



Investors' behaviour in the Athens Stock Exchange (ASE)

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Abstract

Purpose – The purpose of this paper is to investigate the various methods and techniques used by Greek investors (both professional and individuals) when evaluating potential additions to their investment portfolios.

Design/methodology/approach – The paper uses both a questionnaire survey and a series of interviews to examine the practice of investment management in terms of stock market forecasting and stock valuation. The respondents consist of six different groups of investors, drawn from across Greece, namely: official members of the Athens Stock Exchange, mutual fund management companies, portfolio investment companies, listed companies, brokers and individual investors (ININ).

Findings – The results indicate that ININ rely more on newspapers/media and noise in the market when making their investment decisions, while professional investors rely more on fundamental and technical analysis and less on portfolio analysis. The investment horizon seems to have a direct association with the relative importance of the techniques that professionals use for stock analysis. Also, the use of specific techniques seems to have a different impact on the performance of professionals.

Practical implications – The results highlight the practical methods and techniques used by various Greek investors when making their stock investment decisions as well as analysing the consequences of these methods on their performance.

Originality/value – This paper is the first study of the methods used by different classes of investor in the relatively underdeveloped capital market of Greece.

Keywords Investors, Behaviour, Stock exchanges, Greece

Paper type Research paper

Introduction

In conventional financial theory, investors are assumed to be rational wealth-maximisers, following basic financial rules and basing their investment strategies purely on the risk-return consideration. However, in practice, the level of risk investors are willing to undertake is not the same, and depends mainly on their personal attitudes to risk. Research in behavioural finance has developed rapidly in recent years and provides evidence that investors' financial decisions are also affected by internal and external behavioural factors (Shefrin, 2000; Shleifer, 2000; Warneryd, 2001).

Standard analysis of companies' financial statements involves the examination of fundamentals to explain and predict their growth and value added potential. However, in many cases, current fundamentals-based models fail to explain the past adequately,



or predict the future reliably. Largely as a result of these failures, scholars have started to look beyond fundamentals to the role of other “non-fundamentalist” influences on financial and stock markets, including the approach to forecasting taken by practitioners. In this context, Goodhart (1988) finds that the interplay between professional analysts who base their views on fundamental analysis and those who use the chartist approach can be the catalyst for market collapses. Shiller (1989) explains excess bond and stock market volatility by “irrational” patterns of investor behaviour and suggests that technical analysis is one of the important factors that gave rise to the October 1987 international stock market crash. However, despite the increasing interest in non-fundamental analysis, there is little evidence about the prevalence and importance of such techniques in practice (Lui and Mole, 1998).

The objectives of this study are to:

- identify the general practices of individual and professional investors regarding stock analysis in Greece;
- investigate the association that might exist between the time horizon and the relative importance of the techniques that individual and professional investors use for stock analysis; and
- to examine the impact of the various techniques adopted on the performance of individual and professional investors.

To the best of our knowledge, this is the first field study on the practice of investment management in the Greek stock market. The rest of the paper is structured as follows: the proceeding section summarises survey findings on investment practice globally, while the third provides a description of the sample and the research methods. Thereafter, the results are presented and some concluding observations made.

Literature review

Empirical evidence suggests that investment professionals employ a range of practices in different markets and use various techniques for market forecasting across alternative time horizons (Lui and Mole, 1998). Thus, it is probable that the practice of market forecasting and stock selection in Greece may be different from that used in other developed stock markets, such as the US. Today, more than 30 per cent of Greeks own shares either directly or through managed funds (ATHEX, 2004) and government policy is encouraging individuals to take responsibility for their own retirement income, suggesting that this figure is likely to rise in the long term. Despite the importance of individuals’ investment decisions, however, we know little about the factors that influence them. This review of the literature, therefore, concentrates on work involving both individual and professional investors, since they are the focus of the present study.

Individuals’ investment behaviour has been explored through a large body of empirical studies over the past three or four decades. For example, Potter (1971) identifies six factors: dividends, rapid growth, investment for saving purposes, quick profits through trading, professional investment management and long-term growth, that affect individual investors (ININ)’ attitudes towards their investment decisions. Baker and Haslem (1973) argue that investors are primarily concerned with expectations about the future, considering earnings projection and historical data to be of high interest to investors. On the other hand, research by Lee and Tweedie (1975a, b,

1976, 1977) reveals that the general public faces problems in understanding financial reporting in the corporate sector. Blume and Friend (1978) provide evidence that both price and earnings volatility are the primary measures of risk employed by ININ, while Schlarbaum *et al.* (1978) compare ININs' performance with that of professional fund managers and find that the former exhibit considerable skill in their investment decision making.

Lease *et al.* (1974) describe ININ as "investors" rather than "traders" since they are long-term minded and give little interest to short-term yields. Moreover, Lewellen *et al.* (1977) reveal that investors' main source of information is through fundamental or technical analysis. Antonides and Van Der Sar (1990) argue that the perceived risk of an investment is lower if an asset has recently increased in value, consistent with Blume and Friend's (1978) findings. Nagy and Obenberger (1994) investigate the extent to which a listing of 34 variables influence shareholders' perception, and provide evidence of a role for a mix of financial and non-financial variables. Additionally, they found that each shareholder considers the seven different factors employed in a factor analysis in a unique way. Fisher and Statman (1997), relying on general agreement that the investment decision is a complex one, suggest that investors are not only concerned about risk and return when buying shares, but also several other parameters taken into consideration. Clark-Murphy and Soutar (2003) report that the vast majority of ININ in Australia have little interest in speculation and are by nature long-term investors.

