Universitatea “Lucian Blaga” din Sibiu

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Summary of phd. thesis:

CONSIDERATIONS ON TECHNIQUES AND INVESTMENT PERSPECTIVES ON THE CAPITAL MARKET

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Contents

KEY WORDS

Investments, stock market, capital, strategies, indices, management, portfolios, funds, index.

INTRODUCTION

Motivation of theme choice, novelty, actuality and importance

The motivation to choose the theme of the doctoral thesis starts from the fact that the population needs to increase the amount of capital existing on the market. The way to invest passively brings an interesting approach to the modern economy, making it a lesser effort nowadays to create value than the level of effort required in the past. At the same time, studying different approaches to investing, we can say that the degree of success of a proposed investment is directly proportional to the degree of knowledge of the object of the investment.

Capital is a financial or material availability that is used in a lucrative activity that creates goods for exchange with the goal of generating profit.

This type of increase in financial resources has generated specific demand and supply segments: demand for financial resources and supply of financial resources, ie capital. Specific markets have been created, namely financial markets specialized in the division of labor in the money markets and capital markets. Due to the fact that the financial markets are not sufficiently developed, their two forms are not strictly defined, they are interdependent and conditional each other.

In order for society to develop, it must insist on scientific research and technology development. These areas, together with the most important factor, namely education, are the foundation for ensuring progress and, above all, the welfare of the population.

The news of this area is definitely a permanent interest for investors who want to multiply their profit rate as a result of stock exchange transactions. Since information on the capital market is moving very quickly and changes occur in companies from day to day, there is a particular need for the information on which investment decisions can be optimaly based.

Using a few portfolios management principles and strategies, we can assure an investment package that has a diminished risk and does not interfere with the volatility of totally unexpected situations in the investment process.

The purpose of this research is to improve investment processes on the capital market so that the decisions that are made are the best at the best time and at the best price consistent with the risk factor.

Stock exchanges have started to unify their activities, as competition has been maximized, and the service sector has boosted its upward trend. While some of the stock exchanges have grown in activities and turned into profit-generating companies, other stock exchanges have become tradable. Some scholars have decided that for sustainable and innovative development, it is better to merge them for a progressive and efficient management, taking into account the rapid evolutionary pace.

The Romanian capital market offers us the opportunity to better understand the economic course of our country. Observing in a statistical manner the evolution of the Bucharest Stock Exchange in recent years, we come to conclusions that can surprise us, taking into account the outcome of the 2008 economic crisis, as well as the economic instability that is expected to take place soon in the near future.

The doctoral thesis titled "Considerations on techniques and investment perspectives on the capital market" is elaborated in accordance with the methodological parameters of a scientific research using research methods such as: comparative method, observation method, fundamental research methods, as well as analytical methods with econometric content that will be structured according to chapters.

The novelty elements of the PhD thesis consist both in improving the general knowledge of financial market participants and in educating them to make better investment decisions and lower risk.

The current research is based on the fact that the paper will present the evolutions of the current and performing companies that are listed on the Bucharest Stock Exchange, as well as of the stock market indices. These developments are throughout their lifetime, over ten years or even until today. Thus, the effects of the financial crisis in company history will also be found.

The necessity and importance of the theme stems from the opportunity to create value, the need for financial resources, but also the fundamental necessity of man towards expansion, which leads to a continuous development in the field of finance. Due to the fact that in capitalist and democratic systems capital becomes a component in everyday life, one can say that man is constantly seeking opportunities. The stock market is showing the pulse of finance and the decisions of listed companies. Presenting the image of a company sells, creates capital, creates value, thus engaging the economy so that it can exercise its role of balance in today's society.

The fact is that Romanian people do not invest their financial resources frequently on the stock exchange, so rarely encounters people who do so. This is because of the lack of knowledge in the field, but also because if man does not have the basic needs, he can not think about the need for growth and contribution. The stock exchanges work better in a developed system, but they can also work in a developing system, because a start-up investment can bring greater benefits, with a higher risk.

The theme of research in the context of scientific researches in the field and in an interdisciplinary context

The capital market is a very large area in which companies from all industries operate. Thus, the elaboration of the thesis will take into account not only the quantitative aspect of the presented information but also, in particular, its quality and novelty.

Interdisciplinarity comes into effect when we want to invest in the stock market, because much information is required about the subject of the investment. The information comes from the economic, mathematical, political and behavioral field.

Therefore, we can say that our theme includes a wide range of disciplines through which we can deepen our optimization of the investment decision.

The state of knowledge of the concepts of performance and financial position in the literature from Romania and abroad

The issue addressed in the doctoral thesis titled "Considerations on investment techniques on the capital market" was studied by Romanian and foreign researchers. Several books and scientific papers were consulted for the thesis, gathering a bibliography with more than 79 authors. The capital market has extensive specialist literature. We will recall the most important papers that have helped us in the elaboration of this doctoral thesis.

Anghelache Gabriela publishes in 2009 at the Economic Publishing House, Bucharest, the book "Capital Market in European Context". In the same year Corduneanu Carmen publishes at the West University Publishing House, Timişoara, the book "Capital Markets: Theory and Practice".

In 2000, Badea Dumitru G. publishes at Bucharest Economic Publishing House the book entitled Capital Market & Economic Restructuring.

In 2001, Stoica Victor, Galiceanu Mihaela, Ionescu Eduard, publishes at Bucharest Economic Publishing House, the book "Capital markets and stock exchanges".

Brendea Georgian Alin publishes in 2007 ASE Publishing House, Bucharest, entitled "Capital markets in the Romanian economy".

Cuzman Ioan, Cazan Emil, Stefea Petru publishes in 2005 at the University of the West Publishing House, Timişoara, the book "Capital Market: Articles and Studies".

Livia Ilie publishes in 2007 at the Continental Publishing House Bucharest, the book entitled "Capital Market".

In 2008, Duţescu Cristian publishes at C.H. Bech, Bucharest, the title book

"Manipulation of the capital market".

In 2011, Dobre Baron Oana, Muntean Liliana publishes at the Publishing House of Petrosani University, the book titled "Portfolio Management of Titles".

Lipara Carmen publishes in 2012 at ASE Publishing House Bucharest, the book entitled "Evaluation of actions: an approach from the perspective of behavioral theories".

Tutuianu Adrian publishes in 2007 at Hamangiu Publishing House Bucharest, the book entitled "Capital Market. Legal status applicable to participants ".

We will also remember important foreign authors.

Markowitz M. Harry published at the Blackwell Publishing House, Malden, in 1991 the book entitled "Portfolio selection: efficient diversification of investments".

Daniel A. Strachman published the book entitled "Essential Stock Picking Strategies" in 2002 at the Wiley Publishing House.

Brentani Christine published in 2004 at the Elsevier Publishing House, Oxford, the book entitled "Portfolio management in practice".

Research objectives

A fundamental observation is that the capital market is set to be a pillar of contemporary and future human society. Beyond its fundamental funding, investment, risk management, and huge financial flows, it has become representative of a new way of political and economic organization of human society, namely that of democratic capitalism.

The development and promotion of the capital market requires not only the natural involvement of private economic forces, but also the massive contribution of public authorities.

For an integrated development, we propose progressive and rigorous regulation of the field, awareness, education and protection of the public.

So, our work is structured in four chapters, as follows:

- In the first chapter entitled "Domestic capital market, structures, evolutions, legislative framework" we referred to the institutional structures of the capital market, the legal framework regarding the capital market, the market abuse in the European directive and the Romanian law, the manipulation the market and the evolution of the domestic capital market during the financial crisis, but also afterwards.
- In the second chapter, entitled "Evolution of indigenous stock indices in comparison with those of other states", we dealt with the construction of national and international stock exchange indices and indices;
- In the third chapter, "Portfolio Management Principles and Theories", we dealt with effective market theory, theoretical currents about investors' risk aversion or risk preference in investment decisions, portfolios building and evaluation, and a look at postmodern theory of construction of the portfolio.
- In the fourth chapter, entitled "Capital Market Portfolio Management Strategies", we presented strategies for analyzing company choices, management styles, portfolios building strategies, analyzing opportunities for investment in closed or open investment funds, investments in SIFs or Fondul Proprietatea, ending with a simulation of the Markowitz model of a portfolio of four titles.
- In the chapter "Conclusions and personal contributions" we expressed some considerations regarding the capital market and its development in Romania.

The most prominent trends in the financial industry are internationalization or globalization, electronization and innovation. Public access tends to become a direct one, with disintermediation being a trend in which brokers and investment banks need to climb, discovering new services and opportunities. On the other hand, the competition between stock exchanges and new traded vehicles becomes fierce. The solutions used are demultiplexing, self-listing, mergers, regional alliances. Finally, stock exchanges have to be analyzed, starting from assuming the fundamentals, restructure by assuming their own paradigm specifics.

Methodology of research

Scientific research is a process that actively and systematically works to discover, interpret and reorganize facts and events, behaviors or theories. At the same time, research seeks to bring practical applications through events, laws or theories.

The methodology used is based on documentary, bibliographic and theoretical research, as well as analyzes of specific tax practice at national and European level. The data was taken from the websites of financial companies and stock exchange websites. Data was structured using Microsoft Excel. During the research, qualitative research methods were used to collect data such as observation and case study. At the same time, quantitative methods based on deductive processes were used to test the theories, generating results that could be generalized. Thus, starting from identifying problems to assessing them, there is a need to complement the quantitative and qualitative methods, because with the case study and content analyzes studied, the results obtained can be developed, disseminated and publicly consulted.

