychological factors, in addition to general economic factors defended by fundamental analysts. The market price includes all these factors. According to technical analysis, trend occurs as a result of the investment decisions of investors, which change under economical, financial, political and psychological factors. Economical factors with which fundamental analysts engaged have an important place in the market price movements. However, all price movements reflect rational and irrational hopes, fears, knowledge, ambition and expectations. Therefore, stock prices indicate the values attributed to them in the minds of investors rather than their actual values.

In the short term, investor make investment decisions according to the future stock price expected to be in the market rather than past or current situation of the firm, its place in the economy, competitiveness and financial coefficients. Investors buy a stock with the idea of selling it at a higher price when expectations are realized and news and developments occur. If developments are more positive than the expected, the price of that stock will rise; however, if developments are positive but not good enough as expected level, the price of that stock will fall. Otherwise, if the news is not bad enough as expected in the case of falling of the prices after a negative expectation, the market will gather strength and the prices will rise.

3. If very small fluctuations are not considered, the prices move in the direction of a trend in the market and this trend keeps its importance for a significant period of time. According to technical analysis, prices move in the direction of a trend which is determined by supply and demand. Because the information altering supply and demand in the market enters the market not at a given time, but at a time interval.

The differences of information channels give some investors an opportunity to receive and process the information before other investors. The information reaches insider investors, professionals, and finally ordinary investors from its source in a period of time. Thus, the price changes in the market do not emerge suddenly, but in the line of a trend and gradually.

It is possible to determine trend changes through the market analysis itself. In other words, the price movements in the market have a repetitive nature for each other. Past price movements are good indicators for the predictions of future prices. The idea of past price movements' being best indicators for future predictions is based on the assumption that technical analysts make a decision similarly in similar conditions. As fundamental analysts argue, a sufficient amount of repetitive price movements contribute technical analysts to determine trend changes, although they ignore the reemergence of many factors affecting the market such as very complex human behavior with exactly the same patterns from investment filter. The similarities (repetitive movements) are seen as specific price formations in graphs.

2.2.1.3.2. Outstanding Aspects of Technical Analysis

- Due to the determination of stock prices by various parts, expectations are important in technical analysis. The terms of "bull and bear" frequently heard in the stock market specifies the direction of the future expectations of these various parts of the society.

- Fundamental analysis does not contain market dynamics, psychological and incidental factors out of macro and micro factors, and the internal dynamic of

the market mechanism. However, technical analysts argue that all of these mentioned factors take place in the market price of the stock.

- Technical analysts argue that compared to other analysis methods a better, earlier and healthier warning signal was received, by means of various techniques and methods they used. Thus, technical analysts can give some advices as “buy”, “sell” or “hold” to the investors in the stock market.

- Neither fundamental analysis, nor technical analysis can predict the new events which are unexpected and results of these events in advance. But in such cases, while long-term investors pay fundamental analysis importance, short-term investors usually prefer technical analysis. Technical analysis is also preferred by speculators aiming to earn after buying the stock in a few days or weeks. On the other hand, long-term investors use technical analysis for timing besides fundamental analysis.

- The financial statements and the data on which fundamental analysis is based may be made up and may contain deficiencies or inaccuracies. But technical analysis is based on accurate information compiled from the market.

- Fundamental analysis is a kind of method that is quite exhaustive, time-consuming and requires having information about economic issues. However, technical analysis is a kind of method that can be used more easily and requires less education to be realized.

- Fundamental analysis is based on detection of the less-valued stocks and investment in these stocks in the market. However, the efficiency of this investment is based on the case that other investors in the market realize that shares in question are less-valued and provide the price of shares to raise by increasing the demand (Yükçü, Durukan, Özkol; 1999, p. 1041-1042).

2.2.1.3.3. The Weaknesses of Technical Analysis

- Technical analysis is based on the assumption that the variables of the past prices will repeat themselves in the future. The repetition of past graphical models in the future as the main rule of technical analysis is not always valid or

does not always work effectively. Even if these rules work effectively, there is a possibility that the changes of fundamental data may prevent them to work or change the direction of the trend in question.

- The useful result of occurrence of a price or the rules of technical analysis may break down due to the application of the same rule by everyone in the market.
- In fact, the results of technical analysis do not emerge mechanically, but the interpretation of graphs is paid particular importance. However, two different analysts who analyze the same graph may make different investment decisions.

2.2.2. Modern Methods Used in Investment Analysis

2.2.2.1. Traditional (Standard) Finance Theories

Based on the idea of neo-classical economics, Traditional (Standard) Financial Theories assumes a perfect market situation having many participants in a predictable system in which buyers and sellers come together and prices are determined according to supply-demand relationships. For these theories, human is defined as behaving rationally and plausibly, having all kinds of information and as an entity that aims to maximize his benefits.

2.2.2.1.1. Rational Expectations Theory

Rational Expectations Theory is a decision-making model used for modeling expectations of economic actors about future events. Introduced by John F. Muth in 1961, modeling of expectations is used especially in the fields of new classical economy, Keynesian macro economy and finance (Tufan, 2006, p. 19).

Rational Expectations Theory claims that it is possible to predict the future in the best way through utilizing the adaptable information. However, it is not possible to make predictions about human behaviors by only benefiting from Rational Expectations Theory without using other assumptions. Therefore, the estimated results (and therefore rational expectations) do not differentiate from the market equilibrium systematically. This is based on the assumption that people

would not make mistake while forecasting the future and the deviations of people from perfect foresight is incidental. In an economic model, this fact is modeled with the assumption that a variable is typically equal to its expected value and random error term is wrong and represents ignored cases.

This theory assumes that economic units can implement all the information they have. Decision units continuously monitor government policies to be implemented, so they are required to predict the outcomes of these policies. In addition, economic individuals do not make mistakes consistently and systematically in their forward-looking expectations. In this case, the change of government policies makes individuals to change their decisions and future-oriented plans. The adaptation of decision makers is a continuous process. Since there is equality for individuals affected by political shifts, and it is not possible that economic policy makers always deceive economic individuals. Unexpected policy changes may affect the economy far from expected changes. Still, the effects of the new policy will turn to be a neutral position that is equal in terms of individuals, since expectations will adapt to new situation at the end of a certain time (Sarfati, Karabulut; 2004, p.64).

Rational Expectations Theory is proposed in answer to the mistakes of theories based on adaptable expectations. According to adaptable expectations, the expected future value of an economic variable depends on the past values of that variable. For example, people investing in securities exchange can calculate the future value of a stock through using past values of that stock and can provide revenue in this way. This is also the basis of technical analysis approach utilized for stock and stock market analysis. Adaptable expectations approach will not be valid at all time. Investors may not always use all the related information when making investment decision. In particular, they may act with herd behavior instead of rational behavior due to the different factors affecting their psychology. Even the weather can be effective on investor behavior (Tufan, Hamarat; 2004, p. 117).

Rational Expectations Theory is criticized for the assumption that individuals take all information into account while forming their expectations.

Therefore, the expectations may occur in the wrong direction and the deviations of the expected value may not occur systematically. In brief, Rational Expectations Theory is the basis of Efficient Market Hypothesis.

2.2.2.1.2. The Expected Utility Theory

Firstly proposed by Bernoulli and then published and formulized by two researchers, John Von Neumann and Oscar Morgenstern with the work named "Theory of Games and Economic Behavior", Expected Utility Theory forms the basis of Traditional Finance. According to this theory, as a rational being, human (homo economicus) moves in the direction of his own interest, aims to maximize the benefits while making decisions and refers to a hypothetical person purified from his feelings. For Expected Utility Theory, people choose risky or uncertain opportunities so far as they compare the expected benefits of these opportunities (Philippe, 1997, p.342-345).

Neumann and Morgenstern consider Expected Utility as the value which is found by multiplying each potential benefits as a result of a decision or a strategy with the probability of occurrence of each event. Accordingly, there exists a utility function (u) that consists of the results of each individual action (x). So, let us assume the probability of occurrence of action "a" which will cause result "x" as "p", and the probability of occurrence action "b" which will cause same result as "q".

$$\text{If} \quad p.\,U(x) > q.U(x)\,,$$

In other words, if the expected benefit of action "a" is more than the expected benefit of action"b", decision maker will definitely prefer action "a". Here, it is assumed that decision-maker knows the possibilities of different events and takes the decision that will maximize his benefits.

Expected Utility Theory is an approach that shows how people should act rather than how they act. Indeed, EUT describes the behavior of rational investor. On the basis of the objections of this theory, the idea that observed individual

behaviors should be different from the behaviors described or assumed in theory underlies (Bailey, 2002, p 15-20).

Another theory assuming that people are rational is the Expected Utility Theory. The utility that will be obtained under uncertainty in the economy is found through taking the utility of every possible situation into consideration, estimating the possibility of every situation and calculating the weighted average by basing on formers.

According to the Expected Utility Theory, investors (decision-makers) choose risky or uncertain opportunities (prospects) by comparing the expected utilities of them (Philippe, 1997, p. 342-350). The difference between risk and uncertainty is that as risk has the probability, uncertainty does not. In this context, the Expected Utility Theory was formulized in the study, "Theory of Games and Economic Behavior" published by two researchers Von Neumann and Morgenstern (Neumann, 1944). According to this theory, the utility function is expressed as $u: X \rightarrow R$.

Function shows the element that contains the preferences of the person and takes place in the space of results with real numbers for both simple and compound sweepstakes (gambles). If classified theoretically, "u" causes the transformation between the categories of preferences forming under uncertainty and realities. In any sweepstakes (gambles), if the expected utility of L1 is greater than the expected utility of L2, the person will prefer L1. If limited with a separate selection structure, $L: X \rightarrow [0,1]$ will be a simple sweepstake (gamble) and will be expressed as $L(xi)=pi$. In the formula, pi shows the probability and xi shows the chance of winning. If Expected Utility Hypothesis is $\geq$ the relationship of preferences in the satisfaction of entirety, transitivity, convexity/continuity, and independency, then Von Neumann Morgenstern accepts the existence of the utility function. The entirety and the transitivity are discussed above. Provided that $0 \leq p \leq 1$, the expectation of convexity/continuity (also called as Archimedian expectation) express $L1 \geq L2 \geq L3$ for simple sweepstakes (gambles). Here, the person is oblivious across compound sweepstake consisting of the mix of L2, L1 and L3. In the formula, p and (1-p) shows the probability. The meaning of

independency is that the person's being oblivious between L1 and L2 simple sweepstakes. Person is also oblivious across the mix of L1 with L3 having the probability value of "p" selected in random and the mix of L2 with L3 in the probability of "p".

Expected Utility Theory is based on the following assumptions:

1) When faced with a situation of uncertainty, people shall determine "objective possibility" regarding the occurrence of this situation. While doing this operation, they use Bayesian Theorem and they are not accidentally incapacitated.

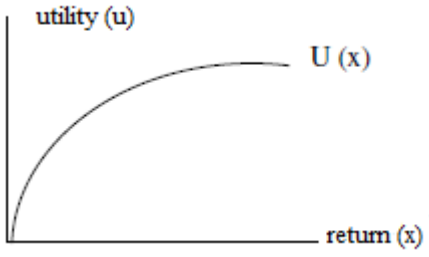
2) Less is better than the more. If A provides more utility than B, the decision-maker will absolutely choose A from among A and B.

3) Taken decisions are consistent. If A provides more utility than B, and B provides more utility than C, the decision-maker will prefer A from among A and C.

4) After detecting the probabilities of uncertain events with which he faced and calculating the expected utility of each event according to these probabilities, decision maker put them in order in their own utility function. The aim of decision maker is to maximize his utility and choose the option that provides this aim.

5) The utility function in question is dish-shaped, which shows that diminishing marginal utility rule is valid (Bailey, 2002).

According to Expected Utility Theory, the utility function is as follows:



Graph 2.1.: The utility function according to the Expected Utility Theory

As can be seen in graph, there is a continuous relationship between the utility and the return, as return increases the utility also increases ($U'(x)>0$); however, the utility gradually increases less and less due to the diminishing marginal utility theory ($U''(x)<0$).

2.2.2.1.3. Bayes' Theorem

One of the studies intended to overcome future ambiguity in decision making belongs to Thomas Bayes. According to Bayes, who is also a mathematician, through utilizing the knowledge of previous incidents in predicting future events, a decision making method can be created that exploits probability and statistics. The only way to measure a situation with an uncertain outcome is to achieve through calculating its probability distribution for Bayes (Adam, 2002, p.2).

Bayes' Theorem is an important issue studied within the framework of statistics and probability theory. This theorem shows the relationship between the conditional probabilities and the marginal probabilities for a random variable in the probability distribution. With this form, Bayes' Theorem describes a relationship acceptable for all statisticians. However, for some statistics, Bayes' Theorem carries a different meaning. That is, on philosophical basis, the probability values are considered to be subjective unveiled by observer rather than being objective. According to the subjectivist thinkers of Bayes' Theorem, it is the basic tool that allows for changing and updating the subjective beliefs about the probability value in the light of new evidence; namely, it is the foundation of a posterior approach which actually points to behavioral finance.

However, due to the rational-oriented atmosphere of that period, Bayes' Theorem was used to be perceived with its first form, that is, a mathematical manipulation of conditional probabilities. For this reason, although Bayesian logic emerged in the 18^{th} century with a stunning publication, it could not find any area of usage. (Adam, 2002, p.5).

2.2.2.1.4. Efficient Market Hypothesis

Efficient Market Hypothesis assumes that securities reflect all the information available and prices does not change with the introduction of new information. So, prices changes are assumed to change in random (Parasız, 2005, p. 225). Gained momentum in 1970s, The Efficient Market Hypothesis was widely accepted for securities analysis in economic and financial circles. EMH took the market of perfect competition into account as a starting point and adopted the rules of this market to the rules of capital market. Within the framework of this approach, if all kinds of information is transferred on the market, the market price of a security at any instant is assumed to be equal to actual value of that security. EMH was established on certain assumptions, respectively (Kocaman,1995, p. 9):

1. The main objective of investor is to maximize his economic benefits.
2. Investors make choices on the basis of risk and return.
3. The risk and return expectations of investors is homogeneous.
4. Investors have identical time horizons.
5. Information can be obtained freely.

Except these simplifying assumptions, EMH includes three other basic assumptions (Shleifer, 2000, p. 2):

a) Investors are rational and they evaluate securities rationally.
b) Even if there are some irrational investors, the behaviors of irrational investors are mutually exclusive and so prices cannot be affected.
c) If investors act irrationally in the same direction, people practicing arbitrage prevent that irrational behaviors affect the prices in the market.

Investors calculate the present value of common stocks through using a discount rate that is found according to the risk state of future cash flows and reduced to present value. In the case of market equilibrium, the price of this common stock is equal to the price formed in the market. The market is overly sensitive to the news that will affect cash flows and risk status of common stock and reflects this news to common stocks instantly. As a result, prices of securities

combine the information available at the time and set the result by calculating the net present value (Shleifer, 2000, p.2).

Modern finance is the body of knowledge built on the pillars of the arbitrage principles of Miller and Modigliani, the portfolio principles of Markowitz, the capital asset pricing theory of Sharpe, Lintner, and Black, and the option-pricing theory of Black, Scholes, and Merton. Modern finance is also based upon Fama's Efficient Market Hypothesis, which is both the most regarded and the most criticized of the principles. Modern finance is compelling because it uses a minimum number of tools to build a unified theory intended to answer all the questions of finance. However, few theories are consistent with all the empirical evidence, and modern finance is no exception. The Efficient Market Hypothesis (EMH) is based on a simple assumption that risk is defined by volatility. According to the theory, investors are risk adverse: they will accept lower returns for a less volatile investment, but are willing to accept more risk for higher payoffs. The theory is simple and elegant, and leads into ingenious mathematical proofs and equations, which may be why it has become so widely accepted (Morien, 2005, p. 1).

The critical question that should be emphasized is whether or not the agents' irrationalities affect market outcomes. If not, this point should not be taken into account by finance researchers. If some or even all market participants are irrational, it is possible that the market mechanism can offset the distorting effect of these individual irrationalities, thereby limiting their impact on prices and allocation. If the market can average out irrationalities dependent upon the structure of the observed behavior, unsystematic irrationalities can be absorbed more easily than systematic deviations from rational behavior (Glaser, 2003, p. 23).

In a capitalist society, prices for goods and services play a central role in resource allocation. The strength of capitalism lies in its ability to make these prices reflect essential information so that resources are deployed efficiently. The following is a classic example of this phenomenon. Consider a fishmonger whose price for fish changes every day in response to availability. These prices have a

direct effect on the behavior of customers entering the shop: if the price is high they may choose to eat beef for dinner instead. In other words, the allocation of fish to the most efficient uses (in this case, to the people with the highest marginal utility of fish consumption) is accomplished by price changes. These price changes directly regulate the use of fish (Dow & Gorton, 1995, p.1). This is a very simple model about the market mechanism in an economy.

Now let us consider the equity capital market and its relation to the allocation of funds for capital investment. If a company's share price goes up, it is not obvious whether its access to equity capital will be altered. According to Dow and Gorton, the mechanism in the stock market differs from the simple fish market, and most other complex markets, in three ways which is going to be mentioned in the following paragraphs (Dow & Gorton, 1995, p.13).

First, the equity price is not a marginal value but an average value. The stock market price is a secondary market price: it values the firm as a whole rather than valuing its each simple investment marginally. The role played by the stock price in a stock market is similar to the fish market example only in the simple case where a newly organized firm issues equity for the first time to fund its investment. In this special case, if investors believe that the capital can be more efficiently deployed elsewhere, or if the expected returns on the project are insufficient to induce enough savings, then the price will be low and the project may not be undertaken. However, only an insignificant fraction of investment capital is raised in this way: the vast majority of investment is funded by retained earnings, by seasoned equity issues, or by new non equity external financing, such as bank loans or bonds.

Second, decisions about the allocation of investment capital are generally delegated to managers with little or no ownership stake in the firm. Managers can decide on dividend policy, leverage, the timing of new issues of seasoned equity, and other securities. They therefore have discretion over the amount of funding available for investing in new assets. The problem of giving managers appropriate incentives is complicated by the fact that their decisions may have implications for the long-term performance of the firm after they have left.

Third, the flow of information in a stock market may be bidirectional: the participants may learn about the quality of the managers' decisions, but the manager may also want to learn the market's valuation of prospective investments. The stock price, although intrinsically irrelevant to the investment decision, may be useful indirectly because it conveys information about prospective investment projects and cash flows. For example a high stock price may signal to the manager that the investors of the firm believe that the firm has profitable investment opportunities. The fact that the manager seeks to infer information from the price means that the stock price is different from the price of fish: the fishmonger's customers do not care that the market price reflects the marginal utilities of other consumers and the marginal costs of fishing. They need only to compare the price with their own marginal valuation. In the stock market, managers (acting on behalf of the shareholders) care about other agents' information as reflected in the price, but the stock price does not reflect the marginal cost of investment funds.

In a setting where consumers learn about product quality from the price, there may be two effects: consumers will infer the quality from the price, and then compare the price to their marginal valuation. In general, Rational Expectations Models capture these two effects. At one extreme, the prices in the preceding fishmonger example have a direct allocative role and no indirect signaling role. When consumers are buying fish it is important that the price reflects information, but the consumers care only about the price and do not need to infer the information that determines the price. In general, commodity prices may have both a direct allocative role and an indirect signaling role. For example, if consumers receive different private signals about the quality of the commodity, the price will convey information about quality as well as information about scarcity. In Rational Expectations Equilibrium, an agent's demand for the fish will depend on the price through this quality inference. We argue that secondary equity prices are at the opposite extreme of fishmonger’s prices: they have an indirect signaling role but no direct allocative role (Dow and Gorton, 1995, p. 3).

2.2.2.1.4.1. The Empirical Foundations of Efficient Market Hypothesis

Like the theoretical evidence for the efficient market hypothesis, the empirical evidence also appeared to be strong during the 1960s and the 1970s. In general terms, the empirical expectation of the efficient market hypothesis can be divided in two broad categories: First, when new information about a security is received, the price reacts as it quickly incorporates the new information. The investors who do not have fast access to the latest news (non smart investors) cannot make a profit from the news and the price adjusts accordingly, thereby preventing both an under reaction and an overreaction, at least in the long run. Second, the security prices do not change without news about its fundamental value, so the price of a security must be equal to its fundamental value (Cornicello, 2004, p. 9).

The principal hypothesis resulting from the quick and accurate reaction of prices to new information is that late information is of no value in making money, where making money is defined as obtaining a higher return after revaluation of the income with a risk adjustment ratio. In this case, the problem is to define an adequate level of risk. This can be measured by a model of fair relation between risk and return, like the capital asset pricing model. It implies that the test can fail because either one of the two hypotheses is false or because both parts of the joint hypothesis are false. In general, when the joint hypothesis is rejected, this could be due to deficiencies in the asset pricing model rather than the efficient market hypothesis which is called as “bad model problem” (Cornicello, 2004, p.9).