There are, however, few studies that examine the way in which various investor groups (both professional and individuals) make their investment decisions in less developed countries and/or those with only moderately sophisticated capital markets. Notable among the exceptions are studies by Nassar and Rutherford (1996) and Naser and Nuseibeh (2003) who show that investors treat annual reports in broadly the same way as do those in developed countries, although they rely more on information obtained directly from the companies and do not tend to consult intermediary sources of corporate information in order to make informed decisions. Overall, investors seem mainly to use fundamental analysis and, to a lesser degree, portfolio analysis (i.e. conventional mean-variance analysis).

Studies concerning professional investors in sophisticated capital markets, such as in Hong Kong (Lui and Mole, 1998; Wong and Cheung, 1999), the UK (Taylor and Allen, 1992; Collison *et al.*, 1996) and the US (Frankel and Froot, 1990; Carter and Van Auken, 1990), reveal that these groups of investors rely more on fundamental and technical analysis and less on portfolio analysis. Arnold and Moizer (1984) examine the general procedures adopted by UK investment analysts in appraising the ordinary shares of companies and report that the primary technique used by analysts is fundamental analysis, followed by technical analysis and β -analysis. Their results are similar to those revealed by an earlier study of Lee and Tweedie (1981), also for the UK market. Moreover, Arnold *et al.* (1984) provide results from a questionnaire survey conducted in the US and UK during 1981 and 1982. The study provides a general description of procedures used by financial analysts in both countries, revealing that both groups attach more importance to accrual-based historical cost accounting numbers, particularly earnings, than to inflation-adjusted accounting numbers or cash flows. Both groups also adopt fundamental analysis rather than technical analysis or β -analysis and rely on discussions with company personnel as a source of information.

Considering the literature as a whole, it is evident that professional investors make extensive use of methods and techniques that differ from those proposed by academics. However, it appears that the traditional approaches, including both fundamental and technical analysis, may still be dominant in many emerging financial markets; it is this issue that the present study attempts to investigate.

Research methods

The sample consists of six different groups: official members of the Athens Stock Exchange – hereafter “ASE” – (OMOA); mutual fund management companies (MF), portfolio investment companies (PIC); listed companies (LC), brokers (BR), and ININ, constituting the frame of investors contributing to the investment process in the ASE. A questionnaire was developed and distributed to 1,014 respondents in Greece in the period between December 2003 and June 2004.

For the selection of the sample the following process was adopted. A database was created, which included all the OMOAs, MFs, PICs and LCs in the ASE except banks or suspended companies. The questionnaire was distributed in three phases; firstly by e-mail and fax, secondly by post and thirdly by contacting and informing the potential respondents by phone and then sending them the questionnaire. However, the distribution of the questionnaire to BR and ININ was quite complicated. For this reason, ten of the brokerage companies were randomly selected from each of the 13 regions in Greece, targeting one questionnaire for each company (130 in total). The same selected brokerage companies were used for the distribution of the questionnaire to ININ, with four copies being sent to each company (520 in total) along with a request to randomly select four of their potential respondents-customers. The returned questionnaires numbered 435 (45 from the OMOAs, 17 from MFs, 17 from PICs, 47 from LCs, 85 from BRs, and 224 from ININs) which represents a 42.90 per cent average response rate. The individual response rate was: 52.33, 56.67, 60.71, 21.36, 65.38 and 43.08 per cent for the OMOA, MF, PIC, LC, BR and ININ groups, respectively.

To test whether the respondents of this study were different from the non-respondents, all the means were compared between the early and late respondents. The rationale behind such an analysis is that late respondents are usually more similar to the general population than early respondents (Armstrong and Overton, 1977). There was no statistically significant difference found in the means of the variables used. Hence, it appears that non-response bias is not a serious issue in this study.

The purpose of the questionnaire and the in-depth semi-structured interviews (Berg, 1998; Wood and Vilkinas, 2005) was to study whether individuals and investment analysts:

- regard some techniques for market forecasting and stock selection as more important, and hence use them more than others; and
- use some techniques more than others in different time periods (e.g. in the short or long term[1], as well as before, during, and after the 1999 crisis[2] in the ASE).

The questionnaire focused on four categories of analyses: fundamental analysis, technical analysis, portfolio analysis, and others' opinions. The first two categories have a long history of global use, while the third category has become popular in the past two decades. The fourth category, others' opinions, is mainly focused on public and private opinions, information in newspapers/media, instinct/experience, foreign

stock markets, government policy, etc. Each category encapsulates a list of techniques that are used for market forecasting and stock selection.

Use of each of the four categories was analysed across five dimensions: short-term forecasting and stock selection usage level (less than a month); long-term forecasting and stock selection usage level (one month to a year); forecasting and stock selection usage level before 1999; forecasting and stock selection usage level during 1999; and forecasting and stock selection usage level after 1999. The respondents were asked to rate their use of these techniques on a five-point ordinal Likert scale, where a 5 equates to “always” and a 1 represents “not at all”.

A number of approaches were used to ensure response quality and to enhance response rate. These collectively constitute a modified version of Dillman’s (1978) “total design method”. More specifically, the process was organised as follows: first, the research instrument was pre-tested twice. In its draft form, it underwent a pre-test with chief executive officers (CEOs) from three companies. A second pre-test was conducted after in-depth discussions with academics and questionnaire design experts. After some minor modifications, the final questionnaire was mailed to CEOs together with a letter explaining the purpose of the study and assuring anonymity, together with a pre-stamped envelope addressed to one of the researchers. Four weeks after the initial mailing a similar follow-up mailing was sent. An early draft of the questionnaire was piloted by a small number of potential respondents from every user group. After the feedback, the wording was modified, where needed, and a few questions were reformulated. The final version of the questionnaire that emerged from this process consisted of ten pages.

