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Financial Investment and Insurance – Global Trends and the Polish Market
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POSSIBILITIES FOR STOCK MARKET INVESTMENT USING PSYCHOLOGICAL ANALYSIS

Summary: The article discusses the importance of psychological analysis for investors when investing in the stock markets. The main objective is to determine the use of the psychological analysis when making investment decisions of licensed securities dealers operating on the Czech stock market, who are registered at the Czech National Bank. The article reports new findings from the explored areas, both theoretical and practical. In the theoretical part, existing approaches are described, including their comparison. The hypothesis of whether securities dealers compile portfolios of investments is verified. The hypothesis is based on investors' psychology. Based on the research conducted by the Czech Securities Dealers in the Czech Republic, including the specific example, findings have come from experience. Further, the article consists of the solutions to development of issues examined in the future, which should support the importance of examined analysis on both the theoretical and practical levels. This analysis is not subject to such investors' interest, as fundamental and technical analysis is, while also providing valuable information for investors.

Keywords: Psychological analysis, investor, investing, instrument, financial market.

DOI: 10.15611/pn.2015.381.21

1. Introduction

The aim of this article is to determine the use of psychological analysis when making investment decisions licensed securities dealers operating on the Czech stock market. The subject of the investigation will be to determine the extent to which brokers use psychological analysis, which existing psychological approaches they prefer and whether they create a portfolio of investments.

Currently, investors in the Czech Republic mainly use technical and fundamental analyses when deciding on what shares to invest in. Due to the growing competition in this field one should not completely neglect psychological analysis with regard to competition, accelerating market changes, yields and risks which are very closely associated with investing.

Psychological analysis can be applied to movements in share prices in order to support and improve the decisions made by investors regarding investment plans and eventual investments.

The benefits of psychological analysis can be seen in the psyche of investors, which can be observed using technical analysis from graphical methods such as a very simple line graph, which individual stock exchanges monitor, built for their needs and for better decision making about investments in selected instruments. Although this analysis has several key benefits, it is taken rather as an additional or secondary analysis. This is highlighted by Veselá [2007, p. 466], who claims that, "psychological analysis is a marginal and rather complementary analytical approach, although analysts and investors do not refute the existence and influence of psychological factors on stock prices in the short term." Krabec [2004, p. 93] has a similar opinion, and adds to the subordination of the analysis by stating that „it is not even considered as a separate type of analysis used on financial markets, even if it has its undoubted importance". On the other hand, Hladík [2003] argues that psychological impulses can only influence the price of such shares for short periods.

The basic attribute of psychological analysis is the mass psychology of stock market investors and mainly non-professionals. An investor who prefers this approach should be capable of expecting changes that may occur in the future, they should also use their own intuition and judgment.

The following authors deal with psychological analysis and psychology either partially or in detail: Loader [2002], Rejnuš [2010], Douglas [2010], Musílek [2011], Fanta [2001], Plummer [2008], Sejkora [2013] and each assigns a different effect.

There are seven investment approaches that include psychological elements in the theory of psychological analysis.

2. Theoretical basis of psychological approaches

The analysis includes known psychological investment approaches that have previously been described in the field of theory. These approaches include: Drasnar's concept of investment psychology, Epstein and Garfield's investment psychology, Keynes' speculative equilibrium hypothesis Kostolany's stock market psychology, Le Bon's crowd psychology, pyramidal principles of investment and the theory of speculative bubbles. We have determined that several authors in the professional literature use slightly different names for the approaches, e.g. the theory of price bubbles instead of speculative.

Drasnar's concept of investment psychology

The author of this concept deals with speculation and gambling including the psychology of investing. The psychology of investing is based on two traditional attributes which are peculiar to most investors, i.e. fear and greed. Drasnar [1995, p. 79] states that "The two dominant forces determining the dynamics of the human mind in relation to the external environment are fear and greed."

In the case that greed predominates on financial markets, investment instruments' exchange rates increase and investors move on a bull stage because purchases dominate. If there is a fear in the foreground, the prices of instruments fall. Investors are on a bear stage and sell out their purchased investments. We can see the two dominant powers switching in Figure 1.