Returning to the informational efficiency view, it is necessary to express the informational efficiency of Fama in detail. The three different forms of the efficient market hypothesis were introduced by Eugene Fama in 1965: the weak, the semi strong, and the strong in detail. Each form occurs in a different level of information and knowledge level concerning a stock.

- **The weak form of the efficient market hypothesis:**

It is also known as the random walk model and has received much attention among the academics and investment practitioners for years. Notably, hypothesis dates back to Bachelier's doctoral dissertation about the of stock prices behavior. But the academic debate over the subject has accelerated after the doctoral dissertation of Fama in 1965. (Hagin 2004, p.55) Random walk hypothesis asserts that the random nature of stock prices can not reveal trends thus there is no way of predicting future prices using past prices. It has become widely associated with the efficient market hypothesis through the work of Fama. It holds that present stock prices reflect all known information with regard to past stock prices, trends, and volume. The weak form implies that knowledge of past stock patterns does not assist investors in obtaining improved performance. Random walk theorists view stock prices as moving randomly about a trend line that is based on rational expectations regarding fundamental factors. Proponents of this view feel that analyzing past data does not permit technical analysis to accurately forecast movements of the prices about the trend line. In addition, new information affecting stock prices enters the market randomly. No predictability exists with regard to news that would affect a stock's price.

- **The semi-strong form of the efficient market hypothesis:**

This form of the market efficiency hypothesis states that current market prices instantaneously reflect all public information. This form reflects a substantially greater level of knowledge and market efficiency than does the weak form. The semi strong form would seek to test whether all publicly available information and announcements are quickly and fully reflected in the market prices of stocks. The shifts from the weak to the semi strong form of the efficient market hypothesis represent a remarkable jump. Consequently, investors cannot obtain superior risk-adjusted returns using any publicly available information. Of course, news about the historical prices and returns are among the publicly available information. Therefore the semi strong form of efficient market hypothesis is an extension of the weak one (Hagin, 2004, p.56).

- **The strong form of the efficient market hypothesis:**

The strong form holds that present market prices reflect all information that is legally possible to achieve about a company. This includes analysis and also any exhaustive studies by institutional financial analysts. According to this form of the efficient market hypothesis, consistently abnormal return performance by market participants is impossible (Hollman, 2005, p. 22). The strong form moves the efficient market hypothesis to a still higher level of information and knowledge. The strong form constitutes a direct challenge to the institutional investor, the most integrated segment of the financial community. Also the strong form of the efficient market hypothesis can be seen as an extension of the semi-strong form of the efficient market hypothesis.

2.2.2.1.4.2. Anomalies

According to the assumption of efficient market hypothesis introduced by Eugene Fama, no investor can provide supernormal returns. However, there have been found empirical findings that contradict with the assumption of efficient market hypothesis. For these findings inconsistent with the hypothesis, the term of "anomaly" is used, which means the deviation from the normal and also accepted in Turkish language (Karan, 2001, p. 276-295).

With an aim to explain the deviations of efficient market hypothesis scientifically, different anomalies in different studies have been tried to be revealed through basing on different empirical findings. Anomalies of the efficient market hypothesis can be grouped under the following headings:

2.2.2.1.4.2.1. The Anomaly of Low-Priced Stocks

This anomaly tries to explain that the shares of companies traded in the stock exchange will provide more returns than other the shares of other companies due to just their low prices. Empirical studies have shown that investors could get supernormal returns by investing in low-priced stocks

2.2.2.1.4.2.2. The Anomaly of Price / Earnings Ratio

This is perhaps the most well-known anomaly among others. Basu, Reinganum and such other scientists have attained a number of scientific results supporting the view that low-valued stock would provide higher returns. Basu also evaluated the performance of portfolios by using the criteria of risk and return of Sharp and Treynor. As a result of the research, it was seen that investing in portfolios having low price/earnings ratio can provide supernormal returns.

2.2.2.1.4.2.3. The Anomaly of Price / Sales Ratio

According to Senchack and Martin (1987), the price/sales ratio is better indicator for returns than price / earnings ratio. It is emphasized here that investors can provide excessive returns from the stocks by taking price/sales ratio into account. This has been tried to be explained as a result of the empirical results, and conclusions inconsistent with the efficient market hypothesis have been reached at the end of these results.

Price/earnings ratio is calculated by dividing the stock price of a company by 12 month - net sales value per share. As P/E ratio, this ratio can easily be calculated by benefiting from accounting data and can be similarly used in creating portfolio strategies.

2.2.2.1.4.2.4. The Anomaly of Market Value / Book Value Ratio

It is revealed that investing in the stock having book value – market price can provide supernormal return in the article of Rosenberg, Reid, and Lanstein (1985).

Market value / book value is calculated by dividing the stock price of a company by equity value per share. It is determined in empirical research that investing in the stocks having low P/E ratio can provide supernormal returns.

2.2.2.1.4.2.5. The Effect of the Days of the Week

In recent years, it has been stated that some days of the week provide positive or negative returns in a statistically significant level in the scientific research made in the United States, Europe, and Far East. According to most of the studies, the most remarkable day has been stated as Monday. By using S & P composite index for the first time, Cross (1973) and French (1980) have found that closing prices of Monday is usually lower than closing prices of Friday and the return of Monday is usually negative.

2.2.2.1.4.2.6. The Anomaly of the Month of January

The anomaly of January explains that stock provide a higher return in the month of January than in other months. Investors can provide higher returns than other months by investing in The month of January. A study of Rozef and Kinney (1976) also justifies this assumption. In their study, they calculated the rate of return of the month of January as 3.5 %, and the rate of return of the month of January as 0.5 %.

The possible causes of the anomaly of the month of January can be explained as such that investors make sales at the last month of the year with the purpose of tax avoidance, and after benefiting from this advantage, they turn to purchase again at the first month of the next year. Another reason is that institutional investors such as mutual funds and investment trusts remove the worst-performing stocks from their portfolios at the month of December in order to show the year-end balance sheet better. Institutional investors may cause a rise in the index in the month of January with their purchases in order to fill their vacant portfolios. The studies have shown that the anomaly of the month of January is originated due to the small firms.

2.2.2.1.4.2.7. The Anomaly of in-Month

Introduced by Ariel (1987), this anomaly argues that the average return of the first half of the month is higher than the average return of the second half of the month. By this way, investors can provide higher returns by investing at the

first half of the month. The possible cause of this condition derives due to the fact that price payback and thus cash inflows to the market are usually made at the first half of the months. So, this condition is called as the anomaly of in-month.

2.2.2.1.4.2.8. The Anomaly of "Before Holiday"

The returns of the stock before holidays have been compared with the returns of normal working days in various studies. Ariel (1990) has determined that the returns before vacations are higher than the returns of normal working days. In his study, Ariel revealed that the higher returns occurred on the day of the transaction a day before the vacation.

2.2.2.1.4.2.9. The Anomaly of Business Cycle

In general opinion, the vitality in the business world affects the vitality of stock indices. Thus, supernormal returns can be attained by investing in the period of economic vitality. However, indices may show a tendency to fall even in the times of no recession in the economy.

2.2.2.1.4.2.10. The Anomaly of the Size of the Firm

In his analysis, Banz (1981) stated that although large-scale companies show good performance, when all the periods are taken into account it is seen that the performance of small-sized firms is indeed better. Through expressing that investing in small-sized firms having less market value would provide higher returns, he argues that this situation is a deviation of efficient market hypothesis. On the other hand, the opponents of Banz state that the risk of small sized firms is higher and therefore, the return of these small size firms' being higher cannot be considered as deviation. In the studies made upon these criticisms, risk-adjusted data and returns are compared and the return of small sized firms is found to be higher. Small sized firms usually provide higher returns compared to large-scale firms which are high-valued.

2.2.2.1.4.2.11. The Anomaly of the Disregarded Firm

While some stocks are more notable in the market, the others remain unnoticed. Empirical studies have shown that investing in unnoticed and disregarded stocks can provide abnormal returns. Bauman (1964) explains this anomaly through stating that unnoticed stocks may have been less valued, which is accepted as a deviation of efficient market hypothesis.

2.2.2.1.4.2.12. The Effect of Surprise Earning

According to the researches, the higher return of the firm lead to an increase of their stock prices in serious.

2.2.2.1.4.2.13. The Division of Stocks and the Effect of Stocks Free of Charge

It has been detected in Western Countries that cheapening of stock prices of the firm by means of the division of stocks or giving stocks free of charge without falling the total value of the firm can be positively effective. Since, the demand for cheaper priced stock usually increases and the price of this stock increases significantly in a short time.

2.2.2.1.4.2.14. The Anomaly of New Firms (The Cheap Price Effect in the Initial Public Offering (IPO))

One of the issues attracted the attention of the researchers from 1970s is to measure the price performance of the initial public offering stocks in the stock exchanges. The most interesting result of the researches conducted on this issue is that after the initial public offering of a stock provides investors for above-average returns especially in the short term. This situation is called as “Cheap Price Anomaly”. According to the efficient market hypothesis such a situation should not be in question, the existence of abnormal returns after the initial public offering (IPO) of the stocks have been started to be evaluated by many researchers in the stock exchanges of many developed countries. This situation is explained as the stock in question is cheaply priced than it should be priced. Still, the various hypotheses are proposed about the reasons of cheap pricing.

2.2.2.1.4.2.15. The Estimations of the Experts

Most of the investors who try to utilize their savings in the stock markets and try to speculate within the framework their limited opportunities benefit from the opinions of various financial experts due to the narrowness of their information and the lack of opportunities to make fundamental and technical analysis. In the capital markets of many developed countries, there are professionally specialized agencies, investment consulting firms and the experts of some reputable broadcasting institutions advising periodically all of which provide financial services to the investors. It is sure that the suggestions which does not reflect the opinions of experts and based on the market rumors also affect the investment decisions of the investors. It has been also suggested that both the opinions of experts and market rumors increased the demand for the stocks recommended, therefore, caused by an increase in the return of the stocks (Karan, 2001, p. 276- 295).

The different formations emerging against to the efficient market hypothesis and called as market anomalies mentioned above are interestedly monitored by investors. Thus, it is possible to make profit by monitoring closely these anomalies in question (Dağlı, 2000, p. 331-332).

2.2.2.1.5. Random Walk Hypothesis

The EMH says that the entire history of information regarding a financial asset is reflected in its price and that the market responds instantaneously to new information. According to the EMH, if any patterns exist, they must be so small that no systematic trading strategy can have a better risk/return profile than the market portfolio. That is to say, no one can make abnormal returns in the market. Andrikopoulos and Shiller (1997, p.4) analyzed the significance of the market portfolio with different assumptions.

Therefore, according to the EMH, no profitable information about future movements can be obtained by studying past price series. Starting from the there is no riskless gain in financial markets, it is sensible that proponents of the EMH

would choose a model of asset prices that constitutes a "random walk" in price space. In modern finance theory, theoretical descriptions are mainly based on the assumption that asset prices follow some form of random walk (Johnson, Jefferies and Hui, 2003, pp. 221).

The theory of random walk in stock prices involves two separate hypotheses:

- Successive price changes are independent.
- Price changes conform to some probability distribution.

Independence means that the sequence of price changes leading up to the time period have no influence on the probability distribution of the stock price. Consequently, in a financial market using a strategy based on past prices data, it is not possible to obtain higher a return than a buy and hold strategy (Cornicello, 2004, p. 10).

2.2.2.1.5.1. The Challenges to the Efficient Market Hypothesis

It can be argued that the basically theoretical background of EMH rests on three arguments which rely on progressively weaker assumptions. First, it is assumed that participants in the market are rational and that they do not make systematic errors in valuing the securities in the market. Second, some investors may be irrational, but as they trade randomly, they cancel out the effects of each other's irrationality without affecting prices. Third, even though there are some irrational investors, they are met in the market by rational arbitrageurs who eliminate their influence on prices. The ideas which challenge EMH are based upon these three assumptions. In the following subsections, this paper will briefly discuss these three assumptions in finance literature. (Shen, 2002, p.2).

2.2.2.1.5.1.1. Agent's Rationality

Recently, there has been a wide range of literature dealing with the rationality of investors. These studies try to examine how investors in financial markets – both professional and individual investors actually behave. Many researches in the area demonstrate investor behavior that is difficult to reconcile

with rationality or with predictions of modern finance models. In one example, Benartzi and Thaler analyzed retirement savings plans for the heuristic bias. Each savings plan offers a fixed number of investment options that varies across firms. Benartzi and Thaler found that some individuals spread their savings evenly across the investment alternatives and do not take into account the riskiness of the investment options (1995, p.90)As a result, it can be argued that the asset allocation of individuals is influenced by the percentage of stock funds offered. The higher the number of stock funds, the higher the allocation to equities a finding that is difficult to reconcile with agents' rationality (Glaser, Noth and Weber, 2003, p. 7).

Another aspect of non-rational behavior is that the market behavior of investors is influenced by framing. The behavior of market participants' changes depending on the framing of gains and losses (Glaser et al., 2003, p. 7). Traders are willing to pay more for assets if they have a short position at the beginning of a trading period compared to situations with a long position, even though the expected value of both portfolios is the same. In the first case, trading is driven by loss aversion, whereas in the second case, diversification is the main reason for trading (Glaser, 2003, p.7).

Furthermore, agents' rationality requires that all available information is evaluated using Bayes' rule. However, if investors use specific heuristics which put too much weight on recent information, this systematic bias has an impact not only on the price reaction to new information but also on the price reaction afterwards when this error becomes obvious. In their 1997 paper, Barberis, Shleifer, and Vishny built a parsimonious model of investors. In their model they tried to show how investors form expectations of future expectations. Investors in the real markets can make systematic errors when evaluating public information. (Barberis et al., 1997, p.27). Investors are prone to a conservatism bias the underweighting of new evidence when updating probabilities. They are also prone to a particular manifestation of the representative heuristic, which is the tendency to expect even short sequences of realizations of a random variable to reflect the properties of the parent population from which the realizations are drawn (Glaser, 2003, p.7).

2.2.2.1.5.1.2. Law of One Price

The law of one price is a fundamental concept of finance theory. According to this rule in an efficient market security must have a single price no matter how it is created. Recently, some puzzles have been discovered proving that the law of one price is violated. This violation is so severe that prices are inconsistent with all valuation models.

One example is security prices of "Siamese twin" shares, such as Royal Dutch Petroleum and Shell Transport and Trading. Twin shares trade at different places or in different countries and the division of current and future cash flows is fixed to each twin. The case of Royal Dutch Shell is a specific, well-known example in the related literature (Froot and Dabora, 1998, p. 2; Mullainathan and Thaler, 2000, p.7). The facts are that Royal Dutch Petroleum and Shell Transport are independently incorporated in the Netherlands and England respectively. The current firm emerged from a 1907 alliance between Royal Dutch and Shell Transport in which the two companies agreed to merge their interests on a 60:40 basis. Royal Dutch trades primarily in the US and the Netherlands and Shell trades primarily in London. According to rational models, the shares of these two components (after adjusting for foreign exchange) should trade in a ratio of 60:40. But they do not. The actual price ratio has deviated from the expected one by more than 35%. It does not make sense to explain this disparity with taxes and transaction costs. This is the violation of the law of one price rule. (Froot and Dobora 1998, p.4; Glaser, 2003, p.5) This is a simple, but well known example illustrating that prices can diverge from intrinsic value because of the limits of arbitrage. Some investors do try to exploit this mispricing, buying the cheaper stock and shorting the more expensive one, but this is not a sure thing, as many hedge funds learned in the summer of 1998 (Froot and Dobora 1998, p.4; Mullainathan and Thaler, 2000, p. 8).

The second example of evidence against the rationality of market prices and law of one price was presented by Lamont and Thaler. They studied equity carveouts by analyzing the spinoff of Palm, which was owned by 3Com. In March 2000, 3Com sold 5% of its Palm shares in an initial public offering and kept the

remaining 95% of the shares. 3Com announced that its shareholders would eventually receive 1.5 shares of Palm for every 3Com share they owned. Accordingly, the stock price of 3Com had to be at least 1.5 times as high as the stock price of Palm, as long as the value of the whole 3Com company was positive. However, the stock price of Palm was far above the stock price of 3Com, implying a value of 22 billion U.S. dollars of 3Com's non Palm business. Rational explanations of why arbitrage is not sufficient to avoid violations of the law of one price are examined at in the next subsection (Glaser, 2003, p.5).

2.2.2.1.5.1.3. Limits to Arbitrage

In financial markets, bubbles and crashes occur from time to time which seems to reject the idea of efficient markets and the positive effect of arbitrage. For example, the NASDAQ Index rose from about 1000 in late 1997 to more than 4500 in March 2000 before declining to 1000 in March 2003. In Germany, the New Market index (Nemax 50) rose to more than 9000 in March 2000 and stood at about 310 by the end of March 2003. These huge changes of market indices are difficult to explain using a modern finance model. Additionally, the question arises why arbitrage cannot dampen these swings which, as common sense suggests, are not only due to new information (Glaser, 2003, p.56).

Several models within the rational framework were developed to explain the limits of arbitrage. If the investment horizon is shorter than the time until the fundamental value of an asset is reached, serious mispricing remains a possibility. Moreover, mispricing can be the result of noise traders as they create additional risk by trading randomly. This additional risk is priced by the market. If noise traders take this additional risk by trading irrationally, they can earn higher returns than rational investors. In other words, irrational investors are not necessarily eliminated from the market due to their losses. It is shown that noise trader risk can worsen mispricing in the short run. If arbitrageurs have short investment horizons, noise trader risk will prevent them from exploiting this mispricing. The literature shows that the survival and the price impact of irrational traders are two independent concepts: They find that the price impact of irrational traders does not rely on their survival in the long run and that they can influence prices even

when their wealth becomes negligible (Glaser, 2003, p.7). It should be also noted that Fama defined the preceding discussions as anomalies in the market. (Fama, 1998, p.283).

Consequently, other market imperfections, such as short sale constraints or non-tradable future income may limit arbitrage, too. In summary, the limits of arbitrage exist and may lead to severe mispricing, even with fully rational market participants and unsystematic irrational behavior of noise traders (Glaser, 2003, p.7). This section is also included and discussed in the behavioral finance subsection as it is one of the main discussion topics of behavioral finance literature.

2.2.2.1.6. Modern Portfolio Theory

Modern Portfolio Theory was developed by Harry Markowitz to use for the management of financial assets (Türko, 1999, p. 423). In June of 1952, a fourteen-page article under the title of "Portfolio Selection" was published in "Journal of Finance", a leading academic journal. The author of this article was Harry Markowitz a twenty five years old post-graduate student who had been known by nobody yet. The article was highly innovative in many ways and ultimately made a great impact in terms of both theory and implementation so that it brought Nobel Prize in the science of economy to Harry Markowitz in 1990. For more than twenty years after the publication of the article, the concept of "Portfolio Selection" could not have taken anybody's attention. In those days, the performance of a security was measured by what it gained or lost to investors. With the crisis of 1973-1974, investors realized that only bull markets have star players and thus became aware of that they should deal with risk as the return ratio (Bernstein, 2006, p. 280-282).

So far, as risky investments, financial asset investment have been handled one by one and it has been tried to examine to what criteria financial decisions may be taken when investing in any financial assets. Instead of handling risky investments one by one, the examination of the combination of financial assets,

and in this way, the consideration of interplay between investments is named as "Portfolio Approach".

If an investor invests all of his wealth in a single financial asset, he may lose all of his wealth in case of the emergence of the unexpected negative developments and so loss of investment. However, when investing in more than one financial asset, the negative result and the loss of all the wealth becomes a very small probability. Even if an investor meets a loss in one or more investments, his possible investments will end up with positive results and the investor will get rid of a great loss.

Generally, the principle application field of portfolio approach that could be used for evaluation of all kinds of risky projects is the management of financial assets. On the other hand, portfolio approach was developed under the assumption that the life of the investment is limited to only one period. The investment period may be a day, a week, a month, a year, or even longer. It will be needed to perform a new analysis and to review investments at the end of the period. In other words, rather than the return of the financial asset in each period in a long period of time, a single return in only one period is important and a new analysis should be performed at the end of the period. This approach contradicts with the purpose of long-term wealth maximization (Bolak, 1998, p. 229-230).

2.2.2.1.6.1. The Capital Asset Pricing Model (CAPM)

Markowitz's portfolio theory was developed by scientists such as Sharpe, Lintner, and Tobin the risk and return of an asset and their relationship with each other was grounded in a more comprehensive scientific base. This theory is called as The Capital Asset Pricing Model (CAPM) in literature. CAPM investigates whether the security in which we plan to invest will get risk-appropriate returns and provides a theoretical framework even explaining the expected return of an asset which has not begun to operate in the market yet (Karan, 2001, p. 195).

