

Research Article
Finance

Is Technical Analysis Profitable on Athens Stock Exchange?

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Received 9 April 2017; Accepted 27 October 2017; Published 29 January 2018

Academic Editor: Raymond A. K. Cox

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Abstract

In this paper, we incorporate a technical analysis strategy of the Greek Stock Market. These are the strategies used by most professionals and significant players in the field of investment analysis on the Greek market. Data were collected from most of the investment companies in Greece. The most frequently used techniques of technical analysis such as RSI, MACD and Stochastic, including the use of patterns and candlestick charts, will be mentioned herein. The methods employed include the use of a questionnaire and statistical analysis. This research was conducted between 22 November 2014 and 22 December 2014. The results provide a strong evidence of the profitability of technical trading rules and contradict the efficient market hypothesis.

Keywords: Technical analysis, MACD, RSI, Stochastic, Bollinger bands, trading strategy.

JEL Classification: G1, G2, G02

1. Introduction

Technical analysis is the study of prices of stocks with charts as the primary tool in order to make better investments. In other words, technical analysis is a method for forecasting the direction of stock prices through the study of past market data, primarily that of price and volume (Kirkpatrick & Dahlquist 2006). The basic idea of technical analysis is to forecast the prices of equities based on their past prices which is one of the most applicable theories in portfolio analysis. Technical analysts research the trend of prices in order to put in market orders that are not contrarian to the market sentiment and tend to believe that their past orders will be compatible with their future effectiveness.

According to the fundamental to modern portfolio theory, the efficient markets are the basis that underpins the financial decision making. Eugene Fama put forth the theory of efficient markets, which continues to garner acceptance throughout the field of finance. The fundamentals of Fama's theory are inherently efficient markets, rational expectations and security prices reflecting all the available information. Therefore, the Efficient Market Theory states that security prices represent everything that is known about a stock at any given moment. As the shared prices instantly reflect all the available information, then tomorrow's prices are independent of today's prices and will only reflect tomorrow's news. In this case, news and price changes are unpredictable. Accordingly, this theory comes to the conclusion that it is impossible to forecast prices as they already reflect everything that is currently known about the stock. Technical analysis, which uses the past price movements to predict future price movements, is totally opposite to market efficiency (Fama, 1970). The weak-form efficient used as an argument against the technical analysis and suggests that past price performance does not provide a predictive power at an underlying future price. In other words, a historical price chart cannot help predicting an underlying future price.

The main aim of this research is to explore various types of technical rules and indicators (MACD, PrOsc, OBV, Chaikin, PVT, PVI, NVI). These rules will be evaluated by their ability to forecast the future prices. This paper also features the strategies used specifically for investing in the Athens Stock Exchange. The methodology used in this study for the analysis of the data is a questionnaire which was used in numerous studies for the use of technical analysis in the past and it is based on relevant foreign surveys; to avoid being an unbiased as much as possible with reliable results and data. The methods of technical analysis applied are further enriched with the use of statistical methods. Furthermore, the basic tools of fundamental investment analysis are tested, which studies the rate between the risk and returns before a decision is made and uses multiple tools that are available to analysts which are discussed with the use of SPSS statistical analysis program data and to correlate the variables.

This paper contributes to the existing literature by first, investigating the usefulness of Technical Analysis in the Athens Stock Exchange. Second, investigating the frequency of using the technical analysis in managing portfolios. Third, recognizing the potential strategies of professional investors in Greece. Fourth, summarizing the professionals' opinion on the efficiency of the market and how the fundamental analysis complements technical analysis. Finally, investigating the performance of various technical trading rules on 60 stocks with the largest capitalization in the Athens Stock Exchange (General Index).

There are hundreds of indicators that investors can use to assist them while analyzing a chart; the most significant ones are MACD and RSI. Further, the indicators that a person can use will greatly depend on his/her trading style. Additionally, it is important for professionals not to believe in the market efficiency and the random walk theory in the Greek market, both of which are fundamental financial theories. However, they need to consider the mutual contribution of the fundamental and technical analysis in the portfolio management.

This paper aims to enrich the existing literature, especially about the Greek market, because there are a few number of articles to designate the strategies and the analysis made by professionals for this particular market: a market that has expanded significantly within the last decades. Neither are there many papers discussing the investment analysis in Greece and this is being attempted with this study. The articles already published on this subject are by Cohen, Kudryavtsev, Hon-Snir, (2011), Venkatesh and Tyagi (2011), Tripathi (2008), Maditinos, Sevic, Theriou (2004), Gehrig, Menkhoff (2006), Cheung, Chinn and Marsh (2004), Kenourgios, D. and S. Papathanasiou (2010) and Fouche and Rensburg (1999).

In this paper, section two presents the literature review, section three describes the data and the methodology used and section four reveals the outcomes and findings of the research. Finally, in Section five, the conclusions are presented.

2. Literature Review

Gencay (1998) refers to technical analysis as the method that can help an analyst by sending signals with great potential returns in the beginning of a trend. The model implemented produces statistically important results in favor of technical rules producing better signals compared to a buy-and-hold strategy. Ameen and Rengasamy (2013) examine the profitability of four bullish and four bearish Japanese candlestick reversal patterns in seven foreign exchange currencies. Their findings show a strong evidence of some profitable candlestick reversal patterns in foreign currency markets.