Concerning the in-depth semi-structured interviews, the CEOs of 10 per cent of the selected groups (four CEOs from the OMOAs, two from the MFs, two from the PICs, five from the LCs and eight from the BRs, a total of 21 persons) and 10 per cent of the selected ININ (22 persons) were interviewed over a period of four months. This enabled the collection of opinions from people with extensive experience and different perspectives, as well as the opinions of the various ININ. The majority of the interviews were tape recorded (although a few interviewees refused to allow recording) and during the interviews we provided the normal guarantees regarding confidentiality (Berg, 1998). The interviewees represented all geographical area of Greece; those from the OMOA, MF and PIC groups effectively came from the Athens region since the companies they represent are established in this region; the interviewees from the LC and BR groups came from different, randomly selected, regions, while interviewees from the ININs’ group came from all 13 regions of Greece. The average age of the interviewees was 34.5 years, and the highest educational qualifications were as follows: 10 per cent held a PhD; 48 per cent were MSc graduates; 25 per cent were undergraduates; and 17 per cent held a secondary school degree.

Analysis of the results

The questionnaire sought information about the respondents’ position within the company, as well as their educational background and years of experience in the field. Examining the position within the company, for respondents in the first four user groups (OMOA, MF, PIC, LC) it was found that, of the whole sample, 20.4 per cent were CEOs, 17.7 per cent were CFOs, 2.7 per cent were shareholders, 32.3 per cent were analysts and 26.9 per cent were “others”. As for the educational background of

the respondents, 57.3 per cent held a masters degree while 26.5 per cent held a bachelors degree. Finally, it was found that 10.8 years of experience was the average for the sample.

Table I outlines the perceptions of the six user groups regarding the level of importance attached to a list of nine factors in their approach to valuation of stocks. On average, respondents rank their instinct/experience as most important, followed by fundamental analysis and the movement of the foreign stock markets, while noise in the market and portfolio analysis are seen as the least important, in contrast to much academic theorising. However, a more detailed examination of each user group reveals that OMOAs, MFs, PICs and LCs consider fundamental analysis to be most important, while noise in the market does not seem to influence them.

These results were confirmed by the interview findings. Typical of the answers given by the CEOs was the view that:

Fundamental analysis is the most important factor in the selection of specific stocks or portfolios, especially when dealing with a relatively new and not fully developed stock exchange. Similarly, the movement of the developed foreign stock markets is also a very important factor.

On the other hand, a typical view expressed by the ININ was the stated view of one that:

Since, we are focused on trading and not on long-term investing, we follow our instinct/experience, we try to get information from newspapers/media, and to focus our investment practices based on the reports from the foreign markets.

This evidence suggests that the ININs' sample may have been biased towards short-term traders.

A closer examination of Table I shows that portfolio analysis seems to be of most interest to MF, but even these respondents only ranked it in fifth place. The results are broadly consistent with previous research undertaken in developed stock markets (Lui and Mole, 1998; Wong and Cheung, 1999; Taylor and Allen, 1992; Collison *et al.*, 1996; Frankel and Froot, 1990; Carter and Van Auken, 1990) in revealing that most groups of investors rely more on fundamental and technical analysis than on portfolio analysis.

The results also reveal that professional investors are interested more in fundamental than technical analysis while BR and ININ do not consider it as their first choice. BR prioritises technical analysis, while media and newspapers mostly influence ININ. This tendency is evident in an interview comment made by the CEO of the biggest BRs' company in Greece:

In contrast with professional investors, whose investment strategy concerns their long-run profitability and, thus, mostly use fundamental analysis, our customers are pressing us for profits every single day. They are acting more as speculators and less as investors.

Therefore, the results regarding ININ contrast with previous studies which identify alternative important factors as influences on the forecasting and selection decisions of ININ (Potter, 1971; Baker and Haslem, 1973; Lee and Tweedie, 1975a, b, 1976, and 1977; Chenhall and Juchau, 1977; Blume and Friend, 1978; Lewellen *et al.*, 1977).

Table I.
The level of importance
attached to different
methods

Item	OMOA (45)		MF (17)		PIC (17)		LC (47)		BR (85)		ININ (224)		Mean for whole sample (435)		Rank	ANOVA Sign. level
Fundamental analysis	4.56	1	4.71	1	4.29	1	3.74	1	3.61	1	2.92	4	3.44	6	2	0.000 *
Technical analysis	3.20	6	2.88	6	3.41	6	2.38	9	3.65	9	2.48	3	2.82	7	6	0.000 *
Both fundamental and technical	3.62	3	3.76	2	4.06	3	2.83	5	3.51	5	2.12	5	2.76	8	7	0.000 *
Noise in the market	2.31	9	2.18	9	1.94	9	2.48	8	2.64	8	2.99	8	2.72	5	8	0.000 *
Portfolio analysis	3.16	7	3.18	5	2.94	7	2.53	7	2.48	7	1.80	9	2.25	9	9	0.000 *
Newspapers/media	2.60	8	2.82	8	2.35	8	2.77	6	2.81	6	3.30	7	3.02	2	5	0.000 *
Instinct/experience	3.40	4	3.65	4	3.65	4	3.09	2	3.67	2	3.47	2	3.47	1	1	0.000 *
Foreign markets	3.80	2	3.71	3	4.12	2	3.04	3	3.75	1	3.26	1	3.44	3	2	0.000 *
Government policy	3.27	5	2.88	6	3.47	5	3.02	4	3.31	6	3.06	6	3.14	4	4	0.117
Cronbach's α test	0.72		0.73		-0.07		0.71		0.59		0.66		0.71			

Notes: Figures are mean values. The “foreign markets” item relates to how investors are influenced of the performance of other stock markets such as NASDAQ, etc. “Government policy” relates to how investors’ investment strategies are affected by decisions about privatisation, etc. The extent of agreement among the respondents of each group concerning their choice of the listed factors is quantified by performing the Cronbach’s- α test, *significance at the 1 per cent level

For stock price valuation and forecasting in the short-term, inspection of Table II reveals that, on average, investors rank technical analysis first, followed by fundamental analysis, the combination of both analyses and finally portfolio analysis.