Obtained results

The large number of companies listed on the stock exchange can make it difficult to choose one or more companies to create value for the investor. That's why, in order to make an optimal choice, we have studied the best companies, but also the stock market indices in Romania, to decide whether or not to invest in these instruments. Of course, the more detailed and longer the analysis, the balance that tends to invest or not invest becomes more accurate.

Information about companies is very important in investment decisions and often the phenomenon of market manipulation can occur, but this is present in any process. So we believe that the engaging quality in the economy of the investment process is more important than the possibility of market abuse.

The Romanian indices of the Bucharest Stock Exchange failed to overcome the pre-financial crisis, such as the countries with more developed economies: Great Britain, France, Germany. Hungary's neighbors' indexes were more performing than clues in Romania.

Analyzing information on index funds, we come to the conclusion that they are good investment decisions that far exceed investments in bank deposits.

Through a strong fundamental analysis of securities, return on investment increases to the advantage of the investor.

The limits of the research done in the doctoral thesis

The capital market is a very broad field in which different approaches to investment can be found. So we can not refer to the whole field, but we can choose a few companies or stock indices with whose data we can make investment considerations. In this thesis, companies with a high trading value were chosen, thus exerting an increased interest from investors, minimizing the risks of long-term investments.

At the same time, the most representative indices for the Bucharest Stock Exchange were chosen, but also for the neighboring countries or economically developed countries. These indices represent a real indicator of national economies, because the indexes are selected by performing companies that meet specific conditions.

The more we know a field, the more profitable we can in the field. Understanding the structure of the capital market as well as the developments of several components, our investment decision can be limited to investing or not investing. Thus, the investment will get a more accurate look, managing to foresee future results.

The state of the research highlights in the thesis a synthesis of the information that has been accumulated so far on some principles and strategies that can be addressed in the investment process. Over time, there has been a significant development in financial markets, with new methods for analyzing securities, but also for predicting the future of the stock. Specialists in the financial sector are developing new models to highlight the most important portfolios performance factors. Their purpose is to efficiently manage capital invested in financial markets. Financial models have been built to achieve an expected return for a specific risk level. With the help of models, portfolios are built that bring superior performance, managing to combine and select assets with specific features. This research implies important information on how to choose the best investment option on the capital market. Scientists have been struggling for decades to minimize risks so their investments reach a high rate of profitability. Of course, it can be said that those who have had big gains have been lucky, because there have been such cases, but often decisions have been well founded. By evaluating the assets of the invested companies and comparing more investment opportunities, the optimal option was chosen.

Sometimes investment decisions have been based on intuition, some investors succeeding in applying exactly the opposite process of human responses that "lead to losses" to choose to overcome natural growth in the market.

In this paper we try to synthesize important aspects of capital market investments, and this is not a guide to gaining profits, but rather an openness to the universe of opportunities that we can appreciate in the investment process.

In order to synthesize this information, we can recall some important papers that have made a great deal of effort in describing reference issues in capital market investments, such as: "The Exchange and the OTC Market", Economica, 2000 by Gabriela Anghelache, "The Market Capital & Economic Restructuring ", Economic Publishing House, 2000 by Badea Dumitru G.," Investment and portfolio management ", Thomson Publishing, Australia, 2006 by Reilly K. Frank," Portfolio selection: efficient diversification of investments " Blackwell, Malden, 1991 by Markowitz M. Harry and "Portfolio theory and capital markets", ed. McGraw-Hill, New York, 2000 by Sharpe F. William. In order to carry out a thorough research on investment processes, we thought that some of the theoretical aspects of the capital market should first be understood, and we will discuss the principle of portfolios management, as well as strategies that underpin the construction of portfolios.

In the first chapter entitled "Domestic capital market, structures, evolutions, legislative framework", we referred to the institutional structures of the capital market, legal framework regarding the capital market, market abuse in the European directive and Romanian law, the manipulation market. In the seventh subchapter, entitled "Conclusions and personal contributions", I expressed some considerations regarding the capital market and its development in Romania

The second chapter entitled "Evolution of indigenous stock indices in comparison to those of other European states" is structured in six subchapters, as follows: In the first subchapter, entitled "Investment index concept" we referred to what are market indices, indices history, volatility and selection of their components. In the second subchapter we referred to the history of indices and index funds, and then we compare the volatility of indices in the next subchapter, in subsection five we treated "Eligibility and selection procedures". In the sixth subchapter entitled "Evolution of indigenous stock indices in comparison with those of other states", we have dealt with the construction of national and international stock exchange indices and stock indices;

Chapter III presents "Portfolio Management Principles and Theories". The subchapters present the "Portfolio Management Principles", "Effective Market Theory and its Impact on Portfolio Management". In our conclusions and personal contributions, we formulate opinions on portfolios management.

Chapter IV, "Strategies for Portfolio Management in the Capital Market", is structured on six sub-chapters. The first subchapter deals with "Analysis Strategies for the Selection of Companies for Capital Market Investment", followed by "Management Steps" in which strategies for investing in the capital market are exposed. The third subchapter presents "Strategies underlying the construction of portfolios". The fourth subchapter deals with "Organization of Portfolio Management and Description of the Investment Process". This is the fifth subchapter dealing with "Investments in Collective Investment Organizations" and in the penultimate subchapter it develops the "Simplified Markowitz Model applied to a portfolio", followed by conclusions and personal contributions.

In the last part of the doctoral thesis "Final conclusions, personal considerations and further developments" are presented the results obtained after the elaboration of the empirical case studies, the validation or invalidation of the preset hypotheses and, last but not least, the shaping of some future directions of the research.

CHAPTER I. CURRENT CAPITAL MARKET, STRUCTURES, EVOLUTIONS, LEGISLATIVE FRAMEWORK

On the capital market, the first stock exchange institution was the Bucharest Stock Exchange, which began its trading activity in 1995. The Rasdaq Electronic Stock Market (initially called the Rasdaq Stock Exchange), which started operating in 1996, followed.

The Bucharest Stock Exchange (BSE) started its activity as a public institution (subsequently public interest), with an electronic market, centralized at first, then with remote access. The exchange was originally organized as an integrated market, ensuring both trading and post-trading (registration, deposit, clearing and settlement).

Subsequently, the Bucharest Stock Exchange has demoted and became a joint stock company. Under the new regulations, it had to outsource its post-trading activities to a new institution, the Central Depositary.

The Rasdaq Electronic Stock Exchange has functioned from the outset as a decentralized market. The trading platform was offered by Rasdaq itself, the post-tracing services by the National Clearing, Settlement and Depository Company and by the shareholders' register companies, and the regulation was carried out by the National Association of Securities Companies (with a role self-regulating organization).

1.1. Theoretical and conceptual considerations regarding the capital market

The capital market is represented as a private market where the demand and supply of financial assets are contacted both in the medium and long term, which are adjusted in a free manner. So, we are talking about a market where the securities are bought and sold in a free way. This market has as main purpose the involvement of the capital of individuals of a physical and legal nature, who want to save (those who buy shares or bond buyers) and who are seeking to invest profitable capital.

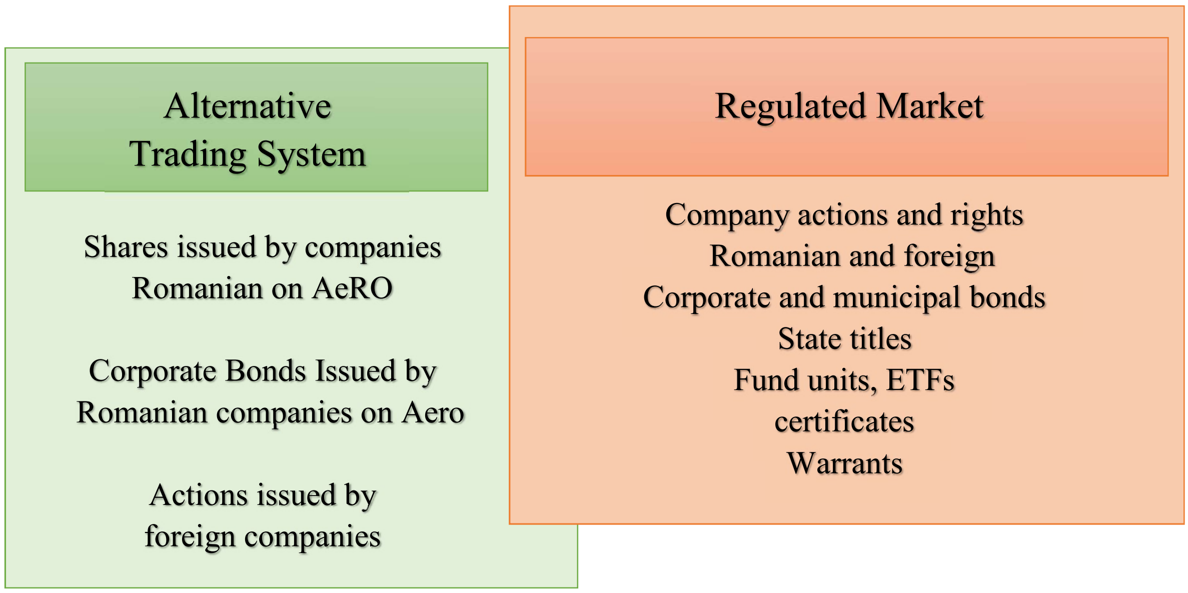
The capital market is a point of interest from several perspectives, conspiring to seize the management of some companies through the significant acquisition of shares or the provision of short-term profits by anticipating the change in the share price.