Brock, Lakonishock and LeBaron (1992) used Dow Jones data which are implementing technical trading rules, moving averages and trend breakouts through statistical analysis and bootstrapping as means of data normalization. They concluded that by using these techniques, they could get much better returns than using random walk or autocorrelation and GARCH models - especially for buy orders - achieving, in this way, a smaller volatility. Pesaran and Timmermann (1995) concluded that in times of great volatility, analysts can predict Dow Jones and S&P500 movements. In the commodities market, Balsara, Carlson and Rao (1996) suggest that investors follow a flexible system according to market conditions. Also, they explained that through this method they can achieve great returns and that analysts can change the system parameters; thus, conforming to the market sentiment.

Referring to the European markets, Detry and Gregoire (2001) confirmed the research of Brock, Lakonishock and Le Baron on most European indices. The results were statistically important, especially the buy signals, because they reveal the importance of future behavioral finance research. Chong and Ng (2008) tested MACD and RSI oscillator in London Stock Exchange that achieved better returns compared to a buy and hold strategy. There are a few surveys referring to the Greek market and the Athens Stock Exchange such as Vasiliou et al

(2008) present statistically important results with the use of technical rules and moving averages between 1995-2005, a significant period for the Greek stock market as the ASE developed substantially during this period and also the Euro was introduced in Greece; thus, achieving great returns. Papathanasiou and Samitas (2010) achieve returns 50% annually for buy and sell orders and 25% for buy orders by using technical analysis.

There is a significant relation between technical analysis, the random walk and markets efficiency theory and over the last decades, many surveys have been conducted proving that stock prices are not always independent. Technical analysis depends on this fact and that is why many analysts depend on it for the prediction of future prices. Conrad and Kaul (1988) proved that there is an autocorrelation between weekly returns of the stocks and portfolios used. There have been patterns in price movements which contrasted the efficiency theory. Malkiel (2003) concluded that the most efficient type of checking markets efficiency is the big hedge funds' returns. However, a large portion of the results shows that hedge funds cannot achieve returns greater than market indices. He concluded that as long as there are stock exchanges, analysts make mistakes and behave irrationally and sentimentally. Wooley (2013) referred to the disadvantages and weaknesses of the efficient markets theory and tried to combine the facts of information asymmetry and authorization in order to create a better prediction model. Simple investors usually authorize the previous ones in order to manage their portfolios, which creates an information asymmetry.

As previously mentioned, Vasiliou, Eriotis and Papathanasiou (2006) followed a bootstrapping procedure in order to normalize data and with the use of technical trading rules, they accomplished better returns than a buy and hold strategy and proved that their findings are contrary to the efficiency of information. Furthermore, in an article published in 2008, the above-mentioned analysts had proven that if investors take advantage of the market anomalies that exist, they can get favorable results. A survey by Charles and Darne (2009) concludes that Chinese stocks trading in a foreign currency are not effective, as opposed to local currency stocks, which appear to be more effective. Additionally, Lima and Tabak (2008) indicate that markets and currency rates do not follow the random walk during periods when announcements and interventions are expected. They also indicate that the predictive ability of analysts during these periods is great.

There is a correlation between technical analysis and the theory of behavioral finance. This theory tries to explain the irrationality of investors' actions and why markets movements differ from the expected according to macroeconomic data. Supporters of technical analysis use this theory because they believe that rationality is not always dominant and that market orders are not always in consistent with the efficient markets and random walk theories. According to Kirkpatrick and Dahlquist (2011), behavioral finance also tries to explain how analysts interpret data and act upon it. This theory is opposed to classical ones such as the capital asset pricing model, the portfolio theory and the capital markets theory which all consider investors' actions as rational and that stock prices follow the random walk and, therefore, cannot be predicted.

The comparison between technical and fundamental analysis is a very important area of research. There are important findings that support the effectiveness of technical analysis. However, fundamental analysis has the academic recognition and is used to predict future stock prices as well as fair stock value. As we will encounter in the literature review below, complementary use of both technical and fundamental analysis is highly recommended. Oberlechner (2001) presents findings of a questionnaire and an interview survey on the perceived importance of chartist/technical and fundamental analysis among foreign exchange

traders and financial journalists in Frankfurt, London, Vienna, and Zurich. The results confirm that most traders use both forecasting approaches and that the shorter the forecasting horizon, the more important chartist/technical analysis is. Bettman, Sault and Welch (2006) study the fact that the two methods can be either contradictory or complementary, in contrast to previous studies that examine only one method of analysis and its effectiveness. They examine a hybrid model of analysis and recommend one that correlates both methods. With the use of statistical tests, they find that their method provides better statistical results and a higher statistically R^2 compared to the use of only one method. In a recent survey for Istanbul Stock Exchange, Senol, Dincer and Timor (2012) using neuron networks attempt to find a model that relies on both fundamental and technical information for better returns on investments. As the information that an analyst must process is enormous, they suggest new methods of processing and analyzing data. According to the use of historical data, the combination of the two analysis techniques sounds to be better. Accordingly, they recommend the use of a hybrid model for the evaluation of stocks and investments with a potentially great predictive power.

