The Objectives, Strategies and Characteristics of Individual Investors in the Tehran Stock Exchange

Shahmansuri Esfandyar
Department of Accounting, Pardis Branch, Islamic Azad University, Iran

Fereydon Rahnamay Roodposhti
Department of Finansial Management, Tehran Science and Research Branch, Islamic Azad University, Iran,
r.roodposhti@gmail.com

Nikoumaram Hashem
Department of Management, Science and Research Branch, Islamic Azad University, Iran

Vakilifard Hamid Reza

Follow this and additional works at: https://scholarhub.ui.ac.id/icmr

Part of the Business Commons

INDONESIAN
CAPITAL MARKET REVIEW

The Objectives, Strategies and Characteristics of Individual Investors in the Tehran Stock Exchange

Shahmansuri-Esfandyar[a], Fereydon Rahnamay Roodposthi[b]*, Nikoumaram-Hashem[b], and Vakilifard-Hamid Reza[c]

[a] Department of Accounting, Pardis Branch, Islamic Azad University, Iran
[b] Department of Financial Management, Tehran Science and Research Branch, Islamic Azad University, Iran
[c] Department of Management, Science and Research Branch, Islamic Azad University, Iran

The present study aims to investigate and classify individual investors' objectives and strategies in the Tehran Stock Exchange. This study used two sets of data, investors' questionnaire and real data in TSE to comparing individual investors' strategies versus market strategies and used T-test, ANOVA and (LSD) to test hypotheses. Investment objectives are classified into five groups: building a financial buffer, capital growth, saving for retirement, investing as a hobby, and speculation; and three most common investment strategies are fundamental, technical and intuitive. Ultimately, the correlation between objectives and strategies is examined with the behavioral characteristics of investors, such as risk appetite, aspiration level and overconfidence. The results show that, investors with technical strategies have higher aspiration levels and appetite for risk than other investors. In addition, Investors with overconfidence have capital growth and building financial buffer objectives, and monthly average return of the fundamental strategy is higher than other strategies.

Keywords: Investment Strategies; Investment Objectives; Overconfidence; Risk Appetite; Aspiration Level

JEL classification: G02

Introduction

This article investigates whether investors in the Tehran Stock Exchange (TSE) have different characteristics; it also aims to identify the specific objectives they have for making investments, the investment strategies they choose, and how these factors affect the performance of their investment. According to Graham et al. (2009), a range of investor characteristics, strategies, and objectives can be explained by identifying these factors; and an appropriate investment performance can be achieved by providing a proper model. Statman (2002) argued that the principles of behavioral portfolio management focus on the fact that behavioral preferences play an important role in the selection of an investment portfolio. Selection of each investor's portfolio, and thus their performance, is affected by traits, such as wishes, hopes, fears and a narrow framing in transactional decision-making. Browning and Cross-

---

* Corresponding author's email: r.roodposhti@gmail.com

11

ley (2001) concluded that, due to the impact of different investment options, it is important to understand how investors are different in terms of the decisions they make, the processes that lead to those decisions, and the investment performance results they achieve in relation to their individual objectives and strategies.

Muralidhar (2016) argued that, due to the use of behavioral-financial and Modern Portfolio Theory (MPT), investors' objectives and priorities are not considered to be the main reasons for saving and investing. Furthermore, Lee et al. (2008) argued that recent studies have not utilized the differences between the types of investment objectives to explain the reasons for investors' decisions or investment performance. Jain et al. (2015) found that individual investor often make irrational investment decisions and deliver a poor performance due to behavioral mistakes such as disposition effects, mental accounting, investors' overconfidence, representativeness, narrow framing, aversion to ambiguity, anchoring, availability bias, and regret aversion.

There are different groups of individual and institutional investors whose behaviors are not rational and who pursue specific objectives. While risk-averse individuals aim to achieve reliable efficiency, risk takers probably aim for high efficiency (Shefrin & Statman, 2000). Heckman (2001) suggested that the impact of unobservable variables, such as investors' priorities and opinions, should be determined in order to understand the investors' choices and behaviors in financial markets. The recognition of individual differences can aid in understanding the underlying causes of behavioral disorders. Imperceptible differences at the individual level may help in understanding the reasons for behavioral abnormalities in people, and it can be used to explain possible investor strategies and objectives within a range of individual characteristics. However, the personality differences of investors have not yet been used to explain investors' performance (Pennings & Garcia, 2010). After the study conducted by Lewellen, Lease, and Schlarbaum (1980), Hoffmann and Shefrin (2014) offered a new approach to examining investors' objectives

and how those impact investors' performance. Hoffmann and Shefrin (2014) classified investment analysis strategies as fundamental, technical, and intuitive strategies; they classified the investment objectives into five groups: capital growth, building a financial buffer, saving for retirement, investing as a hobby, and speculation.

Focusing on different investor characteristics and their investment behaviors, this present research study seeks to answer the following questions: a) what are the differences among investors in terms of their overall investment objectives and their investment behaviors (risk appetite, overconfidence)? b) What investment strategies do they adopt? c) Are the return on investment strategies they use significantly different from each other? Based on the work of Hoffmann, Shefrin (2014) and Lewellen et al. (1980), we developed hypotheses to understand the investors' motivations, the type of investment strategies they selected, and the ways in which they operate based on their characteristics and desired objectives. However, the main limitation of this study is the number of brokerage firms and the number of trading accounts that each investor can have in any number of brokerage firms. Accordingly, we were faced with a problem when evaluating the performance of individual investors' returns. In this present study, some of the hypotheses were based on the empirical results reported in previous studies (Hoffmann & Shefrin, 2011; Kahneman et al., 1991; Lepin & Salberg, 2015). Therefore, the research hypotheses about individual investors' overconfidence, risk appetite, and aspiration levels are:

H_1: Investors that use fundamental analysis have higher overconfidence than other investors.

H_2: Investors that use fundamental analysis have a lower appetite for risk than other investors.

H_3: Investors that use fundamental analysis have higher aspiration levels than other investors.

According to Hoffmann et al. (2010), Lopes (1987), and Shefrin and Statman (2000), based

on the correlation between the objectives and the characteristics of individual investors, the following hypothesis is assumed:

H$_4$: There is a significant correlation between the objective of speculation and the investor's aspiration level.

In addition, based Hoffmann and Shefrin (2014) and Jain et al. (2015), the following hypotheses have been added to assess the selection of investment strategy:

H$_5$: Investors with a capital growth objective prefer to use the fundamental strategy rather than the other strategies.