This approach was set upon a model created to see how assets are priced. The assumptions of CAPM based on these principles are as followings (Karan, 2001, p. 195-196):

1. Investors evaluate their portfolios by looking at one-term expected returns and standard deviations.

2. Investors always expect higher returns. From among two portfolios having same characters except for the expected returns, they choose the one with higher expected return.

3. Investors escape from the risk. From among two portfolios having same characters except for standard deviation, they choose the one with lower standard deviation.

4. Individual assets are infinitely divisible, that is, if an individual want, he can purchase a small percentage of the share.

5. There is a risk-free rate which can investor can borrow or lend.

6. Taxes and transaction costs are irrelevant.

7. All investors have same and one-period investment scopes.

8. Risk-free rate is same for all investors.

9. Information is free and immediately accessible for all investors.

10. The expectations of investors are homogeneous, which means that the ability of investors to understand the expected returns, standard deviations and covariance of securities is the same.

It is clear that many of the assumptions listed above is no realistic. However, rather than the realism of these assumptions, what is important here is to create an appropriate balance between risk and return (Dağlı, 2000, p. 386).

2.2.2.1.6.2. Factor Models

In Markowitz approach, investor has to calculate the standard deviation, the expected return and the covariance of the securities. The investor will try to calculate the best investment option by calculating the efficient frontier from among the portfolios with the highest return and the lowest risk within the investment set consisting of portfolios obtained as a result of these calculations. If there is an opportunity of borrowing and lending in the risk-free rate, at this time, he has to create his portfolio structure according to market portfolio and the options of risk-free securities through taking risk preferences into account.

The most important condition in this model is the existence of the correlation between market index and stock returns. Through basing on the high correlation between the market index and the other stocks, a general model is tried to be obtained that will be used for explaining all stock returns.

The overall structure of all factor models is based on an independent variable that will explain the returns of securities. The general assumption is that there is a high level of correlation between security returns and this independent variable. In fact, there may be more than one variable that can explain the returns of securities. In this case, our model will be the multi-factor model.

As a result, as one of the most important tools of portfolio management, factor models contain the information of expected return, variance and covariance required for the analysis of Markowitz, so puts forward the sensitivity of portfolio towards some factors (Karan, 2001, p. 221-232).

2.2.2.1.6.2.1. One Factor Models

One-factor models try to explain the returns of securities depending on a single factor. Such models are similar to market models that try to explain stock returns by market index; however, one factor models not only use market index as an explanatory factor, but also different macro-economic variables. Gross national

product, inflation rate, market interest rate or industry indices are used as explanatory factors of this model.

2.2.2.1.6.2.2. The Benefits of Factor Models

The most important feature of factor models for Markowitz's model is to be simple. The assumption that the returns of all securities are based on only one factor provides an important advantage according to Markowitz's model. The second advantage of one factor model is that it provides opportunity to make variations. The terms of market risk and firm risk used in market model can be used with a small change in this model. The names of these terms in factor models have changes as the risk factor and the risk that do not derive from factor.

2.2.2.1.6.2.3. Two or Multi Factor Models

So far, one-factor models affecting the prices of stocks have been emphasized. However, the prices of stocks are affected by various macro-economic factors in real. For example, in a research conducted by Chen, Roll and Ross, it was determined those four factors given below are effective in stock prices:

1. The unexpected change arising in the inflation
2. The unexpected change arising in the industrial production
3. The unexpected change arising between the differences of low-grade and high grade bonds.
4. The unexpected change arising at the slope of term structure curve of the interest rates.

It is possible to enhance these factors further. The change in national income, oil prices and foreign trade balance are also effective on the stocks. In this part, firstly two factors and then multi-factors models will be described.

2.2.2.1.6.2.3.1. Two Factors Model

The difference of two-factor model from one-factor model is that, the former is based on the assumption that the change arising in the returns of stocks derives from two separate factors. Thus, stocks will have two separate sensitivity coefficients, one of which is to show the sensitivity for the first factor. The change that cannot be explained by this model is indicated by the error factor. The benefits of this model are:

1. Diversity causes the risk factor to be an average value.
2. Diversity reduces the risk that cannot derive from the factors.
3. The risk that cannot derive from factor is decreased in well-diversified portfolios.

2.2.2.1.6.2.3.2. Multi Factors Model

When it is thought that the returns of stocks derive from more than two factors, three or more factors can be added to the model. The increase of the number of factors does not change the basic logic of the model (Karan, 2001, p. 221-232).

2.2.2.1.6.3. Arbitrage Pricing Theory (APT)

Capital Asset Pricing Model (CAPM) is based on the assumption that while choosing the optimal one among the portfolio options, investors consider return and risk of each stock and select the portfolio that provides the highest return in a certain level of risk. The assumption may not be potential and the concepts of risk and return grounded in the selection may show changes from investor to investor. For example, when portfolio returns are calculated according to pre-tax and after-tax returns of the assets included in the portfolio, different values can be obtained (Akmut, 1989, p. 174).

The difficulties encountered during testing of Capital Asset Pricing Model (CAPM), the various inadequacies of the model, and as a result the issue of

whether CAPM can be tested or not has directed researchers toward looking for new models.

Developed in the 1970s by Stephen A. Ross and again formulated and published by Rose in 1976, Arbitrage Pricing Theory (APT) is the most discussed theory compare to alternative models. The formulation of Ross has less restrictive features compared to CAPM. It can be applied to single-period sampling as well as multi-period sampling.

Arbitrage Pricing Theory named by investors and portfolio managers is a model based on economic basis. Arbitrage Pricing Theory refers to a risk-return relationship that uses a weighted average of risk factors such as non-payment risk, interest rate risk, market risk, purchasing power risk, management risk, and the risk related to assessment of a certain asset. Arbitrage Pricing Theory is a model that shows how to determine the rate of return appropriate for finding the present value of an asset related risk factors.

In Arbitrage Pricing Model (APM), the issue of securities return is formed by the factors in the sector and the market and the existence of positive relationship between risk and return are accepted. These factors are the variables such as gross national product (GNP), inflation, money supply, interest rates. As the number of securities increases, non-systematic risk will fall but systematic risk will not change. The return of securities is expressed as the sum of risks involved according to the risk – free interest rate and variable factors.

On the basis of Arbitrage Pricing Theory (APT), the recognition of important systematic factors affecting the long-term average return of financial assets take place. APT does not regard the numerous factors affecting daily price changes of each share certificates and bonds, but mostly allows for important factors affecting the sum of the assets in the largest portfolios. The intuitive assessments about portfolio returns can be done by recognizing these factors. The ultimate aim that should be achieved here is to obtain a more understandable level of configuration and evaluation of the portfolio and thus to amend the design and performance of whole portfolio (Roll & Ross; 1984, p. 15).

APM, developed by Ross as an alternative for CAPM, is a more complex model compared to CAPM. Based on a linear model, APM assumes that an investment return is based on multiple factors. As a more general and less hypothetical model compared to CAPM, APM does not include a restriction on market equilibrium and the preferences of investors. On the other hand, APM suggests that arbitrage behaviors lead markets towards equilibrium such as the risk-free return attainment of investors (Karan, 2001, p. 247).

2.3. Behavioral Finance Theory

Under this heading, the concept, the development and the evaluation of Behavioral Finance in comparison to Efficient Market Hypothesis will be take place.

2.3.1. The Concept and Scope of Behavioral Finance Theory

It has been widely accepted that human nature consists of multiple motivations, beliefs and behaviors. While psychological research has tried to reveal the diversity and richness of the individual included in his inner world, the science of economics uses highly simplified assumptions in this respect. In Expected Utility Theory, for example, people are treated as stable and rational individuals who try to maximize well defined utility functions. For psychology, on the other hand, anomalies are frequently mentioned that cannot be explained by rational individual behavior of human in decision making process. Through taking into account that the cause of so many anomalies in markets resulting from human psychology or adding the psychological factors in decision making processes, behavioral finance emerged (Tufan, 2004, p.29).

Behavioral finance, indeed, tries to understand the behaviors of financial markets through taking advantage of the theories based on the sciences of psychology, sociology and anthropology. The basis of behavioral finance derives from the principles of these three social sciences mentioned above that may be useful in the development of the knowledge about the behaviors of financial markets (Cornicello, 2003, p. 23).

Having aroused considerable interest of the researches, behavioral finance has not been well defined yet as a newly developing area for economics and finance. But definitions found in the literature are as below (Fuller, 1998, p. 5-12):

- Behavioral finance is the combination of classic economy and finance with psychology and decision making principles.
- Behavioral finance is a scientific approach that tries to explain the causes of anomalies observed and reported in the financial literature.
- Behavioral finance is the examination of the cognitive and logical errors of systematic investor in financial decisions.
- Behavioral finance is the determination of systematic errors of investors in making estimates about expected returns of their financial assets.
- Behavioral finance is the examination of the situations that is full of actions of market participants in the inadequacy and complexity of human nature (Sendhil & Thaler, 2000).
- Especially with the help of behavioral sciences such as sociology and psychology, behavioral finance is concerned with the discovery and disclosure of the observations contradicting with Expected Utility Theory and the predictions of narrowly defined paradigm of rational behavior as a new branch of economy and finance (Frankfurther & Mcgoun, 2000, p. 200-211).

As can be understood from the definitions above, behavioral finance theory is concerned with the effects of the science of cognitive psychology on the individual decision making process, so follows a new approach different from modern financial theories accepted as the infrastructure of the theories of rational individual. Many researchers have been made that explain through which ways people deviate from optimal reasoning and decisions in a systematic way by social scientists. Behavioral finance may enrich economic analysis through transferring the findings related to human nature to financial models. The issue of what will happen if people are not rational provided for traditional financial institutions,

when the concept of rationality is removed or examined in a more flexible way forms the subject of behavioral finance.

2.3.2. The Historical Overview

At the core of behavioral finance is the idea that the principle derived from these social sciences can be useful to improving knowledge of the behavior of the financial market. The field of behavioral finance is not new. Many investors have long considered that psychology plays a key role in determining the behavior of markets (Brabazon, 2000, p. 2). During the classical period, economics had a close link with psychology. Economists began to distance themselves from psychology during the development of neoclassical economics as they sought to reshape the discipline as a natural science, with explanations of economic behavior deduced from assumptions about the nature of economic agents. The concept of homo economicus was developed and the psychology of this entity was fundamentally rational. Nevertheless, psychological explanations continued to inform the analysis of many important figures in the development of neoclassical economics, such as Francis Edgeworth, Vilfredo Pareto, Irving Fisher and John Maynard Keynes (Cornicello, 2004, p. 24).

Indeed, Psychology had largely disappeared from economic discussions until the 1950s. Later, a number of factors contributed to the resurgence of its use and the development of behavioral economics. Expected utility and discounted utility models began to gain wide acceptance, which generated testable hypothesis about decision making under uncertainty and inter-temporal consumption. An increasing number of empirical studies with evidence supporting the presence of continuous anomalies challenged the rational behavior hypothesis. Nonetheless, many principles on which behavioral finance is based are not new. Indeed, they return to the origins of economic theory. Adam Smith, who is considered the father of modern economic thought with his book, "The Wealth of Nations," wrote a lesser known book called "The Theory of Moral Sentiment.” In this work, there are insights into human psychology, many of which are relevant today in behavioral finance. For example, he wrote "we suffer more... when we fall from a better to a worse situation, than we ever enjoy when we rise from a worse to a

better." This explains well the principle of loss aversion. At the same time, Jeremy Bentham, whose utility concept had an important influence on the foundation of the neoclassical economy, wrote extensively about the psychological underpinnings of utility (Cornicello, 2004, p. 23-24).

The ignorance of the psychological approach in economic theory, and consequently in finance theory, began with the neoclassical revolution in which all the studies in this field were constructed based on the assumption of the nature of homo economicus . In the early part of the 20th century, the works of some economists, such as Vilfredo Pareto, Irving Fisher, and later, John Maynard Keynes, had some psychological insight, however, discussion about the influence of psychology on finance had largely disappeared. (Cornicello, 2004, p. 24) During the second half of the 20th century, interest in the psychological principles of economics reappeared. Psychologists like Daniel Kahneman and Amos Tversky started using the economic model as a benchmark against which to contrast their psychological models. Tversky and Kahneman's 1979 article on prospect theory could be accepted as the main contributor to the growth of "modern" behavioral finance (Kahneman and Tversky, 1979).

In the 1980s, interest in behavioral finance started to grow rapidly as different studies representing evidence about anomalies which traditional theories were not able to explaining the financial markets emerged. This interest in behavioral finance continues to grow today with a number of scholars and practitioners actively involved in these studies, as well as with a far-reaching and growing base of literature. It is necessary to note that behavioral finance theory attracted great favor among finance academics and researchers after Daniel Kahneman won the Nobel Prize in Economics.

However, it is only in recent years that a series of concerted formal studies have been undertaken in this area. Paul Slovic's paper on individual's misperceptions about risk (1972), and Amos Tversky and Daniel Kahneman's papers on heuristic driven decision biases (1974) and decision frames (1979) played seminal roles (Brabazon, 2000). Perhaps the most important paper in the development of behavioral finance was written by Kahneman and Tversky in

1979. This paper, “Prospect Theory: Decision Making Under Risk,” used cognitive psychological techniques to explain a number of documented anomalies in rational economic decision making (en.wikipedia.org). Further milestones in the development of the field include a well attended and diverse conference at the University of Chicago (Hogarth and Reder, 1987), a special 1997 edition of the respected Quarterly Journal of Economics “In Memory of Amos Tversky” devoted to the topic of behavioral economics, and the award of the Nobel prize to Daniel Kahneman in 2002 “for having integrated insights from psychological research into economics, especially concerning human judgment and decision making under uncertainty”.

The results of these studies were at variance with the rational, self interested decision maker posited by traditional finance and economics theory. Although several definitions of behavioral finance exist, there is considerable agreement between them. Lintner defines behavioral finance as being “the study of how humans interpret and act on information to make informed investment decisions” (Brabazon, 2000, p. 2). Thaler defines behavioral finance as “simply open minded finance,” claiming that “sometimes in order to find the solution to an [financial] empirical puzzle it is necessary to entertain the possibility that some of the agents in the economy behave less than fully rationally some of the time” (Brabazon, 2000, p. 2).

In his study, Olsen asserts that “behavioral finance does not try to define ‘rational’ behavior or label decision making as biased or faulty; it seeks to understand and predict systematic financial market implications of psychological decision processes.” (Olsen, 1998, p.11) It should be noted that no unified theory of behavioral finance exists at this time.(Brabazon, 2000, p.2) Olsen points out that most of the emphasis in the literature thus far “has been on identifying behavioral decision making attributes that are likely to have systematic effects on financial market behavior” (Olsen,1998, p.12).

One idea core to behavior finance is that the principles derived from the social sciences can improve the knowledge about investors’ behavior in financial markets. This research doesn't imply a rejection of previous theories. On the

contrary, it provides a useful theoretical framework upon which studies on behavior finance try to improve. Despite strong evidence that securities markets are highly efficient, there is a growing body of evidence that long term historical phenomena contradict the efficient market hypothesis and cannot be captured plausibly on models based on perfect investor rationality. The "irrational investors approach" assumes that securities market arbitrage is imperfect, and thus that prices can be too high or too low (Baker, Ruback and Wurgler, 2004, p. 1). These phenomena are referred to as stock market anomalies. Behavioral finance seeks to understand and explain these recognized phenomena.

The underlying assumptions of the efficient market hypothesis are that transaction costs are zero, markets are not segmented, and there is easy entry into the security markets (Hollman, 2005, p. 22). The behavioral assumptions that underlie the efficient market hypothesis argue that investors act in an unbiased fashion to maximize the values of their portfolios, which is usually referred to as rational expectations, and that investors always act in their own self interest (Hollman, 2005, p. 22). Behavioral finance questions the validity of these last two assumptions. Researchers in cognitive psychology and the decision sciences have documented that people systematically make errors in judgment and mental mistakes. Behavioral finance as a new area for research may be able to explain these anomalies in the efficient market hypothesis.

As mentioned in the previous parts, Eugene Fama, the pioneer who identified the three forms of the efficient market theory, argued that the theory survives the criticisms of behaviorist academics who point out anomalies in the markets. Fama claimed that market anomalies are chance results. Any new models introduced to explain anomalies should be considered in relation to how they view the big picture. Fama believed existing behavioral models are inadequate because they seek to explain specific anomalies, and there is no overriding theory that could overturn the efficient markets model. It appears that until there is a unifying theory, there is no validity. (Fama, 1998, p.283) However, this does not mean that there are no anomalies in the markets and the EMH is performing perfectly in the market mechanism (Hollman, 2005, p. 23).

According to Shiller, the basic problem with the efficient markets hypothesis is that it is telling a half truth. The hypothesis is useful when presenting market efficiency as a simple concept to college students and amateur investors, but they may come to believe that it is easy to get rich quickly. However, this is not the case when trading in speculative financial markets. The short run, day-to-day or month-to-month profit opportunities that people imagine they have found are probably not there. Shiller's response to Fama emphasized that the real world is not very similar to the world presented in Fama's assumptions. (Shiller, 2001a, p. 11).

In his 2003 paper, Glaeser wrote that psychology is not going to argue that human beings do not respond to incentives, nor is psychology going to suggest that risk free opportunities for profit will be possible. If anything, situationalism creates more of a problem for psychology than for economics. In the real world, situations are manmade. To understand heterogeneity across time and space, psychologists need theories that explain how exogenous variables shift the supply of cues, framing, and other situational factors. For example, psychology tells us that people form beliefs in large part by listening to people around them, so it isn't a surprise that there can be cognitive errors in their decision making process. But psychology doesn't help us to understand the exogenous factors that lead to different errors in different times, such as in the financial markets. If it is possible to combine economic insights about the supply of influence and psychological insights about the impact of that influence, then a chance to understand equilibrium outcomes can be achieved (Glaeser, 2003, p. 3).

It should not be underestimated that the theories related with psychology are used to support behavioral finance, and to challenge the efficient market hypothesis. Within the last two decades, finance literature has accumulated a substantial number of observations of anomalies inconsistent with the efficient market hypothesis. These anomalies suggest that the underlying principles of the efficient market hypothesis are not entirely correct. It may be necessary to look also to other models of human behavior that have been studied in social sciences (Shiller, 2001b, p. 1307).

As a new paradigm, behavioral finance seeks to supplement the standard theories of finance by introducing behavioral aspects to the decision making process. Contrary to Markowitz and Sharp approach, behavioral finance deals with individuals and ways of gathering and using information. Behavioral finance seeks to understand and predict systematic financial market implications of psychological decision processes. In addition, it focuses on the application of psychological and economic principles for the improvement of financial decision making (Olsen, 1998).

Accordingly, behavioral finance offers a forum that goes beyond the limits of economic assumptions in pursuit of a better model of financial behavior that includes both cognitive and emotional behaviors. One could argue that prospect theory is the behavioral theory that has the most remarkable impact on economic research. Thus, in the next subsection, this study will briefly discuss the prospect theory of Kahneman and Tversky.

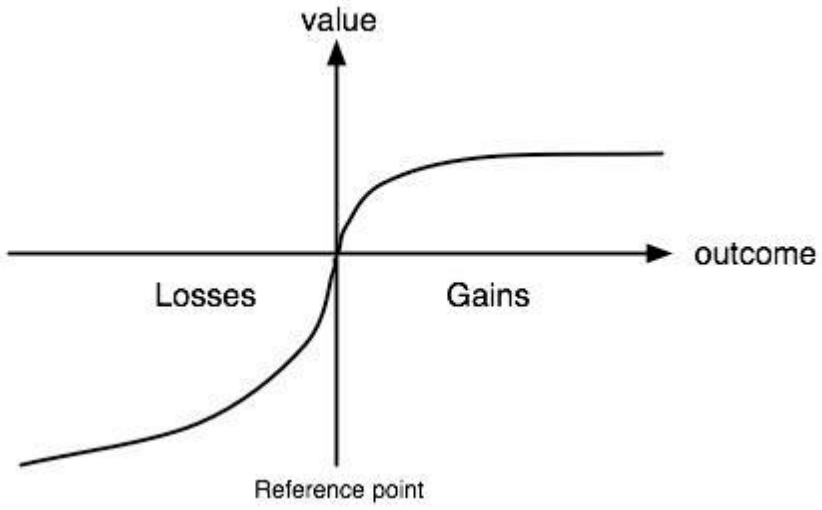
2.3.3. The Prospect Theory

Prospect theory was developed by Daniel Kahneman and Amos Tversky in 1979. Starting from empirical evidence, it describes how individuals evaluate losses and gains. In the original formulation, the term prospect referred to a lottery. Kahneman and Tversky developed this theory to remedy the descriptive failures of expected utility (EU) theories of decision making. Prospect theory attempts to describe decisions under uncertainty, and has also been applied to the field of social psychology.