Examining each group separately, OMOAs (mean = 3.42), PICs (3.59), BR (3.36), and ININ (3.36) consider technical analysis as the most important method for short-term use; the MFs rank it second (3.35) after fundamental analysis (3.41), while the LCs actually rank technical analysis last (2.68). In this context, a view typical of those expressed by the ININs in the interviews was:

We use fundamental and/or technical analysis because the newspapers we read use them, although we cannot really understand them.

Finally, portfolio analysis was ranked by the sample as a whole, with only LC, who considered it as the second most important investment practice, differing from the overall trend.

Examination of the user groups' perception for long-term horizon generated a somewhat different pattern of results. As Table III shows, fundamental analysis ranks first across the whole sample, followed by the combination of fundamental and technical analysis. Technical analysis only ranks in third place in the long run, with a mean barely higher than that of portfolio analysis.

One of the most important findings emerging from Table III is evidence that the combination of fundamental and technical analyses is the second most important approach, while portfolio analysis achieves a mean of (2.95) which, while again the lowest, is above the mid-point of 2.5 and higher than that achieved in the short term (2.18). This leads us to conclude that portfolio analysis plays a more important role for valuation and forecasting over longer time horizons. This finding is consistent with the responses of interviewees in both the CEO and ININ groups concerning the level of usage of techniques across the two time horizons.

From the evidence presented above, it could be concluded that technical analysis is used more often in the short term, while fundamental analysis ranks first in usage in long-term valuation and forecasting. Three potential explanations for this pattern are evident in specific quotes obtained during the interviews firstly:

... accounting manipulations may easily be applied to a single period, but in the long-term these manipulations are easily identified and the true condition of the company is exposed.

Secondly:

... long-term aggregated accounting ratios give a better indication of the strategic position of a company, a group of companies (competitors) or the industry as a whole; and

... the new established accounting (e.g. EVA) and discounted cash flow (e.g. SVA, CVA) measures are mainly used for the performance measurement (evaluation) of the implemented strategies, thus they are bound to cover the whole period of implementation and not only a part of it, otherwise the reported results may lead to wrong conclusions and further actions.

Finally, the combination of fundamental and technical analyses seems to be more important in the long term. This finding is arguably intuitive in the case of fundamental analysis for the reasons stated above. However, the same line of reasoning could be applied to technical analysis, given that some of its inherent techniques (e.g. trend-following indicators, chart-pattern analysis) aim to provide

Table II.
The level of usage
attached to different
methods in the short-term

Item (N)	OMOA (45)		MF (17)		PIC (17)		LC (47)		BR (85)		ININ (224)		Mean for whole sample (435)		ANOVA Sign. level	
	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank	Rank
Fundamental analysis	3.18	3	3.41	1	3.35	3	2.85	1	2.69	3	2.75	2	2.84	2	0.001 *	2
Technical analysis	3.42	1	3.35	2	3.59	1	2.68	4	3.67	1	3.36	1	3.36	1	0.000 *	1
Both fundamental and technical	3.36	2	3.24	3	3.53	2	2.70	2	3.19	2	2.38	3	2.75	3	0.000 *	3
Portfolio analysis	2.49	4	2.47	4	2.59	4	2.70	2	2.39	4	1.87	4	2.18	4	0.000 *	4
Cronbach's- α test	0.60		0.45		0.68		0.80		0.70		0.44					

Notes: Figures are mean values. The extent of agreement among the respondents of each group concerning their choice of the listed factors is quantified by performing the Cronbach's- α test, *significance at the 1 per cent level

Item (N)	OMOA (45)		MF (17)		PIC (17)		LC (47)		BR (85)		ININ (224)		Mean for whole sample (435)		Rank		ANOVA Sign. level	
	Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank	
Fundamental analysis	4.36	1	4.41	1	4.24	1	3.53	1	4.00	1	3.58	1	3.80		1		0.000**	
Technical analysis	2.82	4	2.88	3	2.82	4	2.38	4	3.28	3	3.04	2	2.98		3		0.000**	
Both fundamental and technical	3.49	2	3.35	2	3.82	2	2.81	2	3.62	2	2.84	4	3.11		2		0.000**	
Portfolio analysis	2.87	3	2.88	3	3.18	3	2.53	3	3.19	4	2.95	3	2.95		4		0.074*	
Cronbach's α test	0.61		0.44		0.46		0.75		0.47		0.70							

Notes: Figures are mean values. The extent of agreement among the respondents of each group concerning their choice of the listed factors is quantified by performing the Cronbach's α test. * significance at the 10 per cent level, ** significance at the 1 per cent level

Table III.
The level of usage
attached to different
methods in the long-term

accurate forecasting of trends in the competitive position of a company or an industry. Similarly, portfolio analysis also garnered more support in the long term, but still ranked in last position.

The analysis then continued by investigating the particular elements and techniques used as part of the fundamental and technical analysis processes. Table IV summarises the results in this regard for the former.

Beginning with the accounting measures, on average, all user groups rank price-earnings (P/E) as their first preference, earnings per share (EPS) as their second, net operating profit after taxes (NOPAT) as their third, and return on equity (ROE) as their fourth preference. From the market value-based measures, first in the usage ranking comes economic value added (EVA), with market value added (MVA) – which is very similar to EVA – second, and shareholder value analysis (SVA) – possibly because of its computing difficulty – third. Amongst the discounted cash-flow measures, the dividend discount model (DDM) comes first, net present value (NPV) second, internal rate of return (IRR) third, and cash flow return on investment (CFROI) – arguably the least known of the measures in the group – fourth. Considering the three groups of measures together, it is clear that traditional accounting measures are preferred by all user groups, with the five highest mean values being related thereto.