H$_6$: Investors with the objective of building a financial buffer prefer to use the fundamental strategy rather than the other strategies.

Finally, according to Hoffmann et al. (2010) and Hoffmann and Shefrin (2014), to evaluate the investors' performance, the following hypothesis is assumed:

H$_7$: The average return on individual investment strategies is similar to the return on market strategies.

In this present study, the investment objectives and strategies are examined and classified using a sample of 343 individual investors in the Tehran Stock Exchange. Furthermore, the correlation of these objectives and strategies with investors' performance is tested on the basis of behavioral characteristics, such as risk appetite, aspiration level, and overconfidence. Portfolios based on investment strategy are used to evaluate and compare the individual investors' return on investment strategies with the market return. The results of this research, which is consistent with the study conducted by Hoffman et al. (2010), indicate that there is a significant, strong correlation between aspiration level and risk appetite and the capital growth objective. Furthermore, investors that use technical strategies have higher aspiration levels and a higher risk appetite than investors that use fundamental and intuitive strategies. There is a positive significant correlation between investors' overconfidence in the capital growth objective and building a financial buffer, but contrary to the

findings reported by Hoffmann and Shefrin (2014), the results of this present study indicate that the average return on technical investment is lower than the average return on performance when investors use the fundamental strategy.

This paper is organized as follows. The literature review discusses some of the related studies on individual investors' characteristics, objectives, and strategies, including an analysis of fundamental, technical, and intuition strategies. This paper also addresses the impact that investors' characteristics and objectives have on various types of investors. Then, the data pertaining to the results of a behavioral questionnaire and market data, such as stock returns, are presented. After that, the basic grounds for the examinations and inferences are discussed. Finally, the results are explicated and conclusions are drawn.

Literature Review

Decision-making is done based on a series of restrictions that may question the concept of rational choice. These restrictions may be external or they may originate from internal investment bias (Simon, 1955). Graham et al. (2009) have found that we have a limited understanding of the relationship between investors' decisions, the processes that lead to these decisions, and the investment performance because existing studies have either only examined a part of this relationship using socio-demographic variables, such as gender and age, or trade channels, such as psychological underlying processes and the drivers of investor decisions. In this regard, the behavioral portfolio theory explains why some of investors simultaneously buy bonds and lottery tickets by examining several reasons why they do so (for example, avoiding poverty in retirement and the potential to make money) as well as some of their aspirations (Statman, 2002). Establishing the relationship between behavioral components and investment performance, the experimental research by Hoffmann et al. (2010) combines the survey responses of individual investors with their transactional records to integrate a set of diverse data at a wide interval. This survey directly measures inves-

13

tors' characteristics, such as their investment objectives and strategies, which are normally invisible.

Individual investor characteristics and objectives

An investor's objectives are based on the investor's priorities. An investor's aspiration level plays an important role in those objectives. The correlation between investor objectives and their impact on investment in uncertainty conditions are defined according to Lopes' (1987) two-factor theory of risky choice. The first factor is associated with building a financial buffer, and the second factor is related to aspiration level. Aspiration levels vary in different people (Shefrin & Statman, 2000). Lopes (1987) argued that some people are motivated only by their desire to have a financial buffer and other people are only motivated by the possibility of earning a high return; however, both lower and higher motivation existed in all the subjects that participated in that study. Most people have a passion for making money, but the rate of wealth, which they define as being wealthy, is different.

Shefrin and Statman (2000) and Lopes (1987) argued that behavioral investors build their portfolio in the form of a layered pyramid in which each layer is designed to fulfill a specific purpose and to prioritize against possible risk. Furthermore, according to Lepin and Salberg (2015), investors select their portfolios to be consistent with their aspiration levels, and they consider their portfolios in pyramid-shaped assets based on behavioral theory. In this regard, the low-risk tools are placed at the bottom of the pyramid, and the high-risk tools are placed at the top of the pyramid. The bottom layer indicates the desire to build a financial buffer, and the top layer contains the high-risk assets and the ability to acquire higher returns. According to Diecidue, van de Ven, and Weitzel (2008), the aspiration level is correlated with the results of financial decision-making; they have concluded that, in accordance with the aspiration level, the investment decision maker not only pays attention to risky projects,

but also to the possibility of success and failure while being faced with financial decisions. Nabavi and Heydari (2014) utilized Merton's Anomie Theory to construct and validate a criterion to measure aspiration level, perceived opportunity, and the gap between them. Grable and Lytton (1999) explored conceptual, methodological, and empirical issues related to the development of a financial risk-tolerance assessment instrument. They found that financial risk tolerance is a significant factor in financial decisions; however, very few recognized, valid, and reliable assessment methods are available for use by financial service providers and educators. According to Barber and Odean (2001), overconfidence impacts the investors' ideas and beliefs and helps explain why some of investors are too optimistic and have forecasts that are too ambitious. According to Kahneman et al. (1991), if investors have enough confidence in their stock selection skills to be less regretful in the future, they will achieve high performance from their portfolios and make more ambitious forecasts, and they can make unbiased decisions. In a research study on online traders, Hoffmann and Shefrin (2011) compared the information drawn from transaction records of all clients and questionnaire data obtained for a sample of clients of the largest online broker in The Netherlands. They found that the investors' portfolio decisions are significantly affected by their overconfidence, and this leads to an understanding of the merit, speculation, and level of risk appetite.

Individual investor strategies

Numerous studies have examined the application of investment strategies in most of the organized stock markets around the world. According to most of these studies, returns on securities can be increased by using specific trading strategies (Jain et al., 2015). Investors apply different strategies for making their transactions. Fundamental and technical analysis strategies are two types of analyses that dominate the literature on the stock market; and investors that do not use these two strategies are either investors that lack knowledge about investment

analysis or investors that make decisions on the basis of intuitive judgments (Murphy, 1999).

Fundamental analysis

The fundamental analysis approach essentially pays attention to the intrinsic value of a stock. This approach analyzes information obtained from financial statements, including the dividend, the sales growth, and the ability to increase a company's earnings, as well as external factors, such as environmental, economic, and industrial analyses (Reilly & Brown, 2011). Piotroski (2000) provided a model in which companies are ranked based on fundamental variables, such as profitability ratios, leverage, and operational efficiency. In this model, the rank of each company is defined based on fundamental financial variables. Mohanram (2005) studied the financial fundamental variables of Bursa Malaysia. According to the research results, companies with a high basic rank had greater returns, while those with a lower rank had lower returns. Using univariate analysis, Altman (1983) selected five out of 22 financial ratios as indices for measuring the financial health of companies. In this model, a score is calculated for each company based on five fundamental variables derived from combined financial ratios, and the resulting score refers to the level of a company's financial health.