Shiller refers to prospect theory as a mathematically formulated alternative to the theory of expected utility maximization an alternative that is supposed to capture the results of such experimental research (Shiller, 2001, p. 1308-1310). Prospect theory is probably the most widely accepted behavioral theory and has the most impact on economic research. It is very influential despite the fact that it is viewed by many economists as less important than expected utility theory. Expected utility theory offers a restrained representation of rational behavior under uncertainty. It works well as a foundation for an economic theory based on

the assumption of strictly rational behavior. However, it is known that in certain circumstances EU incorrectly predicts human behavior as it is shown in experimental evidence. Many theories are created to match this evidence, prospect theory being foremost among them.

Prospect Theory is a mathematically alternative to the theory of expected utility maximization. The utility theory offers a representation of truly rational behavior under certainty. According to expected utility theory, investors are risk-averse. Risk aversion is equivalent to the concavity of the utility function, i.e. the marginal utility of wealth decreases. Every additional unit of wealth is valued less than the previous equivalent increase in wealth. Despite the obvious attractiveness of this expected utility theory, it has long been known that the theory is systematically failed to predict human behavior, at least in certain circumstances. As mentioned at the beginning of this section, prospect theory was first developed by Daniel Kahneman and Amos Tversky in their milestone paper, "Prospect Theory: An Analysis of Decision Under Risk" (1979). In prospect theory, Kahneman and Tversky formalized loss-averse behavior and other seeming anomalies as behavioral elements. They replaced the utility function with a valuation function that evaluates changes in expected income from the current level based on a current reference frame that conditions expectations. While increases in income are weighted by a small marginal utility, decreases in income are weighted by a larger marginal utility.



Graph 2.2.: Hypothetical Value Function, Kahneman & Tviersky, 1979, p. 286

Prospect theory is basically divided into two stages: editing and evaluation. In the editing stage, the different choices are ordered following some heuristic so as to simplify the evaluation stage. The evaluations around losses and gains are developed starting from a reference point. The value function (sketched in Figure.1) which passes through this point is shaped, and as its asymmetry implies, given the same variation in absolute value, there is a bigger impact of losses than of gains (loss aversion). Some behaviors observed in economics, like the disposition effect or the reversing of risk aversion/risk seeking in case of gains or losses (termed the reflection effect), can be explained referring to prospect theory.

The three main characteristics of Tversky and Kahneman's value function, which replaces the expected utility value function in the investor's decision, are as follows (Mullainathan and Thaler, 2000, p. 6):

- The value function is defined over changes to wealth rather than levels of wealth (as in Expected Utility) to incorporate the concept of adaptation.

- The loss function is steeper than the gain function to incorporate "loss aversion," which is the concept that people are more sensitive to decreases in their well-being than to increases in their well-being.

- Both the gain function and loss function display diminishing sensitivity (the gain function is concave, the loss function is convex) to reflect experimental findings. To fully describe choices, prospect theory often needs to be combined with an understanding of "mental accounting."

In conclusion, the discontinuity on the slope at the reference point is probably the most significant element evidenced by prospect theory. But at the same time, it doesn't accurately define what determines the location of the reference point, nor how to distinguish the difference between very high probabilities and extremely high probabilities. The experimental evidence shown by Kahneman and Tversky does not point out systematic patterns which could be codified in a generalized theory, therefore these elements could not be specified (Cornicello, 2004, p. 26).

Shiller reviewed prospect theory in finance, positing that expected utility theory, with its rational expectations derivative, is still the dominant paradigm for investor decisions in finance, and for economic decisions in general. (2001). Here it will be useful to note that the importance of behavioral finance theory has been growing rapidly in the last decades. The full range of asset pricing models are surveyed and assessed by Campbell in 2000. He focused on the interplay between theory and empirical work and on the trade-off between risk and return. Facts about interest rates, aggregate stock prices, and cross-sectional patterns in stock returns have stimulated new research on optimal portfolio choice; inter temporal equilibrium models, and behavioral finance.

Many of these models have been used to identify anomalies in investor behavior. Cochrane also discusses the broad category of alternative APMs, called multifactor models (Gorener, 2003, p. 20). A paper by Barberis, Huang and Santos from 2001 discusses prospect theory in the context of national income accounts, incorporating consumption and changes in wealth as part of the reference frame. They also surveyed recent finance literature that focuses on prospect theory and loss aversion (Barberis et al., 2001, p.48).

Another research direction in the literature follows the practice of the first Kahneman and Tversky paper, and obtains responses by surveying. This approach seems less satisfactory than working with a large panel of historical data: as Kahneman and Tversky point out, survey responses may be influenced by the phrasing of the questions.

Recently, prospect theory has been entering the literature about investor behavior. In many cases, however, it keeps its links with psychology. Many sensible and plausible ideas from psychology do not come into finance in forms that are readily testable, particularly with high frequency data. This matter is well illustrated by Shefrin in the year 2000. He identifies and discusses several practices associated with reference dependence, including mental accounting, hedonic editing, regret minimization, and what is commonly called isolation (Gorener, 2003, p. 21). The original Kahneman and Tversky (1979) paper contains these concepts. However, the scope for analyzing them in the historical

financial market data only does not seem very promising, as the findings should be supported with empirical findings using real market financial data.

In brief, prospect theory differs from many other psychological theories in that it has a solid mathematical basis, which gives economists the opportunity to play with it. Prospect theory has some elements similar to expected utility theory. In both theories, individuals maximize a weighted sum of "utilities," but the difference with prospect theory is that the weights are not the same as the true probabilities, and the utilities are determined by a "value function" rather than a utility function. It can be argued that behavioral finance literature has two important aspects: cognitive biases and limits to arbitrage. These two subjects will be discussed in the following subsections.

2.3.4. The Behavioral Sciences Correlated with Behavioral Finance

The reason of the development of Behavioral Finance as a matter of science is the impossibility of the protection of traditional distinctions between various disciplines such as psychology, sociology and anthropology while solving practical problems of industry and other social institutions. Any event can be explained in different levels, so it is necessary to apply the theories and concepts of other behavioral sciences to economics (Drake, 1990, p. 19).

The foundations of cognitive inference and judgments of behavioral finance used in explaining of anomalies in the markets is based on the sciences of sociology, psychology, and anthropology investigating social, societal and cultural dimensions of human behavior.

It is seen that behavioral finance utilizes the literature of behavioral sciences mentioned above both at the beginning and at the development stage theoretically and practically. In addition, it is also known that the scientists who made a significant contribution to the emergence of Behavioral Finance such as Amos Tversky and Daniel Kahneman essentially have the origin of the science of psychology

2.3.4.1. Sociology

Sociology is the leading branch of social sciences, actually as the most industry-related social discipline through focusing on the examination of social relationship between economic agents. Essentially Sociology is large-scale science with a long history; however, the main purpose of this discipline is to research the factors affecting the preferences of people in their financial decisions when its relation with finance is the case (Curry, 1997, p. 96-98).

The sin qua non factor of social interaction is communication for behavioral finance focusing on the reflections of human behaviors to finance. The main kinds of social communication are as follows:

- **Exchange:** When the term of exchange is the case, we usually understand the exchange of money; but indeed, exchange is societal. For example, a child may exhibit a good behavior in exchange for a bar of chocolate, or a friend of us may compliment and we may thank him/her in return. In both cases, social behavior is exchanged for a social reward (return).

- **Cooperation:** It is process of working together to reach a common goal. For example, a group of students may help each other to prepare themselves for the exam or a doctor and a nurse may work together to save the life of a patient.

- **Competition:** It is the challenge between two or more people to get the same reward. Some cultures may be more competitive.

- **Conflict:** The attempt of people's destroying each other physically or socially. So many social campaigns intend to remove all kinds of conflict in the society.

- **Pressure:** It is the process in which people are forced to do something they do not want. The person putting pressure on someone uses power.

On the other hand, social behaviors are divided into four groups by Weber:

1. **Purposive /instrumental rationality:** It is related to the expectations about the behavior of other human beings or objects in the environment. These expectations serve as means for a particular actor to attain ends; ends which Weber noted were "rationally pursued and calculated.

2. **Value / belief-oriented rationality:** Here the action is undertaken for what one might call reasons intrinsic to the actor: some ethical, aesthetic, religious or other motive, independent of whether it will lead to success.

3. **Emotional rationality:** It is effectual, determined by an actor's specific affect, feeling, or emotion – to which Weber himself said that this was a kind of rationality that was on the borderline of what he considered "meaningfully oriented."

4. **Traditional rationality:** It is determined by ingrained habituation ((Bozkurt, 1998, p.10-11).

Other explanations demonstrating the relationship between sociology and behavioral finance are as follows:

Modern Sociology not only determines the rules that apply in the social structure, but investigates how these rules will reflect to economical, political and daily life as well. In addition the matter of how to use the results obtained by researching various economic and social events in business life, political life and similar environments and as a result of the use of these results which developments will emerge in the individual behavior and social structure is one of the fields of study of Sociology.

In sum, it would be correct to say that each economical, political and social decision taken today is based on the information obtained as a result of sociological investigations.

2.3.4.2. Psychology

Generally, investors tend to interpret the information received from the market and take their decisions according to their own ideas about the fact in which the status of perception is activated. It is possible to define perception as hearing, understanding and evaluating process of information (stimulus), related to surroundings of people. What is important here is that human behavior affects the style of perception that caused this behavior. Therefore, two different people may perceive the same information (stimulus) differently. The reasons of perception differences are affected by some factors such as personal values, goals and objectives, requirements, cultural area in which people grew up, information, feelings, past experiences, and even physical features. So, these factors can be classified as internal and external factors (Koçel, 2003, p. 532-533).

As an internal factor, motivation is influential in the decisions of individuals. In literature, there are many motivation theories researching the motivation of employees especially in the field of organization management. These theories are relevant for behavioral finance in the sense whether investors are motivated or not when taking financial decisions (Koçel, 2005, p.548).

According to social psychology, investors are more interested in investment areas from which greater return can be provided. For example, if an investor expects that the return of real estate is higher than the return of stock market, he will begin to research about real estate and reduce his interest for stock market. In this point, Lawler and Porter adds the variables of having sufficient information and ability and role variables perceived by individuals for themselves to motivation and expectation variables Therefore, without having information about investments tools, investment would not exceed beyond gambling. (Koçel, 2005, p. 551-552).

2.3.4.3. Anthropology

The relationship between behavioral finance and anthropology is based on the branch of economic anthropology that combines social life with economy. Economic anthropology is divided into three sections:

Formalism: It is linked to neo-classical economics and defines economy as the work of utility maximization under the conditions of scarcity. Robbins defines economics as a science that examines human behavior in the establishment of relationships in terms of the use of alternatives between scarcity and objectives. In this sense, there are assumptions as followings:

- Individuals try to do utility maximization while making a choice among alternatives, and they always choose the best for themselves.
- Individuals behave rationally by using all the information that can measure the cost and benefits. In addition, they take the time spent and the opportunity costs into account and enter to the efforts of other utility maximization.
- Individuals live in the conditions of scarcity while having endless requirements.
- The studies of utility maximization of individuals are based on the principle of diminishing marginal value. For this principle, if an individual benefit from goods or services more, above the standard, the utility of that goods or services will begin to decline. For example, watering plants sufficiently will cause them to grow, but watering them more than they need will dry them at the end.

Realism: This approach was firstly developed in the study of "Big Transformation" written by Polanyi. For this approach, economy has two meanings:

- Economy is the logic of rational act and decision-making in term of making choice among the alternatives in the condition of scarcity.

- Realism considers neither rational decision nor the condition of scarcity. Realism is only concerned with how human live in the social and natural environment. The life strategy of a society is seen as its adaptation of environmental and material conditions and this process may or may not contain utility maximization.

Realism is not valid in the economies in which market mechanism does not operate. For example, in planned economies, individuals pay more importance to social relations, cultural values, ethics, politics and religion than economic profit.

Culturalism: This approach deals with the attributed values of goods purchased by people according to their cultural background. For this approach, economic analysis should be made with respect to what local people understand about the terms of exchange, money and profit (Drake, 1990, p. 26).

2.3.5. Basic Cognitive Biases

Cognition refers to any kind of knowledge or opinion about oneself or the world. Two cognitions can be either relevant or irrelevant to one another. If they are relevant, then they must be consonant or dissonant (i.e. that one does not follow from the other). Dissonant cognitions produce an aversive state which the individual will try to reduce by changing one or both of the cognitions. The basic cognitive biases are mentioned in the preceding subsections (Festinger, 1957, p.70).

2.3.5.1. Endowment Effect

The endowment effect suggests that people place a higher value on something they already own than they would be prepared to pay to acquire it. The consequences of this mindset can be disastrous, prompting investors to hold on to stocks long after they've surpassed any reasonable estimation of fair value and putting them at risk for substantial loss when the inevitable correction occurs (Thaler, 1980).

2.3.5.2. Loss Aversion, Mental Accounting and Framing

As described above, prospect theory shows an abrupt change of the slope at the reference point which leads to a large asymmetry between the value that people give to gains and the value they give to losses. In other words, for people, and consequently for investors, the displeasure that they feel from a loss is greater than the pleasure they feel from a gain. In their 1991 paper, Tversky and Kahneman suggested that in the domain of money, people value a loss roughly twice as much as an equally sized gain. This asymmetry in valuation is called loss aversion (Ritter, 2003, p. 431).

One of the leading studies on loss aversion is by Samuelson in his 1963 paper, in which he illustrated loss aversion. Samuelson asked a group of colleagues if they would accept a bet that could win them $200 with a probability of 50%, or lose them $100 with the same probability. One of his colleagues said that he would not bet, but he would take, if he offers 100 such bets. Because, he thought for one time is not enough to make it reasonably sure that the law of average will turn out in his favor. (Samuelson, 1963, p. 51). Benartzi and Thaler presented another example in their 1995 paper: Suppose that an investor must choose between a risky asset that pays an expected 7 % return per year with a standard deviation of 20% ; similar to stocks, and a safe asset that pays a sure 1% return with a standard deviation of 0. By the same logic that is applied to Samuelson's college student, the attractiveness of the risky asset will depend on the time horizon of the investor. The longer the investor intends to hold the asset, the more attractive the risky asset will appear, so long as the investment is not evaluated frequently. Put another way, two factors contribute to an investor being unwilling to bear the risks associated with holding equities: loss aversion and a short evaluation period. This is referred to as myopic loss aversion (Benartzi and Thaler, 1995, p. 75).

"*Mental accounting is the set of cognitive operations used by individuals and households to organize evaluate and keep track of financial activities.*"(Thaler, 1999, p.183).

The existence of myopic loss aversion is not only due to loss aversion; it is also tied to another element: mental accounting. Mental accounting is constituted by a wide range of cognitive processes related to the way people analyze and treat the results of transactions and other financial events. Mental accounting is also related to framing. A frame can be defined as the form used to describe a decision problem. It is the decision maker's subjective conception of the acts, outcomes and contingencies associated with a particular choice. The frame that a decision maker adopts is controlled partially by the formulation of the problem and by the norms, habits, and personal characteristics of the decision maker. It is often possible to frame a given decision problem in more than one way. Framing effect is a change of preferences between options as a function of the variation of frames, such as through variation in the formulation of the problem. In finance theory, it is assumed that the frame is irrelevant to the behavior, because the frame is assumed to be transparent. But this is not always so. When a person has difficulty looking through an opaque frame, his decision typically depends on the particular frame he uses (Cornicello, 2004, p. 24). Framing can also be defined as the idea that the way in which a concept is presented to an individual matters. (Ritter, 2003, p. 432).

In sum, there are three interrelated elements of mental accounting. The first is the way incomes are framed or experienced. For example, individuals give different weights to money according to the way it is obtained. Money obtained by hard work is more valued than money obtained from the lottery, because the latter is considered unexpected and costless (Cornicello, 2004, p. 24).

Another psychological inclination among individuals is to catalogue events into different mental accounts based on superficial attributes. An idea underlying mental accounting is that decision makers have a psychological inclination to separate different types of gambles into different accounts, and to make decisions according to the prospect theory of each account, ignoring the possible interactions among them (Cornicello, 2004, p. 24). This can have the effect of people arbitrarily dividing their investments into separate accounts. For example, many people have a household budget for food, and a household budget for entertaining. At home, where the food budget is present, they will not eat lobster

or shrimp because they are much more expensive than fish casserole. But in a restaurant, they will order lobster and shrimp even though the cost is much higher than a simple fish dinner. If they instead ate lobster and shrimp at home, and the simple fish in a restaurant, they could save money. But because they are thinking separately about restaurant meals and food at home, they choose to limit their food at home (Ritter, 2003, p. 432).

Finally, the last psychological inclination among individuals is related to the length of time in which mental accounts are evaluated. This could suggest, for example, that people who "balance" their account every week, as opposed to people who balance their account every month, are more likely to spend money won in a lottery during the same week than in the subsequent ones. As time passes, the effect decreases (Cornicello, 2004, p. 24).

Loss aversion is related to other elements, one of which is the so called endowment effect. The endowment effect was first identified by Thaler in his work dated 1980. Thaler used the term to refer to the finding that randomly assigned owners of an object appear to value the object more than randomly assigned non-owners of the object. In sum people value an object more once their property right to it has been established. (Kahneman, et al., 1999, p.194). Thus, as a result of endowment effect, people assign more weight to a loss than to a foregone gain, and are influenced by loss aversion for this reason. (Ritter, 2003, p. 433).

Loss aversion makes people suffer a so called status quo bias. This implies that individuals tend to prefer the status quo to changes which involve losses of some goods, even when these losses are offset by gains of other goods. A status quo bias can also exist without the presence of loss aversion. This can be due to the costs of thinking, transaction costs, or psychological commitments to prior choices. The existence of these two biases is represented well in prospect theory (Cornicello, 2004, p. 28-29).

2.3.5.3. Heuristics

Heuristics, or rules of thumb, make decision making easier. But they can sometimes lead to biases, especially when things change. These can lead to suboptimal investment decisions. When faced with N choices for how to invest retirement money, many people allocate using the 1/N rule. If there are three funds, one-third goes into each. If two are stock funds, two-thirds goes into equities. If one of the three is a stock fund, one-third goes into equities.(Ritter, 2003, p. 431) In 2001, Benartzi and Thaler showed that some investors follow the 1/N rule when dealing with complex investment plans.(Benartzi and Thaler, 2001, p.96).

2.3.5.4. Overconfidence and Self attribution

The concept of overconfidence is based on a large body of evidence from cognitive psychological experiments and surveys showing that individuals men are more overconfident than women overestimating their abilities and estimations, as well as the precision of their information. This excessive self confidence is perhaps the steadiest principle in psychology of judgments. Overconfidence leads people to overestimate the probability of success and to underestimate the probability of failure. This misleads people who calibrate their answers of moderate or extreme difficulties. It also makes people create confidence intervals that are too narrow when they have to decide on uncertainty conditions, and then they become more surprised than they expect to be by the results (Cornicello, 2004, p. 30).

It is clear that there is a link between rationality and overconfidence. Many economists would agree that their definition of rationality should not be taken too literally. According to their definition, individuals have an unlimited ability to observe and process information. In real life, individuals have limited processing abilities, and hence use ambiguous rules to translate the information they receive from the environment into estimates of cash flows and firm valuations. For example, investors especially individual investors – could not incorporate the news about antitrust proceedings against Microsoft into concrete views about the

future competitiveness of the industry, and how this, in turn, would affect Microsoft's future cash flows. Instead, they did much of their analysis based on "hunches" or "feelings," which can be easily influenced by behavioral biases (Daniel and Titman, 2000, p. 4).

Overconfidence is one of the most strongly documented behavioral biases in behavioral finance literature. DeBondt and Thaler found that stocks that experience extremely good performance over a three to five year period tend to be outperformed by prior "losers" during the subsequent three to five years (DeBondt and Thaler,1985, p. 793., .Fama, 1998, p. 285). They explained these results by investor over-reaction. They pointed out that investors believe great performance in the past is a proxy for great performance in the future, and as a result investors bid up the prices of past winners without thinking that firms can't grow forever. DeBont and Thaler argued that overreaction could be taken as a prediction of behavioural finance altering the efficient market hypothesis (DeBondt and Thaler,1985, p. 793., Fama, 1998, p. 285).

In their summary of the micro foundations of behavioral finance, DeBondt and Thaler (1994) stated that "perhaps the most robust finding in the psychology of judgment is that people are overconfident." Entrepreneurs, managers, investment bankers, and market professionals, such as security analysts and economic forecasters can all exhibit overconfidence bias. Moreover, some evidence suggests that experts tend to be affected more by overconfidence bias than relatively inexperienced individuals (DeBondt and Thaler,1995, p.24, Rodriguez, 2002, p. 4).