The research of Maditinos et al (2006) highlights the importance of these two methods in portfolio management and proving that most analysts do not rely on only portfolio theory but also on technical and fundamental analysis. According to all of the above-mentioned, hedge funds, public organizations and corporations use fundamental analysis while professional investors use technical analysis. The combination of both methods is more reliable on a long-term basis, but for short-term orders, technical analysis is preferred. A survey on India's stock exchange by Tripathi (2008) confirms that the majority of investors use both methods, compared to the previous decades when the technical analysis was used exclusively. The fact that these two methods are complementary is obvious in a research of Papadamou and Costas (1990). According to the macroeconomic data and the policy applied by central banks, they conclude that both methods are used in the Forex market and that each method includes certain advantages and disadvantages. Cohen, Kudryavtsev and Hon-Snir (2011) conclude that investors use both fundamental and technical trading techniques. Nowadays, we witness the development of methods such as fusion analysis, which combines both fundamental and technical data. Finally, there are studies such as the one by Mishra (2013) which try to utilize both methods. He also suggests new methodologies of using them, which may be the future of the portfolio management and investments as they examine data and orders both in short and long terms.

3. Data and Methodology

3.1. Data

First of all, it must be noted that this research is based on the researcher's personal interest on investments and the strategies followed by professionals in Greece, mostly related to Athens Stock Exchange. There are many foreign studies attempting to prove the efficiency of technical analysis by using various techniques and tools for example the survey of Brock, Lakonishock and LeBaron (1992), Detry P. and Gregoire P. (2001), Chong and Ng (2008); in addition to some Greek studies such those of Vasiliou, Papathanasiou and Eriotis (2008), Papathanasiou and Samitas (2010) and some postgraduate theses. There are many studies that examine the use of the technical analysis, mostly on Forex and indices, but there is no

previous study about the use of technical analysis in Greece, and, therefore, this research tries to cover this gap.

After stating the targets and research questions, the literature review is discussed. The next step is the selection of the research method; in this case, the questionnaire selected, which was based on previous foreign surveys, in order to obtain greater credibility and academic consistency. According to the literature review, the most common data gathering methods are interviews, experiments, research-actions or observations, case studies and questionnaires. Each method presents some advantages and disadvantages, depending on the kind of data and the type of research conducted.

The initial sample was targeted at investment professionals with expertise in portfolio management. Hence, the only restriction was that the respondent had to be a professional investor. Important factors such as the size of the sample, according to Papanis (2007) are the available time and cost, the desired accuracy and minimization of errors and the method selected for sampling. Another important sampling factor is the representativeness of the sample (Karageorgos, 2002) so that the conclusions may be generalized and provide us with a bigger picture that resembles the reality with conclusions that are as credible as possible.

According to the sample size mentioned by Cohen and Manion (1994), there is no specific answer, but the most important factors are the correlations between the sample groups and the variables of the questionnaire. In the present research, the initial target of the sample size was to exceed 100 persons. The questionnaire was forwarded to almost all of the investment companies in Greece and there were satisfying responses from professional investors. Sampling was layered because the respondents were expected to have a deep knowledge of investments. Also, the questionnaire can produce better results from simple sampling, according to Roussos (2011). Next step was the dispatch of the questionnaire to the participants of the survey. The final sample number was 108, which was quite satisfying, especially in our case where all respondents were Greek professionals. This research was conducted from November 22, 2014 to December 22, 2014.

In order for the questionnaire to provide us with data that can be used, certain features and conditions must be valid. Errors must be minimized so that the tool assists us achieving our goals and provides us with correct and valid conclusions that can be generalized. According to Karageorgos (2002), the basic characteristics of the means used for the gathering of data should be validity, credibility, objectiveness and applicability. An important factor for the success of the research and the method used is the minimization of errors, which is the deviation between the data acquired and the real data, that should be measured if the research had been conducted on all the population and not on a sample.

3.2 Research Methodology

As mentioned previously, the most famous research methods are the following: experiment, interview, observation, case studies and questionnaires. Each method has some advantages and disadvantages, depending on the data required the cost, time available, the sample, the questions, etc. Most of the time, a combination of all the above provides us with better results. Observation would be a costly and timely method that refers mostly to behavioral analysis and it would not be easy for the researcher to be present in the investment

companies in order to observe the analysts (Karageorgos 2002). Experimental studies where a researcher can try the results of changing parameters in closed environments and different conditions; therefore, it is not an appropriate method for a research on the use of technical analysis. According to Karageorgos (2002) and Cohen and Manion (1994), questionnaires have important advantages because only one person is required for creating them and the cost is much more affordable. Additionally, the use of questionnaires is flexible and it gives us the opportunity to use a bigger sample, which increases the credibility of the method. The use of technology, with the use of the internet, makes it easier for researchers to collect a substantial amount of data. According to Cohen and Manion (1994), the method of the interview provides us with the advantage of asking for clarifications and dig deeper, when required, but it demands more resources than a questionnaire.

Among the methods available for a researcher and in relation to the goals, the method of a questionnaire was selected. According to Karageorgos (2002), the questionnaire is the way of communication between a researcher and the respondents. It is the most widely used method and it can be credible if the number of respondents is substantial, with few errors and if it is designed correctly, it can provide us with high response rates and a great amount of data and information. It can be distributed in various forms: printed, via postal mail and today there are many new ways via internet such as e-mail or questionnaire forms through questionnaire-making programs. This questionnaire was used with small alternations in similar surveys such as those by Jagongo, Mutswenje (2014), Tripathi (2008), Cohen et al (2011), Cheung and Chinn (2001). The levels of the questionnaire that must be followed by the researcher, according to Theofanidis (2007) are initial research and approach, questionnaire draft, pilot testing, corrections, final print and cover letter.