Wafi et al. (2015) have found that, in order to estimate the fair (intrinsic) value of shares, they used valuation models by fundamental analysts in stock markets; these analysts use information of current and future earnings of the company to evaluate the fair value and then compare it to the market value to determine whether it would be a viable investment. Given the complexity and importance of common stock valuation, so there are many techniques (Reilly and Brown, 2002), such as Dividend Discount Models (DDM), Discounted Cash Flow Models (DCFM), and Residual Income Valuation Model (RI). Wafi et al. (2015) find that it is difficult to use both DDM, and DCFM, because of the difficulty in calculating the Terminal Value (V) for future periods extending to the next three, so the best models to predict stock prices in those

markets, are the models that rely on financial ratios.

Ghodrati and Moghaddam (2012) investigated the prediction power of Altman and Ohlson models in predicting bankruptcy of listed companies in Tehran Stock Exchange (TSE). They examined accuracy of Altman and Ohlson models in TSE. They found that in 90% confidence level z-score model have acceptable prediction powers in Companies listed in TSE (Ahmadi et al., 2012).

Technical analysis

Technical analysis forecasts future price changes by examining past prices and the volume of transactions. Technical analyses focus on the use of geometric and mathematical diagrams and equations to obtain the stock price (Murphy, 1999). According to Shefrin and Hoffmann (2014), investors that rely on technical analysis only investigate stock price changes; those investors believe that the historical information and data refer to the future price rise of goods and stocks. Sweeney (1988) concluded that the technical strategy can lead to profitable results by applying filter rules and moving average rules. According Hoffman and Shefrin (2014), individual technical investors make decisions based on guesses about short-term changes in the stock exchange; they have portfolios with a high turnover, they accept high risk, they are more involved in trading options, and they earn lower returns.

Intuitive method

Intuitive behavior refers to behavior and decisions based on past experience and documentation. In the intuitive method, a series of rules of thumb are used to facilitate the decision-making process, and the human mind uses these rules to solve complex issues (Cimpian & Salomon, 2014). The exact calculation of utility requires full knowledge of the calculation of all returns and accurate management of the portfolio. Therefore, investors that do not make decisions based on financial and investment knowledge utilize an experimental method (in-

tuitive method) that focuses on past experience and reasoning to estimate the ultimate costs and earnings (Hoffmann et al., 2011). Herding behavior is observed in the financial markets in different developed and developing countries. In addition to individual investors, decision-making mistakes are seen in corporate executives. According to research that examined German firms, managers made intuitive mistakes in their investment decisions (Kotof, 2013).

A Brief Introduction to Tehran Stock Exchange (TSE) and Individual Investors

Emphasizing the attractiveness of investment in Iran, the McKinsey Global Institute (2016) concluded that Iran has the potential of adding a trillion US dollars to its gross domestic product (GDP) and creating 9 million new jobs by 2035. According to this report, this is equivalent to an annual economic growth rate of 6.3%, and it is predicted that this rate will gradually increase over the next two decades. This type of growth requires the investment of about 3.5 trillion US dollars; and it increases the global GDP by more than 1%. According to Mehrani et al. (2016), TSE has 62% institutional shareholders and 38% individual shareholders. Furthermore, the population of Iran is now more than 80 million; and more than 6 million active stock codes have been registered in brokerage firms. The investors' average age is 27.8 years; and the average return on TSE was about 37% from 2008 to 2014.

According to domestic research on Iran stock exchange behavior, 40% of investors adopt herding behavior and 33% apply an analytical process to their investment behavior and their decisions to buy and sell stocks. Furthermore, about 22% of their reactive behavior and about 5% of their decisions to buy and sell shares are intuitive (Vakilifard et al., 2013). According to Heybati et al. (2010), investors are trying to invest their savings in the capital market in order to achieve the greatest return. The investors' objective of investment is to maximize their wealth through stock analysis and selection using fundamental and technical analyses. In a study on the correlation between managers'

overconfidence and investment and fund performance, Ghalibafasl et al. (2013) found that there is a significant direct correlation between investment managers' overconfidence and risk, but an inverse correlation with returns.

Research Methods

Data and sample

This study used two sets of data. First, it used an investors' questionnaire, which was designed based on the study by Hoffmann et al (2010), to collect data on the investors' characteristics and their investment objectives and strategies. Second, data comparing individual investors' strategies with market strategies of real data in TSE was also analyzed. In the first step, a questionnaire was used to collect data from TSE brokerage firms (10 brokerage firms). The list of active and domestic real customers is available from each brokerage firm. Based on Krejcie and Morgan (1970) guidelines a sample size of 384 samples is required in a study; we distributed questionnaires to a total of 1150 participants at the 10 brokerage firms. As shown in Table 1, the questionnaire is classified into five main groups of questions, and the questions for each group were obtained from reliable sources such as Hoffmann et al. (2010). The questionnaire was designed in Google Docs, and it was sent to the participants via email at the beginning of December 2014. Of those, a total of 343 electronic questionnaires (30%) were collected at the end of March 2015.

In the second step, the data from the second capital market group was compared with data from the fundamental, technical, and intuition groups to construct a portfolio scenario in order to evaluate and compare the individual investors' performance with actual market returns. Investors select stock with a desired investment objective based on a selected investment strategy. For instance, an investor that uses a fundamental strategy tries to find stocks with stronger fundamental properties to buy and sell in the stock market, but an investor that uses a technical strategy tries to find stocks that have appropriate technical features in order to enter

Table 1. Research Questions

Number of question	Resource	Variable
8 Questions	Pompian (2006)	Overconfidence
9 Questions	Grable & Lytton (1999)	Risk appetite
5 Questions	Nabavi & Heydari (2014)	Aspiration level
6 Questions	Researcher Constructed (2014)	Investment strategies
5 Questions	Hoffmann, Shefrin, & Pennings(2010)	Investment objectives

Note: This table shows the combination of variables in the questionnaire, classified into five groups based on the respondents' information. The first group refers to the investment objectives of capital growth, building a financial buffer, investing as a hobby, saving for retirement, and speculation. The second group refers to the investors' selected strategies based on fundamental, technical, and intuition analyses. The third group refers to the investors' behavior characteristics, risk appetite. The fourth group refers to the investors' behavioral characteristics, aspiration levels, and the last group refers to the investors' behavior characteristics, overconfidence.