1.2. Institutional capital market structures

Bucharest Stock Exchange is the main operator on the capital market, authorized and regulated by the Financial Supervisory Authority (ASF). The Bucharest Stock Exchange (BVB) manages both the regulated market and the alternative trading system that meets the European and international requirements. Thus, the Bucharest Stock Exchange facilitates the dynamics of the financial flows between the investors who want to invest, ie to multiply their financial resources, and the issuers who are represented by those who need financial resources to develop their business.[1]

We present graphically the financial instruments traded at BvB in Fig. 1:

Fig. no. 1. Financial instruments traded on the Bucharest Stock Exchange



Source: realized by author

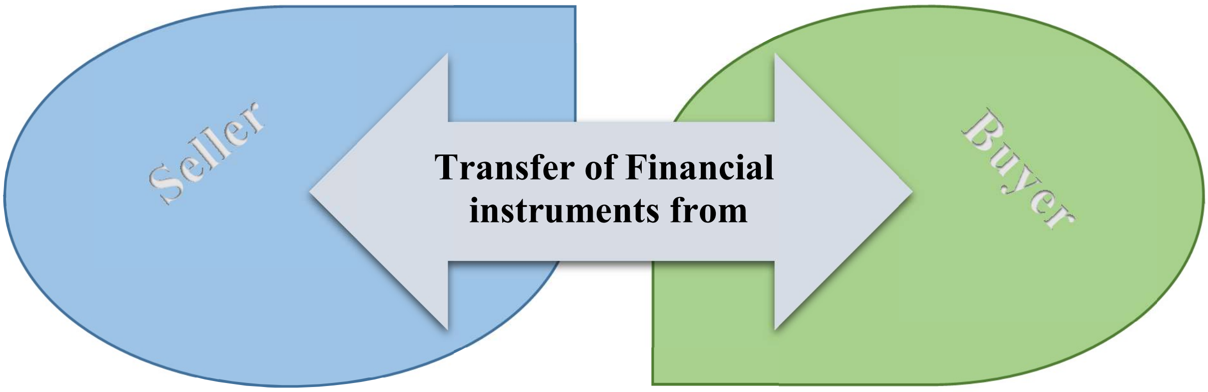
Another important institution for the Bucharest Stock Exchange is represented by the Central Depository. The central depository is a member of the BvB Group. This central institution shall ensure that the transactions are settled by clearing and settlement with the financial instruments concerned. At the same time, the Central Depository also keeps records of the registers of all the listed companies listed on the Bucharest Stock Exchange.

[1] Brendea Georgian Alin - „Piața de capital în economia României", Ed. ASE, București, 2007

All transactions between the seller and the buyer are facilitated by the Central Depository. Both the transfer of financial instruments and the money between the buyer and the seller are processed by this institution in complete safety. After carrying out the operations in question, the share registries of a large number of companies in Romania are updated.

The settlement is represented in this institution by extinguishing the obligations that are involved in the transfer of the financial instruments, following the payments related to the transaction. Settlement involves two main transactions, namely the transfer of financial resources from the buyer to the seller and the transfer of financial instruments from the seller to the buyer as shown in Fig. 2.

Fig. no. 2. Central Depository attribution

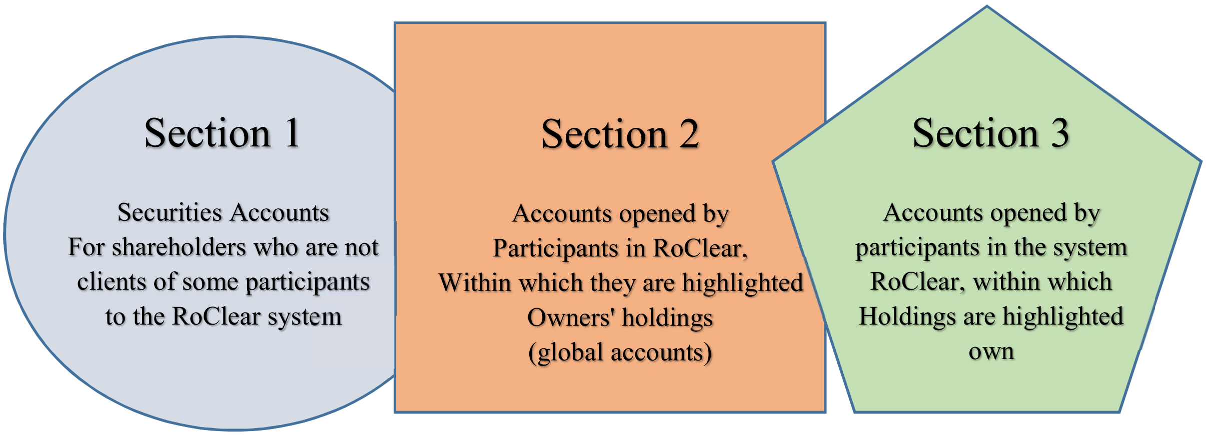


Source: realized by author

The Central Depositary offers services to participants, issuers and holders of financial instruments:

The Central Depository shall safely keep and update the register of shareholders of the issuer of financial instruments.

The register is organized in three sections as shown in Fig. 3



Source: realized by author

Fig. no. 3. Keeping and updating the Issuer's Registry of Financial Instruments.[2]

The Financial Supervisory Authority (ASF) is an authority belonging to the Romanian State, with the role of regulating, supervising and controlling the non-banking financial markets of our country. The ASF activity is subject to control by the Romanian Parliament and is divided into three areas of activity related to the three regulated markets: the capital market, the private pensions market and the insurance market.

1.3. Legislative framework on the capital market

An important moment was the adoption of the privatization law of companies that once again showed the need for a secondary market. This was due to the fact that it introduced large amounts of bearer securities (Property Certificates) on the financial market, which, however, were not considered securities but had the role of familiarizing the investor with the securities and , last but not least, to demonstrate the need to create an organized framework to sell and buy them. Moreover, it has established in the market the first institutional investors that have had the role of familiarizing the population of the country with the term "portfolio investor".

The need for an alternative bank market was felt, as the lack of placement alternatives led to the promotion of pyramid games, and their tolerance by the authorities of the country, followed by their collapse, generated confusion at the level of individual investors.

[2] www.bvb.ro

1.4. Market Abuse in European Directive and Romanian Law

The term "privileged information" is the translation of the "insider information" formula. This formula could translate more semantically, though not in the spirit of the Romanian language by "inside information", that is, information that I know or could only know the people inside a structure.

Obviously, in the operational sense of the directive, privileged information, as it is defined, is less than the syntactic meaning. Therefore, information can not be considered by itself or by its nature to be privileged, but must be classified as such after its interpretation. Qualification is a mandatory step because of its consequences for both those who use that information on the capital market and those who judge it.

1.5. Market manipulation

Market manipulation is generally defined by restrictively stating three distinct situations in which it can occur. Assimilation of an act with one of the three qualifies it as market manipulation, a) The transactions and the orders (possibly not finalized in transactions), which aim not to invest / disinvest as such (which, by the way, many times it is achieved), but the effects on the market (in the case of the price) or its context. Traders are also accused, not just successful transactions, because they also influence the market's context and its perception by investors.

Obviously, the incriminated maneuvers must be intentional, and in our opinion the onerous interest is implicit.

Two forms of manipulation are included in the definition:

a. when transactions or orders are intended to mislead other bidders, bid or price.

b. when transactions or orders are meant to keep the price at a level that no longer represents the real level of balance of true demand and offers.

A last category of market manipulation covers the influence or attempt to influence the market, not through transactions or orders, as in the case of the first types of manipulation described above, but through the dissemination of false or biased information, including through mass dissemination channels, or Internet.

At the end of Chapter I, we presented the conclusions and personal contributions, mainly referring to the following:

- The capital market has a well-defined structure within a specific legal framework. By integrating these rules into an investment system, it may be the right framework where the balance tilts to invest or not invest.

- Market abuse and market manipulation are the immoral part of the economic activity on the stock exchange and can affect the investment process.

- The thesis of the author's research and the realization of the PhD thesis is the realization of a current image based on the identification and analysis of the evolutions and tendencies manifested on the market, the institutional picture of the international capital markets, the anticipation of tendencies and the formulation of opinions on them.

- It starts from the fundamental observation that the capital market is configured as a pillar of contemporary and future human society. Beyond its fundamental functions, financing, investing, risk management, the huge financial flows that it engenders, it has become representative of a new way of political and economic organization of human society, namely that of democratic capitalism.

- Looking at Romania and the Bucharest Stock Exchange, as well as the institutionalized construction, the evolution and prospects are still promising. But they are to be frustrated by an optimal mix of institutional intelligence and courage, in the context of a clear and immediate risk of losing independence and identity even on a continental level.

- The capital market is vast and diverse, and it also represents a vibrant economic environment in a continuous and dynamic development. Trying to surprise it on a single criterion or in a unitary perspective is not a valid, functional one. That is why a kaleidoscopic look or an approach that surprises fragments and then assembles them in search of an overall view seems the most appropriate. This explains the title and the approach of the research, as well as the various fields of analysis contained in the chapters.

All of these conclusions are concentrated in the final conclusions and are presented in the thesis on pages 40-42.

CHAPTER. II. THE EVOLUTION OF EXCHANGE INDICES IN COMPARISON WITH THOSE OF OTHER STATES

2.1. The index concept in the investment sphere

We need a new framework to think about indices, indexing and the distinction between active and passive investments that reflect the new reality of leveraged investment. Although technology has made possible the emergence of many useful new financial products and services, any form of leverage - including leveraging technology - can create new and greater risks. In the financial industry, Moore's Law must be weighed against the updated version of Murphy's Law: "Anyone can move on, move on and go faster and worse when computers are involved." The starting point of this new framework is to broaden the definition of a financial index by focusing on its core function.