Questions, according to Tseles (2010) must be interesting and must be easy to analyze. A questionnaire must meet some certain requirements (Karageorgos, 2002). In other words, it must be in a clear language, it should avoid reference to personal issues, it should require short answering time, being readable, has an aesthetic quality and it must have questions that do not indicate a specific answer. According to Papanis (2007), other important questionnaire features are clarity, comprehensiveness and instructions for completing it, when necessary. The majority of the questions in this study are closed type and using the Likert scale from 1 to 5.

The potential sample selected in this study is persons who are familiar with the use of the internet and personal computers. Accordingly, the questionnaire makes the process easier. This method, as opposed to other research methods, facilitates to participate in the research without any special knowledge and effort on behalf of the participants; therefore, the sample can be big enough to meet the research targets with a few margin of possible errors. Most of the questions are be closed-type, according to Karageorgos (2002), as they contribute to the objectivity, ease and speed of analysis and express the respondents' opinions.

The stages of the research are the following, first, comprehension of the purpose of the research and the kind of data that should be gathered. Second, the determination of the variables. Third, the type of questions, mostly closed questions and a few open questions. Fourth, the formulation of the questions' wording. Fifth, the evaluation of the questions. When the questionnaire is ready, it can be published in a form on Google Drive. Finally, the questionnaire is divided into four basic sections, as shown in the appendix. In the first section, there are demographic questions to collect a number of basic elements about the investors such as their age education and experience. The next section focuses on the use of technical analysis, i.e. patterns, indicators and oscillators. Then, there are some questions

about fundamental analysis and how complementary it is to the technical analysis. At the end of the questionnaire, there is a section with certain general questions about the market efficiency, the random walk theory and the investors' attitude towards market sentiment and psychology.

4. Empirical Results

4.1 Demographic Data

First of all, out of 108 respondents in total, there are 11 aged between 21 and 30 years old, 45 aged between 31 and 40 years old, 39 from 41 to 50 years old and 13 over 50 years (figure 1).

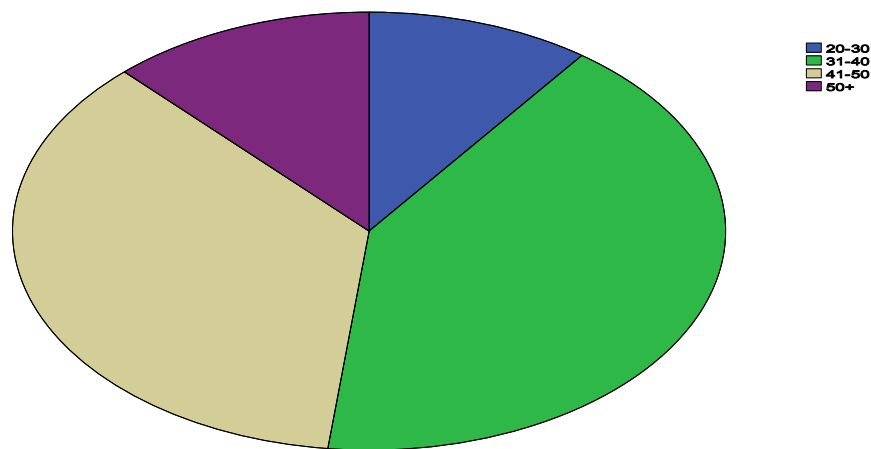


Figure 1. Demographic data – Responders age

The majority, 66 persons own a master's degree, which indicates the progress of the educational level compared to the past; 33 have a bachelor's degree, 7 hold a PhD and only 2 do not have a university degree (figure 2).

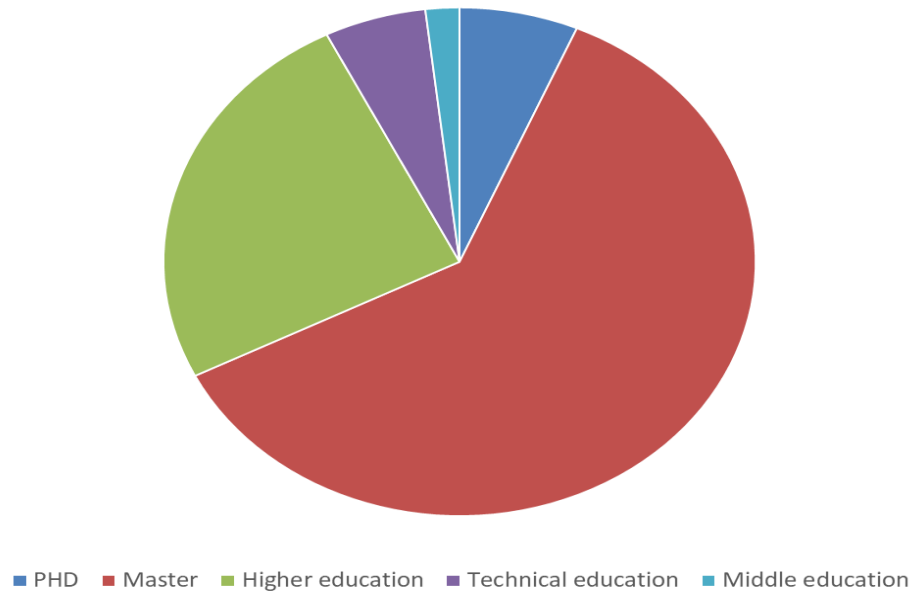


Figure 2. Respondents' level of education

Figure 3 shows the financial markets' experience. In particular 11 persons have from none to 3 years of experience, which is positive for the targets of the research and its credibility; 30 have an experience from 3 to 10 years and the rest over 10 years (figure 3).