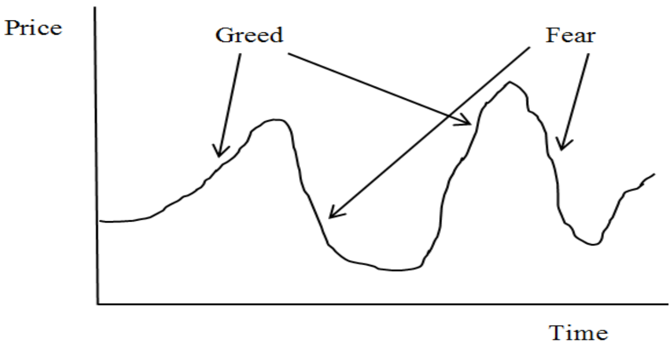

Figure 1. Drasnar´s concept of investment psychology

Source: own work.

Epstein and Garfield's investment psychology

The authors of this psychological investment approach conducted a survey, where respondents were divided into two groups of small investors and professionals. The sample of respondents was made up of 140 small and 175 professional investors. The respondents were then divided into six groups based on the psychological profile of the investors determined by the results of the study [Epstein, Garfield 1992].

Table 1. Psychological profile of investors

Investor	Relation to investing
Conflicting	Indecisive, constantly changing their investment decisions.
Depressed	Negative regardless of the profit or loss.
Revenge	The best based on the information available, small losses are tolerated.
Masked	Very positive, longs for victory.
Fussy	Their priority is to respect the rules and each investment is thoroughly investigated.
Paranoid	Distrust in investing supported by an aversion to risk.

Source: own work based on [Epstein, Garfield 1992; Veselá 2007].

The detailed examination of investors in this survey led the authors to create the following six types of investor: conflicting, depressed, revenge, masked, fussy and paranoid. According to the psychological profile of the investor, certain attributes were assigned to them based on their relation to investing, including certain characteristics, based on which, advice and recommendations were formed for the different types of investors. A brief description of the individual investors is given in Table 1.

Keynes' speculative equilibrium hypothesis

The hypothesis is based on the instability of investment markets and includes five factors that create this instability [Keynes 1963].

The first concerns the level of professionalism, on every investment market there are professional and non-professional investors. Professionals innovate, put forward offers, analyze, and evaluate market developments and their approach encourages greater professionalism and development in the studied area. On the other hand, a larger number is made up of non-professional investors who invest in areas which they do not understand and who are the owners of shares in companies that they have never managed and their knowledge does not contribute to the development of the sector in which they invest, but to its instability.

The second factor concerns fluctuations in revenues from realized investments. Such instability is reported in companies whose business is mainly focused on seasonal products such as the production of mineral water, which sees higher consumption in the summer and less in the winter, whereby creating absurd trends in the development of rates.

The third factor concerns mass psychology, which is partially due to the lack of knowledge of investors who are mainly influenced by public opinion. This situation occurs in society, in exceptional circumstances, either positive or negative, such as the financial crisis, when it is expected that this situation will take a long time and no upturn is in sight. Pessimism and optimism change on the capital markets the same as people's moods.

The penultimate factor is based on moral values of competition of professionals, where ethical and moral principles are required, as well as a higher level of knowledge than private investors. Professionals should be able to absorb and mitigate the consequences of inexperienced individuals who rely only on themselves. The action of professionals lacks earlier and more accurate identification of the changes that may occur, and therefore the general public usually do this for them. Professionals should pay more attention to the prediction of new events and changes which act upon the collective psychology of the market.

The last factor involves the establishment of a relationship of trust between monetary institutions and persons who do not have enough of their own funds and therefore need to borrow in order to invest. It is necessary to examine the deficit unit (the potential borrower) in detail to see whether they will effectively utilize the borrowed financial capital from surplus units such as banks. Any weakening of one of these bodies creates serious consequences for the economy, ending up in e.g. a stock market crash. On the other hand, strengthening of the market, including the rebuilding of confidence among investors, is a precondition for an upturn but it is not a sufficient condition because it will be some time before enough trust is gained and investors can get over their state of discontent.

These five factors are not enough for the current financial market, therefore they need to be complemented by other factors which are significantly reflected in the moods of investors on today's markets. These other factors are globalization and information technology.

Kostolany's stock market psychology

Investors are divided into two main groups, i.e. players and speculators. Players or non-professional investors (shaking hands) make up the majority, i.e. 90% of those who want to get rich quick. Their investment behaviour is associated with a mass crowd, when a lot of investors buy, then they buy too, and vice versa. Speculators (firm hands), who make up about 10%, are not subject to the influence of the mass crowds of sales and purchases but rely on their sophisticated experience, they have their own opinions and thoughts that predict success but usually in the longer term [Musílek 1999].