These results are quite logical and do not diverge from theory and previous research findings (Prakash and Rappaport, 1977; Sandahl and Sjögren, 2002). Although theory proposes the use of the new market value-based performance measures, research findings are still contradictory in the sense that the majority of scholars point to the superiority of the traditional accounting measures in explaining the expected returns of stocks in any developed stock market (Holms and Sugden, 1999; Maditinos *et al.*, 2005).

Table V presents an equivalent summary of the results for technical analysis techniques. Across the sample as a whole, the use of the technical indicators is ranked first, with chart analysis second, although the mean values (2.72 and 2.65, respectively) are very close. At the individual user group level, OMOAs and PICs rank chart analysis first, while all other groups prefer the technical indicators. Amongst the technical indicators, those that are used most often are moving average convergence divergence (MACD), moving average, relative strength index (RSI), and momentum, all of which indicate belief in trends. These results are consistent with previous research findings in emerging markets (Wong and Cheung, 1999).

Table VI shows the results disaggregated across the three sub-periods. Inspection of the findings reveals that fundamental analysis, technical analysis, both fundamental and technical analysis, portfolio analysis, and foreign markets rank in first place for the third time period (i.e. post-1999). However, noise in the market, newspapers/media and instinct/experience rank in first place during the second time period (1999) when a crisis and major collapse occurred in the Greek stock market. This evidence is an indication that factors such as noise in the market, newspapers/media and instinct/experience can drive investors to make sub-optimal decisions. However, noise in the market and newspapers/media rank last for the third time period, suggesting that investors may have realised that these led them to make some erroneous decisions during the crisis. A typical quote from the ININ interviewees in this regard was:

During the stock market crisis we lost a lot of money. Some of us lost even our houses and were left with big overdrafts to our banks. After this crisis we have become very cautious and

Accounting measures	OMOA	Rank	MF	Rank	PIC	Rank	LC	Rank	BR	Rank	ININ	Rank	TOTAL	Rank
NOPAT	3.53	3	3.20	5	2.50	5	2.74	5	2.67	3	2.92	2	2.90	3
EPS	3.98	2	4.32	2	3.85	2	3.05	2	2.73	2	2.79	3	3.01	2
ROI	3.29	5	3.22	4	2.92	4	2.94	3	2.27	5	1.95	4	2.33	5
ROE	3.53	3	3.96	3	3.35	3	2.93	4	2.36	4	1.93	5	2.40	4
P/E	4.27	1	4.43	1	4.15	1	3.56	1	3.48	1	3.53	1	3.65	1
<i>Market value-based</i>														
EVA	3.21	1	2.77	1	3.12	1	2.27	1	1.94	1	1.36	2	1.86	1
SVA	2.36	3	2.06	3	2.20	3	1.73	3	1.78	3	1.32	3	1.62	3
MVA	2.54	2	2.54	2	2.65	2	1.84	2	1.88	2	1.43	1	1.75	2
<i>Discounted cash flow</i>														
NPV	3.30	1	2.90	2	2.82	2	2.52	2	2.40	1	1.64	3	2.13	2
IRR	3.04	3	2.22	4	2.67	3	2.73	1	1.96	5	1.50	5	1.94	3
Payback	2.46	5	1.88	8	1.82	9	2.39	3	1.89	7	1.54	4	1.81	5
DDM	3.27	2	3.49	1	3.62	1	2.05	5	2.34	2	1.98	1	2.29	1
CFROI	2.48	4	2.43	3	2.67	3	1.92	6	2.23	3	1.76	2	2.00	4
DCA	2.41	8	2.12	5	2.42	5	1.57	9	1.76	9	1.25	9	1.57	9
EP	2.45	6	2.08	6	1.85	8	2.14	4	1.98	4	1.33	6	1.70	6
EVM	2.35	9	1.96	7	1.95	7	1.69	7	1.92	6	1.31	8	1.62	7
CVA	2.44	7	1.84	9	2.40	6	1.64	8	1.77	8	1.32	7	1.61	8

Notes: Figures are mean values; Cronbach's- α and the ANOVA test found no evidence of significant differences; the questionnaire also allowed respondents to select "other" but no substantive findings emerged in this context. NOPAT – net operating profit after taxes; EPS – earnings per share; ROI – return on investment; ROE – return on equity; P/E – price-earnings ratio; EVA – economic value added; SVA – shareholder value added; MVA – market value added; NPV – net present value; IRR – internal rate of return; DDM – dividend discount model; CFROI – cash flow return on investment; DCA – discounted cash flows; EP – economic profit; EVM – economic value management; CVA – cash value added

Table IV.
The level of usage
attached to different
fundamental analysis
techniques

Table V.
The level of usage
attached to different
technical analysis
techniques

	OMOA	Rank	MF	Rank	PIC	Rank	LC	Rank	BR	Rank	ININ	Rank	Total	Rank
Chart analysis	3.24	1	2.82	2	3.38	1	1.81	2	3.68	2	2.25	2	2.65	2
Technical indicators	3.00	2	3.29	1	3.19	2	1.68	1	3.76	1	2.42	1	2.72	1
Moving averages	3.13	1	3.29	1	3.38	1	1.83	2	3.83	2	2.54	2	2.83	2
RSI	2.91	2	3.12	2	3.13	2	1.66	3	3.51	3	2.42	3	2.65	3
Bollinger bands	1.98	7	2.76	4	2.50	6	1.57	4	2.80	5	1.83	5	2.07	5
MACD	2.80	3	2.94	3	2.88	3	1.85	1	3.90	1	2.69	1	2.86	1
Momentum	2.53	4	2.24	5	2.69	5	1.55	6	2.96	4	2.08	4	2.27	4
OBV	2.09	6	1.94	7	1.88	7	1.47	7	2.23	7	1.70	6	1.83	7
Parabolic	1.87	8	1.82	8	1.69	8	1.45	8	1.99	8	1.58	7	1.69	8
Stochastic oscillator	2.47	5	2.06	6	2.88	3	1.57	5	2.69	6	1.57	8	1.95	6