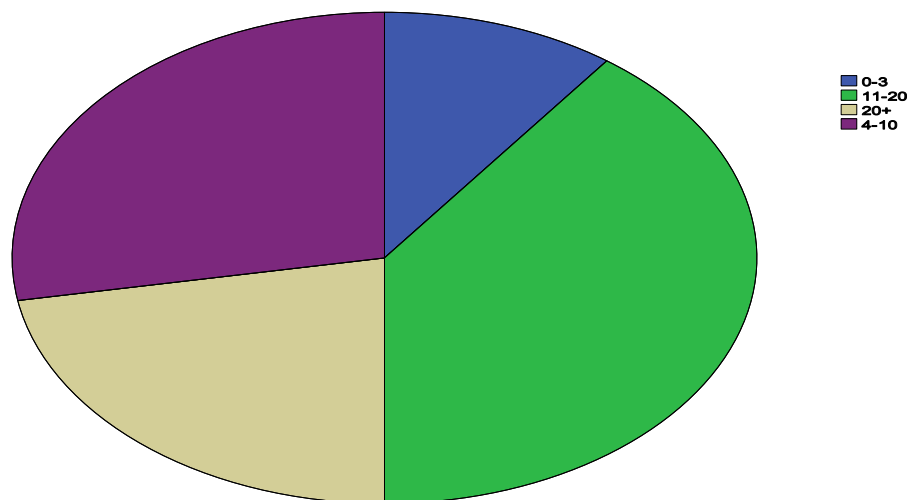


Figure 3. Responders' professional experience (years)

4.2 Statistical Analysis and Results Presentation

As mentioned above, the statistical program SPSS version 17.0 was used for the data analysis and the presentation of the tables.

In the first section, it is shown that 85 out of 108 participants use technical analysis with a normal frequency, which represents a percentage of 78.7%. Of course, this depends on

the job profile of every respondent. The majority of studies on the effectiveness of the technical analysis actually verifies it. The time frame of those using technical analysis is a combination of both short and long-term orders (55.6%) or only short-term (31.5%) and rarely long-term (13%). The technical analysts are usually more aggressive and with a shorter time horizon, as referred by Oberlechner (2001), which is verified by the majority who uses 1-day diagrams (53.7%). There is a common frequency of the recordings of buy and sell orders, as shown in the appendix. An important feature is using the stop-loss in every order, which is done by 75.9% of the participants, but the remaining 24.1% does not use it frequently. Every manual on the technical analysis indicates the importance of the stop-loss so that the investor does not lose a big part or even all of his/her invested capital [Achelis (2001), Edwards, Magee (2007) and Murphy (1999)]. As mentioned in the general strategies used, 74 out of 108 participants or 68.5% depend on a combination of both strategy and instinct, 33 participants (30.6%) depend solely on their strategy and only one participant depends on his/her instinct.

The most important statistics for the results are, first, the most popular trend indicator is the moving average, with a percentage use of 82.4%, MACD follows with 46.3% and Price Oscillator with 30.6%. Second, the frequency of use of Bollinger bands is scattered within the range between rare and frequent use; despite the fact that they display the volatility of the stock prices. Third, the most frequently used oscillator (from those mentioned in the questionnaire) is the RSI (71.3%, i.e. medium to very frequent use), MACD follows with 64.8% (again medium to very frequent use), then Stochastic with 49.1% (medium to frequent use) and Ichimocu with 23.1% (medium to frequent use). In addition, 75% of the investors believe that candlesticks and patterns are important and that they are of a smaller importance if compared to the oscillators and indicators which are trusted by 62 out of 108 participants or 57.4%, as shown in the appendix. The volume indicators are not used frequently, as only 34.2% of participants use them often. OBV is used the most (50%) while Chaikin is used rarely (12%). This last result is contrary to what most well-known manuals of the technical analysis suggest such as the manual by Dimopoulos (1997) which suggests the use of volume confirmation.

In the second section of the questionnaire, a balance between the use of technical and fundamental analysis can be seen. These are the most frequently used theories, among others such as CAPM, which are used only by a few number of participants. Forty three respondents use mostly the fundamental analysis while 46 uses the technical analysis during portfolio and investment analysis, five respondents utilize the behavioral finance. The fact that these two methods are complementary may be observed in the research results: only 5 participants believe that they are contradictory tools, while 103 participants or 95.4% believe that they are complementary. Most of the respondents (90 out of 108 or 83.4%) use fundamental analysis moderately to frequently, thus proving its value. This section and the responses confirm the surveys by Maditinos et al (2006) and Cohen, Kudryavtsev and Hon-Snir (2011) which have proven that the differences in their use lie on the investment duration and the character (aggressive or conservative) of each investor. The survey also shows that those who mostly use fundamental analysis, are long-term oriented and more conservative, which verifies Oberlechner's research (2001). Seventy five of respondents use fundamental analysis for long-term purposes, 24 for long-term and short-term purposes and only 8 for short-term purposes; as opposed to those who use the technical analysis and usually give short-term orders or a combination of long-term and short-term orders. With reference to the fundamental data used by investors, the economic growth rate is of a significant importance (answer chosen by 70 out of 108 respondents), the interest rates by central banks (78 out of

108 respondents), then GDP (54 out of 108 respondents), unemployment (44 out of 108 respondents) and inflation (54 out of 108 respondents). With reference to microeconomic data, P/E (72 out of 108 respondents) is considered to be the most important factor, next to it follows the net value of the company (41 out of 108 respondents) and cash inflows (55 out of 108 respondents). Stock dividends (34 out of 108 respondents) are considered to be a less important factor, earnings per share (33 out of 108), ROE (35 out of 108), ROI (28 out of 108) and company growth rate (35 out of 108).