Kostolany [2000] based this factor on the perpetual cycle of the stock exchange, where rates evolve over time and repeatedly in the same way.

Le Bon's crowd psychology

Le Bon's psychology is based on the nature of the crowd. Mass crowds are created on financial markets, where the crowd either buys or sells on mass, which means that they succumb to the influence of the crowd. Le Bon identifies several kinds of crowds which typically show the following general characteristics: impulsive, capricious, irritable; suggestible and gullible; exaggerated and naive; intolerant and dictatorial, and immoral [Le Bon 1994].

Pyramidal principle of investing

This principle differs considerably from the other theories presented here and is considered as being fraud in the Czech Republic pursuant to Article 250 of the Criminal Code. However, from time to time we still come across this principle under the name of either airplane or pyramid.

The founder is considered to be Charles Ponzi, who moved from Italy to Boston and acquired many clients in 1919 and 1920 whom he talked into investing by offering them the prospect of easy wealth. Within eight months he had earned 15 million US dollars [Veselá 2007].

The essence of this investment is based solely on reallocation from new investors to investors who entered into the pyramid before them. The investor who entered first, earned the most, and vice versa. Therefore, it is a zero sum investment because there is no new investment but it moves from the lower to upper levels of the pyramid.

Veselá [2007, p. 513] highlights that claiming "that for determining of number of investors can be used the expression y^{n-1}, where n is the order of the rounds of newcomers investors from the beginning and y corresponds to the number of newcomers who must be gained for this game by existing investors to meet the conditions for obtaining financial benefits." Pyramidal principle of investing is shown in Figure 2. We assume that each new investor invests 1000 € and gains additional 10 new investors.

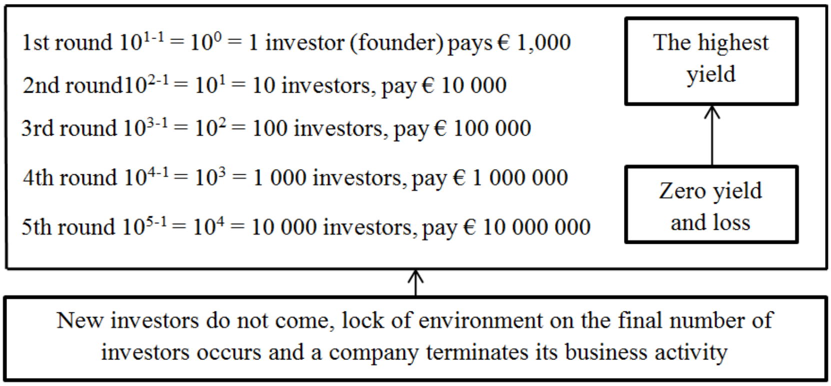

Figure 2. Pyramidal principle of investing

Source: own work.

The theory of speculative bubbles

Sometimes there are situations on markets, e.g. stock prices, real estate, commodities, where there are extreme peaks and troughs without prior warning. In these situations, stock prices deviate significantly from their intrinsic value. On a theoretical level, this reaction from investors can be explained by an extraordinary event that triggers a rise or fall in stock prices, which is supported by mass psychology.

These speculative or price bubbles are considered to be very unwelcome and dangerous because they cause stock market crashes, which have very wide implications not only for investors but for the entire national economy because they cause a collapse in the economic system. These collapses are reflected in huge financial losses, even for the smallest investors. There is usually a reduction in the standard of living of nearly the entire population, increased unemployment and stricter conditions for obtaining loans. Households and businesses begin to save which is then reflected in reduced demand for goods and services resulting in an economic recession.

Market economies have had a number of well-documented global crises in the past, but it is still impossible to prevent such crises in a timely manner and limit their negative consequences. In recent times, there was the so-called global financial crisis, which began in 2008 due to the US mortgage market, and affected almost the entire world. The issue of speculative bubbles in real estate markets is for example dealt with by Shiller [2008] or Glaeser, Gyourko and Saiz [2008]. The most famous crises include: the crash of the New York Stock Exchange, the Mexican crisis, the Russian crisis, the Turkish financial crisis and the global crisis. The issues of such crises, including their causes and solutions, are dealt with by a number of authors including Valdez and Wood [2003], Hunter, Kaufman and Pomerleano [2003], Cassidy [2012], Jílek [2009], Musílek [2011], and Rejnuš [2010]. Speculative bubbles can be divided into two main groups according to their initial impulse. The first group consists of speculative bubbles that give an initial impetus to the bull market phase, i.e. growth in the market (buying), and the second group consists of bubbles that give an opposite priority impulse, i.e. to the bear market phase (selling) on the financial market, this process is shown in Figure 3, where the bubble in the bear market phase is more dangerous for investors because there is an assumption of higher losses and a longer interval required to transform into a bull market and even a dangerous withdrawal from the market.