Experimental evidence also suggests that the degree of overconfidence varies according to the situation an individual faces. Overconfidence is generally stronger for more diffuse tasks for which feedback is slow, such as making diagnoses of illnesses, as opposed to more mechanical tasks which provide immediate and conclusive outcome feedback, such as weather forecasting, horserace handicapping, or solving arithmetic problems. While there are clear disadvantages associated with overconfidence, there are also offsetting benefits which suggest that, overconfidence may increase an individual's chances of

passing on their genes. Evolutionary theories suggest that individuals who appear to be the strongest and the smartest are more likely to attract women and reproduce. For similar reasons, being confident may enhance short-term economic survival. Even in the money markets, where results are easy to measure and reward, assuming the past investment performance equal, portfolio managers who appear more confident will attract clients more. The ability to act as smart and strong is therefore a survival psychological inclination which provides a comparative advantage to individuals with overstated opinions of themselves (Daniel and Titman, 2000, p. 4).

In stock exchange markets; evidence indicates that reactions to new information are generally asymmetrical and industry related in transactions. There is a strong reaction to bad news about stocks that performed well in the past, while the reaction to bad news about stocks that performed badly in the past is relatively small. This is seen as important in behavioral explanations of the value anomaly since when past winning stocks are subject to a larger response to negative surprises, they tend to be more volatile than past losing stocks, thereby contradicting the rational relationship between risk and expected return. This shows that investors generally fail to judge correctly when dealing with uncertain outcomes. Overreaction to bad earnings announcements of past winners and under reaction to good earnings announcements from past losers can be identified as a trading pattern. The failure of investors to alter their beliefs about certain stocks, and to foresee that a good earnings signal from a past losing stock is a sign 40 of more earnings to come, creates opportunities for certain investment strategies, such as the momentum and contrarian, to achieve above average results (Andrikopoulos, 2007, p. 63).

Consequently, an important point in this theory is that individuals can better fool others about the strength of their abilities if they can first fool themselves. At this point, it should not be forgotten that financial markets are interactive. In other words, self confident individuals will appear to be more competent than individuals who are insecure about their own abilities. As a result, individuals who successfully filter information in ways that add to their self confidence may,

in theory, be more successful than individuals who always interpret information rationally (Daniel and Titman, 2000, p. 5).

2.3.5.5. Self control, Regret avoidance and Cognitive dissonance

Self control consists of setting up special accounts that are considered off-limits to spending urges (Thaler and Sheffrin, 1981). Glick (1957) reports that the reluctance to realize losses constitutes a self-control problem. For example, old investors, especially retirees who finance their living expenditures from their portfolios, worry about spending their wealth too quickly, thereby outliving their assets.

Regret avoidance is the tendency to avoid actions that could create discomfort over prior decisions, even though those actions may be in the individual's best interest. Researchers have argued that one of the reasons that investors are reluctant to sell losing positions is because to do so is to admit a bad decision. This reluctance can be linked to both regret avoidance and belief perseverance. To avoid the stress associated with admitting a mistake, the investor holds onto the losing position and hopes for a recovery.

Cognitive dissonance theory, drawn from psychology proposes that human beings employ a self-defense mechanism when faced with information that conflicts with their beliefs in order to shield them from the simple fact of being wrong. This mechanism involves systematically avoiding information that contradicts our beliefs dissonant information. When this is not possible, human beings will try to downplay the importance of this news or try to discredit the source. At the same time, they will actively seek a source of information that is in harmony with their own convictions and only once information is in line with beliefs in the form of consonant information will the need to seek information diminish.

Rabin (1998) pointed out that people tend to weigh heavily on salient, memorable, or vivid evidence even if they have better information. Once strong hypothesis is formed, people are often inattentive to new information

contradicting their hypotheses, but they often misinterpret the new evidence as additional support for their initial hypotheses (Ritter, 2003, p.437).

2.3.5.6. Representativeness and Availability

Representativeness could be defined as; people tend to judge the probability of an event by finding a 'comparable known' event and assuming that the probabilities will be similar. Representativeness bias was first identified by Kahneman and Tversky (1972, p.430). If things change, people tend to be slow in picking up on the changes. In other words, they anchor onto the ways things have normally been. According to conservatism bias people are slow to adapt to new conditions (Shiller 2001a, p.4). The conservatism bias is at war with the representativeness bias. If things change, investors will underreact as a result of conservatism bias. But if there is a long enough pattern, they will adjust and possibly overreact, underweighting the long term average (Ritter, 2003, p. 433).

One of the first studies in which the representativeness heuristic was traced was made by the psychologists Kahneman and Tversky (1974). They showed that people, in forming subjective judgment, tend to categorize the events as typical or representative of a well-known class. It would be defined as reliance on the stereotypes. This heuristic can lead people to judge the stock market changes as bull or bear market without valuing that the likelihood that sequences same sign price changes happen rarely. In the same way it could lead the investors to be more optimists about the past winners and more pessimists on the past loser.

Another important heuristic is the availability. One of the first description of this was made by Kahneman and Tversky (1974). It influences people in the situation in which people assess the frequency of class or the probability of an event by the ease whit which instances or occurrence can be brought to mind. In other words, it leads people to give a higher weight to the events that are easier remembered.

2.3.5.7. Conservatism and Overreaction

Overreaction suggests that people are overly influenced by random occurrences. According to Ritter (2003): ―Conservatism suggests that when things change, people tend to be slow to pick up on the changes. In other words, they anchor on the ways things have normally been. When things change, people might underreact because of the conservatism bias. But if there is a long enough pattern, then they will adjust to it and possibly overreact, underweighting the long-term average.

De Bondt and Thaler (1985, 1987) find that investors overreact to drastic or unexpected events or information. They find that portfolios of prior losers outperform that of prior winners in the long run. Since investors count on the representative heuristic, they become too optimistic about recent winners and too pessimistic about recent losers.

Kahneman and Riepe (1998) noted that ―the human mind is a pattern seeking device, and it is strongly biased to adopt the hypothesis that a causal factor is at work behind any notable sequence of events.‖ As a result, investors tend to over interpret patterns that are coincidental and unlikely to persist. They react to recent history and their own experiences, without paying enough attention to events that were not directly experienced or retained in memory.

The Barberis (1998) theory states that extrapolation from random sequences, wherein agents expect patterns in small samples to continue, creates overreaction (and subsequent reversals), whereas conservatism, the opposite of extrapolation, creates momentum through underreaction.

Hong and Stein (1999) suggest that gradual diffusion of news causes momentum, and feedback traders who buy based on past returns create overreaction because they attribute the actions of past momentum traders to news and hence end up purchasing too much stock, which, when positions are reversed, causes momentum.

2.3.5.8. Disposition Effect and Recency Bias

The disposition effect refers to the pattern of people are reluctant in realizing paper losses and hasty in realizing paper gains. According to Shefrin and Statman people sell winners to early and hold loosers to much. And they named this bias as disposition effect.(Shefrin and Statman, p.777) For example, if someone buys a stock at $30 whose value drops to $22 before rising to $28, most people will not want to sell until the stock rises above $30. The disposition effect evidences itself in lots of small gains being realized, and a few small losses.

In fact, people treat as if they are trying to maximize their taxes. However rational investor neither should be so reluctant about losses nor so hasty about gains. It is also possible to find evidence for the disposition effect in aggregate stock trading volume. In a stock market, trading volume tends to grow during a bull market, If the market then turns back, trading volume tends to fall. The sharp drop of the Japanese stock market by over 80% from the late 1980s to the mid 1990s can be given as an example. The fact that volume tends to fall in bear markets results a decrease in the commissions of stock brokerage houses. And this means a high level of systematic risk. As an example, in the U.S., aggregate stock market volume has not dropped since the beginning of the bear market in April 2000. This may be due to increased trading by institutions, since stock trading by individuals has in fact declined. The significant drop in transaction costs associated with the move to decimalization and technological advances partly account for this (Ritter, 2003, p. 433).

Recency bias is the tendency for people to place greater importance on more recent data or experience. One great example of recency bias is contained in a study conducted by Yale University economics professor Robert Shiller. At the peak of the roaring 1980s Japanese bull market, Shiller found that 14% of Japanese investors expected a crash. After the crash, 32 percent said they expected a crash. This perfectly illustrates the tendency for investors to become more optimistic when the market goes up and more pessimistic when it goes down. And it's this tendency that causes large numbers of investors to consistently buy high and sell low.

Kahneman and Tversky (1973) find that people usually forecast future uncertain events by focusing on recent history and pay less attention to the possibility that such short history could be generated by chance.

2.3.5.9. Herding

According to Nofsinger and Sias herding can be defined as a group of investors trading in the same direction over a period of time (Nofsinger and Sias, 1999, p. 2263). Herd behavior occurs when many people make the same action in order to mimic the behavior of others. The reason why people's judgments are similar is partially due to the fact that people react similarly to the same information. At the same time, the social environment also has a strong influence on people's judgment. When an individual's judgment clashes with the judgment of a large group, the individual tends to change his judgment to fit that of the crowd. Because he simply thinks that all the other people could not be wrong, and as a consequence, the propensity of the crowd affects the individual's decision making process. The individual accepts the large group's judgment rather than facing the fear of expressing a contrary opinion in front of the group. Psychologists have demonstrated the existence of herding behavior in several experiments (Cornicello, 2004, p. 33).

Even if people are completely rational, herding behavior can still exist. People may participate in herding behavior when they take into account the judgment of others, even if they know that everyone else is behaving in a herdlike manner. This results in group behavior that can be defined as irrational since it arises from an information cascade. The information cascade may appear when individuals overweight the signals from the crowd and ignore, or underweight, their private information. Accordingly, they mimic the crowd (Kim and Nofsinger, 2005, p. 239).

Furthermore, when talking about herding and the effect of the crowd upon the individual's decision making process, the effect of word-of-mouth enthusiasm should be noted. Word-of-mouth enthusiasm accelerates the effect of herding behavior over the market (Shiller, 2002, p. 14). People generally trust their

friends, relatives, and colleagues. Consequently, their suggestions can influence a wide range of individual decisions, including financial decisions. Talking with other people about buying opportunities can have an important influence on investment decisions. Besides, the media has the power to influence the individual's decisions, but with less power than word-of-mouth (Cornicello, 2004, p. 34).

2.3.5.10. Limits of Arbitrage and Noise Trading

Although misvaluations of financial assets are common in financial markets, it is easy to reliably make abnormal gains from these misevaluations. There are two types of misevaluations: those that are recurrent or arbitrageable, and those that are non repeating and long term in nature. As a result of misevaluations in the market, trading strategies can be profitable. Because of this, hedge funds and other smart investors search the market continuously, and keep them from ever getting too big. By this way, the market mechanism works efficiently.

In long term, it is nearly impossible to identify the peaks and troughs in real time until they have passed. And it is may be very risky. For example; getting into early risks causes losses that wipe out capital as it is in the Long Term Capital Management case. A worse situation is if limited partners or other investors are supplying funds, then withdrawals of capital after a losing streak may result in buying or selling pressure that exacerbates the inefficiency. Hedge funds may be accepted as a group of investors who positively affect market efficiency because they are in the search for misvalued assets in the markets and try to make money in this way. A relative value hedge fund takes long and short positions, buying undervalued securities and finding highly correlated securities that are overvalued, then takes arbitrage position. A macro hedge fund, on the other hand, takes speculative positions that cannot be easily hedged, such as shorting NASDAQ during the last two years (Ritter, 2003, p. 434).

Glaser, Noth and Weber surveyed the literature about arbitrageurs and their effect in market efficiency. They argued that the effect of arbitrageurs is limited in financial markets, at least in the short horizon (Glaser, 2004, p. 6).

The following is a good example of the limits of arbitrage in the financial markets which is mentioned in the preceding paragraphs: The case of Royal Dutch Shell. In the beginning Royal Dutch Petroleum and Shell Transport and Trading are independently incorporated in the Netherlands and England respectively. The current firm emerged from a 1907 alliance between Royal Dutch and Shell Transport and Trading. The new firm has been 60 % owned by Royal Dutch Petroleum and 40% owned by Shell Transport and Trading. Royal Dutch trades primarily in the US and the Netherlands and Shell trades primarily in London. According to rational models, the shares of these two companies (after adjusting for foreign exchange) should trade in a ratio of 60:40. But they do not. The actual price ratio has deviated from the expected one by more than 35% for more than a year. It does not make sense to explain this disparity with taxes and transaction costs. According to Froot and Dabora stock prices are affected from the location of trade (Froot and Dabora, 1999, p.13). This is the violation of the law of one price and is a simple, but well known example illustrating that prices can diverge from intrinsic value because of the limits of arbitrage rule (Glaser et al., 2003, p. 5). Some investors do try to exploit this mispricing, buying the cheaper stock and shorting the more expensive one, but this is not a sure thing, as many hedge funds learned in the summer of 1998 (Mullainathan and Thaler, 2000, p. 8).

The crucial assumption on which EMH depends is that the beliefs of human beings are rational. This is consistent with the widely accepted economic theory which postulates that rational decision makers search for the option which has the largest subjective expected utility, determined by reference to probabilities derived from the available information set. Economists have long resisted the possibility that human beings may act irrationally in the market setting, which is a large part of the foundational stone of agents rationality in the EMH. Irrational behavior that interferes with market efficiency has become known as "noise"(Glen, 2005, p. 97).

According to Black; noise is the opposite of information. Investors in financial markets mainly trade on noise as it is information causing inefficiencies in the financial markets (Black, 1986, p.529).

Noise refers to those pricing influences that are not associated with rational expectations about the underlying value of the asset (Glen, 2005, p. 98). Such expectations are not necessarily rational. They should not be. Investment strategies based on noise may represent anything from loyalty to a friend to a personal heuristic. The noise theory is not so concerned with why individual investors show these suboptimal behaviors, but rather the effect of irrational behavior on the market (Glen, 2005, p. 98). Noise traders are investors whose investment decisions rely more on psychological factors than on sound investment management principles (Andrikopoulos, 2007, p. 61).

Noise theory models "hold that the public capital markets are infected by a large volume of trading based on information unrelated to fundamental asset values. These trades are largely undertaken because of underlying emotional or psychological impulses unrelated to the asset's value. Besides, most investors do not have the capacity or inclination to make comparative investment decisions independently, making them susceptible to external expressions of experts and peers. In the end, even if a public capital market is efficient in the sense of swiftly incorporating public information into security prices that does not necessarily mean that securities prices in that market reflect fundamental values. Although Noise Theory has recently received extra attention, the notion itself is old, dating to John Maynard Keynes. Keynes assumed that investors on the whole were not conducting fundamental analysis, but rather, were more apt to act based on information unrelated to the fundamental value of the particular asset (Glen, 2005, p. 99).

The central idea of noise theory is that information unrelated to fundamental values has an impact on the prices of capital assets. However, this is not noise theory’s most important contribution to modem economic analysis. The "more important implication of noise theory is that it reveals markets to be nonlinear systems, to which the linear mathematics and reasoning that underlie the EMH are inadequate (Glen, 2005, p. 99).

Black introduced the concept of noise traders to finance literature. Noise traders have an impact in financial markets, and trade on anything other than

information. Black highlighted that noise trading is essential to the existence of liquid markets. It is noteworthy that noise may be the main reason of inefficiencies in financial markets but it also makes them possible. As noise trading makes the market more liquid by improving trading volume in the market (Black, 1986, pp. 531).

In financial markets, there is always a group of investors investing through the advice of financial gurus; they trade actively on the stocks or base their trading strategies on price patterns and other popular models (Cornicello, 2004, p. 22).

It can be argued that noise traders generally lose money in the markets while information traders often earn a profit. The presence of noise traders in the market also influences market prices. Of course, the higher the number of noise traders in the market, the greater their influence on asset prices, even though it would be more profitable for people to trade on information. However, it should be emphasized that if it is not easy to take positions against noise traders as information traders would fail to correct the mispricing and to earn a profit (Ritter, 2003, p. 431).

The presence of noise traders in financial markets and the effect of their trades on the market are closely related with the arbitrage possibilities. The efficient market hypothesis explains that the presence of the irrational investor is deleted by the rational arbitrageurs who cut out the irrational investor's influence on stock prices.

In financial markets, arbitrage opportunities are risky and therefore limited. The opportunities for arbitrage are based on close substitutes for the security in which noise traders invest. It is not easy for an arbitrageur to take position and eliminate the mispricing effects of noise traders, especially in the short run (Ritter, 2003, p. 431). These are usually available for derivative securities, like options or futures, but occasionally the arbitrage requires notable trading volume. In other cases, there are no close substitutes.

An arbitrageur cannot sell stocks and buy a substitute portfolio at the same time because this simply does not exist. In this case, the arbitrageur can only sell or lessen his exposure to the stocks, but this arbitrage is not risk free, and if the investor is risk adverse, his interest in this arbitrage will be limited. There are two main difficulties for this type of trading strategy. First, arbitrageurs cannot take an adequate amount of positions in order to offset the effects of noise because of the increasing risk. As information gives him an opportunity but does not guarantee the profit. Taking larger positions will increase the risk and this will limit the arbitrageur. Secondly, the arbitrageur can never be sure if he is trading on information or noise. If the information used has already been included in prices then he will be trading on noise. In this situation one can never be sure until it comes through. Consequently, the presence of arbitrageurs on the market does not eliminate the effect of the noise traders because of the limits of arbitrage in financial markets (Black, 1986, p. 532).

2.3.6. Behavioral Finance: Contributions to Modern Finance Theory

In literature, it has been highlighted that bias and framing effects driven by heuristic, cause market prices to deviate from fundamental values. Additionally, it has been suggested that behavioral finance may offer an explanation for empirical evidence which casts doubt on existing financial models (Brabazon, 2000, p. 5).

In 1985, De Bondt and Thaler argued that overreaction or underreaction may occur in financial markets as investors rely on representativeness bias (DeBondt and Thaler, 1985, p. 793). Investors could become excessively optimistic about past winner stocks and excessively pessimistic about past loser stocks, and this bias could cause prices to deviate from the fundamental values. As a result of the biased attitudes of investors, overreaction and underreaction of investors to new information occurs in financial markets. Anchoring and overconfidence may lead analysts to fail to adjust their earnings estimates sufficiently in case of unexpected price changes. This could lead to subsequent price adjustments as analysts revise their incorrect estimates. According to Brabazon, as a result of the arguments of behavioral finance several implications

about behavioral patterns may arise in financial markets (Brabazon, 2000, p. 5). Such as the:

- Overreaction or underreaction to price changes or news
- Extrapolation of past trends into the future
- Lack of attention to fundamentals underlying a stock
- Focus on popular stocks
- Seasonal price cycles.

If such patterns exist, there may be scope for investors to exploit the resulting pricing anomalies (differences) to obtain superior risk adjusted returns. On a theoretical level, the exploitable pricing anomalies undermine the current credibility of the EMH and it is accepted as a contribution to mainstream in finance. The internal difficulties involved in testing strict hypotheses about the EMH would make it difficult to reject the hypothesis completely. Proponents of the hypothesis could argue that behavioral finance had indeed uncovered some interesting insights but there is a potential to build a trading system which relies on these anomalies if significant attention is focused on them. There is no detailed framework incorporating the varying findings of behavioral finance. Without this, there may be scope to develop models which incorporate behavioral explanatory variables which outperform modern financial models (Brabazon, 2000, p. 5).

New models should overcome the model dredging problem which is one of the major criticisms of behavioral finance. Model dredging problem was first pointed out by Fama (Fama, 1991, p.1576). In essence, these models would generate “new” information which had not previously been incorporated in investors’ decision models (Brabazon, 2000, p. 5). At the end of this subsection, it is noteworthy that; EMH does not assume that all investors are rational, but it does assume that markets are rational. The EMH does not assume that markets can foresee the future, but it does assume that markets make unbiased forecasts of the future. In contrast, behavioral finance assumes that, in some circumstances, financial markets are informationally inefficient (Ritter, 2003, p. 430). Behavioral finance is not a separate discipline, but will increasingly become part of

mainstream finance. Nonetheless, it may threaten the throne of EMH in finance literature.

Efficient Market Hypothesis, is a milestone on the road to Modern Finance Theory. A large body of literature has been written in order to discuss its effects over financial markets, and notably over stock markets. The hypothesis is both simple and empirically testable. These properties give rise to its dominance over the challenging theories. Here it is noteworthy that EMH is a crucial step in Modern Finance Theory. As highlighted before, the main idea behind the EMH is that, financial markets are at least weakly efficient due to trading of rational investors in the market. However, it is impossible to claim that all investors are rational in financial markets. There are also investors who behave unreasonably in decision making. It is clear that trading of these irrational investors may result divergence of security prices from the fundamental values. At this point, Fama argued that a financial market may be efficient even in the presence of irrational investors. Their trading will create arbitrage possibilities by which rational investors will offset their distorting effect (Fama, 1991, p.1577).