The answers to the second section of the questionnaire show that most of the respondents agree with the non-existence of market efficiency, that is 98 out of 108 respondents, a rate of 90.8% chosen from 1 to 3 on the questionnaire scale, and just 9.2% chose that they agree or fully agree with market efficiency. It must be noted that only one person fully agrees with the market efficiency which reveals a disagreement between the professionals and the basic economic theories. Only 12 participants answered positively on the question of the random walk existence in Greece (4 to 5 Likert scale), that is a percentage of 11.1%. Additionally, there are 34 respondents who answered neutrally and 62 persons (57.4%) answered that they disagree and fully disagree. A large number of studies and surveys are verified, according to which today various facts and anomalies cannot be verified, such as Shiller (2003), Novickyte (2014), Mishkin and Eakins (2012) and finally Vasiliou, et al (2006).

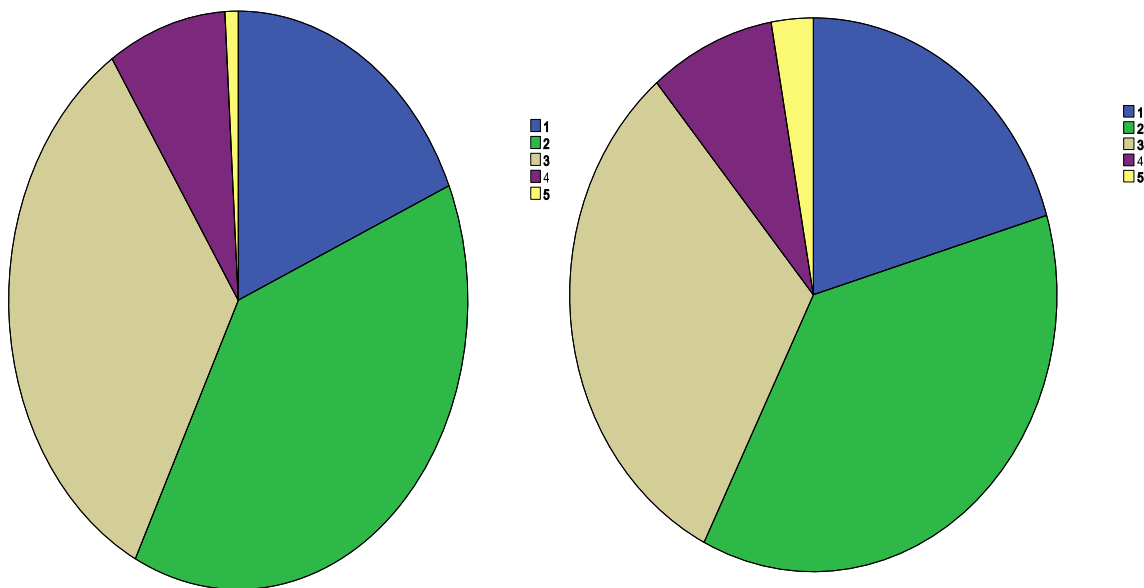


Figure 4. Market efficiency and the random walk hypothesis agreement (1 fully disagrees-5 fully agree)

This survey showed that only 1 person slightly disagrees about psychology importance in investments, nobody fully disagrees and 11 persons are neutral. The rest 96 respondents, a rate of 88.9%, agree that psychology plays an important role in investing in the Athens Stock Exchange. As it refers to big hedge funds' speculative orders, the majority of 93 respondents believe that they can alter stock prices to a great extent, which is in contrast to

the random walk and market efficiency theories. This is a fact that has taken place in a lot of world stock exchanges. As it refers to long-term investors, there is a balance between short and long-term moves. Hence, in Greece, there are aggressive investors with a target of fast profit and more conservative investors with a longer investment time frame to ensure the acquiring of profits.

4.3 Variables' Correlation

It is interesting to extract some correlations between two different responses from the questionnaire, which could give us extra information about the strategies of professional investors. First, as it refers to the use of technical analysis, 8 out of 11 (72.7%) between the ages of 20 to 30 use it very frequently, 27 out of 45 (60%) between the ages of 31 to 40, 24 out of 39 (61.5%) between the ages of 41 to 50 and 10 out of 13 (76.9%) between the ages of 50 and more. Extreme age categories prefer it more, as shown in table 1.