Under this new definition, financial indices can vary greatly in complexity. To distinguish more complex versions from traditional market indices, we will refer to traditional indices as 'static' and more complex 'dynamic' indicators.

2.2. Short history of indices and index funds

Sharpe listed four conditions for a portfolio to be strong, which he said should be "1) a viable alternative, 2) it can not be easily beaten, 3) it has a low cost, and 4) it can be identified before fact. " Sharpe highlighted the difference between step-active management in his exhibit. However, with the proliferation of automatic trading algorithms it became clear that the fifth default condition was not necessarily passivity. The benchmark algorithms for high-performance computation have blurred the line between passive and active. The key distinction was the lack of human intervention and discretion. If a trading strategy could be encoded in a set of transparent rules that provide consistent results on similar data sets, as did the reference algorithms used to test the machines that implemented them, how does it differ in the spirit of a built index using a passive portfolio? Academics and managers have questioned the original assumptions behind the CAPM portfolio. Merton [1973] extended the inter-temporal model, while Ross [1976] destroyed the CAPM beta in a multifactorial structure.

2.3. Volatility of indices

This paper discusses the issues that need to be considered when measuring index risk and presents the data and highlights the comparative analyzes of the historical index volatility. Specifically, we can take into account a long history of short and long-term risk measures for US capital ratios, and we can analyze the range and correlation between index volatility in a broad set of indices, including global capital, the US sector, the Treasury USA and other select markets.

Over the past ten years, the BET index has shown signs of increasing its stability. In FIG. 4 we can see how volatility gradually increases over the course of ten years.

Fig. no. 4. Volatility of the BET index (2010-2018)

Source: Graph realized by author based on data obtained from www.investing.com

Această stabilizare demonstrează faptul că dezvoltarea economică a companiilor componente este pozitivă și că ne putem aștepta la un viitor satisfăcător al randamentului indicelui.

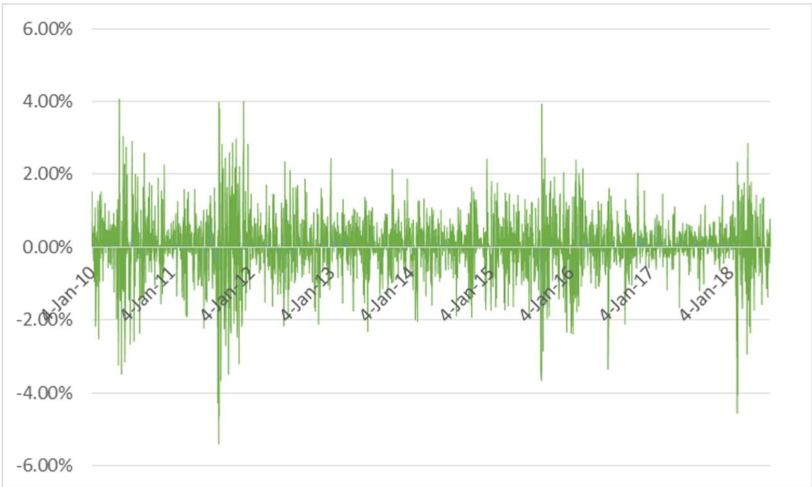
Indicele BET a continuat să își revină după impactul avut în 2008 cu ocazia crizei economice. În fig. 5 putem observa performanța acestuia pe o perioadă de zece ani. În anii 2011, 2015 și 2017 a avut scăderi mai mari, dar întotdeauna a dat semne de refacere, reușind să aibă o performanță relativ bună pe termen lung.

Fig. no. 5. BET index score (2010-2018)

Source: Graph realized by author based on data obtained from www.investing.com

If we were to make a comparison of the BET index with the US index of performance DJIA - Dow Jones Industrial Average, we can see in Fig. 6 volatility of DJIA. The US index has a lower volatility than the BET index. The volatility of the DJIA does not exceed 6%, but BET volatility reaches 10%.

Fig. no. 6. Volatility of DJIA Index Profitability (2010-2018)



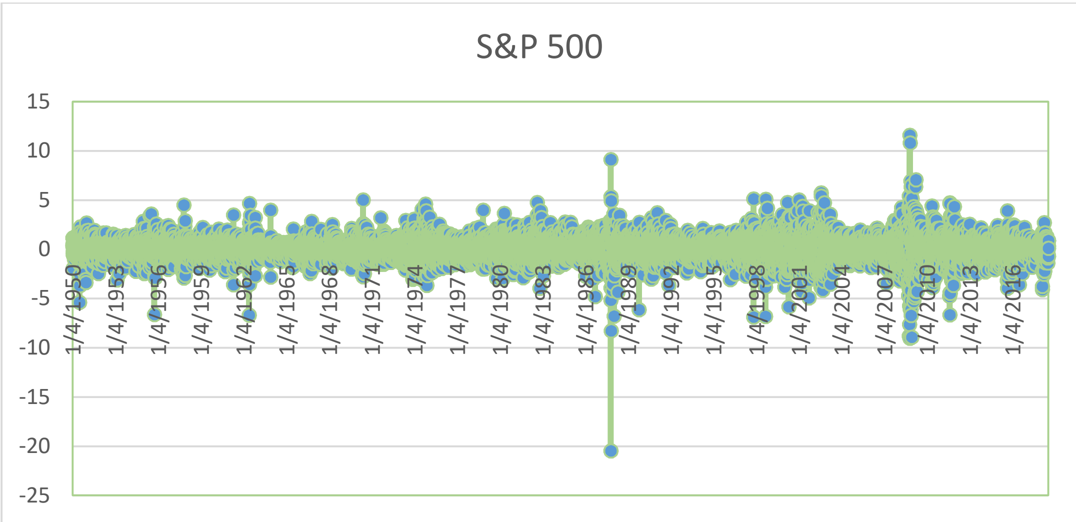
Source: Graph realized by author based on data obtained from www.investing.com

Fig. no. 7. DJIA Index Score (2010-2018)

Source: Graph realized by author based on data obtained from www.investing.com

We can see in FIG. 7 that the DJIA index has a much more stable growth than the BET index, as proof stands behind the strong US economy. The DJIA index is a strong index of US industry companies, being slightly correlated with the S&P 500 index.

Fig. no. 8. Volatility of return on S&P 500 index (1950-2018)



Source: Graph realized by author based on data obtained from www.investing.com

In FIG. no. 8 we can observe the greatest volatility when the greatest crises occurred in history. It can be noticed the impact of the 2008 crisis in 2000, 1990. These economic crises have had a very strong impact on investors' portfolios and have led the world to lose confidence in these long-term investments.

2.4. Index Building Methodology

The main components of the compositional methodology of an index are as follows:
- construction (how the securities are selected to achieve the desired exposure of the index);
- the weight (how the components of the index are weighted relative to each other)
- calculation (how to generate index values and returns)
- review (how the index is maintained continuously)

If two indices follow the same market, one can expect the results to be the same, but this happens rarely or almost never.

Indexing methodologies may be complex, but they are not a mystery. In fact, one of the essential features of an index methodology is usually transparency.

2.5. Procedures relating to the eligibility and selection of indices of the index

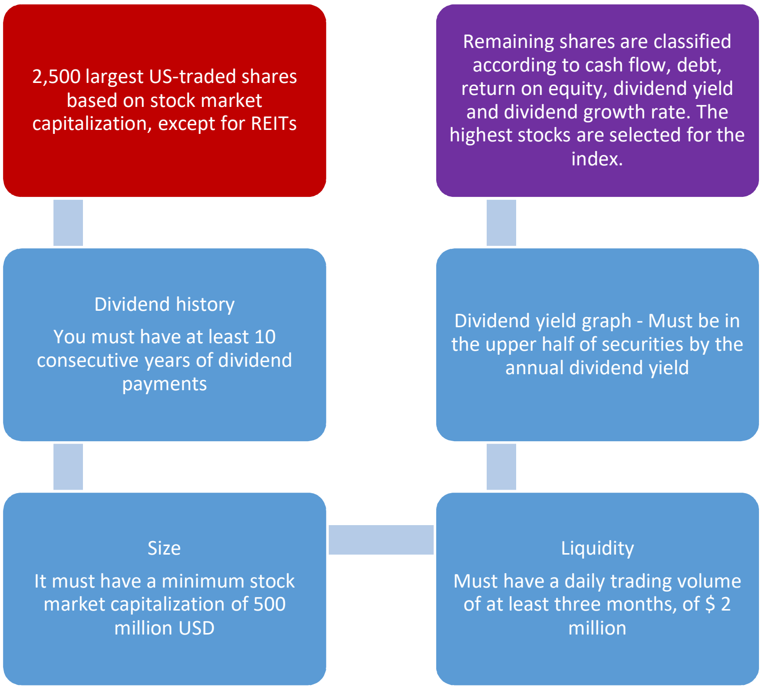
The eligibility and selection criteria determine which securities are eligible and eventually included in an index. Typical criteria include a security market limit, the location of the issuer's headquarters and the currency or coins in which the guarantee is denominated. For example, the criteria could specify that all stocks in the U.S. with a market cap of $ 5 billion, will be eligible for the index or only technology stocks will be eligible.

Liquidity, a measure of the frequency of trading an asset or a security, is often a key eligibility criterion. If the intentional use of an index is to highlight an investment product, liquidity can be a determining factor for how easily a vendor of products wishing to reproduce the index could acquire the asset for the product portfolio. As a result, illiquid or thin securities that might otherwise be eligible for an index may be excluded.