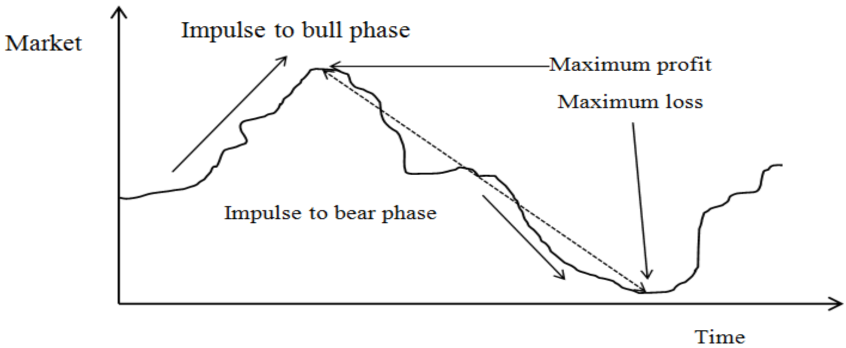

Figure 3. Impulse of speculative bubbles to the bull or bear market phase

Source: own work.

3. Scientific methods used

One of the major methods used is an analysis applied for the research of reference books and Internet resources related to the examined matter of the article. The analysis is followed by the synthesis in bringing knowledge of available resources together. Another method applied is comparison of individual psychological approaches. An empirical research with securities dealers was carried out having used a method of questionnaire to gain data and information. The obtained data were statistically evaluated. A quantitative research was carried out to both confirm and disprove the stated hypothesis. The principles of logic and logical reasoning were also used in assessment of psychological analysis in practice.

4. Comparison of the individual psychological approaches

Each individual psychological approach provides the investor with a number of advantages and disadvantages. Each approach has its merits and distinction from the others. Some of them can be simply and quickly applied in practice using e.g. technical analysis. However, psychological analysis is considered secondary and is not given as much attention as other analyses, even though e.g. the pyramidal principle is considered to be very dangerous and unwanted in the investment community. A comparison of the various psychological approaches is included in Table 2, except for the pyramidal approach which is prohibited by law.

Table 2. Comparison of the psychological approaches

	Selected aspects of individual psychological approaches				
Psychological approach based on	Division of investors into groups	Psychological profiles of investors	Mass crowd effect on investment	Investment based on the mood of the investor	Causes a stock market crash
Drasnar	No	No	Yes	Yes	No
Epstein & Garfield	Yes	Yes	No	Yes	No
Keynes	Yes	Yes	Yes	Yes	No
Kostolany	Yes	Yes	Yes	Yes	No
Le Bon	No	No	Yes	Yes	No
Theory of speculative bubbles	No	No	Yes	No (extraordinary event)	Yes

Source: own work.

5. Methods of research

On the basis of analysis of the examined issues, in January 2014, a questionnaire was compiled consisting of questions focused on psychological analysis and its impact on the stock markets. Before creating the final version of the questionnaire main target and respondents were formulated, criteria and progress of the survey were defined.

The questionnaire contained eleven questions focused on analysis and methods used by securities dealers during making investment decision. The composition of the questionnaire followed the whole range of methods and approaches usable in practice. There were pre-processed answers to individual questions whereas each question contained several possible answers. It was a questionnaire with closed answers. The focal point of the questionnaire consisted in questions according to which it was possible to statistically evaluate the stated hypothesis.

The aim of the research was to find out whether licensing securities dealers, operating on the Czech stock market, use psychological analysis when investing in shares. The result of the research will determine whether traders use a psychological analysis and its existing approaches including the portfolio of investments that are compiled from investors' psychology.

In February 2015, a study was conducted on Czech securities dealers, which are referred to by the Czech National Bank (ČNB) as Czech private entities based on direct ownership. As of the 31st of January 2014 there were 13 of these companies operating in the Czech Republic [ČNB 2014]. The aim of the study was to determine whether Czech companies use psychological analysis when investing in shares. This type of analysis does not create such a large amount of interest as fundamental and technical analysis.