Table 1. Frequency of technical analysis' implementation and age

	1	2	3	4	5	Sum
20-30	0	2	1	1	7	11
31-40	2	8	8	5	22	45
41-50	4	5	6	4	20	39
50+	1	1	1	2	8	13
Sum	7	16	16	12	57	108

Source: Results of the Survey Questionnaire

With reference to the use of fundamental analysis, 6 out of 11 (54.5%) between the ages of 20 to 30 use it very frequently, 22 out of 45 (48.9%) between the ages of 31 to 40, 24 out of 39 (61.5%) between the ages of 41 to 50 and 5 out of 13 (38.5%) between the ages of 50 and more (table 2). There is a slighter preference among the older ages.

Table 2. Frequency of fundamental analysis' implementation and age

	1	2	3	4	5	Sum
20-30	0	1	4	4	2	11
31-40	4	4	15	11	11	45
41-50	4	3	8	5	19	39
50+	1	1	6	2	3	13
Sum	9	9	33	22	35	108

Source: Results of the Survey Questionnaire

Table 3 shows that there is a correlation between traders' experience and the importance of psychology and the market sentiment. Nobody believes that psychology is not important except one respondent that is neutral (0-10 years experience). Similarly, in the category from 11 to 20 years of experience, 86% believes psychology is very important in financial analysis and in the category of most experienced the percentage of belief is 79.2%.

Table 3. Importance of psychology and markets' experience

	1	2	3	4	Sum
0-3	0	0	4	7	11
11-20	1	5	16	21	43
20+	0	5	6	13	24
4-10	0	1	13	16	30
Sum	1	11	39	57	108

Source: Results of the Survey Questionnaire

Finally analysts with 0-10 years of experience trade mostly in the short term in a percentage of 43.90%, 21.95% in the long term while the rest 34.15% trade both in the short and long terms. Analysts with experience of 11-20 years trade both in the long and the short term (39.53%), 37.21% trade in the short term and 23.26% mostly in the long term. Most of

the experienced analysts (20 years of experience and above) trade both types of orders as shown in table 4.

Table 4. Orders' time-frame and markets' experience

		Short term orders	Both types	Long term orders	Sum
	0-3	7	4	0	11
What experience do you have in financial markets (years)?	11-20	16	17	10	43
	20+	6	15	3	24
	4-10	11	10	9	30
	Sum	40	46	22	108

Source: Results of the Survey Questionnaire

5. Conclusions

In this section, we present the results of the analyses. One important fact is that the sample consisted of professional investors and people with a great expertise in investments, both theoretically and empirically. The results are briefly presented here and extensively in the appendix. According to the researchers, the research method applied was the appropriate one, as it refers to meeting the targets and the results. Its advantages are low cost and time, formulaic answers, variables' focus and easy manufacturing. Variables' correlation presents some aspects referring to investors' features, risk profile and trading orders and the SPSS program that can extract easily the results and correlations, according to what the researcher is looking for. The questionnaire answers the questions of the survey and at the same time presents the basic principles of the technical analysis today. An effort was made to keep the questionnaire itself short so that it would not be long and tiring for the participants. In addition, the response rate was sufficient, counting 108 valid answers and showing that technical analysis today is a very important method, used very often (78.7% rate) by professionals.

The research focused on the Greek financial market, because of the fact that there is not similar survey, only a few that counts the profitability of basic indicators and tools such as surveys by Vasiliou et al (2008) and Wong, Manzur, Chew (2003), contrary to the

international literature and studies such as Tripathi (2008), Fouche, Rensburg (1999) and Venkatesh & Tyagi (2011).

Technical analysis, one of the most popular methods of the investment analysis and portfolio management, tries to predict the future moves of stock prices using statistical indices, diagram patterns and the introduction of psychology and market sentiment; its importance has been proven by international literature and studies. Also, investors' attitude towards the random walk and efficient markets was looked into, as well as the fact that technical and fundamental analysis complement each other.

This section presents the conclusions of this study's survey which are, first, the technical analysis is an evolving field and this can be proved by the plethora of academic studies and the relevant literature published during the last decades. Professional investors use technical analysis tools to a great extent in order to achieve satisfying returns. In an attempt to understand macroeconomic and other data, professional investors test by technical analysis, through indicators, oscillators, volume, patterns and candlestick charts. According to the respondents, in this study and also past surveys such as those of Brock, Lakonishock and LeBaron (1992), Pesaran, Timmermann (1995) Balsara et al (1996) and Vasiliou et al (2008), there is a consistency of returns. Second, according to the survey, psychology is an important element in financial markets and more sources of information are required apart from the macroeconomic data. The above-mentioned reasons and the lack of trust in market efficiency, information and the random walk theory are the main reasons why analysts trust the technical analysis. If the market efficiency and the random walk theory existed to a greater extent, the technical analysis would have no reason to exist. Besides, the majority of analysts uses both technical and fundamental analysis as means of achieving better returns. This fact is in agreement with various studies such as Conrad, Kaul (1988) and Vasiliou, et al (2006) Papathanasiou et al (2015), which proves along with data normalization techniques that there is an autocorrelation of prices, in contrast to the past financial theories. Third, the most popular technical trading tools are RSI and MACD, as explained in the literature review section of this paper. Candlesticks and patterns are considered to be important too, although indicators and oscillators are considered more effective. Fourth, the majority of respondents agree to the use of the fundamental data along with technical data, and though they believe that the market sentiment can be better observed with technical tools, macroeconomic and fundamental data are also important to them. This fact is proved clearly during the last years from the evolution of techniques such as fusion analysis, a method combining both fundamental and technical data. Fifth, an important fact is that analysts do not trust a single method of investment analysis. According to the surveys of Oberlechner (2001), Bettman, Sault, Welch (2006), Maditinos, Theriou (2006), Cohen, Kudryavtsev, Hon-Snir (2011), it is suggested not to use a single method of analysis. Each method has its advantages and disadvantages and provides the analyst with different information, which is used for making safe conclusions. This fact is confirmed by this survey; professional investors believe in the complementing of various methods. Finally, investors who use technical analysis are more aggressive, using shorter timeline orders, than investors who use more traditional methods. For this reason, their strategies are different in relation to the past, when the safest strategy was a buy and hold strategy. Modern computers and applications have contributed to the great velocity of the financial markets and the succession of orders.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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APPENDIX A (QUESTIONNAIRE ANSWERS)