Table 2. Description of the Research Variables

Variable	Description
Traits:	
Male/Female	Questionnaire respondents' gender
Age	Questionnaire respondents' age
Experience	Spatial domain of the respondents' experience: 1= Novice and 5= very advanced
Novice/advanced/very advanced investor	Self-assessed investment skill: one if an investor reports to be a novice, advanced, or very advanced investor, respectively.
Characteristics:	
Overconfidence	**We asked the following 8 Questions to analyze Overconfidence. Self-assessment for:** • Predictability of price bubbles, • Prediction of profitability in future years, • Portfolio diversification, • Self-confidence, • Investment potential, • Your investment strategy under positive market volatility, • Your investment strategy under negative market volatility, • Investment experience.
Risk appetite	**We asked the following 9 Questions to analyze Risk appetite. Self-assessment for:** • Your friends' opinion about your risk appetite level, • The diversity of the portfolio, • Your investment strategy in the high risk capital market, • 6 conceptual questions about risk self-assessment
Aspiration level	**We asked the following 5 Questions to analyze Aspiration level:** • Ambitions, • Having a good financial position, • Having a beneficial job, • Gaining respect, • Gaining Attractiveness.
Investment strategies:	
Technical analysis	**We asked the following 6 Questions to analyze Investment strategies:** • Questionnaire 1: My main investment strategy is Technical analysis • Questionnaire 2: I am only interested in the price movements in the market and I look at charts Market data: market data is classified and scenario-making is done for them using the technical analysis filter.
Fundamental analysis	• Questionnaire 1: My main investment strategy is fundamental analysis • Questionnaire 2: I try to analyze the characteristics of a company in order to estimate its value Market data: market data is classified and scenario-making is done for them using Altman's model.
Intuition	• Questionnaire 1: My main investment strategy is intuition • Questionnaire 2: I try to consider advice from my friends and other available information Market data: market data is classified and scenario-making is done for them using the turnover filter.
Investment objectives:	
Saving for retirement Investing as a hobby (entertainment) Building a financial buffer Speculation (gambling) Capital growth	**We asked the following 5 Questions to analyze main Investment objectives;** My main Investment objectives is: • Saving for retirement • Investing as a hobby (entertainment) • Building a financial buffer • Speculation (gambling) • Capital growth

Note: this table categorizes the research variables into traits, characteristics, investment objectives, and strategies.
Self-reported in the questionnaire on a scale ranging from 1 = for lower score to 5= higher score.

17

and invest in the stock exchange.

Data was collected for a five-year period from April 2010 to March 2015, and the data covers all of the 450 companies listed on the TSE. The statistical samples are quarterly (three months) returns. Monthly return is obtained from calculated the daily return (R_{it}), the received dividend per share (DPS), and the preferred stock. The additional return of market is calculated based on the difference between the mean total return of the statistical samples or $R_{m,t}$ from the monthly market return. Table 2 shows the main research variables in specific categories. These variables are categorized as follows: traits, characteristics, investment objectives, and strategies.

Methodology

This study uses the Friedman test to rank the investment strategies and objectives. Furthermore, it applies the Kolmogorov-Smirnov test (KS) to examine the normality of the main research variables (overconfidence, risk appetite, and aspiration level). A one sample T-test is used to test the mean sample in order to determine the extent to which the mean sample is higher or lower than a constant value.

This study uses one-way analysis of variance (ANOVA) to test H_1 to H_3 and to determine the existence or lack of difference between the mean overconfidence, risk appetite, and aspiration level and investment strategies. After determining the difference between the means of the groups, Fisher's least significant difference method (LSD) is used to determine if the groups are significantly different. Spearman's rank correlation coefficient is used to test H_4 and to identify the correlations between the investors' characteristics and their objectives.

One-way analysis of variance (ANOVA) is used to test H_5 and H_6 and to determine the existence or lack of difference between the mean investment objectives and strategies, and then Fisher's LSD is also used to determine if these are significantly different. To test H_7, we first measured and evaluated the values of the returns, risk, and coefficient of variation (CV) for the market portfolio as a proxy and also for

the investment portfolio information. Finally, the constructed portfolio is used to evaluate the performance of each of the investment and market strategies. A one-sample T-test is also used to examine the mean risk and return of the study population.

Constructed Portfolio Strategy

In this research study, fundamental data obtained from the financial statements (Model 1), data obtained from the technical analysis (Model 2), and data obtained from using the intuition strategy (Model 3) were extracted from shares of companies listed on the TSE. We created a scenario of capital market investment strategies, extracted the risk and return, and eventually evaluated the performance of each investment strategy. For a better estimate between the return on individual investors and the real simulated market data, stock prices in the first quarter are associated with a high risk portfolio, and the stock prices in the fourth quarter are associated with a low risk portfolio.

Model 1: Fundamental Portfolio

Altman's model (1983) was utilized to create the portfolios of companies that use the fundamental strategy. This model identifies stocks that were chosen based on good fundamental strategies and that have high financial strength as follows:

$$Z = 1.2_{x1} + 1.4_{x2} + 3.3_{x3} + 0.6_{x4} + 1_{x5}$$

Where:

X_1: Net working capital to asset ratio

X_2: Retained earnings to asset ratio

X_3: Operating income to asset ratio

X_4: Market value of securities to debt ratio

X_5: Sales to asset ratio

Z is introduced as follows. According to Altman's model (1983), if z<1.81, the fundamental situation is weak; if $1.81 \geq z \geq 2.99$, the fundamental situation is moderate, and if $z \leq 2.99$, the fundamental variables are strong and their

Table 3. The Kolmogorov-Smirnov Test Values

Variable	K-S
Overconfidence	%29
Aspiration level	%27
Risk appetite	%04

Note: As shown above, all the Kolmogorov-Smirnov test statistics are less than the error level of 0.05 and the data normality hypothesis is accepted at significance level of 95%.

financial health is high. The present research study selected a Z value range greater than 1.81 for stock selection with a moderate to high fundamental situation after extraction of three-month inter-period data from stock companies from April 2010 to March 2015, and the calculations were based on Altman's model.