While price weighing is the simplest weighting method, it is not commonly used. More typical weighting methodologies are factors other than stock prices.

2.5.1. Dow Jones US Shares Selection Dividend 100

Fig. no. 9. Selection of shares

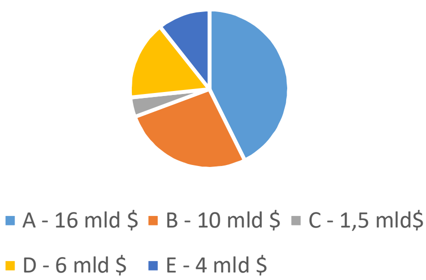


Source: Graph realized by author based on data obtained from www.bloomberg.com

- Market capitalization weighing

In terms of market-based weighing, the headline titles are weighted according to their size.

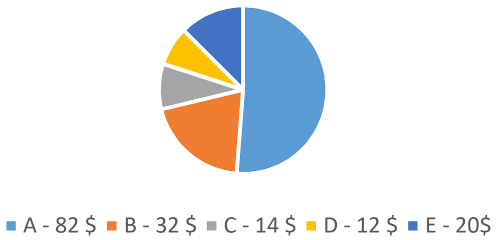
Fig. no. 10. Weighing based on market capitalization



Source: Graph realized by author based on data obtained from www.bloomberg.com

- Adjusted weighing based on market fluctuation

Fig. no. 11. Weighing based on share price

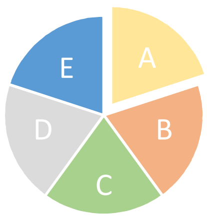


Source: Graph realized by author based on data obtained from www.bloomberg.com

- Equal weighing

In an equal-weighted index, each title has the same weight, regardless of its market ceiling. The benefit of an equal weighted index when used as a basis for an investment product is that it will exceed a market-weighted index over periods when lower-end stocks exceed capital stocks.

Fig. no. 12. Equal weighing



If an index is equally weighted, all component shares have the same impact on index performance.

Source: Graph realized by author based on data obtained from www.bloomberg.com

- Fundamental weighing

- Factor weighing

The yield of an index can be calculated by comparing index values from one period to another. For example, if the value of the index was 1,878.48 at closing day trading and 1,894.86 on closing day one, the difference of 16.38 would mean a gain of 0.87% of the value.

2.5.2. Divider

The divisor is the key to calculating the index. It is an arbitrary but usually publicly available number that is set at the time an index is released. The divisor is used as the denominator in the equation for calculating the index level in the case where the numerator is the cumulative market value of the securities in the index. Because the numerator value can easily be trillions of dollars, the first thing the divisor does is scale it down or reduce that figure to an intelligible number.

$$\frac{Sum\ of\ market\ value\ of\ shares}{Divider} = Index\ level$$

Formula for calculating the index level

More importantly, the divisor is the means to maintain a continuous measure of the market assessment, even if the list of index components is modified and floating shares are adjusted for different securities. This continuity is possible because the divisor is regularly adjusted to offset any changes other than stock prices that would affect the index value. Such changes may include rights offers, dividends, and special dividends.

2.5.3. Types of returns

The equity and fixed income indices are most often calculated as price indices or total returns. Many indicators, including the S & P 500, are computed in both ways.

Price yield - In a price calculation, the variable amount of the index reflects the evolution of the prices of its component securities or the unrealized gains and losses. In a total return index, on the other hand, the changeable value is determined by a combination of price changes and reinvested earnings on dividends or other cash payments. This means that the total return of an index of shares in which any of the components pays dividends will always be higher than the cost price.

Total yield - The calculation of an index's total return differs from the calculation of the total return on an index-based product, such as a mutual fund, if dividend income is reinvested to buy additional shares. In an index, dividends become an additional factor in calculating the level of change of the index.

2.5.4. Ethical stock indices

A particular type of specialized indexes are those of ethical investment indications that include only those companies that meet environmental or social criteria, those of the Calvert Group, the KLD, the FTSE4Good index, the Dow Jones Sustainability Index, the STOXX Global ESG Leaders Index, some standard Aei Ethics indicators and the Wilderhill Clean Energy Index.

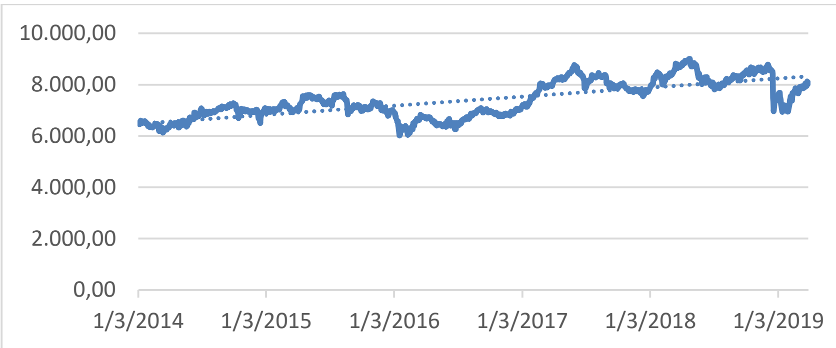
In 2010, the OIC announced the launch of a stock index that respects the Islamic law ban on alcohol, tobacco and gambling. Other such actions, such as the Dow Jones Islamic Market World Index, already exist.[3]

2.6. Evolution of indigenous stock indices compared to those of other European countries

2.6.1. Considerations on Romanian stock indices

In this subchapter we present the evolution of BVB indices in the period 2014 - 2019.

Fig. no. 13. BET Index



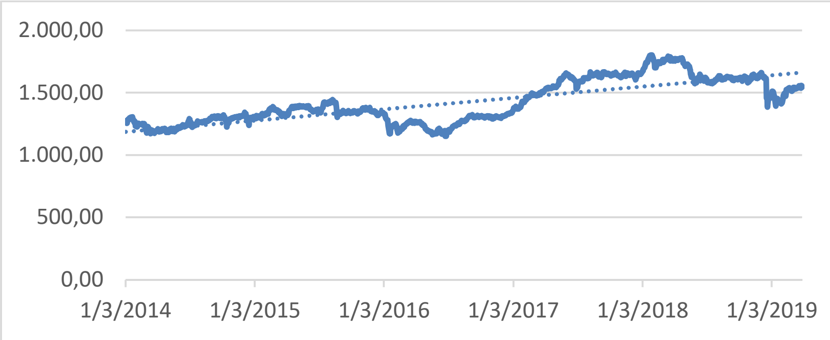
Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

From the point of view of the evolution of this index, we observe a growth trend in Fig. 13. At the same time, we notice a rather pronounced fluctuation in 2014-2017. This period seems to be a transition of companies towards more predictable economic activity.

[3] https://us.spindices.com/indices/equity/dow-jones-islamic-market-world-index

The composition of this index makes it attractive to investors. The index is composed of the most traded companies. Whether investors choose to invest in the BET index or choose to invest in one of its components, the BET remains a benchmark for stock market investments.

Fig. no. 14. BET-BK Index

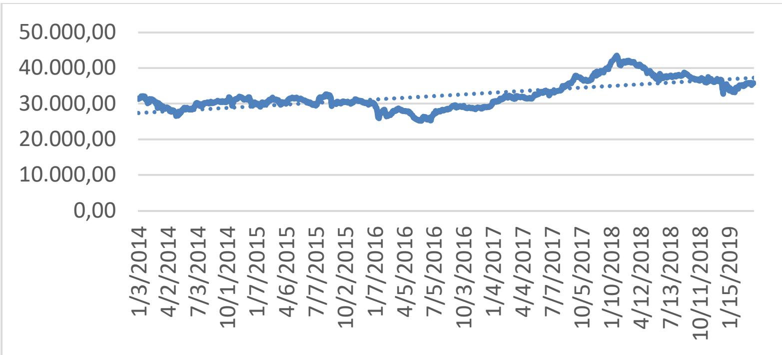


Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET BK is a benchmark index. This index helps fund managers. It is aimed at showing developments in investments in funds that have preponderant placements in shares.

We see a lower fluctuation volatility than the BET index, precisely because of a lower component weight of at most 10%. However, we see the same fluctuation in the period 2014-2017 in Fig. 14, in the evolution of this reference index of the Bucharest Stock Exchange.

Fig. no. 15. BET-FI Index



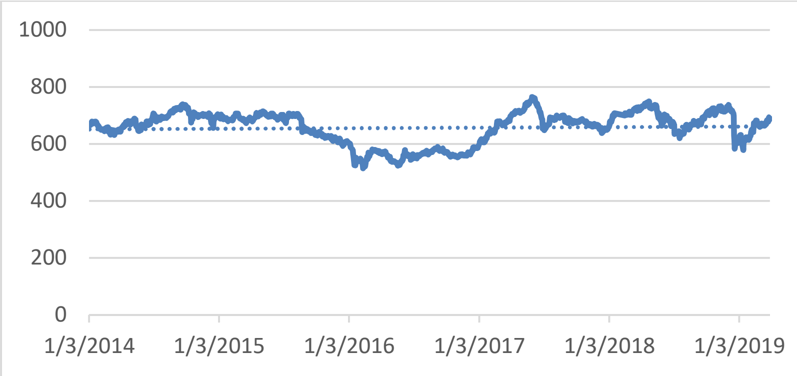
Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET-FI index tracks the progress of SIFs and Fondul Proprietatea.

As we can see in Fig. 15, this index did not grow smoothly, decreasing in the periods 2015-2016 and 2018-2019.