Notes: Figures are mean values; Cronbach's- α and ANOVA test found no evidence of significant differences in responses; the questionnaire also allowed respondents to select "other" but so substantive results emerged in this context

Item		OMOA	Rank	MF	Rank	PIC	Rank	LC	Rank	BR	Rank	ININ	Rank	TOTAL	Rank
Fundamental analysis	<99	3.79	2	3.64	2	3.27	2	2.59	2	3.09	2	2.71	2	2.92	2
	=99	3.51	3	3.07	3	3.09	3	2.55	3	2.33	3	2.24	3	2.50	3
Technical analysis	>99	4.29	1	4.35	1	4.29	1	3.04	1	3.44	1	3.20	1	3.43	1
	<99	2.77	3	2.86	3	3.09	3	1.68	3	2.74	3	1.72	3	2.09	3
Both fundamental and technical	=99	2.95	2	3.61	1	4.00	1	2.04	2	3.24	2	2.56	2	2.75	2
	>99	3.18	1	3.12	2	3.41	2	2.25	1	3.73	1	2.72	1	2.95	1
Noise in the market	<99	3.05	3	3.07	2	3.00	3	1.80	3	2.78	2	1.69	3	2.13	3
	=99	3.08	2	2.85	3	3.18	2	2.00	2	2.65	3	1.93	2	2.25	2
Portfolio analysis	>99	3.42	1	3.47	1	3.71	1	2.32	1	3.50	1	2.64	1	2.92	1
	<99	2.82	2	2.79	2	2.54	2	1.89	3	2.80	2	2.75	2	2.67	2
Newspapers/media	=99	3.28	1	3.54	1	3.00	1	2.47	1	3.53	1	3.79	1	3.51	1
	<99	2.33	3	2.29	3	2.18	3	2.08	2	2.19	3	2.62	3	2.42	3
Instinct/experience	>99	2.46	2	2.14	3	1.91	3	1.91	2	2.16	2	1.68	2	1.89	2
	=99	2.28	3	2.54	2	2.09	2	1.83	3	1.97	3	1.61	3	1.81	3
Foreign markets	>99	2.69	1	2.82	1	3.06	1	2.11	1	2.70	1	1.96	1	2.27	1
	<99	2.95	2	3.36	2	2.91	2	2.17	3	2.97	2	2.92	2	2.86	2
Government policy	=99	3.26	1	3.54	1	3.00	1	2.57	1	3.52	1	3.85	1	3.55	1
	>99	2.62	3	2.76	3	2.18	3	2.32	2	2.50	3	2.82	3	2.66	3
	<99	3.36	2	3.71	3	3.36	1	2.51	3	3.27	3	3.09	3	3.11	3
	=99	3.51	1	3.77	2	3.36	1	2.76	1	3.39	2	3.54	1	3.42	1
	>99	3.24	3	3.82	1	3.29	3	2.76	1	3.53	1	3.34	2	3.32	2
	<99	3.10	3	3.14	2	3.27	2	2.45	2	3.04	2	2.88	2	2.90	2
	=99	3.31	2	2.85	3	3.18	3	2.42	3	2.91	3	2.82	3	2.85	3
	>99	3.73	1	3.65	1	4.25	1	2.72	1	3.87	1	3.60	1	3.60	1
	<99	3.18	1	3.50	1	3.55	2	2.47	2	2.18	3	2.83	2	2.86	2
	=99	3.13	2	3.46	2	3.91	1	2.40	3	3.10	2	2.74	3	2.86	2
	>99	3.02	3	3.12	3	3.47	3	2.64	1	3.43	1	3.57	1	3.36	1

Notes: Figures are mean values; Cronbach's- α and ANOVA tests found no evidence of any significant differences in responses

Table VI.
The level of usage
attached to different
methods in three
sub-periods (before,
during and after 1999)

prefer to invest our money where the BR advise us or mainly through the mutual fund and PIC. We do not base our judgment solely in our experience any more, we have realised that the noise in the market and the financial newspapers are not very good advisors and they could make very bad forecasts.

Finally, perceptions regarding the level of performance (in terms of gains and losses) of each user group were examined by asking respondents to evaluate their performance on a ten-point Likert scale, where 1 – “not very successful” and 10 – “very successful”. The results[3] revealed that PICs (mean = 7.29) and MFs (7.24) ranked their performance the highest, followed by OMOAs (7.18). LC (6.32) ranked in fourth, followed by BR (5.94); ININ, with a mean of only 4.54, were last. These results suggest that the strategies implemented by the PICs, MFs, and OMOAs were the most successful, while the strategy of ININ, based mainly on noise in the market and media information, and on little use of fundamental analysis, was associated with relatively poor investment performance.

Conclusions and summary of findings

The results of this study indicate that most Greek investors rely heavily on fundamental and technical analysis, and less on portfolio analysis. Fundamental analysis is mostly used by the MF, OMOA, PIC and LC groups, while the BR and ININ groups consider it to be less important. Technical analysis is more popular among the BR group, but less so among other investor groups. Interestingly, the combined use of both fundamental and technical analyses is relatively popular among all user groups. There are differences across time horizons, however, with fundamental analysis being seen as the most important approach in the long-term, but technical analysis being key in the short-term. Portfolio analysis earns a higher reputation in the long-term, but still ranks in last position.