According to EMH, even though the arbitrage mechanism may be limited in the short-run, it surely works in the long- run. Thereby the distorting effect of irrational investors will be eliminated in the long run as the limits of arbitrage disappears, which means there is no free lunch in financial markets. It is not possible to make abnormal gains in the market by using legal information in the long–run. Thus, EMH is an appealing and widely accepted hypothesis that at least represents a complete explanation to market mechanism by yielding a simple and testable model, albeit imperfect and needs to be developed. Recent research has proved that there is still much work to build an adequate theory in this respect. So, as the next step of rest work, Behavioral finance is not a separate discipline, but instead will increasingly be part of mainstream finance (Ritter, 2003, p. 430). Although, it has been in its infancy, it has already led to a profound deepening of our knowledge of financial markets and the rapid new development in this field as well.

3. Methodology

The purpose of this study is to investigate the observability of behavioral characteristics of individual investors in our country by conducting an empirical study about behavioral finance approach that has started to get much attention by academic circles in recent years. In this sense, it is aimed to test the main reasons of the behaviors of irrational investors put forward by behavioral finance. The study further aims to identify the demographic and other differentiating factors associated with the individual investors.

For this purpose it is aimed to evaluate the relationship between the financial investment preferences of individual investors and the behavioral profile of the investor consisting of cognitive and emotional shortcuts that has an effect on the formation of financial profile of the investor in terms of behavioral finance. So, this study aims to empirically survey in an academic context the occurrence of behavioral finance related phenomena among the Turkish stock market investors. In this context, the study intends to test on the Turkish stock market investors some of the drivers of their irrational behaviors as outlined by behavioral finance.

In order to obtain the necessary data for this study, a field study is conducted by using questionnaire method. Actually, it was aimed to reach 300 participants for this survey. However, due to the lack of punctuality of some participants, the survey was carried out with 265 respondents living in Izmir on the basis of random sampling method including 95 % confidence interval and 5 % sampling error. There are 30 questions in the survey. Part of the survey questionnaire is about the investor's personal information while the rest of the questionnaire is aimed toward identifying the psychological factors affecting the investment decisions of the individuals surveyed. The survey covers the responses from 265 individual investors in period from 01.11.2012 to 01.03.2013. Random sampling methodology was used. Data collected in the survey were analyzed by tabulating the frequency and percentage (%) distributions using the SPPS 16.0 software. Additionally, Pearson Correlation Analysis, Mann-Whitney U Test, Kruskal-Wallis Analysis of Variance and Chi-Square tests were used to test 24 hypotheses set prior to the study.

3.1. Hypotheses

H_1: There is a relationship between the year of stock investment and the average retention period of the stocks.

H_2: There is a relationship between the year of stock investment and the number of stocks in the portfolio.

H_3: There is a relationship between closely monitoring the stock market and the average retention period of the stocks.

H_4: There is a relationship between closely monitoring the stock market and the number of stocks in the portfolio.

H_5: There is a relationship between closely monitoring the stock market and the year of stock investment.

H_6: There is a relationship between the frequency of review of stock investments and closely monitoring the stock market.

H_7: There is a relationship between the frequency of review of stock investments and the year of stock investment.

H_8: There is a relationship between taking risk and choosing either risky option or risk free option in the loss proposal.

H_9: There is a relationship between the increasing tendency of buying the stock in the good weather conditions and the increasing tendency of selling the stock in the bad weather conditions.

H_{10}: There is a relationship between taking risk in the loss proposal and taking risk in the gain proposal.

H_{11}: There is a relationship between disposing of the gainer stocks while holding the loser stocks and the thought of waiting until former purchase price of the stocks.

H_{12}: There is a relationship between closely monitoring the stock market and considering the most gainer and loser stocks on a daily basis in buying and selling of the stocks.

H_{13}: There is a relationship between the frequency of being directed by financial intermediaries and the year of stock investment.

H_{14}: There is a relationship between the frequency of being directed by financial intermediaries and closely monitoring the stock market.

H_{15}: There is a relationship between the frequency of being directed by financial intermediaries and the thought of handing the management of portfolio in professional managers reduces the personal satisfaction from investment.

H_{16}: There is a relationship between gender and risk-taking.

H_{17}: There is a relationship between age and risk-taking.

H_{18}: There is a relationship between the level of education and risk-taking.

H_{19}: There is a relationship between gender and the effect of psychological situation on investment decisions.

H_{20}: There is a relationship between age and the effect of psychological situation on investment decisions.

H_{21}: There is a relationship between the level of education and the effect of psychological situation on investment decisions.

H_{22}: There is a relationship between gender and the frequency of being directed by financial intermediaries.

H_{23}: There is a relationship between age and the frequency of being directed by financial intermediaries.

H_{24}: There is a relationship between the level of education and the frequency of being directed by financial intermediaries.

3.2. The Evaluation of Survey Results

The data obtained from the survey is interpreted through using SPSS 16.0 package program and tabulating the frequency and percentage (%) distributions. In addition, in order to test the hypothesis stated above, Pearson's Correlation Analysis, Mann-Whitney U-test, the Kruskal-Wallis analysis of variance test, and chi-square test are used.

Due to the lack of fulfillment of the variables specified with the measurement in the hypotheses (due to the uneven distribution of frequencies in groups), Mann-Whitney U-test is used to compare the two groups and Kruskal-Wallis analysis of variance test is used to compare the groups more than two. Chi-square test is used to test the hypotheses taking the quantitative variables as a subject. One part of the hypotheses represents continuous variable feature and a linear relationship is expected between compared groups; so, Pearson's Correlation Analysis is used to analyze these variables.

At the next stage of the study, the frequency and percentage distributions of the responses of survey questions is dwelled upon. During this process, survey questions are grouped according to the types of questions and aforementioned information are presented with the help of six tables.

Table 1: Distribution of Demographic Data

Variables	Number	Percentage Distribution
Age		
< 20	3	% 1.1
20-25	30	% 11.3
26-30	45	% 16.9
31-40	86	% 32.4
41-50	73	% 27.5
51 >	28	% 10.5
Gender		
Female	57	% 21.5
Male	208	% 78.4
Education Level		
Primary school	10	% 3.7
High school	65	% 24.5
Vocational school	53	% 20
University graduate	125	% 47.1
Post-graduate	12	% 4.5

As can be seen in Table 1, the vast majority of investors (%70.4) is formed with by persons over the age of 30. This case may be interpreted as investors can usually reach to optimal financial power as from the age of 30.

Again, when looked at the distribution by gender, the weightiness of male participants (78.4) is remarkable. This shows that still, male investors are predominantly active in the financial markets and investment decisions are considered as a job of men.

When distributions about the level of education is analyzed, it is seen that 71.6 % of investors have vocational, university and post-graduate degree which shows that the majority of people investing in common stocks have higher level of education. Similarly, it can be inferred from Table 1 that investors with lower level of education are less interested in securities investment due to the lack of information.

Table 2: The Distributions of the Experiments of Investors in the Stock Market, the Number of Stocks in the Portfolios and the Average Stock Retention Period

Variables	**Number**	**Percentage Distribution**
Experiences in the stock market (year)		
< 1	36	% 13.5
1-3	50	% 18.8
4-6	66	% 24.9
7-10	65	% 24.5
10 >	48	% 18.1
The number of stock in the portfolio		
1-2	92	% 34.7
3-4	107	% 40.3
5-9	52	% 19.6
10-14	6	% 2.2
15 >	8	% 3
The average period of holding stocks (day)		
< 7	29	% 10.9
7-30	58	% 21.8
31-60	79	% 29.8
61-90	35	% 13.2
91 >	64	% 24.1

As can be seen above, the general data on the stocks of investors takes part in Table 2. The experiences of investors about the stock market are almost equally distributed except from the investors with experiences less than 1 year. When looked at Table 2, the percentage of investors that entered to the stock market in the last year is in a considerable level (13.5 %). In a crisis environment that has affected all over the world and also our country, this rate grasped in the last one year may be considered as meaningful. As can be understood from Table 2, 75 % of the investors have three or less than three stocks. Here, it can be inferred that the vast majority of investors do not make portfolio diversification to reduce risk, so they can be defined as insensitive to risk management. In addition, the rate of investors whose portfolio contains more than 10 stocks is only 5.2 %.

Lastly, the average retention (holding) period of stocks is examined in Table 2. It is observed that investors mainly hold the stocks by 1 to 8 weeks (51.6 %). The rate of investors holding the stocks more than 3 month is also quite high (24.1 %). It can be inferred from this rate that approximately a quarter of investors see stocks a long-term investment instruments and avoid from short-term speculative behaviors.

Table 3: The Distributions of Investors' Monitoring the Stock Market, Considering the Most Gainer and the Most Loser Stocks while Buying and Selling of the Stocks and the Frequency of Being Directed by Financial Intermediaries

Variables	**The Degree of Frequency**				
	Often	**Usually**	**Sometimes**	**Rarely**	**Never**
The frequency of closely monitoring the stock market					
Number	66	140	46	9	4
Percentage Distribution	% 24.9	% 52.8	% 17.3	% 3.3	% 1.5
The frequency of considering the most profitable and losing stocks while buying and selling the stocks					
Number	43	102	67	30	23
Percentage Distribution	% 16.2	% 38.5	% 25.2	% 11.3	% 8.6
The frequency of being directed by financial intermediaries					
Number	22	37	74	54	78
Percentage Distribution	% 8.3	% 13.9	% 27.9	% 20.3	% 29.4

It can be inferred from Table 3 that the stock market is very closely monitored by investors. A group of investor with a rate of 77.7 % informs that they monitor the stock market "often" or "usually". Due to the nature of the stock market, investors are already required to monitor the market closely and should constantly be on guard. Further, due to their investment strategies, investors who hold the stocks for a short period of time are inevitably required to monitor the market closely and constantly. The most profitable and losing stocks are published on the newspapers, TV canals and internet every day. The frequency of considering these publications in buying and selling the stocks are seen in Table 3. While more than half of the investors (54.7 %) consider these publications "often" or "usually", almost 20 % of the investors takes these publications into consideration either "rarely" or "never". Ultimately, the frequency of being directed by financial intermediaries is introduced in Table 3. While 8.3 % of the respondents answer the question of "How often are you directed by financial intermediaries?" as "often", almost 14 % of them answer as "usually". That is, the rate of respondents intensively directed by financial intermediaries is only 22.2 %. From this point, it is possible to say that investors think that the best decision-makers are again themselves. In other words, a large part of the investors are not affected by the redirections of financial intermediaries.

Table 4: The Distribution of the Stock Investments

Variables	The Degree of Agreement				
	Strongly Agree	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
The frequency of sharing the view that " the shares of well-known firms are profitable"					
Number	54	123	17	53	18
% Distribution	% 20.3	% 46.4	% 6.4	% 20	% 6.7
The frequency of sharing the view that " the tendency of selling stocks increases in bad weather conditions"					
Number	26	63	45	93	38
% Distribution	% 9.8	% 23.7	% 16.9	% 35	% 14.3
The frequency of sharing the view that " the tendency of buying stocks increases in good weather conditions"					
Number	34	70	48	83	30
% Distribution	% 12.8	% 26.4	% 18.1	% 31.3	% 11.3

The frequency of sharing the view that " handing the management of portfolio in professional managers reduces the personal satisfaction taken from investment"					
Number	47	107	34	65	12
% Distribution	% 17.7	% 40.3	% 12.8	% 24.5	% 4.5
The frequency of sharing the view that " as a saver, I have very good knowledge about the securities market"					
Number	27	129	46	60	3
% Distribution	% 10.1	% 48.6	% 17.3	% 22.6	% 1.1
The frequency of sharing the view that " the investor who constantly trades securities to provide the aliveness of his portfolio has more profit than the investor expecting to gain in the long-term"					
Number	40	105	20	88	12
% Distribution	% 15	% 39.6	% 7.5	% 33.2	% 4.5
The frequency of sharing the view about a stock, the price of which has fallen, that " lost is just a temporary situation, the stock will gain value again, at least waiting until the stock reaches its purchased value will be more accurate"					
Number	56	129	32	48	4
% Distribution	% 20.8	% 48	% 11.9	% 17.8	% 1.5
The frequency of sharing the view that " the past returns and performances of a stock play an important role in trading stocks"					
Number	68	160	15	17	5
% Distribution	% 25.6	% 60.3	% 5.6	% 6.4	% 1.8
The frequency of sharing the view that " psychological condition is effective on investment decisions"					
Number	44	114	25	62	20
% Distribution	% 16.4	% 43	% 9.4	% 23.3	% 7.4

In Table 4, the frequency of sharing the different views about stock investments takes place. Approximately two-thirds of the respondents answer the question of "the shares of well-known firms are profitable" as "strongly agree" and "agree". In this sense, it is a common belief that well-known firms are at the same time good investment intermediaries.

The second and third questions of Table 4 investigating investor behaviors with respect to weather conditions reveal an interesting case. Accordingly, while the rate of investors answering the question that "the tendency of selling stock increases in bad weather conditions" as "strongly agree" and "agree" is 33.5 %, and the rate of investors answering the same question as "disagree" and "strongly disagree" is 49.3 %. This means, more than half of the investors do not associate selling stocks with bad weather conditions. In the opposite case, while the rate of investors answering the question that "the tendency of buying stock increases in good weather conditions" as "strongly agree" and "agree" is 39.2 %, the rate of investors answering the same question as "disagree" and "strongly disagree" is 42.6 %; both of which rates are very close to each other. This case can be

concluded as good weather conditions are more decisive than bad weather conditions in terms of investors.

The rate of investors answering the question that “handing the management of portfolio in professional managers reduces the personal satisfaction taken from investment” as “strongly agree” and “agree” is 58 %. Namely, investors not only perform investments as a quest for a gain, but also for the sense of personal satisfaction. The options of “strongly disagree” and “agree” are preferred by only 29 % of the investors. This result demonstrates that investors connect to psychological factors while performing their investments. Since, an investor whose only aim is to gain in the market without considering any sense of personal satisfaction is expected to answer this question as “strongly disagree”.

In order to test the level of self-confidence of investors, the questions measuring to what extent investors share the related view are also located in Table 4. As can be seen, a large part of the investors (58.7 %) rely on their financial knowledge through answering the question as “strongly agree” and “agree”. 23.7 % of the investors choose either “strongly disagree” or “agree” options. So, as mentioned above, investors within the scope of this study do not show much consideration toward the redirections of financial intermediaries. Again, in Table 4, there are the opinions of investors in respect of their tendency for short and long-term investments. The results indicate that more than half of the investors (54.6 %) think that short-term investment is more useful than long-term one.

The question in Table 4, that “for a stock the price of which has fallen, lost is just a temporary situation, the stock will gain value again, at least waiting until the stock reaches its purchased value will be more accurate” is asked to measure “disposition effect”. Investors exposed to disposition effect tend to hold their losing stocks for a long time, do not want to sell the losing stocks at least until the purchase price and as a result their losses can be folded. The answers given to this question also support what has been mentioned until here, since almost 69 % of the investors mark this question as either “strongly agree” or “agree” options. The question of “the past returns and performances of a stock plays an important role in trading stocks” is also asked and almost 86 % of the investors report that

past returns and performances are very important for individual investment decisions. Only 8.2 % of the investors state that past returns and performances are not effective in investment decisions. In the last question of Table 4, almost 60 % of the investors declare that psychological state is effective on investment decisions. Almost 30 % of the investors argue that they invest under completely rational conditions regardless of psychological states.

Table 5: The Frequency of Investment Revisions, the Comparison with the Strategies of Other Investors and the Level of Risk-Taking

Variables	Number	% Distribution
The frequency of revision of stock investment		
Everyday	125	% 47.1
Every few days	60	% 22.6
Once a week	42	% 15.8
Once a month	12	% 4.5
Every few months	4	% 1.5
Regularly but without a specific period	20	% 7.5
No idea	2	% 0.75
The frequency of comparisons with the strategies of other investors		
Better than average level	50	% 18.8
Average level	176	% 66.4
Worse than average level	12	% 4.5
No idea	27	% 10.1
The frequency of taking risk		
Usually	106	% 40
Sometimes	129	% 48.6
Never	30	% 11.3

In Table 5, the firstly the frequency of revision of stock investment is searched. Here, it is seen that 69.7 % of the investors revise their investments either “everyday” or “every few days”. This is a fairly high rate.

When the rate of closely monitoring the stock markets (77.7 %) found in Table 3 is thought, the consistence of revision of stock investments is an expected outcome. It is so natural that people consistently revising their investments perform a transaction frequently. In addition, the opinions of investors regarding investment strategies are given in Table 5. 18.8 % of the investors regard their own investment strategies as superior than the strategies of other investors. This can be associated with the sense of self-confidence mentioned before. On the other hand, the rate of investors stating that their investment strategy may be

worse than the average level is only 4.5 %. What is striking is that two-thirds of the investors evaluate their strategies as at the average level.

The answer regarding to the level of taking risk is also given in Table 5. As can be seen, almost all of the investors like taking risk either "usually (40 %)" or "sometimes (48.6 %)". This is an important observation in terms of securities market. Because investors' taking risk to this extent (40 % + 48.6 %) bring about preferring risky options and so irrational behaviors in their investments.

Table 6: The Distributions about Decision-Making Preferences

Statements about decision-making	**Options**	
The frequency of options in the event of a decision-making	**₺ 3000 gain with 100 % probability**	**₺ 4000 gain with 80 % probability**
Number	145	120
Percentage Distribution	% 54.7	% 45.2
The frequency of options in the event of a decision-making	**₺ 3000 loss with 100 % probability**	**₺ 4000 loss with 80 % probability and no loss with 20 % probability**
Number	63	202
Percentage Distribution	% 23.7	% 76.2
Assume that you have a portfolio consisting of stocks A and B, and you are required to sell one of these stocks due to the need of urgent cash. In the event that stock A provides for 20 % return, stock B provides 20 % loss since you bought, which stock do you prefer to sell?	**Stock A**	**Stock B**
Number	184	81
Percentage Distribution	% 69.4	% 30.5

In Table 6, the results of the questions posed by Kahneman and Tversky to test the reflection effect in behavioral finance are given. As almost 55 % of the investors choose the option of exact gain in the event of gain, 76.2 % of the investors choose the very risky option in the event of loss, which is a fairly high percentage. However, risky options include a large probability among the options. In relation to the answers of these questions, some tests are applied and more detailed explanations are given in the following parts of this study.

The majority of investors (almost 70 %) state that they will sell the gaining stock. This is very meaningful and expected result. If the investor sells the losing

B stock, he will accept that buying B-stock was a bad decision. The investor will feel regret in the event of selling this stock. For this reason, the decision of selling the losing stock which means the recognition of bad investment decision of the investor will be postponed. On the other hand, the decision of selling the profitable stock will cause to pride the investor on the good investment decision.

3.2.1. The Results of Hypotheses Applied Correlation Analysis

Table 7: The Results of Hypotheses Applied Correlation Analysis

Hypothesis Number	Compared Statements	r	ρ
1	The year of investing in stocks The average holding period of stocks	0.247	0.000
2	The year of investing in stocks The number of stocks in portfolio	0.221	0.000
3	The closely monitoring the stock market The average holding period of stocks	-0.001	0.978
4	The closely monitoring the stock market The number of stocks in portfolio	0.021	0.709
5	The closely monitoring the stock market The year of investing in stocks	0.153	0.010
6	The frequency of revising stock investment The closely monitoring the stock market	0.256	0.000
7	The frequency of revising stock investment The year of investing in stocks	0.104	0.084
9	The increase in the tendency of buying stocks in good weather conditions The increase in the tendency of selling stocks in bad weather conditions	0.612	0.000
12	The frequency of closely monitoring the stock market The frequency of considering the most profitable and most losing stocks on the daily basis while trading stocks	0.015	0.783
13	The frequency of being directed by financial intermediaries The year of investing in stocks	0.114	0.053
14	The frequency of being directed by financial intermediaries The frequency of closely monitoring the stock market	0.061	0.297
15	The frequency of being directed by financial intermediaries The thought of handing the management of portfolio in professional managers reduces the personal satisfaction taken from investment	-0.068	0.242

As can be seen in the hypothesis number 1 in Table 7, there is a positive relationship between the year of investing in stocks and the average holding

period of stocks (r=0.247, p=0.000). So, H_1 is accepted. As the experience of investors increases in the stock market, the holding period of the stocks also increases. The cross-comparisons also justify this hypothesis. While 34.7 % of the investors with experience of 7-10 years and 40.3 % of the investors with experience of more than years hold their stocks for more than 90 days; this rate is 13.5 % for the investors with experience of less than 1 year. As the holding period of stocks extends, the rate of return of the stocks increases in the stock market.

For the hypothesis number 2 in Table 7, there is a positive relationship between the year of investing in stocks and the number of stocks in portfolio (r=0.221, p=0.000). So, H_2 is accepted. The cross-comparisons also justify this hypothesis. While the rate of having more than 5 stocks in the portfolios of investors with experience of less than 1 year is 10.5 %, the rate having more than 5 stocks in the portfolios of investors with experience of more than 10 years is 29 %. As a result, as the year of investing in stocks increases, the number of stocks in the portfolio also increases. This means, investors with more experiences are more sensitive for the risk.