Its components are taken individually in subchapter 4.5.4. Investments in SIF-type companies.

Fig. no. 16. BET-NG Index

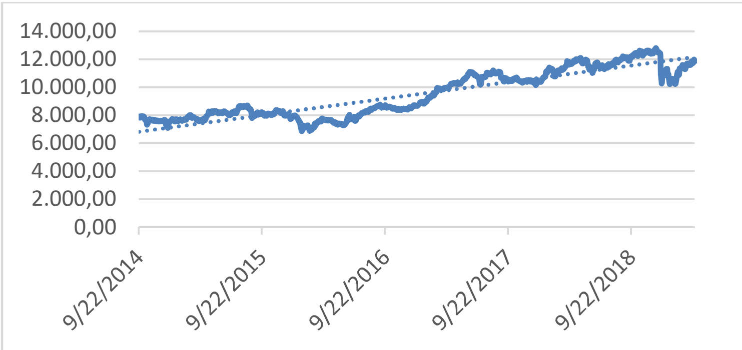


Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET-NG index is an energy index. We can see from Fig. 16, a fall in the index over the period 2015-2017. For the rest of the period there is some stability of the volatility of this index.

Companies in the energy sector have always been an attraction to large-scale investors.

Fig. no. 17. BET-TR Index

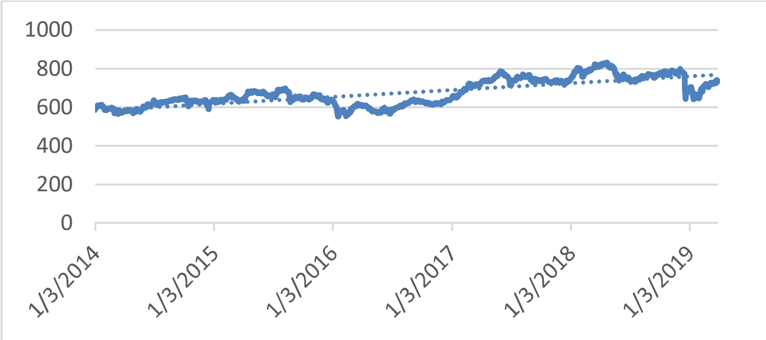


Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET-TR index is a Total Return index. This index also includes dividends paid by companies included in the BET index. Compared to other stock indices, the BET-TR index is performing better due to the inclusion of dividends offered by BET Components.

Owning the BET basket is one of the best decisions in the Romanian investment field, investors succeeding in bringing substantial gains to their own capital.

Fig. no. 18. BET-XT Index

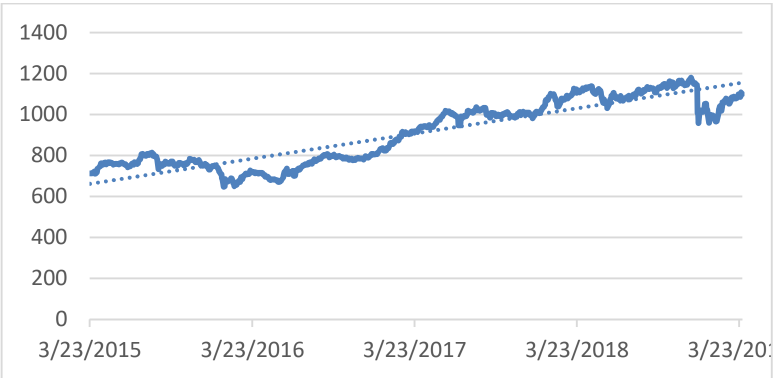


Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET-XT index is shown by the 25 most liquid companies listed on the Bucharest Stock Exchange. Similar to the other indices, it reflects the evolution of components in each sector according to the evolution of share prices. We are seeing the increase from 2013 to 2019, however, with a marked fluctuation in 2014-2017.

The rule by which companies are included in this index is liquidity, as well as other aspects such as the financial situation, legal elements, transparency or interest of the participants.

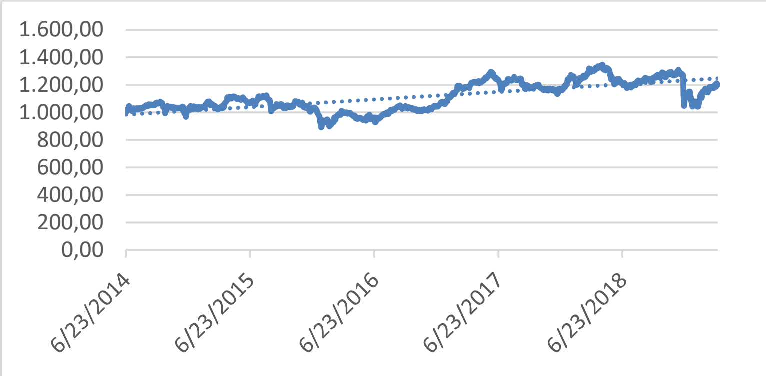
Fig. no. 19. BET-XT-TR Index



Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET-XT-TR index is a Total Return index. This index also includes dividends from companies included in the BET-XT index. Compared to other stock indices, the BET-XT-TR has better performance due to the inclusion of dividends offered by BET-XT component companies. This index had a very good performance over the period 2015-2019, better than the other BVB indices over the same period.

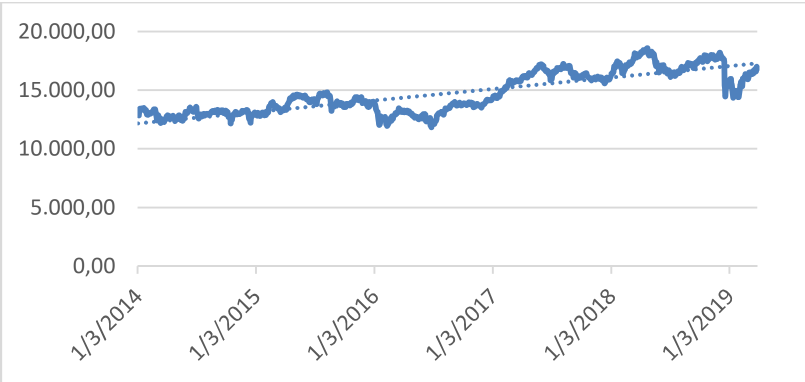
Fig. no. 20. BET Plus Index



Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The BET Plus index is growing in the 2014-2019 period, but also has a more pronounced fluctuation between 2015-2017. As we can see in Fig. 20.

Fig. no. 21. ROTX Index



Source: Graph realized by the author based on data from www.bvb.ro (April 2014-April 2019)

The ROTX index only includes blue chips. Companies are selected based on market capitalization, liquidity, availability of market prices, sectoral representativeness and market participants' interest.

As evidence that the index is made up of the most stable companies on the market, it has brought a good performance in 2014-2019. And it also shows a more pronounced fluctuation between 2015-2017.

In the following table, we briefly present how the benchmarks of the most important stock exchanges in the region have evolved.

Table no. 1. Evolution of european stock exchanges

Stock Exchange	Reference Index	Index value 2014	Index value 2015	Index value 2016	Index value 2017	Index value 2018
Warsaw Stock Exchange	WIG20	2.315,94	1.859,15	1.947,92	1.956,72	2.463,25
CEESEG Prague Stock Exchange	PX	946,71	956,33	921,61	924,04	1.083,65
CEESEG Budapest Stock Exchange	BUX Index	16.634	23.920	32.003	39,377.3	39,138.9
Bursa de Valori Bucureşti	**BET**	**6,485.42**	**6,970.85**	**6,906.0**	**7,164.3**	**7,910.8**
Bulgarian Stock Exchange	SOFIX	522,1	460.9	586,43	650,86	664,08
CEESEG Ljubljana Stock Exchange	SBI Top	776,24	696,15	717,59	707,96	794,62
Athens Exchange	FTSE/ATHEX Large Cap	2.679	1.833	1.773	1.634,97	1.954,37

Source: https://asfromania.ro

The total value of transactions that took place on BSE declined in 2015 compared to 2014 by 15.3%. The most significant fall in value was recorded for share transactions (-32.3%), while the value of government securities transactions was approximately 2.4 times higher than in 2014.[4]

[4] https://asfromania.ro

Analyzing the main stock market indices in the region, we will present in the table below the values traded on BVB in the last 7 years.

Table no. 2. Total securities traded on BSE

Yr	No. tranzactions	Value	Capitalization
2018	536.222	8.290.217.224	142.986.113.235
2017	808.429	11.457.326.504	142.986.113.235
2016	653.270	9.253.798.584	146.549.746.292
2015	985.248	8.803.398.908	146.002.473.957
2014	787.753	12.990.643.873	129.958.141.655
2013	636.405	11.243.500.680	133.829.707.066
2012	647.974	7.436.052.589	97.720.863.603

Source: https://asfromania.ro

BET Indexes (Bucharest exchange trading indexes)

The BET-FI index as well as the other indices in Romania show increases in the European economic standard, at levels similar to those in the UK or Germany, not taking into account the emergence of a new economic crisis.