Users of fundamental analysis prefer to employ accounting measures in their analysis, followed by discounted cash-flow measures, with the relatively new market value-based measures taking third place with the lowest mean values. These results are quite logical and do not diverge from theory and previous research findings. Users of technical analysis provide evidence of preferences for technical indicators rather than chart analysis; among the latter, MACD, moving averages and RSI are the most used.

In terms of the type of fundamental analysis undertaken, there was consistency across most of the user groups. Overall, amongst the accounting measures, users ranked P/E as their first preference, EPS as second, NOPAT as third and ROE as their fourth preference. Amongst the market value-based measures, first in the usage ranking comes EVA, followed by MVA with SVA coming third. Finally, amongst the discounted cash-flow measures, DDM comes first, NPV second, IRR third, and CFROI fourth.

In terms of technical analysis, the use of the technical indicators was ranked ahead of chart analysis, but the mean values were very close. At the individual user group level, the OMOAs and PICs favoured chart analysis, while all other groups preferred the technical indicators. Amongst the technical indicators, those that were favoured were MACD, moving average, RSI, and momentum.

When the research time-frame was divided into three sub-periods, it became evident that during the second period (i.e. 1999) the use of fundamental analysis and portfolio

analysis was very limited, while technical analysis and factors such as noise in the market and media information drove investors' strategy to a much larger extent. It appears reasonable to argue that the use of these techniques was a response to the chaotic market conditions existing in Greece in 1999, at which time fundamentals were relatively poor indicators of short-term value. Consistent with this line of reasoning, it was found that in the third period (i.e. post-1999) the use of fundamental analysis, the combination of fundamental and technical analyses and portfolio analysis all grew in popularity. Technical analysis still played a role, but factors such as noise in the market and media information were used less frequently by all user groups.

The self-assessment of financial performance of each user group revealed that PIC, MF, and OMOA performed better than the rest of the groups. In contrast, ININ performed worse, with a self-assessment well below the average. These results suggest that the investment practices employed by the PIC, the MF and the OMOA, which were based mostly on fundamental analysis and less on non-financial factors, provided satisfactory returns. In contrast, the investment practices employed by ININ, which in most cases were based upon non-financial factors such as instinct/experience, newspapers/media and noise in the market, led them to experience significant capital losses. In summary, although finance theory suggests that investors should mainly focus on conventional portfolio analysis, the results of this study indicate that they are more concerned with fundamental and technical analysis; this evidence is consistent with that of earlier studies of emerging stock markets.

The results of this study suggest that various areas exist in which related research might be desirable. In particular, future work could usefully involve:

- conducting a similar survey in Greece in the current (i.e. 2007 environment);
- examining attitudes and opinions in a larger sample, at least in terms of ININ;
- carrying out more in-depth semi-structured interviews;
- gathering further information on the procedures which investors use to forecast future earnings and free cash flows;
- exploring the methods analysts adopt to calculate key ratios and measurements such as P/E, EPS and SVA; and
- conducting a similar study in different international markets, both those with the same characteristics as Greece and those with markedly different ones, to compare the results and establish generalisability.

Given the limited knowledge regarding investment decision-making processes and consumer behaviour as it applies to financial assets and services, the possibilities for further research in this area, particularly in developing markets, are extensive.

Notes

1. After consultation with representatives of the various user groups, we agreed to define short-term as periods of less than a month, and long-term (the period between one month and one year). A few suggested adding medium-term (from one to six months) too, but the majority did not agree, since their understanding of long-term seemed to include the medium term, and they did not use this term.
2. The Greek capital market has experienced extreme fluctuations during the last few years, with the General Index sitting below 2000 units before 1999, before rising dramatically to

nearly 6,500 units during 1999 and then falling back significantly (to below 1,700 units) in subsequent years; we, therefore, decided to divide the research time-frame into three sub-periods based on these patterns, to examine whether any substantive differences in investor behaviour manifested themselves.