Model 2: Technical Portfolio

Common indicators of technical analysis were selected for filtering in order to construct a technical portfolio. This method was evaluated and approved by a group of technical investment professionals and 20 technical experts. The portfolio selection filter is written as follows:

TEMA is the Triple Exponential Moving Average, CCI is the Commodity Channel Index, StochK is the Stochastic Oscillator, MA is the Moving Average, and RSI is the Relative Strength Index.

Technical stock is purchased at the beginning of period if the following conditions are true:

1. If "TEMA Close 5 days" is higher than "MA Close 5 days", and crosses it.

2. If the 14-day RSI can cross the 30-day RSI, and it is also higher than the 30-day RSI (RSI 14 days > 30 day).

3. If the 14-day CCI crosses the 100-day CCI (CCI 14 days: Cross CCI 100 days).

4. If StochK (15 days) < StochK (30 days)

5. If the stock day turnover is higher than the 15-day moving average.

If these five conditions are observed as the filter for technical stock selection, then 50 top shares are purchased at the beginning of the period and sold at the end of three months. This process is repeated for the entire period.

Model 3: Intuition Portfolio

The turnover ratio of traded stocks is used to extract data for the intuition portfolio. A stock with high turnover indicates that the investors use intuitive strategies to buy that share. The turnover ratio is calculated for the total market share, and 50 shares with a high turnover are selected. The turnover ratio is found by dividing the volume of the traded shares with their stock market value.

Results and Discussions

Data Description

In this study, Cronbach's alpha value equal to 87.9% was obtained for the reliability of questionnaire, so the reliability of all the questions is acceptable. As shown in Table 3, Kolmogorov-Smirnov test statistics are 29%, 27%, and 4% for overconfidence, aspiration level, and risk aversion, respectively; and the variable behavior is normal at a significance level of 5%.

According to the results of the descriptive statistics, 80% of the respondents are male and 20% are female. In terms of age, 14% of the respondents are older than 50 years; 29% range in age from 35 to 50 and 57% range in age from 20 to 35; this indicates that most of the study population consisted of young adults. The respondents' average age is 32 years; and more than 90% of them have a bachelor's degree or a higher educational degree, and more than 83% have experience working as an investor. According to the results, 53% of the investors use fundamental strategies; 28% use technical strategies; and 19% use intuitive strategies. Table 4 shows the rankings for the investment strategies and objectives using the Friedman test and mean ranks. According to the significance level of the Friedman test (0.000), the hypothesis

Table 4. Descriptive Statistics and Mean Ranks of the Investment Objectives and Strategies

Variable		Frequency Percentage	Std. Deviation	Mean Rank	Rank
Investment objectives	Capital growth	27%	0.846	4.39	1
	Building financial buffer	22%	1.005	3.42	2
	Saving for retirement	19%	1.082	2.74	3
	Speculation	17%	1.039	2.46	4
	Hobby	15%	1.065	1.99	5
Investing strategies	Fundamental analysis	53%	0.7263	2.45	1
	Technical analysis	28%	0.7910	1.86	2
	Intuition	19%	0.7462	1.70	3
sig Friedman Test:			0.000		

* Significance level: $p < 0.05$
Note: This table shows the results of the Friedman test for ranking the investment objectives and strategies. The frequency percentage refers to the percentage of the respondents' participation in that variable compared to the rest of the comments.

Table 5. Analysis of Variance Results for Investor Characteristics and Investment Strategies, and the Technical, Fundamental, and Intuition Strategy Analyses

Characteristics	F-Statistic	p-value
Overconfidence	10.048	[0.000] *
Risk Appetite	4.39	[0.013] *
Aspiration level	3.625	[0.028] *

Significance level: * $p < 0.05$
Note: This table shows the analysis of variance between the investors' characteristics and investment strategies (technical, fundamental, and intuition). For example, the first row shows the F-test results indicating a significant difference between the three investment strategies among investors with the overconfidence characteristic.
In this table, H_1 and H_0: $\mu_{strategy1} = \mu_{strategy2} = \mu_{strategy3}$

Table 6. Results of the LSD Test for the Differences between Investor Characteristics and Investment Strategies

Investment strategies	Overconfidence			Risk Appetite			Aspiration level		
	TA	FA	IN	TA	FA	IN	TA	FA	IN
TA	-	-0.019 [0.962]	-2.304 [0.000]*	-	-1.664 [0.003]*	-1.341 [0.105]	-	-1.383 [0.008]*	-0.806 [0.288]
FA	0.019 [0.962]	-	-2.285 [0.000]*	1.664 [0.003]*	-	0.322 [0.659]	1.383 [0.008]*	-	0.576 [0.391]
IN	2.304 [0.000]*	2.285 [0.000]*	-	1.341 [0.105]	-0.322 [0.659]	-	0.806 [0.288]		-

Significance level: * $p < 0.05$:
TA=Technical Analysis; FA= Fundamental analysis; IN= Intuition
Note: This table shows which investment strategy has a stronger correlation with the investor characteristics in comparison to the other strategies. The values presented in this table refer to LSD statistics, and the values in parentheses refer to the significance level. For instance, for investors with the overconfidence characteristic, the mean return on the technical strategy is significantly different from the mean return on the intuition strategy.

about the equality of ranks among respondents and investors is rejected. Based on the mean ranks, the respondents gave the highest priority to the fundamental strategy (2.45), followed by the technical strategy (1.86), and finally the intuitive strategy (1.70). To prioritize the investment objectives according to their significant level (0.00) and to obtain the mean ranks (Table 4), the highest priority and importance is allocated to the capital growth objectives (4.39), followed by building a financial buffer (3.42), saving for retirement (2.74), speculation (2.46), and finally investing as a hobby (1.99).