During the study all of the companies were contacted firstly by telephone and then the questionnaire with the research questions was sent electronically to the relevant members of staff of the companies. We received five completed questionnaires, which accounts for a return of approximately 38%. Gathered information was mathematically and statistically evaluated. Considering the number of securities dealers doing business on the Czech market, the sample can be considered as being representative.

The results of research at the Czech Securities Dealers

The relationship between the application of psychological approaches and the compilation of portfolios was determined during the study, and for this purpose the following hypothesis was tested – "Companies use psychological analysis when investing in shares." To verify this we used the chi-square test of independence and the relative integrity of the answers to the research questions in the questionnaire.

The independence between the following two questions was tested.

1. Do you apply any of the psychological approaches when investing in shares in the questionnaire stated in your company? Respondents could choose from the known psychological approaches, namely: Drasnar's concept, Epstein and Garfield's investment psychology, Keynes' speculative equilibrium hypothesis, Kostolany's stock market psychology, Le Bon's crowd psychology, their own psychological approach or "No", i.e., none of the approaches are applied. More than half of the companies said that none of the approaches were applied; in relative terms this

means that approximately 60% of the surveyed companies and 40% use at least one of the mentioned approaches.

2. Do you compile investment portfolios based on the psychology of investors, i.e. based on the investor's risk and return? Respondents had two options, either yes or no. Of the companies surveyed 80% said that they did not compile such portfolios, only 20% of them expressed a positive response.

The results of Pearson's chi-square test can be seen in Table 3, whereby the calculation was performed using the STATISTICA program.

Table 3. Results of Pearson's chi-square test

Do you apply any of the psychological approaches when investing in shares in your company?	Do you compile investment portfolios based on the psychology of investors, i.e. based on the investor's risk and return?	
	Yes	No
Yes	0%	40%
No	20%	40%
Pearson's chi-square test 0.8333, $p = 0.3613$, $\alpha = 0.05$		

Source: own work.

The results show that there was positive correlation between the studied issues because the value of p is higher than the value of α. These two questions show that Czech companies engaged in investing in securities do not sufficiently utilize psychological analysis when compiling portfolios.

The further questions in the survey also confirmed this fact. Therefore, only the results of some of the selected questions will be included here.

One of the selected questions, which were the subject of the study, was the following: Which of the following analyses do you consider to be the most important when investing? The respondents had three response options: fundamental, technical, or psychological analysis. The results are as follows: 80% of the companies stated that fundamental analysis is the most important, 20% of the companies stated technical analysis and none of the companies stated psychological analysis.

The same results were obtained for the next question which was whether companies considered psychological analysis separately when investing or as an addition to fundamental or technical analysis. Most of the companies, i.e. 80%, said that it was an addition to fundamental or technical analysis, and only 20% considered it separately.

Another question that showed identical results was whether companies employ a psychological analyst. Only 20% of the companies stated that they employed this kind of employee on a full-time basis, the remaining companies, i.e. 80%, stated that they did not employ such an analyst at all, although they had the possibility of employing them part-time, or they outsourced these services.

Almost all of the questions in the survey showed that the Czech investment companies only marginally deal with psychological analysis or not at all.

6. Use of psychological analysis in practice

The application of psychological analysis is not complicated and several approaches can be used to numerically express whether an investor will make a profit or loss. For example, we selected the development of shares of the company NWR on the Prague Stock Exchange during one month, which is expressed graphically in Figure 2. The company NWR (New World Resources Plc) is one of the leading producers of black coal and coke in Central Europe. In the Czech Republic it mines through its subsidiary company OKD, and the company's shares are traded on three stock exchanges: London, Warsaw and Prague [NWR 2013].

A short time period is recommended to be used for the psychological analysis. Figure 4 explains some of the selected psychological approaches.

Keynes' and Le Bon's approach

Keynes' approach involves five factors that create instability on financial markets. One of these factors is changes in optimistic and pessimistic moods. Investors in a declining phase have a pessimistic mood and deepen their losses and investors in a growth phase, have an optimistic mood because they are generating profit.

Le Bon characterizes this in a similar way based on the nature of the crowd. If the crowd has an optimistic mood it collectively buys but if a pessimistic mood prevails the crowd collectively sells.