What is your age?	Sum (Percentage%)	What is your education?	Sum (Percentage)
1. 20-30	11 (10.2)	1. Middle education	2 (1.9)
2. 31-40	45 (41.7)	2. Technical education	7 (6.5)
3. 41-50	39 (36.1)	3. University	26 (24.1)
4. 50+	13 (12)	4. Master Degree	66 (61.1)
		5. Doctorate	7 (6.5)

How often do you use technical analysis?	Sum (Percentage)	Are patterns and candlesticks important for your analysis?	Sum (Percentage)
1. Rarely	7 (6.5)	1. Not important	8 (7.4)
2.	16 (14.8)	2.	19 (17.6)
3.	16 (14.8)	3.	31 (28.7)
4.	12 (11.1)	4.	16 (14.8)
5. Very often	57 (52.8)	5. Very important	34 (31.5)

Do you often use volume indicators during your analysis?	Sum (Percentage)	Which volume indicators do you use?	Sum
1. Rarely	27 (25.7)	1. OBV	54
2.	23 (21.3)	2. Chaikin	13
3.	21 (19.4)	3. PVT	13
4.	20 (18.5)	4. NVI	8
5. Very often	17 (15.7)	5. None	6

Which indicators do you use the most during your analysis?		Sum	How often do you use Bollinger Bands?		Sum (Percentage)
1. Moving average		89	1. Rarely		26 (24.1)
2. MACD		50	2		20 (18.5)
3. Price Oscillator		33	3		27 (25)
4. Other		28	4		14 (13)
			5. Very often		21 (19.4)

How often do you use Stochastic oscillator?		Sum (Percentage)	How often do you use RSI oscillator?		Sum (Percentage)
1. Rarely		27 (25)	1. Rarely		18 (16.7)
2		28 (25.9)	2		13 (12)
3		20 (18.5)	3		16 (14.8)
4		10 (9.3)	4		23 (21.3)
5. Very often		23 (21.3)	5. Very often		38 (35.2)

How often do you use MACD oscillator?		Sum (Percentage)	How often do you use Ichimochu oscillator?		Sum (Percentage)
1. Rarely		22 (20.4)	1. Rarely		56 (51.9)
2		16 (14.8)	2		27 (25)
3		18 (16.7)	3		17 (15.7)
4		28 (25.9)	4		5 (4.6)
5. Very often		24 (22.2)	5. Very often		3 (2.8)

Are patterns and candlesticks or indicators and oscillators more important for your analysis?	Sum (Percentage)	What time-table do you use for technical analysis?	Sum
1. patterns and candlesticks	46 (42.6)	1. <1 hour	23
2. indicators and oscillators	62 (57.4)	2. 1 hour	37
		3. 4 hours	34
		4. 1 day	58
		5. >1 day	40

Do you perform back-testing of your strategy?	Sum (Percentage)	Do you use stop-loss for your orders?	Sum (Percentage)
1. Rarely	15 (13.9)	1. Rarely	6 (5.6)
2	24 (22.2)	2	6 (5.6)
3	21 (19.4)	3	14 (13)
4	21 (19.4)	4	35 (32.4)
5. Very often	27 (25)	5. Very often	47 (43.5)

Do you use		How often do you	
technical analysis	Sum	use fundamental	Sum
mostly for short	(Percentage)	analysis?	(Percentage)
term or long term			
orders?			
1. Long	14 (13)	1. Rarely	9 (8.3)
2. Short	34 (31.5)	2	9 (8.3)
3. Both	60 (55.6)	3	33 (30.6)
		4	22 (20.4)
		5. Very often	35 (32.4)

Which market fundamental data do you use for your analysis?		Sum (Percentage)	Which company fundamental data do you use for your analysis?		Sum (Percentage)
1. GDP		54 (50)	1. P/E		72 (66.7)
2. Growth rate		70 (64.8)	2. ROE		35 (32.4)
3. Unemployment		44 (40.7)	3. Net value		41 (38)
4. Interest rates		78 (72.2)	4. Financial flows		55 (50.9)
5. Inflation		54 (50)	5. Dividend		34 (31.5)
			6. EPS		33 (30.6)
			7. Growth rate		35 (32.4)

Do you believe that there is market efficiency in the Greek market?		Sum (Percentage)	Do you believe that fundamental and technical analyses are substitute or contradictory tools?		Sum (Percentage)
1. Strongly disagree		20 (18.5)	1. substitute		103 (95.4)
2		42 (38.9)	2. contradictory		5 (4.6)
3		36 (33.3)			
4		9 (8.3)			
5. Strongly agree		1 (0.9)			