For the hypothesis number 3 in Table 7, there is no relationship between closely monitoring the stock market and the average holding period of the stocks (r= - 0,001, p=0,978). So, H_3 is rejected.

For the hypothesis number 4 in Table 7, there is no relationship between closely monitoring the stock market and the number of stocks in the portfolio (r=0,021, p=0,709). So, H_4 is rejected.

For the hypothesis number 5 in Table 7, there is a positive relationship between closely monitoring the stock market and the year of investing in stocks (r=0,153, p=0,010). H_5 is also accepted. As the investment experiences of investors increase, the frequency of revising the stocks also increases. The cross-comparisons also justify this hypothesis. As approximately 16 % of the investors having less than 1 year experience declares that they often review their investments, this rate is doubled as 32.5 % for the investors having more than 10 years experience.

For the hypothesis number 6 in Table 7, there is a positive relationship between the frequency of revising the stocks and the frequency of closely monitoring the stock market (r=0,256, p=0,000). So, H_6 is accepted. Similar results are also obtained by cross-analysis and while 75 % of the investors revising the stock market frequently revise their investments everyday; this rate is 42 % for the investors revising usually, 25% for the investors revising sometimes and 0 % for the investors revising rarely.

H_7 is rejected since there is no relationship between the frequency of revising the stock investments and the year of investing in stocks (r=0,104, p=0,084). However, H_9 is accepted; since there is a positive relationship between the increase of the tendency of buying stocks in good weather conditions and the increase of the tendency of selling stocks in bad weather conditions (r=0,612, p=0,000). So, it is possible to say that weather conditions are effective on the psychology of the investors.

On the other hand, H_{12} is rejected; since there is no relationship between closely monitoring the stock market and considering the most profitable and losing stocks on the daily basis while trading stocks (r=0,015, p=0,783). H_{13} is also rejected; since there is no relationship between the frequency of being directed by financial intermediaries and the year of investing in stocks (r=0,114, p=0,053).

Similarly, H_{14} is rejected; because there is no relationship between the frequency of being directed by financial intermediaries and closely monitoring the stock market r=0,061, p=0,297). H_{15} is also rejected, since there is no relationship between the frequency of being directed by financial intermediaries and the thought of handing the management of portfolio in professional managers reduces the personal satisfaction taken from investment (r= - 0,068, p=0,242).

3.2.2. The Results of Hypothesis Applied Mann-Whitney U-Test and Kruskal -Wallis Analysis of Variance

Table 8: The Results of the Hypothesis Number 8 (H_8)

Loss Proposal	$\overline{x}$	sd	Test Values	
			Z	ρ
₺ 3000 loss with 100 % probability	2.37	0.608	-1.089	0.273
₺ 4000 loss with 80 % & no loss with 20 %	2.24	0.665		

H_8 claims that there is a relationship between taking risk and choosing either risky option or risk free option in the loss proposal. As can be seen in Table 8, there is no relationship between taking risk and choosing either risky option or risk free option in the loss proposal (Z= - 1,089, p=0,273). So, H_8 is rejected.

Table 9: The Comparison of the Tendency of Risk-taking according to Demographic Variables

Variables	$\overline{x}$	sd	Test Values	ρ
Gender				
Female	1.67	0.079		
Male	1.70	0.045	Z = -0.082	0.930
Age				
20-25	1.67	0.710		
26-30	1.63	0.704		
31-40	1.58	0.598	$X^2 = 5.753$	0.214
41-50	1.79	0.646		
51 >	1.75	0.615		
Education Level				
Primary school	1.89	0.829		
High school	1.67	0.581		
Vocational school	1.73	0.665	$X^2 = 2.921$	0.568
University graduate	1.64	0.662		
Post-graduate	1.89	0.669		

In Table 9, it is investigated whether there is a relationship between risk-taking and gender, age and education level. According to this table, H_{16} is rejected, which claims that there is a relationship between gender and risk-taking. Since any meaningful relationship between risk-taking and gender cannot be found as in Table 9 (Z= - 0,082, p=0,930).

H_{17} claims that there is a relationship between risk-taking and age. However, there cannot be found any significant relationship between age and risk-taking. (X^2= 5,753, p=0,214). So, H_{17} is rejected.

Lastly, in Table 9, the relationship between risk-taking and education level is tested. As can be seen in Table 9, there is no relationship between education level and risk-taking (X^2= 2,921, p=0,568). Thus, H_{18} is rejected.

Table 10: The Comparison of the Effect of Psychological State on Investment Decisions According to Demographic Variables

Variables	$\overline{x}$	**sd**	**Test Values**	**ρ**
Gender				
Female	2.58	1.197	Z = -0.154	0.874
Male	2.62	1.225		
Age				
20-25	3.05	1.410	$X^2 = 13.291$	0.010
26-30	3.01	1.181		
31-40	2.48	1.174		
41-50	2.39	1.120		
51 >	2.30	1.135		
Education Level				
Primary school	2.53	1.126	$X^2 = 4.378$	0.355
High school	2.43	1.130		
Vocational school	2.90	1.316		
University graduate	2.57	1.221		
Post-graduate	2.59	1.072		

In Table 10, the effect of psychological state on investment decisions according to three different demographic variables. For Table 10, firstly H_{19} is rejected, since there is no relationship between gender and the effect of psychological state on investment decisions (Z= - 0,154, p=0,874).

However, H_{20} is accepted, since there can be found a positive relationship between age and the effect of psychological state on investment decisions (X^2= 13,291, p=0,010). The difference of binary comparisons reveals that the rate of risk-taking of the investors who are less than 30 is higher than the rate of risk-taking of the investors who are 31 and more than 31. This means, as age increases, the tendency of taking risk reduces.

Lastly, there is no relationship between education level and the effect of psychological state on investment decisions (X^2= 4,378, p=0,355). Namely, H_{21} is rejected.

Table 11: The Comparison of the Frequency of Being Directed by Financial Intermediaries According to Demographic Variables

Variables	$\overline{x}$	sd	Test Values	ρ
Gender				
Female	3.21	1.404	Z= -1.355	0.173
Male	3.51	1.204		
Age				
20-25	2.82	1.308	$X^2 = 6.398$	0.168
26-30	2.76	1.330		
31-40	2.41	1.280		
41-50	3.29	1.226		
51 >	2.66	1.135		
Education Level				
Primary school	2.53	1.291	$X^2 = 2.487$	0.644
High school	2.56	1.231		
Vocational school	2.50	1.248		
University graduate	2.46	1.301		
Post-graduate	3.07	1.373		

In Table 11, the relationship between the frequency of being directed by financial intermediaries and the variables of gender, age and education level is tested. H_{22} is rejected, because there is no relationship between gender and the frequency of being directed by financial intermediaries (Z= -1,355, p=0,173).

Again, H_{23} is rejected, since there is not a relationship between age and the frequency of being directed by financial intermediaries (X^2= 6,398, p=0,168). Finally, H_{24} is also rejected, since there cannot be seen any relationship between education level and the frequency of being directed by financial intermediaries (X^2= 2,487, p=0,644).

3.2.3. The Results of Hypotheses Applied Chi-Square Analysis

Table 12: The Test Result of the Hypothesis that "there is a relationship between taking risk in loss proposal and taking risk in gain proposal"

Variables	₺3000 gain with 100 % probability	₺4000 gain with 80 % probability	Total
₺3000 loss with 100 % probability	36	24	60
	% 60.8	% 39.2	% 100.0
	% 24.6	% 18.6	% 22.4
	% 13.8	% 8.6	% 22.4
₺4000 loss with 80 % probability and no loss with 20 % probability	108	97	205
	% 53.0	% 47.0	% 100.0
	% 75.4	% 80.2	% 77.6
	% 40.8	% 36.8	% 77.6
Total	144	121	265
	% 54.6	% 45.4	% 100.0
	% 100.0	% 100.0	% 100.0
	% 54.6	% 45.4	% 100.0
$X^2 = 1.112$, $\rho = 0.289$			

As can be seen in Table 12, there is no relationship between taking risk in loss proposal and taking risk in gain proposal (X^2 = 1,112; P = 0,289). So, H_{10} is rejected. While 54.6 % of the investors choose the exact gain option in gain proposal, 75.4 % of the same investors choose risky option in loss proposal. However, in both proposals, the risky options include the possibility of a bigger profit or loss compared to the other option. This case can be concluded as investors are exposed to reflection effect of behavioral finance.

As can be seen Table 13 below, there cannot be detected any relationship between two questions posed for the bias of regret aversion. There cannot be found any relationship between the question of "Do you agree with the statement about a stock with reduced price in your portfolio? Loss is a temporary situation, the stock will gain value again, at least waiting until the stock reaches its purchased price will be more accurate" and the question of "Assume that you have a portfolio consisting of A and B stocks, and you are required to sell one of these stocks due to the need of urgent cash. In the event that A stock provides for 20 % return, B stock provides for 20 % loss since you bought, which stock do you prefer to sell?" (X^2 = 1,993; P = 0,735). Thus, H_{11} is rejected.

Table 13: The Test Result of the Hypothesis that "there is a relationship between the tendency of disposing of the gaining stocks while holding the losing stocks and the thought of waiting until the stock reaches its purchase value."

Types of Stocks	The Level of Agreement					Total
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	
Stock A	41	85	22	32	2	182
	% 21.6	% 45.4	% 14.3	% 17.5	% 1.2	% 100.0
	% 74.0	% 65.2	% 65.8	% 65.8	% 50	% 66.1
	% 14.3	% 30.7	% 8.5	% 12.0	% 0.6	% 66.1
Stock B	13	43	10	15	2	83
	% 15.2	% 52.8	% 11.4	% 18.4	% 2.2	% 100.0
	% 26.0	% 34.8	% 34.2	% 34.2	% 50.0	% 33.9
	% 6.2	% 15.0	% 4.7	% 7.4	% 0.6	% 33.9
Total	54	128	32	47	4	265
	% 20.5	% 45.7	% 13.2	% 19.4	% 1.2	% 100.0
	% 100.0	% 100.0	%100.0	% 100.0	% 100.0	% 100.0
	% 20.5	% 45.7	% 13.2	% 19.4	% 1.2	% 100.0
$X^2 = 1.993$, $\rho = 0.735$						

3.3. Observations about Results

With the help of survey results, the overall observations regarding the explanation of investment preferences of individual investors dwelling in İzmir via behavioral finance can be concluded as followings:

When results of this study are analyzed, it is seen that a large part of individual investors monitor the stock market very closely. Again, a large part of the investors revise their investments frequently. Today, both visual media and print media have an important place in stock market through which investors are able to revise their stock investments more closely. As a result of this very often updated information in the market, investors tend to make changes on their portfolio very frequently and these quick actions tend to make them loss in their stock transactions in the same speed. A large part of the investors sell their gaining stocks and hold their loosing stocks or at least hold their loosing stocks until the price recovers back to their original purchase price. While regrets are avoided, investors choose not to face the reality of having losses. Overall, this behavior pattern causes the investors to act irrationally. Similarly, a large part of

the investors decide to make investment in stocks through considering representation factor of the firms whose shares are traded in the stock market. Namely, investors tend to invest in the stocks of publicly recognized firms. So, they tend to invest in stocks without analyzing their performance of the return.

Moreover, stock market investors tend to carry out their investments in short maturities. The result of this study demonstrates that only one fourth of the investors make investments for more than three months. Further, they tend to perceive even six- month investments as a long term investment, which has been actually regarded as medium term investment.

Furthermore, individual investors in some ways satisfy themselves by managing their own portfolios. This tendency causes deviation from rational behavior and increased occurrences of irrational reactions due to the presence of risk taking and thrill seeking investor behavior in the market. Individual investors seek risk in times of losses and avoid risk in times of gains. As a result individual investors are subject to aversion and deviate from rational behavior.

To conclude, this study is able to prove that psychological prejudices affect the investment decisions of individual investors to an extent. In contrast to traditional assumptions, many systematic mistakes are very frequently committed or many investors tend to avoid rational solutions even if they knew it. The prospect theory and of course cognitive bias help to understand the irrationality in the market that influence investor decisions and patterns that turn into herd behavior cause anomalies as well as extreme or insufficient reactions in the market. Since psychological prejudices cause investors to irrationally deal in financially detrimental stock transactions, investor reactions based on these irrational transactions feed valuation bubbles and distort market equilibrium. However, a more common understanding of these prejudices is required to enhance not only the level of knowledge about them but the efficient use of stock market as well.

4. Conclusion

The purpose of this study is to carry out an empirical research concerning behavioral finance approach which has started to get much attention by academic circles in recent years in order to investigate the observability of this approach in practice in our country. In this respect, it is aimed to test the subliminal causes of irrational investor behaviors put forward by behavioral finance for the investors in our country. Through applying survey method, it is aimed to provide information about prevalent profile of stock investors in our country and their general tendency within the scope of behavioral finance approach in order to contribute future studies in this sense.

In world economies, securities markets have great importance due to the function of transferring savings to the real sector especially during the 1990s. The fulfillment of this function by stock markets depends on the effectiveness of rational investors who are able to correctly interpret the information conveyed to them in the creation of market prices. Traditional finance theories use the assumption that investors act rationally in order to explain the operation and process of the markets. Indeed, while explaining the markets, traditional finance theories evolves out of the idea that how investors should act, rather than how they tend to act in reality.

A survey, "The Change of Investor Behavior during and after the Speculative Bubble at the end of the 1990s" also supports the similar assumption that a more common understanding factors underlying world economies and the way in which psychological factors affect our decision-making should help them avoid the occurrence of such phenomenon and enhance the efficiency of today's global financial markets (Johnssons, M., Lindblom, H., & Platan, P., 2002, Lund University, Sweden).

For this reason, behavioral finance puts forward that some financial phenomena can be better explained with the idea that people are not rational beings. While there may be investors investing in accordance with the assumptions of traditional finance, there may also be investors acting differently

than traditional theories due to the lack of information of lack of correct evaluation of the information in the market.

Within the scope of behavioral finance, the general tendencies and the benchmarks of individual investors living in Izmir can be summarized as follows:

While the holding period of stock of the individual investors shortens, their trading volume increases. Increasing trading volume leads to the loss by raising the transaction costs and thus costs. Nowadays, increasing media broadcasts provides investors for monitoring the stock market more closely. This may result in increasing volume of transactions and shortening of average holding periods of the stocks besides to the benefit of awareness concerning the market process.

Individual investors carry out their investments for relatively short periods in the stock market. For general tendency, while only a small part of the individual investors make long-term investments for more than six months, a period of six months is not considered to be even a medium term investment in capital markets.

Generally, a large part of the investors decide to make investment in stocks through considering representation factor of the firms whose shares are traded in the stock market. Investors tend to invest in the shares of publicly recognized firms regardless of their potential return. Further, individual investors tend to choose the shares of unfamiliar regional firms in their investment decisions.

In the case of using short-term indicators in the investment decisions, individual investors perform more transactions and the holding period of them shortens such as the effectiveness of gaining and losing stock on daily basis on their investment decisions. Strikingly, a large part of the investors sell their gaining stocks and hold their loosing stocks or at least hold their loosing stocks until the price recovers back to their original purchase price. While regrets are avoided, investors choose not to face the reality of having losses. Overall, this behavior pattern causes the investors to act irrationally.

Individual investors usually have the illusion of understanding later. While about a past experience, they say that “it was already obvious to happen as such”, they do not make investment in parallel to this view. This is the result of the trend of over-confidence and self attribution. Similar developments are already observed in the interpretations of many financial experts and even market experts tend to describe a development in the market easily.

Markets are dominated by the perceived risk rather than the existing risk. Investors tend to define their portfolios as having average risk. Individual investors tend to show the illusion of optimism against the existing risks. The differentiation of risk perception may lead to the irrationality of investor behaviors. The lowness of risk perception may also lead to the increase of market risk. Individual investors trust in their investment strategies and financial knowledge extremely. As a result, overconfidence brings about the trading volume more than the average and the shortness of holding periods of the stocks. Originally, individual investors are aware of that long-term investments are more profitable rather than constantly trading. Despite being aware of this situation, they act differently in practice. Although a large part of the investors are aware of the truths in literature or tested, they are not able to utilize these truths in their investment strategies due to their psychological biases. They may connect to the stocks in their portfolio with the endowment effect. However, their future expectations may contradict with their existing investments. Generally, individual investors do not prefer to hand over the management of their portfolios and combine this situation with the sense of over-confidence. They, in some ways, satisfy themselves by managing their own portfolios. This tendency causes deviation from rational behavior and increased occurrences of irrational reactions due to the presence of risk taking and thrill seeking investor behavior in the market. Individual investors seek risk in times of losses and avoid risk in times of gains. As a result individual investors are subject to personal isolation and deviate from rational behavior.

Individual investors tend to attribute the causes of wrong investments to other causes. They carry imposition bias, that is, while they attribute the profitable investments to themselves, they attribute the wrong investments to different

reasons, which bring about the sense of disaffirmation of wrongness and over-confidence. While individual investors pay lower attention to macro-economic indicators, pay more attention to the indicators that may cause herd behavior such as technical analysis. Particularly, the developments in the foreign markets are closely monitored, thus the volatility in the local markets may increase with the increasing information flow. In foreign markets, many economic indicators of many countries are given weight in investment decisions. Especially in the last ten years, the movements of foreign markets have increasingly affected the markets of our country. On the other hand, investors not giving sufficient importance to the macroeconomic indicators of their country may show behaviors that are not able to reflect the existing economic situation, and thus securities markets may forfeit the feature of being indicator of economic performances of their country.

A large part of the individual investors approve the existence of anomalies and trust in anomalies. A variety of differences in terms of gender are found in the individual investors. While male investors refer to a large share in the stock market, female investors in part refer to a limited share compared to their male counterparts. Male investors perform more transactions and increase their costs with the sense of over-confidence compared to female investors. Female investors, on the other hand, are more affected by environmental information and pay more importance to the recommendations of their friends and financial intermediaries. Female investors are less risk-taker and they show fewer searches for personal satisfaction compared to male investors. The level of belief in anomalies of male investors is higher than of female investors.

It is identified that risk-taking individual investors are unable to diversify their portfolios, perform more transactions than the average and have more over-confidence than the average. All in all, a very small part of the individual investors carry the sense of risk-aversion.

As indicated by the results of this study, psychological prejudices affect the behaviors of the investors. Many investors, contrary to the assumptions of traditional approach, either make systematic errors or apply the rational solution even if s/he knows it. Moreover, media, friends and other similar environmental

factors affect the preferences of the investors and these processes turning to be herd behavior can cause the anomalies and either excessive or inadequate reactions in the market.

In order to prevent the exposure of individual investors to psychological prejudices and at least to reduce their effects, different suggestions are presented. It is propounded that education substantially eliminates the psychological biases. In many developed capital markets, investors are attempted to be educated by the way of direct informing.

Since the 1990s, with the arrival of free market economy to a dominant position in the world, the importance of investor education has increased. By means of investor education, it is tried to provide individuals to take the best financial decisions by reducing the errors caused by behavioral tendencies of the individuals. In developing countries, the new growing of financial markets and the lower level of financial knowledge of the investors consist a great potential for the benefits that will be provided from investor education. These benefits are considered to be not only in favor of investors, but also in favor of whole society by means of the financing of productive investment through the transfer of resources to financial sector. With the help of all these applications, the preference of the best financial decision, the smoother functioning of the markets, the efficient use of resources by transferring savings to the financial system, and ultimately the contribution to an increase in social wealth are aimed. Additionally, survey results indicates that for certain conditions, a large part of the investors indeed behave irrationally due to the psychological biases rather than the lack of information.

Another suggestion for reducing the losses caused by psychological biases of individual investors is to follow certain principles in the investments and to invest systematically. In this sense, some systems and suggestions are given in many books about the stock market.

Nofsinger put forward five basic strategies to cope with the psychological biases. The first one is the comprehension of psychological biases. The process of

the comprehension of psychological biases is related to understand the sources of past mistakes made in the past period (Nofsinger, J.R., 2005, p.22).

If the definition of a lot of prejudice pointed out by behavioral finance is known by investors, probably these investors will be better able to understand the sources of their mistakes. For their investment decisions, they will be able to reduce these mistakes due to being aware of these patterns of behaviors. The second basic strategy of Nofsinger is to know why to invest. For Nofsinger, rather than open-ended and uncertain definitions, rational definitions should be included in the definition of second strategy. Third strategy is to give place to quantitative criteria for the selection of the factors that will affect the investment decisions. Fourth one is the diversification of investments. The fifth and last strategy is related to environmental factors such as not going to financial session rooms and not closely monitoring the investments. In brief, individual investors may show irrational behaviors in their investment decisions under the influence of psychological biases, which results to reduce the effectiveness of the markets.