Changes in pessimistic and optimistic moods according to Keynes are shown in Figure 4, including the investor crowd which either collectively buys or sells according to Le Bon.

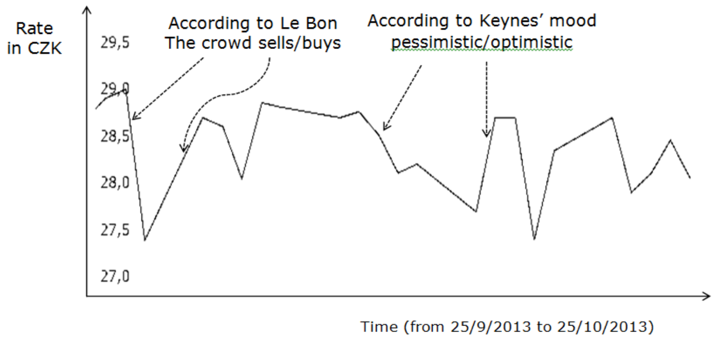

Figure 4. Keynes' and Le Bon's approach to buying and selling shares in NWR

Source: own work based on BCPP (2013).

7. Discussion

The research confirmed the insufficient use of psychological analysis in practice at securities dealers at their portfolio managers.

This result was proved on a sample of Czech securities dealers registered with the CNB. Although the sample was confirmed by statistical methods as representative, it showed its narrowness, because it penalized only selected participants of the stock market. To prove the objectivity of the obtained results, it would be appropriate to extend the sample examined by other entities as securities dealers, foreign licenses operating in the Czech Republic or even abroad. Therefore, the subject of further research for the use of psychological analysis will be the gradual expansion of the sample and thus providing better outcomes.

Although the research was conducted on a limited scale, its outcomes clearly confirmed that from the equity analysis the psychological analysis is used the least. For an extension of practical use of this analysis in the investment is appropriate to increase publishing activities related to this issue in the field of theory, and further, to expand and use positive experience of those subjects, which successfully use the psychological analysis.

The research results cannot be confronted with similar studies because they are not available either in Czech terms or in foreign literature.

8. Conclusions

The professional literature mainly describes and discusses fundamental and technical analyses. This paper focuses on the importance of psychological analysis and its significance for investors when investing on stock markets. Several of the selected psychological approaches were applied to a specific example from practice and specifically in shares of the company NWR, where it is clear when to buy and when to sell shares. In addition, it is possible to determine the size of losses or profits using several of the approaches. Each approach has its own specific features that allow investors to choose which approach to use. The investor can either prefer the approach or completely disregard it depending on their attitude.

To consider psychological analysis as of secondary importance is not only merely a local phenomenon, although it was confirmed by a study of Czech securities dealers. The graphics clearly show the justification and significance of psychological analysis and the benefits of its application in practice. The main priority is its simplicity, whereby it does not require complicated models, calculations or structures. It is one of the ways to start investing in stocks with the support of psychological analysis and not only for new, small and less knowledgeable investors.

This issue certainly deserves more attention both in theory and in practice. There are several ways in which we can further develop psychological analysis and thus provide this approach with more prestige for investors. One of the ways is to supplement any of the selected approaches with a calculation of the intrinsic value and thereby determine the profit or loss more accurately. It is also possible to carry out market research of foreign securities dealers who invest using psychological analysis and not only in the Czech Republic. The results of the conducted research could yield a new insight into the issues examined and thereby promote the importance of psychological analysis to investors when deciding on investing in selected investment instruments.

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WYKORZYSTANIE ANALIZY PSYCHOLOGICZNEJ W INWESTYCJACH NA RYNKU AKCJI

Streszczenie: Głównym celem artykułu jest podkreślenie znaczenia analizy psychologicznej na rynkach kapitałowych. Wykorzystano do tego analizę spółek akcyjnych, która nie wywołuje takiego zainteresowania jak analiza techniczna czy fundamentalna. Zostało to potwierdzone poprzez badania na maklerach działających na czeskim rynku papierów wartościowych. Wynikiem badań było stwierdzenie, w jakim stopniu przedsiębiorcy wykorzystują analizę psychologiczną. W artykule przedstawiono zastosowane metody, wyniki badań oraz sugestie, jak promować wykorzystanie analizy psychologicznej nie tylko w teorii, lecz także w praktyce.

Słowa kluczowe: biznesmen, portfolio, podejście psychologiczne, badania, giełda.