3. Available from the authors on request.

References

- Antonides, G. and Van Der Sar, N.L. (1990), "Individual expectations, risk perception and preferences in relation to investment decision-making", *Journal of Economic Psychology*, Vol. 11 No. 2, pp. 227-45.
- Armstrong, J.S. and Overton, T.S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, Vol. 14, pp. 396-402.
- Arnold, J. and Moizer, P. (1984), "A survey of the methods used by UK investment analysts to appraise investment in ordinary shares", *Accounting & Business Research*, Vol. 14 No. 55, pp. 195-207.
- Arnold, J., Moizer, P. and Noreen, E. (1984), "Investment appraisal methods of financial analysts: a comparative study of US and UK practices", *International Journal of Accounting*, Spring, pp. 1-18.
- ATHEX (2004), *ATHEX Annual Statistical Bulletin*, Athens Exchange, Athens.
- Baker, H.K. and Haslem, J.A. (1973), "Information needs of individual investors", *Journal of Accountancy*, Vol. 136 No. 5, pp. 64-9.
- Berg, B.L. (1998), *Qualitative Research Methods for the Social Sciences*, 3rd ed., Allyn and Bacon, Boston, MA.
- Blume, M.E. and Friend, I. (1978), *The Changing Role of the Individual Investor: A Twentieth Century Fund Report*, Wiley, New York, NY.
- Carter, R.B. and Van Auken, H.E. (1990), "Security analysis and portfolio management: a survey and analysis", *Journal of Portfolio Management*, Vol. 16 No. 1, pp. 81-5.
- Chenhall, R.H. and Juchau, R. (1977), "Investors information needs: an Australian study", *Accounting and Business Research*, Vol. 7, Spring, pp. 111-9.
- Clark-Murphy, M. and Soutar, G.N. (2003), "What individual investors value: some Australian evidence", *Journal of Economic Psychology*, Vol. 25 No. 4, pp. 539-55.
- Collison, D.L., Grinyer, J.R. and Russell, A. (1996), "UK managers' decisions and their perceptions of capital markets", *Journal of International Accounting and Taxation*, Vol. 5 No. 1, pp. 39-52.
- Dillman, D. (1978), *Mail and Telephone Surveys: The Total Design Method*, Wiley, New York, NY.
- Fisher, K.L. and Statman, M. (1997), "The mean-variance optimization puzzle: security portfolios and food portfolios", *Financial Analysts Journal*, Vol. 53 No. 4, pp. 41-50.
- Frankel, J. and Froot, K.A. (1990), "Chartists, fundamentalists and the demand of dollars", in Courakis, A.S. and Taylor, M.P. (Eds), *Private Behavior and Government Policy in Independent Economies*, Oxford University Press, Oxford.
- Goodhart, C.A.E. (1988), "The foreign exchange market: a random walk with a dragging anchor", *Economica*, Vol. 55, pp. 437-80.
- Holmes, G. and Sugden, A. (1999), *Interpreting Company Reports and Accounts*, 7th ed., Financial Times/Prentice-Hall, London.
- Lease, R.C., Lewellen, W.G. and Schlarbaum, G.G. (1974), "The individual investor: attributes and attitudes", *Journal of Finance*, Vol. 29 No. 2, pp. 413-38.

- Lee, T.A. and Tweedie, D.P. (1975a), "Accounting information: an investigation of private shareholder usage", *Accounting & Business Research*, Autumn, pp. 280-91.
- Lee, T.A. and Tweedie, D.P. (1975b), "Accounting information: an investigation of private shareholder understanding", *Accounting & Business Research*, Winter, pp. 3-13.
- Lee, T.A. and Tweedie, D.P. (1976), "The private shareholder – his sources of information and his understanding of reporting practices", *Accounting & Business Research*, Autumn, pp. 304-14.
- Lee, T.A. and Tweedie, D.P. (1977), *The Private Shareholder and the Corporate Report*, Institute of Chartered Accountants in England and Wales, London.
- Lee, T.A. and Tweedie, D.P. (1981), *The Institutional Investor and Financial Information*, Institute of Chartered Accountants in England and Wales, London.
- Lewellen, W.G., Lease, R.C. and Schlarbaum, G.G. (1977), "Patterns of investment strategy and behavior among individual investors", *Journal of Business*, Vol. 50 No. 3, pp. 296-333.
- Lui, Y.H. and Mole, D. (1998), "The use of fundamental and technical analyses by foreign exchange dealers: Hong Kong evidence", *Journal of International Money and Finance*, Vol. 17 No. 3, pp. 535-45.
- Maditinos, D., Šević, Ž. and Theriou, N. (2005), "Performance measures: traditional accounting measures versus modern value-based measures. The case of earnings and EVA[®] in the Athens Stock Exchange (ASE)", paper presented at 3rd Conference on Accounting and Finance in Transition, University of Greenwich, London, July.
- Nagy, R.A. and Obenberger, R.W. (1994), "Factors influencing individual investor behavior", *Financial Analysts Journal*, Vol. 50 No. 4, pp. 63-8.
- Naser, K. and Nuseibeh, R. (2003), "User's perception of corporate reporting: evidence from Saudi Arabia", *The British Accounting Review*, Vol. 35 No. 2, pp. 129-53.
- Nassar, M.A. and Rutherford, B.A. (1996), "External users of financial reports in less developed countries: the case of Jordan", *The British Accounting Review*, Vol. 28 No. 1, pp. 73-87.
- Potter, R.E. (1971), "An empirical study of motivations of common stock investors", *Southern Journal of Business*, Vol. 6 No. 1, pp. 41-4.
- Prakash, P. and Rappaport, A. (1977), "Information inductance and its significance for accounting", *Accounting Organisations and Society*, Vol. 2 No. 1, pp. 29-38.
- Sandahl, G. and Sjögren, S. (2002), "Capital budgeting methods among Sweden's largest groups of companies. The state of the art and a comparison with earlier studies", *International Journal of Production Economics*, Vol. 84 No. 1, pp. 51-69.
- Schlarbaum, G.G., Lewellen, W.G. and Lease, R.C. (1978), "Realized returns on common stock investment: the experience of individual investors", *Journal of Business*, Vol. 51 No. 2, pp. 299-325.
- Shefrin, H. (2000), *Beyond Greed and Fear*, Harvard Business School Press, Boston, MA.
- Shiller, R.J. (1989), *Market Volatility*, The MIT Press, New York, NY.
- Shleifer, A. (2000), *Inefficient Markets: An Introduction to Behavioral Finance*, Oxford University Press, Oxford.
- Taylor, M.P. and Allen, H. (1992), "The use of technical analysis in the foreign exchange market", *Journal of International Money and Finance*, Vol. 11 No. 3, pp. 301-14.
- Warneryd, K-E. (2001), *Stock-market Psychology: How People Value and Trade Stocks*, Edward Elgar, Cheltenham.

Wong, M.C.S. and Cheung, Y-L. (1999), "The practice of investment management in Hong Kong: market forecasting and stock selection", *Omega, The International Journal of Management Sciences*, Vol. 27 No. 4, pp. 451-65.

Wood, J. and Vilkinas, T. (2005), "Characteristics associated with success: CEOs' perspectives", *Leadership & Organization Development Journal*, Vol. 26 No. 3, pp. 186-96.

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