To sum up, neither investor education nor strategy suggestions are solutions to completely eliminate the irrational behaviors of individual investors. Actually, there is no need for such an exact solution. Because, no matter which the subject is, the existence of human psychology will always interfere with any standard criteria. What is important here is the prevention of the unification of non-standard behaviors of the investors. With this purpose, the most important thing is to realize the significance of each financial strategy and evaluate them for the sake of the optimal investment. While actualizing this process, it is required to be aware of new approaches which can be claimed as measures of forecasting. Whatever the issue is, there is only one thing underlying the issue of forecasting; namely, awareness. Yet, it can be realized that neither behaviors nor the most rational decisions can be directed due to the human nature. However, with the help of social awareness the value of accumulation, the meaning of investment can be taught to societies not after being investor, but from childhood onward. Such awareness can be the best route that will provide great contribution for both well-being and welfare of the societies that is actually the subliminal concern of Behavioral Finance.

QUESTIONNAIRE

1. Gender:

☐ Male
☐ Female

2. Relevant age group:

☐ Under 20
☐ 20 – 25
☐ 26 – 30
☐ 31 – 40
☐ 41 – 50
☐ Over 50

3. The level of education:

☐ Primary school
☐ High school
☐ Academy
☐ University graduate
☐ Post- graduate (M.S. & PhD)

4. The year of experience in the stock market (Year):

☐ Less than 1 year
☐ 1 - 3 years
☐ 4 - 6 years
☐ 7 - 10 years
☐ More than 10 years

5. The number of stock in the portfolio:

☐ 1 - 2
☐ 3 - 4
☐ 5 - 9
☐ 10 - 14
☐ 15 >

6. What is your average holding period of the stocks (Day) ?

☐ < 7
☐ 7 - 30
☐ 31 - 60
☐ 61 - 90
☐ 90 >

7. How often do you monitor the stock market closely?

☐ Often
☐ Usually
☐ Sometimes
☐ Rarely
☐ Never

8. How often do you consider the most profitable and losing stocks in daily basis while trading (buying or selling) the stocks?

☐ Often
☐ Usually
☐ Sometimes
☐ Rarely
☐ Never

9. How often do you need to be directed by financial intermediaries?

☐ Often
☐ Usually
☐ Sometimes
☐ Rarely
☐ Never

10. Do you agree with the view that "the shares of well-known firms are profitable"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

11. Do you agree with the view that "the tendency of selling stocks increases in bad weather conditions"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

12. Do you agree with the view that "the tendency of buying stock increases in good weather conditions"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

13. Do you agree with the view that "handing the management of portfolio in professional managers reduces the personal satisfaction taken from investment"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

14. Do you share the view that "as a saver, I have very good knowledge about the securities market"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

15. Do you agree with the view that "the investor who constantly trades securities to provide the aliveness of his/her portfolio is more profitable than the investor who expect to gain in the long-term"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

16. Do you agree with the view about a stock, the price of which has fallen, that "lost is just a temporary situation, the stock will gain value again, at least waiting until the stock its purchased value will be more accurate"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

17. Do you agree with the view that "past returns and performances play an important role in trading stocks"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

18. Do you agree with the view that "psychological condition is effective on the investment decisions"?

☐ Strongly agree
☐ Agree
☐ No idea
☐ Disagree
☐ Strongly disagree

19. How often do you revise your stock investment?

☐ Everyday
☐ Every few days
☐ Once a week
☐ Once a month
☐ Every few months
☐ Regularly but out of a specific period
☐ No idea

20. How do you evaluate your investment strategy when comparing with the strategies of other investors?

☐ Better than average
☐ Average
☐ Worse than average
☐ No idea

21. How often do you take risk?

☐ Usually
☐ Sometimes
☐ Never

22. In the event of a decision making which one do you prefer?

☐ ₺3000 gain with 100 % probability
☐ ₺4000 gain with 80 % probability

23. In the event of a decision making which on do you prefer?

☐ ₺3000 loss with 100 % probability
☐ ₺4000 loss with 80 % probability and no loss with 20 % probability

24. Assume that you have a portfolio consisting of A and B stocks and you are required to sell one of these stocks due to the need of urgent cash. In the event that A stock provides for 20 % return, B stock provides for 20 % loss since you bought, which one do you prefer to sell?

☐ A stock
☐ B stock

25. In which stock do you prefer to invest?

☐ A stock of a local firm operating in your city
☐ A stock of a global firm with foreign partnership

26. Which stock do you hold in the recession period?

☐ A stock that you monitor before and hold constantly
☐ The stocks of top-ten firms in the market
☐ A risky stock with the probability of higher return of a medium-size firm

27. What will be your action about a stock price/return rate of which is high and seems to be higher?

☐ I immediately buy that stock, but consider it as a short-term investment
☐ I wait the testification of trend for a while and then buy that stock as a short-term investment
☐ I immediately sell that stock
☐ I wait the testification of trend for a while and then sell that stock
☐ I cannot decide what to do

28. What is the main reason of the volatility of indices of stock market?

☐ Economic instability
☐ Political instability
☐ Manipulation and speculation
☐ The direction of the market at big investors' will
☐ The shallowness of stock market
☐ Other

29. What is your main information source that directs your investments?

☐ Personal experiences
☐ Friends
☐ The reports of banks and financial intermediaries
☐ Print media
☐ Visual media
☐ Social media
☐ Other

30. What are the factors that you take into account in trading stocks?

☐ The rate of interest
☐ The rate of exchange
☐ Current conjuncture
☐ Foreign markets
☐ The directions of financial intermediaries
☐ Technical analysis
☐ Tips taken from close environment
☐ Past experiences about that stock
☐ Psychological state
☐ Other

5. References

Adam, Klaus., 2002, "On the Relation Between Robust and Bayesian Decision Making", Center for Financial Studies Working Paper No. 2003/02, 2-8p.

Andrikopoulos, Panagiotis., 2007, "Modern Finance vs. Behavioral Finance: An Overview of Key Concepts and Major Arguments", Icfai Journal of Behavioral Finance, Vol. 4(2), 52-70p.

Akmut, Özdemir., 1989, "Sermaye Piyasası Analizleri ve Portföy Yönetimi", Ankara, 174s.

Akgüç, Öztin., 1998, "Finansal Yönetim", 7. Baskı, Muhasebe Enstitüsü Eğitim ve Araştırma Vakfı Yayınları, İstanbul, 485-498s.

Ariel, Robert, A., 1987, "A Monthly Effect in Stock Returns", Journal of Financial Economics.

Ariel, Robert A., 1990, "High Stock Returns Before Holidays: Existence and Evidence on Possible Causes", Journal of Finance, 1611-1626s.

Athanasoulis, S. G. & Shiller R. J., 1997, "The Significance Of The Market Portfolio," Cowless Foundations Discussion Paper Volume 154, 4p.

Bailey, R., E., 2002, "Economics of Financial Markets", Lecture Notes, Department of Economics, University of Essex, U.K., 15-20p.

Baker, Malcolm, Ruback, Richard S., Wurgler, Jeffrey.,2004, "Behavioural Corporate Finance: A Survey", National Bureau of Economic Research Working Paper No.10863, 1p.

Banz, Rolf, W., 1981, "The relationship between return and market value of common stock", Journal of Financial Economics, 3-18p.

Barberis, Nicholas., Shleifer, Andrei., & Vishny Robert., 1997, "A Model of Investor Sentiment", Journal of Financial Economics, Vol: 49, 307-343.

Barberis,Nicholas., Ming Huang, and Tano Santos, 2001,"Prospect Theory and Asset Prices", Quarterly Journal of Economics Vol.116(1), 153p.

Başoğlu, Ufuk, A. Ceylan, Parasız, İlker., 2001, Finans, Teori, Kurum ve Araçlar, Ekin Kitabevi, Bursa, 471-473s.

Bauman, W, S., 1964, "Investment Experience with Less Popular Common Stocks", Financial Analysts Journal, 79-88p.

Benartzi , Shlomo., Richard H. Thaler., 1995, "Myopic Loss Aversion and the Equity Premium Puzzle", The Quarterly Journal of Economics, Volume 110(1), 73-92p.

Benartzi, Shlomo., Richard H. Thaler., (2001) ”Naïve Diversification Strategies in Defined Contribution Saving Plans”, The American Economic Review, 79-98p.

Bernstein, Peter L., 2006, Tanrılara Karsı: Riskin Olaganüstü Tarihi, Scala Yayıncılık, Çeviri: Canan Feyyat, 280-282p.

Black, Fisher., 1986, “Noise”, Journal of Finance, Vol. 41(3), Papers and Proceedings of the 44th Annual Meeting of the America Finance Association, New York, 529-532p.

Bolak, Mehmet., 1998, “İşletme Finansı”, Birsen Yayınevi, İstanbul, 183-253s.

Bolak, Mehmet., 2001, “Sermaye Piyasası Menkul Kıymetler ve Portföy Analizi”, Beta Basımevi, İstanbul, 191-192s.

Bowman, R., J. Buchanan., 1995, “The efficient market hypothesis a discussion of institutional, agency and behavioral issues” Australian Journal of Management vol. 20(2), 155-166p.

Bozkurt, Ünal., 1998, “Menkul Kıymet Yatırımlarının Yönetimi”, İktisat Bankası Eğitim yayınları, No:4, 10-11s.

Brabazon, Tony., 2000, “Behavioural Finance: A new sunrise or a false dawn?”, Working Paper, CoIl Summer School University of Limerick, 2-5p.

Civan, Mehmet., 2004, Finansal Hesaplar, Gazi Kitabevi, Ankara, 222s.

Cornicello, Giuseppe., 2004, “Behavioral Finance and Speculative Bubble”, UniversitaCommercial Luigi Bocconi, Milano, Yüksek Lisans Tezi(E.T.), 8-34p.

Cross, F., 1973, “The behavior of stock prices on Fridays and Mondays”, Financial Analysts Journal, 67–69p.

Curry, T. ,Jioubu, R. ,Schewirian, K. , 1997, “Sociology for the 21st Century”, Printice Hall,New Jersey, 96-98p.

Dağlı, Hüseyin., 2000, “Sermaye Piyasası ve Portföy Analizi”, Derya Kitabevi, Trabzon, 301-386s.

Daniel, Kent D., Titman, Sheridan., 2000, "Market Efficiency in an Irrational World". NBER Working Paper No. W7489, 4-9p.

De Bondt, Werner F. M., Thaler, Richard., 1985, ”Does The Stock Market Overreact?”, Journal of Finance, Volume 40(3), 793-805p.

De Bondt, Werner F. M., Thaler, Richard.,1994, ”Financial Decision Making in Markets and Firms: A Behavioural Perspective “, NBER Working Paper No:4777, 2-8p.

Dow, James., Gorton, Gary., 1995, "Stock Market Efficiency and Economic Efficiency: Is There a Connection?," NBER Working Papers 5233, 1-13p.

Drake, Paul, W., 1990, "The Origins of Liberty: Political and Economic Liberalization in the Modern World, 19-26p.

Fama, Eugene F., 1991, "Efficient Capital Markets II", Journal of Finance, Vol.46(5), 1575-1617p.

Fama, Eugene F., 1998, "Market efficiency, LongTerm Returns, and Behavioural Finance", Journal of Financial Economics Vol.49(3), 283-306s.

Frankfurter, G.M. and Mcgoun E., 2000, " Market Efficiency or Behavioural Finance: The nature of Debate", **Journal of Psychology & Financial Markets**, Vol.1 Issue ¾, 200-211p.

Festinger, Leon., 1957, "A Theory of Cognitive Dissonance", 70p.

French, K., 1980, "Stock returns and the weekend effect", Journal of Financial Economics 8, 55–69p.

Froot, Kenneth A. & Dabora, Emil, M., 1998, "How are stock prices affected by the location of trade?" NBER Working Paper No. 6572, 2-10p.

Fuller, J., Russel, 1998, "Behavioral Finance and Source of Alpha", Journal of Pension Plan Investing, Vol:2, No:3, 5-12p.

Glaeser, Edward L., 2003, "Psychology and the Market", Discussion Paper No. 2023, Harvard Institute of Economic Research, 3-23p.

Glaser, M., Noth, M., Weber, M., 2003, "Behavioural Finance", No: 0314 Chp 26., prepared for Blackwell Handbook of Judgment and Decision Making, 5-56p.

Glen, Patrick J., 2005, "The Efficient Capital Market Hypothesis, Chaos Theory, and the Insider Filing Requirements of the Securities Exchange Act of 1934: The Predictive Power of Form 4 Filings", Fordham Journal of Corporate and Financial Law, 97-99p.

Görener, Rifat, 2003, "Investors' Behaviour and Rotated Asset Pricing Models: Empirical Evidence", Rensselaer Polytechnic Institute Doctoral Dissertation, 20-21p.

Hagin, Robert L., 2004, "Investment Management : Portfolio Diversification, Risk, and Timing : Fact and Fiction.Hoboken", NJ, USA: John Wiley & Sons, Incorporated, 55p.

Haugen, R., A., 2004, "The New Finance", Pearson Education Inc. USA, 3rd Edition, 11-20p.

Hogarth, Robin, M., & Reder, Melvin, W., 1987, "Rational Choice", Chicago: The University of Chicago Press 25-30p.

Hollman, Wayne A., 2005, " Buy and Sell Decisional Analysis of Financial Advisors", Walden University, Doctoral Dissertation, 22-23p.

Johnson, Neil F., Jefferies, P., & Hui, P. M., 2003, "Financial Market Complexity", Oxford University Press, 221p.

Johnssons, M., Lindblom, H. & Platan, P., 2002, "The Change of Investor Behavior during and after the Speculative Bubble at the end of the 1990s", 87p. Master's Thesis in Finance, Lund University, Sweden.

Kahneman, Daniel; Tversky, Amos., 1972, "Subjective probability: A judgment of representativeness", Cognitive Psychology. Jul Vol.3(3), 430-454p.

Kahneman, D. & Tversky, A., 1979, "A Prospect Theory: an Analysis of Decision Under Risk", Econometrica, 47, 263-291s.

Karan, Mehmet,Baha., 2001, "Yatırım Analizi ve Portföy Yönetimi", Hacettepe Üniversitesi Finansal Araştırmalar Merkezi Yayınları, Ankara, 195-455s.

Karaşin, Gültekin., 1986, "Sermaye Piyasası Analizleri", Sermaye Piyasası Kurulu Yayınları, Ankara, 3-81s.

Karslı, Muharrem, 1994, "Sermaye Piyasası Borsa Menkul Kıymetler", İrfan Yayıncılık, İstanbul, 430-432s.

Kim, Kenneth A., Nofsinger, John N., 2005, "Institutional Herding, Business Groups, and Economic Regimes: Evidence from Japan", Journal of Business, Vol.78(1), 213-242p.

Kocaman, Berna., 1995, "Yatırım Teorisinde Modern Gelişmeler ve İstanbul Menkul Kıymetler Borsası'nda Bazı Gözlem ve Değerlendirmeler", İMKB Araştırma Yayınları, No: 5, İstanbul, 9s.

Koçel, Tamer., 2003, "İşletme Yöneticiliği", Beta Yayıncılık, 9. Baskı, İstanbul, 532-552s

Kondak, Nuray., 1999, "Menkul Kıymet Pazarına Giriş"**,** Der Yayınları, İstanbul, 28-30s.

Levy, Robert, A., 1966, "Conceptual Foundations of Technical Analysis"**,** Financial Analyst Journal, Vol. 22, No. 4, 83-89p.

Mongin, Philippe., 1997, "Expected Utility Theory" ,Handbook of Economic Methodology, (Other writers: J.Davis,W.Hands,and U.Maki,eds.(London,Edward Elgar, 342- 350p.

Morien, Travis., 2005, "Modern Portfolio Theory Criticisms", 1-6p.

Mullainathan, Sendhil. & Thaler, Richard H., 2000, "Behavioural Economics," NBER Working Papers 7948, 6-8p.

Neumann, John, Von & Morgenstern Oskar., 1944, "Theory of Games and Economic Behavior", Princeton University Pres.

Nofsinger, J. R., Sias, R. W., 1999, "Herding and Feedback Trading by Institutional andIndividual investors", Journal of Finance 54(6), 2263–2295p.

Nofsinger, John, R., 2005, "The Psychology of Investing", Pearson Education Hall, Second Edition, s.1 (e.t s.22).

Okka, Osman., 2005, "Finansal Yönetime Giriş", Nobel Yayın Dağıtım, Ankara, 6-10s.

Olsen, R., 1998, "Behavioural finance and its implications for stock price volatility", Financial Analysts Journal, Vol.54(2), 10-18p.

Öçal, T. & Çolak, Ö.F., 1999, "Finansal Sistem ve Bankalar", Nobel Yayın Dağıtım, Ankara, 292-295s.

Parasız, M., İlker., 1999, "Ekonomi Sözlüğü", Ezgi Kitabevi, Bursa, 586s.

Parasız, İlker., 2005, Para, Banka ve Finansal Piyasalar, 4.Baskı, Bursa, Ezgi Kitabevi, 225p.

Ritter, Jay R., 2003, "Behavioural Finance", Pacific-Basin Finance Journal Vol. 11(4), 429-437.

Roll, Richard., Ross, Stephan, A., 1984, "The Arbitrage Theory Approach to Strategic Portfolio Planning", Financial Analyst Journal, Vol:40, 15s.

Rosenberg, B., K. Reid, and Lanstein R., 1985, "Persuasive evidence of market İnefficiency", Journal of Portfolio Management 9, 18-28p.

Rozeff, M. S. and Kinney, W. R., 1976, "Capital Market Seasonality: The Case of Stock Returns", Journal of Financial Econonics, 379-402p.

Samuelson, P. A., 1963, "Risk and uncertainty: a fallacy of large numbers",(Reprint), Scientia, 49-56p.

Sarfati, Metin., Karabulut, Gökhan., 2004, "Rasyonel Beklentiler Teorisi", İktisat Dergisi, Sayı:453, 64s.

Senchack, A. J., Jr. and Martin, John D., 1987, "The relative performance of the PSR and PER investment Strategies", Financial Analysts Journal, 46-56p.

Shefrin, Hersh., Statman, Meir., 1985, "The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence" The Journal of Finance, Vol. 40(3), 777-790p.

Shen, Quian.,2002, "Momentum and Contrarian Strategies in Financial Markets", Southern Illnois Universty Graduate School Doctoral Dissertation, 2-5p.

Shiller, Robert J., 2001a,"Bubbles, Human Judgment, and Expert Opinion", Cowles Foundation Discussion Paper No. 1303, Cowles Foundation for Research in Economics, Yale University, 4-11p.

Shiller, Robert J., 2001, "Human Behaviour and the Efficiency of the Financial System", Chapter 20 in Handbook of Macroeconomics, 1999, Vol.1, Part C, 1305-1340s.

Shiller, Robert J., 2002, "From Efficient Market Theory to Behavioural Finance", Cowles Foundation Discussion Paper No: 1385, Cowles Foundation for Research in Economics, Yale University, 10-15p.

Shleifer A., 2000, "İnefficient Markets: An Introduction to Behavioral Finance", Oxford: Oxford Universty Press, 2p.

Slovic, Paul., 1972, "Psychological Study of Human Judgement: Implications for investment decision-making", Journal of Finance: 27, 779-801p.

Statman, Meir., 1999, "Behavioural Finance: Past Battles and Future Engagements", Financial Analysts Journal, Vol55(6), 18-27p.

Taha, Hamdi., 1989, "Belirsizlik Açıklayan Kelimelerin Belirsizlik Dereceleri", Uludag Üniversitesi İ.İ.B.F Dergisi, Cilt. X, Sayı.1-2, 106-107s.

Thaler, Richard., 1999, "Mental Accounting Matters", Journal of Behavioural Decision Making, Vol.12(3),183-206p.

Thaler, Richard., 2000, "From Homo Economicus to Homo Sapiens", The Journal of Economic Perspectives , Vol. 14(1), 133-141p.

Tufan, Ekrem., Hamarat, Bahattin., 2004, "Do Cloudy Days Affect Exchange Returns: Evidence from İstanbul Stock Exchange", Journal of Naval Science, Vol:2, No:1, 117s.

Tufan, Ekrem., 2006, "Davranışsal Finans", Orion Yayınevi, Ankara, 11-20s.

Türko, R., Metin., 1999, "Finansal Yönetim", Alfa Basın Yayın Dağıtım, İstanbul, 423-502s.

Türko, R., Metin.,1998,"Finansal Yönetim", Alfa Basın Yayın Dağıtım, İstanbul, 510s.

Tversky, A., Kahneman, D., 1974, "Jugment under Uncertainty:Heuristics and Biases", Science, New Series,Volume 185,Issue 4157, 1124-1131p.

Yükçü, Süleyman., Durukan, M, B., Özkol, E., 1999, "Finansal Yönetim", Vizyon Yayınları, İzmir, 995-1042s.