Results

Table 5 shows the results of the H_1, H_2, and H_3 tests. As seen, a significant difference was observed between the three different investment strategies (fundamental, technical, and intuition) in terms of investors' overconfidence (p-value=0.000). Furthermore, as shown in Table 6, based on the results of the LSD test for H1 (p-value=0.962), there is no difference between overconfidence in investors that use a fundamental strategy and investors that use a technical strategy, but overconfidence in inves-

Table 7. Correlation between Investor Objectives and Characteristics

Investor Objectives	Investor Characteristics		
	Overconfidence	Risk Appetite	Aspiration Level
Saving for retirement	0.049	-0.065	0.189
	[0.364]	[0.229]	[0.000]*
Investing as a hobby	0.035	0.059	-0.035
	[0.516]	[0.274]	[0.515]
Building a financial buffer	0.091	-0.027	0.192
	[0.028]*	[0.093]	[0.000]*
Speculation	0.087	0.102	0.247
	[0.107]	[0.060]	[0.000]*
Capital growth	0.212	0.121	0.294
	[0.000]*	[0.026]*	[0.000]*

Significance level: * p<0.05

Note: This table shows the correlation between investor objectives and investor characteristics using Spearman's correlation statistics. The values in the table refer to Spearman's rank correlation coefficient, and the values in parentheses indicate the significance levels of each correlation.

tors that use both of those strategies is higher than the overconfidence of investors that use the intuition strategy (p-value=0.000).

The risk appetite of investors that use the fundamental strategy is not higher than the risk appetite of investors that use the other two strategies, so H_2 is rejected. As the results of the LSD test show, there is a significant difference between the investors' risk appetite and different investment strategies (p-value=0.013). As shown in Table 6, the risk appetite of investors that use the fundamental strategy is lower than the risk appetite of investors that use the technical strategy (p-value=0.003).

The aspiration levels of investors that use the fundamental strategy are not higher than the aspirations of investors that use the other two strategies, so H_3 is also rejected. The study's findings show that there is no difference in the aspiration levels of investors that use different investment strategies (p-value=0.028). Furthermore, based on the LSD test results, the aspiration levels (sig=0.003) of investors that use the fundamental strategy are lower than the aspiration levels of investors that use the technical strategy.

This finding is inconsistent with the results reported by Hoffmann et al. (2010) who observed that investors that use the fundamental analysis strategy have higher aspiration levels than investors that use the technical strategy; they also have a higher risk appetite and greater overconfidence. Therefore, at TSE:

A. The overconfidence of individual investors that use fundamental and technical strategies

is equal, but it is higher than the overconfidence of investors that use the intuitive strategy.

B. Individual investors that use the technical strategy have a higher risk appetite and higher aspiration levels than investors that use the fundamental strategy.

Based on the values presented in Table 7, there is a significant correlation between investor objectives and investor characteristics. The results indicate that there is a significant correlation between aspiration levels and the objective of speculation (p-value=0.000) for individual investors, thus supporting H_4. Furthermore, the overall results of the tested investor objectives and investor characteristics indicate that all the investors that are active in the TSE have higher aspiration levels except for those with the investing as a hobby objective (p-value=0.515) which does not show any significant correlation.

According to the results shown in Table 7, overconfidence is higher in investors with objectives of building a financial buffer and capital growth. Investors with the objective of capital growth have higher risk appetite, overconfidence, and aspiration level than Investors with the other four objectives. This is consistent with Shefrin and Hoffmann's (2014) findings on the significant correlation between aspiration level and risk appetite.

In general, the results of this test indicate that;

A. There is a significant positive correlation between aspiration level and investment objec-

21

Table 8. Analysis of Variance Results for the Analysis of the Investment Objectives and the Investment Strategies

Investment Objectives	F-test	sig
Capital growth	4.215	[0.016] *
Building a financial buffer	4.131	[0.017] *
Speculation (gambling)	0.226	[0.798]
Saving for retirement	0.929	[0.939]
Investing as a hobby	0.826	[0.439]

Significance level: * p<0.05:

Note: This table shows the analysis of variance between each investment objective and the investment strategy (technical, fundamental, and intuition). For example, the first row shows the significant difference between the three investment strategies among investors with capital growth objectives using F-test statistics. In this table, H_1 and H_0:$\mu_{strategy1}=\mu_{strategy2}=\mu_{strategy3}$ indicate that at least the means of one of the strategies are significantly different.

Table 9. LSD Test Results for the Correlation between the Investment Objectives and the Investment Strategies

Investment Strategies	Capital growth			Building a financial buffer		
	TA	FA	IN	TA	FA	IN
TA	-	0.178 [0.112]	0.475 [0.004]*	-	0.260 [0.063]	0.578 [0.005]*
FA	-0.178 [0.112]	-	0.296 [0.042]*	-0.260 [0.063]	-	0.317 [0.081]
IN	-0.475 [0.004]*	-0.296 [0.042]*	-	-0.578 [0.005]*	-0.317 [0.081]	-

Significance level: * p<0.05:

TA=Technical Analysis, FA= Fundamental analysis, IN= Intuition

Note: The results presented in Table 9 indicate which investment strategy has a stronger correlation with one investment objective in comparison to the other investment strategies. The values presented in this table refer to LSD statistics, and the values in parentheses refer to the significance level. For example, the mean technical strategy return is significantly different for investors with a capital growth objective than it is for investors that use the intuitive strategy. There is no significant difference between the investment objectives of speculation, saving for retirement, and investing as a hobby; thus, the LSD test was not conducted for those objectives.

tives (except for investing as a hobby)

B. The investors with the capital growth objective have higher risk appetite, overconfidence, and aspiration levels than the other investors.

C. Most of the investors with high overconfidence have capital growth and building financial buffer objectives.

Based on the ANOVA results shown in Table 8, the correlation between investor objectives and investor strategies for H_5 and H_6 is accepted, based on the obtained values for the f-statistic and significance level. The results indicate that the capital growth objective (p-value=0.016) and building a financial buffer objective (p-value=0.017) have a significant correlation with investment strategies; but, the significant correlation is not proven between these variables for the other objectives.

According to the LSD test results presented in Table 9, there is no significant correlation between the technical and fundamental strategies for the capital growth objective (p-value=0.112). However, in capital growth objectives, investors that use the fundamental strategy (p-value=0.004) and investors that use the technical strategy (p-value=0.042) chose more often than investors that use intuitive strategy. Therefore, H_5 under which the investors chose to use fundamental strategies with capital growth objectives is rejected.