The Pearson correlation indicator between the daily yields of the Romanian stock exchange indices in the period 2014-2019:

Table nr. 3. Pearson Correlation Index of BSE Indices

Coeficient Pearson	BET	BET-BK	BET-FI	BET-NG	BET-TR	BET-XT	BET-XT-TR	BET Plus	ROTX
BET	-	-	-	-	-	-	-	-	-
BET-BK	0.8369	-	-	-	-	-	-	-	-
BET-FI	0.6275	0.1154	-	-	-	-	-	-	-
BET-NG	0.0770	0.1034	0.0607	-	-	-	-	-	-
BET-TR	-0.006	0.0126	0.0470	-0,0062	-	-	-	-	-
BET-XT	0,0256	0.1265	0.0924	0,0739	0,0050	-	-	-	-
BET-XT-TR	0.0058	0,0243	-0.0137	-0,0016	0,0007	0,0137	-	-	-
BET Plus	0.0271	0,0426	0.0103	0,0078	-0,0018	0,0235	0,9705	-	-

ROTX	0,0634	0.1307	0.1306	0,0812	0,0060	0,1071	0,9328	0,9495	-

Source: calculated by the author based on data from www.bvb.ro (April 2014-April 2019)

There is a perfect and strong correlation between the BET and BET BK, BET XT TR and BET Plus, BET XT TR and ROTX, BET Plus and ROTX indices. It is a moderate correlation between BET indices and BET FI. In addition, the yields of indices have a poor or null correlation, as can be seen in table no. 3.

2.6.2. Indicative international stock indices

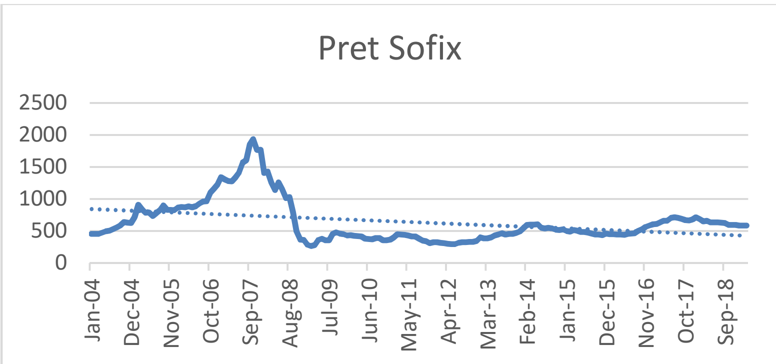
The index that was created by the Bucharest Stock Exchange is called BET and comes from Bucharest Exchange Trading. It is published by Reuters under the name BETI. This is a weighted index that has market capitalization and was designed to reflect the trend of the price collectivity of the 10 highly liquid stocks traded in the first category of the Bucharest Stock Exchange.

For the correlation of investment decisions, account may also be taken of international indices that are a reflection of the world stock market.

In this research we are conducting a study of the indices and their correlation with the investment decisions. Understanding how to use the indices as well as organizing them according to their investment objectives is of real use in increasing investment experience in the global capital market.

2.6.3. Representative indices of neighboring countries

Fig. no. 22. Bulgaria – SOFIX

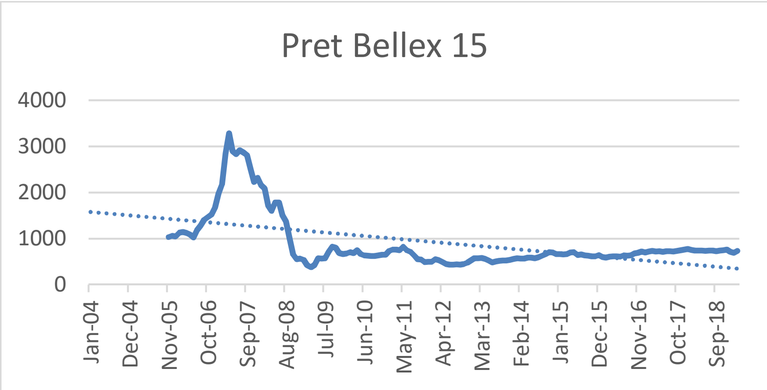


Source: Graph realized by the author based on data from www.investing.com (April 2014-April 2019)

2008 was a turning point for indices in the countries neighboring Romania. Our country's neighbors were in the same economic deadlock as ourselves, registering sharp declines in company performance. This has led to unsatisfactory developments in the indices that, in fact, reflect the state of the national economy.

Bulgaria has lasted until 2012 so that the SOFIX index correction is evident in the capital market. The index has had a relative stability until today, registering a slight increase.

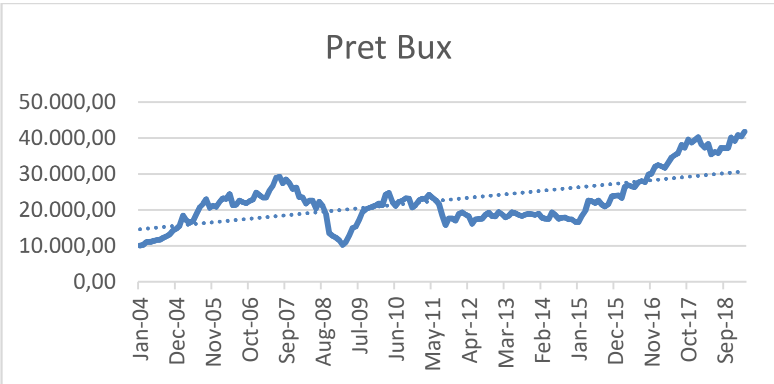
Fig. no. 23. Serbia – BELEX15



Source: Graph realized by the author based on data from www.investing.com (January 2004-January 2019)

In Fig. no. 23 we see the evolution of the main index in Serbia. Compared to Bulgaria, the Serbian index began to show its correction only in 2014. The effects of the crisis were more pronounced in Serbia than the indices of Bulgaria, Hungary and Romania. Apparently, the economic crisis affected the economies of countries with a more modest economy in a more aggressive way.

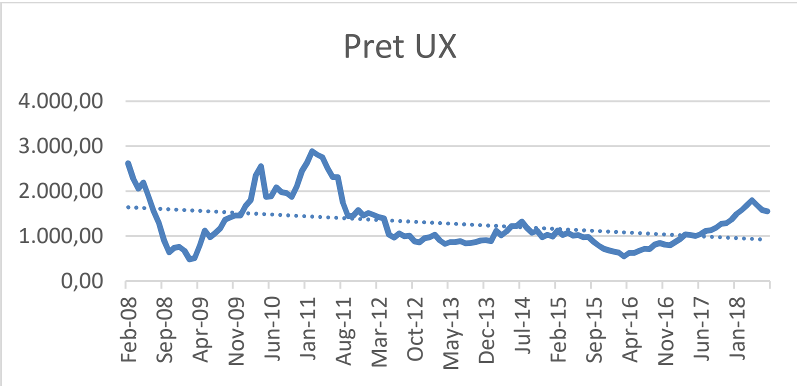
Fig. no. 24. Hungary – BUX



Source: Graph realized by the author based on data from www.investing.com (January 2004-January 2019)

Hungary is the only neighboring country to Romania, whose indexes have been able to go well beyond the economic crisis. The BUX index has achieved a 50% better performance today than in 2008. Hungary's companies have achieved good performance even though they have had a delayed correction. Hungary's economic growth may be an aspect where Romania can learn both politically and entrepreneurship.

Fig. no. 25. Ucraine – UX



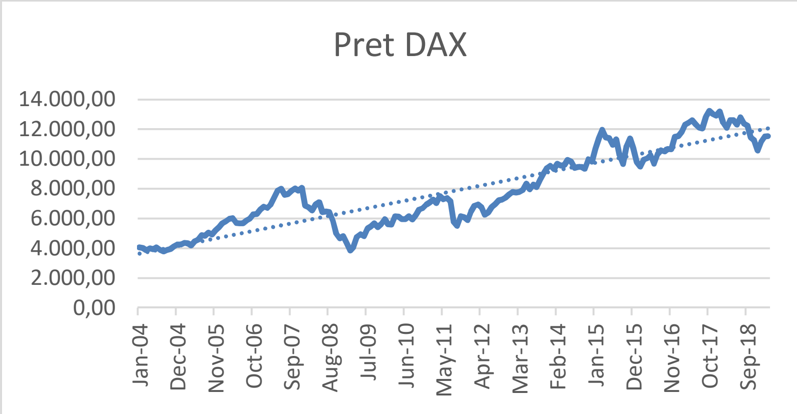
Source: Graph realized by the author based on data from www.investing.com (Feburuary 2004-January 2019)

Ukraine's main index failed to achieve its performance before the economic crisis. Regional instability and managerial decisions have led to a decline in company performance.

We can say that the clues in Romania are better than our neighbors, with the exception of Hungary, which shows very good economic development, surpassing the pre-crisis indices of 2008.

2.6.4. Representative indices of developed countries

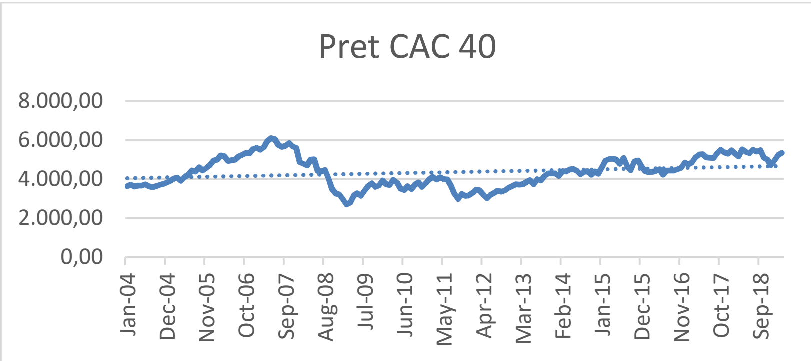
Fig. no. 26. Germany – DAX



Source: Graph realized by the author based on data from www.investing.com (January 2004-January 2019)

In the developed countries the correction started much faster than Romania and our neighbors. An economy based on production, quality and attention to detail have made this country a promoter of the European economy. Germany has the highest rise in indices in Europe.