The results also indicate that H_6, under which the investors chose to use the fundamental strategy with the objective of building a financial buffer, is also rejected. According to the LSD test results presented in Table 9, there is no significant difference between investors that use technical and fundamental strategies (p-value=0.063) for building a financial buffer. However, investors that use the intuitive strategy (p-value=0.005) chose building a financial buffer as an objective less often than the investors that use the technical strategy. The overall results are as follows:

A. Technical and fundamental strategies do not have any significant difference in terms of

Table 10. Comparison of the 60-month Mean of Return, Risk, and CV

Investor Strategy	Market Portfolio			Individual Investor Portfolio			Constructed Portfolio			r_C-r_M	r_{II}-r_M
	r	σ	cv	r	σ	cv	r	σ	cv		
TA	3.7%	4.3%	117%	2.9%	1.7%	58%	3.7%	2.4%	65%	0.00% [00%]	-0.80% [-8.7%]
FA	3.7%	4.3%	117%	2.8%	2.0%	73%	3.2%	2.9%	93%	-0.50% [-3.2%]	-0.90% [-8.3%]
IN	3.7%	4.3%	117%	2.3%	1.3%	55%	4.3%	1.6%	36%	0.60% [6.9%]	-1.40% [-19%]

TA=Technical Analysis, FA= Fundamental Analysis, IN= Intuition

r = Monthly Return, σ = standard deviation, CV= Monthly Return divided by the standard deviation, r_C-r_M= Excess return for the constructed portfolio, r_{II}-r_M= Excess return for the individual investor portfolio

Note: The table above shows a comparison between return, risk, and CV for technical, fundamental, and intuitive strategies among three different portfolio groups. The values in parentheses refer to the T-test results comparing the risk and return of the portfolios. The market portfolio was obtained based on the monthly return and risk data from the TSE Index. Data for the individual investor portfolio was extracted based on real information. The researcher's constructed portfolio is based on Model 1, Model 2, and Model 3.

selecting the capital growth objective and the building a financial buffer objective.

B. Technical and fundamental analysts select the capital growth objective equally, but they select it more often than intuitive analysts.

C. Technical and fundamental analysts select the building a financial buffer objective equally, but they select it more often than intuitive analysts.

The results presented in Table 10 show a comparison of the mean of 60 months of return, risk, and CV in technical, fundamental, and intuitive strategies in order to test H_7. The average monthly return of the market is 3.7%, while the individual investors' average return is 2.9% when using the fundamental strategy, 2.8% when using the technical strategy, and 2.3% when using the intuition strategy. In all three strategies, the individual investors achieved less return than the average market return. According to the results, individual investors that used the fundamental strategy had a higher return than investors that used the technical and intuition strategies. This is consistent with the results reported by Hoffmann and Shefrin (2014).

The T-test results comparing the average risk and the monthly return with market return (Table 10) indicate that the fundamental investor's portfolio with -8.3% had the lowest mean deviation, and the average return of the intuition investor's portfolio (-19%) had the highest deviation from the return. According to the results of the average risk and monthly constructed portfolio return, the constructed fundamental portfolio with a deviation of 3.2% had the lowest return, and the technical portfolio with a deviation of 00% is similar to the market. However, the intuitive portfolio, which was selected based on widely-traded stocks, had a higher return (6.9%) than the average market return.

We concluded that the present study's findings are consistent with the results reported by Hoffman et al. (2010), which indicated that there is a significant and strong correlation between aspiration level, risk appetite and capital growth objectives. Our results show that, investors who use technical strategies have higher aspiration levels and a higher risk appetite than investors that use fundamental and intuitive strategies. This result is inconsistent with Hoffmann et al. (2010) who observed that investors who use the fundamental analysis strategy have higher aspiration levels than technical investors. We find out that there is a positive significant correlation between investors' overconfidence in the capital growth objective and building a financial buffer. Finally, our findings are consistent with Hoffmann and Shefrin (2014) that the average return on performance using the technical strategy is lower than the average return on performance using the fundamental strategy.

Conclusions

This study's results show that individual investors give the highest priority to using fundamental strategies for selecting stocks to buy and sell, followed by technical strategies, and least of all intuitive strategies. Furthermore, their main investment objectives are capital growth,

23

building a financial buffer, saving for retirement, speculation, and, finally, investing as a hobby. Based on Hoffman et al. (2010), there is a significant, strong correlation between aspiration level and risk appetite and capital growth objectives. The overconfidence behavior in the individual fundamentalist investor is equal to the overconfidence behavior of the technical investor. Contrary to Hoffmann and Shefrin (2010), the scores for risk appetite and aspiration level were higher for technical investors than fundamental investors. The results of the performance evaluation indicate that fundamental investor's average return is better than

technical investors, and this is consistent with the results reported by Hoffmann and Shefrin (2014).

This research concludes that active investors in the TSE have higher aspiration levels; and the investors that chose the capital growth objective have higher overconfidence, a higher risk appetite, and higher aspiration levels than other investors. Comparing the results of the constructed scenario model for capital market strategies in this research, we found that investors will be able to achieve a higher return than the average market return by using the intuitive strategy and investing in widely-traded stocks.

References

Ahmadi, A., Soleimani, B., Vaghfi, B., Hesam, S., & Salimi, M. B. (2012). Corporate bankruptcy prediction using a logit model: Evidence from listed companies of Iran. *World Applied Sciences Journal, 17*(9), 1143-1148.

Altman, E. I. (1983). *Corporate financial distress: A complete guide to predicting, avoiding and dealing with bankruptcy*. New York: John Wiley and Sons.

Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics*, *116*(1), 261-292. doi:10.1162/003355301556400

Browning, M., & Crossley, T. F. (2001). The Life-Cycle Model of Consumption and Saving. *Journal of Economic Perspectives, 15*(3), 3-22. doi:10.1257/jep.15.3.3

Cimpian, A., & Salomon, E. (2014). The inherence heuristic: An intuitive means of making sense of the world, and a potential precursor to psychological essentialism. *Behavioral and Brain Sciences, 37*(5), 461-480. doi:10.1017/S0140525X13002197

Diecidue, E., van de Ven, J., & Weitzel, U. (2008). Shareholders' expectations, aspiration levels, and mergers. In K. J. McCarthy & W. Dolfsma (Eds.), *Understanding Mergers and Acquisitions in the 21st Century* (pp.148-164). Palgrave Macmillan. doi:10.2139/ssrn.1103482

Ghalibafasl, H., Kordi, M., & Azhdari, F.

(2013). Overconfidence of Investment Managers and the Performance Assessment Indexes of Mutual Funds. *Journal of Financial Management Strategy,* 17-34. Retrieved from: http://www.maaref.ir/view.asp?Type=pdf&ID=1224152&l=en

Ghodrati, H., & Moghaddam, A. M. (2012). A Study of the Accuracy of Bankruptcy Prediction Models: Altman, Shirata, Ohlson, Zmijewsky, CA Score, Fulmer, Springate, Farajzadeh Genetic, and McKee Genetic Models for the Companies of the Stock Exchange of Tehran. *American Journal of Scientific Research*, *59*, 55-67.

Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review, 8*(3), 163-181. doi:10.1016/S1057-0810(99)00041-4

Graham, J. R., Harvey, C. R., & Huang, H. (2009). Investor Competence, Trading Frequency, and Home Bias. *Management Science, 55*(7), 1094-106. doi:10.1287/mnsc.1090.1009

Heckman, J. J. (2001). Micro Data, Heterogeneity, and the Evaluation of Public Policy: Nobel Lecture. *Journal of Political Economy, 109*(4), 673-748. doi:10.1086/322086

Heybati, F., Rahnama, R. F., & Salmani, S. (2010). Relationship between Two Stocks Pricing Approaches In Tehran Stock Ex-

change. *Financial Knowledge of Securities Analysis*, *3*(5), 115-136. Retrieved from http://en.journals.sid.ir/ViewPaper.aspx?ID=208274

Hoffmann, A. O., Shefrin, H., & Pennings, J. M. (2010). Behavioral portfolio analysis of individual investors. doi:10.2139/ssrn.1629786

Hoffmann, A. O., & Shefrin, H. (2011). Online Investors: What They Want, What They Do, And How Their Portfolios Perform. What They Do, and How Their Portfolios Perform. doi:10.2139/ssrn.1719796

Hoffmann, A. O. I., & Shefrin H. (2014). Technical Analysis and Individual Investors. *Journal of Economic Behavior and Organization*, *107*(part B), 487-511. doi:10.1016/j.jebo.2014.04.002

Jain, R., Jain, P., & Jain, C. (2015). Behavioral Biases in the Decision Making of Individual Investors. *IUP Journal of Management Research, 14*(3), 7-27. Retrieved from http://search.proquest.com/openview/a784f7b36b7654aef55f3b42d288ce6a/1?pq-origsite=gscholar

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *Journal of economic perspectives, 5*(1), 193-206. doi: 10.1257/jep.5.1.193

Kotof, D. (2013). *Behavioral Biases and Corporate Decision Making on Investing Abroad* (MPRA Paper No 49858). Retrieved from https://mpra.ub.uni-muenchen.de/49858/1/mpra_paper_49858.pdf

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607-610. doi: 10.1177/001316447003000308

Lee, H.-J., Park, J., Lee, J.-Y, & Wyer, R. S. (2008). Disposition Effects and Underlying Mechanisms in E-Trading of Stocks. *Journal of Marketing Research, 45*(3), 362-78. doi:10.1509/jmkr.45.3.362

Lepin, C., & Salberg, E. (2015). Différences culturelles dans l'interaction entre physiothérapeutes et patients migrants en milieu hospitalier. Retrieved from RERO DOC Digital Library: http://doc.rero.ch/record/259099

Lewellen, W. G., Lease, R. C., & Schlarbaum, G. G. (1980). Portfolio design and portfolio performance: the individual investor. *Journal of Economics and Business, 32*(3), 185-97. Retrieved from https://ssrn.com/abstract=284046

Lopes, L. L. (1987). Between Hope and Fear: The Psychology of Risk. *Advances in Experimental Social Psychology, 20*, 255-95. doi:10.1016/S0065-2601(08)60416-5

Mehrani, K., Roodposhti, F. R., Nekomaram, H., & Saeedi, A. (2016). Behavioral trading strategies and investor sentiment: Empirical research in Tehran Stock Exchange (TSE). *Indonesian Capital Market Review, 8*(2). doi:10.21002/icmr.v8i2.5708

Mohanram, P. S. (2005). Separating winners from losers among lowbook-to-market stocks using financial statement analysis. *Review of Accounting Studies, 10*(2), 133-170. doi: 10.1007/s11142-005-1526-4

Muralidhar, A. (2016). Goals based investing, the KISS Principle, and the Case for New Financial Instruments. doi:10.2139/ssrn.2715053

Murphy, J. J. (1999). *Technical analysis of the financial markets: A comprehensive guide to trading methods and applications*. Penguin.

Nabavi, S. A., & Heydari, A. (2014). A test of Merton's anomie theory The case of Ahvaz male high school students. *Sosiological Review, 21*(1), 147-181. Retrieved from https://jsr.ut.ac.ir/article_56300_0.html

Pennings, J. M. E., & Garcia, P. (2010). Risk & Hedging Behavior: The Role and Determinants of Latent Heterogeneity. *The Journal of Financial Research, 33*(4), 373-401. doi:10.1111/j.1475-6803.2010.01279.x

Piotroski, J. D. (2000). Value investing: The use of historical financial statement information to separate winners from losers. *Journal of Accounting Research, 38*, 1-41. doi:10.2307/2672906

Pompian, M. M. (2006). *Behavioral Finance and wealth management: How to Build Optimal Portfolios That Account for Investor Biases*. New Jersey: John Wiley & Sons.

Reilly, F., & Brown, K. (2011). *Investment analysis and portfolio management*. Cen-

25

gage Learning.

Reilly, F., & Brown, K. (2002). *Investment Analysis and Portfolio management* (7th ed.). South-Western.

Shefrin, H., & Statman, M. (2000). Behavioral portfolio theory. *Journal of financial and quantitative analysis, 35*(2), 127-151. doi:10.2307/2676187

Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics, 69*(1), 99-118. Retrieved from http://www.jstor.org/stable/1884852

Statman, M. (2002). Lottery Players / Stock Traders. *Financial Analysts Journal, 58*(1), 14-21. doi: 10.2469/faj.v58.n1.2506

Sweeney, R. J. (1988). Some New Filter Tests: Methods and Results. *Journal of Financial and Quantitative Analysis, 23*(3), 285-300. doi:10.2307/2331068

Vakilifard, H., Foroughnejad, H., & Khoshnood, M. (2013). Evaluation Investor's Behavior in Tehran Stock Exchange with Analytic Network process (ANP). *Asset Management & Financing, 1*(2), 19-34 . Retrieved from http://uijs.ui.ac.ir/amf/article-1-139-en.html

Wafi, A. S., Hassan, H., & Mabrouk, A. (2015). Fundamental Analysis Models in Financial Markets–Review Study. *Procedia Economics and Finance, 30*, 939-947. Doi:10.1016/S2212-5671(15)01344-1.