Fig. no. 27 France – CAC 40

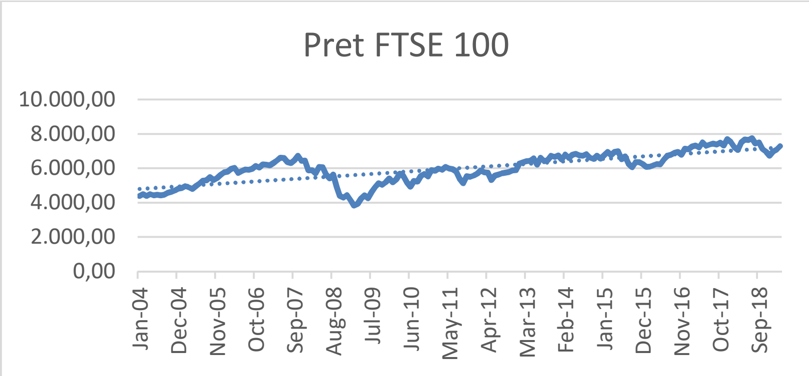


Source: Graph realized by the author based on data from www.investing.com (January 2004-January 2019)

We note that in the developed countries the economic crisis did not have an impact on the level of the capital market indices. A big increase was also the main index of France.

Growth is lower than Germany, but higher than Great Britain. The French economy had a rapid correction and managed to make a positive development.

Fig. no. 28. Marea Britanie – FTSE 100



Source: Graph realized by the author based on data from www.investing.com (January 2004-January 2019)

The United Kingdom has had a slower evolution towards Germany and France than the main indices. Growth was slower than the other developed countries, but the correction started two years after the start of the economic crisis.

What we can notice is that the Romanian indices have a very good performance compared to the countries that are neighboring us, from which it follows that the Romanian economy is working better and better. We can also note the levels of the very good indices of Hungary, Great Britain and Germany that have managed to cross the level achieved before the 2008 crisis. It is recommended to invest in indices in the countries where they are growing.

Table no. 4. Correlation of international index returns according to the Pearson correlation indicator.

Indices	SOFIX	BELLEX 15	BUX	UX	DAX	CAC 40	FTSE 100
SOFIX	-	-	-	-	-	-	-
BELLEX 15	0,624366	-	-	-	-	-	-
BUX	0,558811	0,499781	-	-	-	-	-
UX	0,526845	0,573232	0,531473	-	-	-	-
DAX	0,468755	0,394743	0,629178	0,4851	-	-	-
CAC 40	0,501291	0,43426	0,646129	0,4743	0,9019	-	-
FTSE 100	0,498839	0,453028	0,614649	0,5545	0,7817	0,8412	-

Source: calculated by the author on the basis of data on the index pages for 2004-2019

We observe according to table no. 4 a strong correlation between the indices of developed countries DAX and CAC 40 as well as FTSE 100 and CAC 40. For the other countries there are average correlations between the monthly yields of their indices.

2.6.5. Considerations on investments in index funds

We have noticed the remarkable success of long-term index investment strategies, even if it is demonstrated that the performance of the Standard & Poor's 500 has exceeded more than 85% of all the capital funds managed actively over the past three years, making the process both replicable and sustainable. For a better understanding of the evolution of index funds in recent years, we conducted an analysis of some of the most important index funds on the Romanian and foreign levels:

Table no. 5. Increase of index funds

Fund name	Evolution in last 6 yrs 2013-2019(%)	Evolution în last 5 yrs Anual average(%)	Evolution în last 10 yrs (%)
BT Index România ROTX *	+66,3	+13,26	+175,5
Certinvest BET FI Index *	+54,96	+10,99	*
Certinvest XT Index *	+40,01	+8,00	*
Index Europa BRD *	+37,27	+7,45	*
Certinvest BET Index *	+50,93	+10,18	*
BT Index Austria ATX *	+10,58	+2,11	*
Vanguard Growth Index Fund Investor Shares (USA)	+65,75	+13,15	+16,18
Vanguard S&P 500 ETF	+57,95	+11,59	*

* Established in the period after 2010

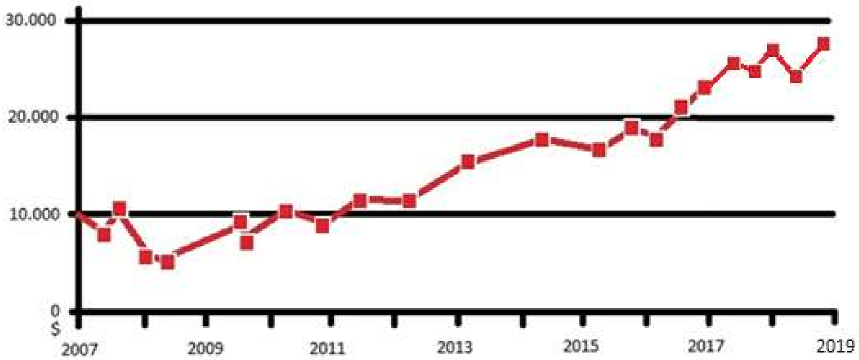
Source: Author's table based on the results of the funds taken from http://www.aaf.ro/statistici-de-investments-funds

From the point of view of the researched period, we consider that these funds appeared relatively late in Romania, having an age of approximately 8-9 years. During the economic crisis, all sectors of the economy were affected, so decreases were recorded among these funds.

There are certainly risks in these investments, but they are considered to be lower compared to other types of investment. It is normally accepted that a high level of risk can also bring high potential gains. Considering that these investments are a gamble may be an opinion, but the fact that on average double or triple earnings on bank deposits makes a calculated risk that is acceptable in the long term and earnings are profitable.

Analyzing the evolution of funds over a 10-year or 5-year period, we can get an overall view of the effectiveness of this type of investment. Fig. 20 demonstrates this in the context of the last economic crisis.

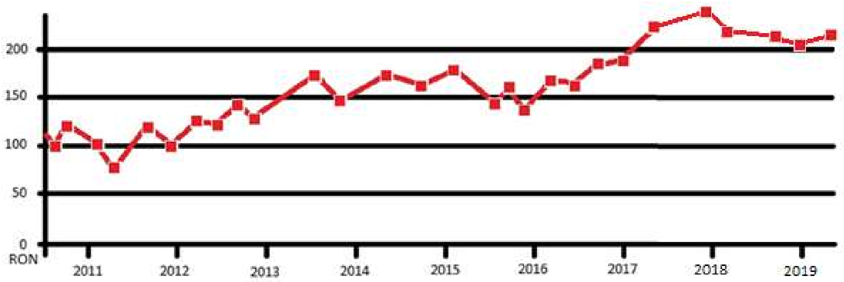
Fig. no. 29. Vanguard Growth Index Fund Investor Shares (USA)



Source: Made by author based on https://personal.vanguard.com (April 2007 - January 2019)

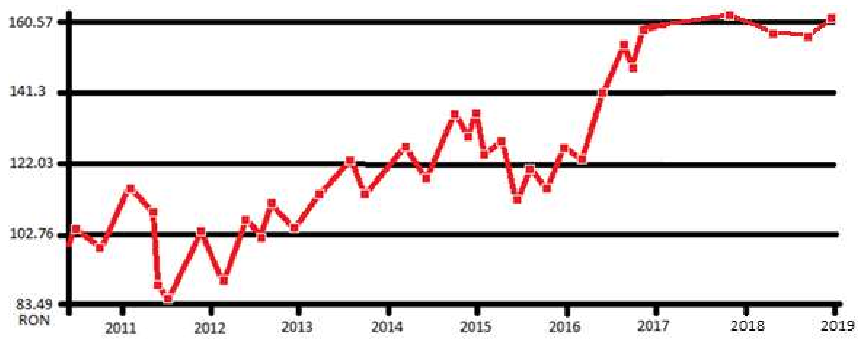
We can therefore consider that the investor engages in an indefinite period of variability to which capital is subject during that period. The more this variation is borne by the investor, the greater the efficiency. Fig. 29 and 30 show a long period of variability.

Fig. no. 30. Certinvest BET FI Index



Source: Made by the author based on data from http://investitii.certinvest.ro (January 2011 - January 2019)

Fig. no. 31. Index Europe BRD



Source: Made by the author based on data from http://www.brdam.ro (January 2011 - January 2019)

We believe that we need to focus on new forms of investment, because, relying solely on banks, our economies are stagnating in the long run. We also appreciate the need for time to understand the potential and the way the index funds work. By investing in these funds, the investor can better accommodate and understand the market without exposing himself to high risk ever since the beginning of the investment activity.

As far as capital growth is concerned, we believe that this must be a constant concern, regardless of a possible market depreciation that can lead to a surplus.

So in Chapter II we look at the activity of the Romanian and other countries' indexes and we come to the following conclusions:

- We find that Romania has performance indices, even if it failed to reach the pre-crisis performance of Germany or the UK. We also show a viable opportunity for long-term investment, namely in index funds, which bring much better performance than investments in banks.

- The thesis of the author's research and the realization of the PhD thesis is the realization of a current image based on the identification and analysis of the evolutions and tendencies manifested on the market, the institutional picture of the international capital markets, the anticipation of tendencies and the formulation of opinions on them.

- It starts from the fundamental observation that the capital market is configured as a pillar of contemporary and future human society. Beyond its fundamental functions, financing, investing, risk management, and its huge financial flows, it has become representative of a new way of political and economic organization of human society, namely that of democratic capitalism.

- The most prominent trends in the professional side are given by internationalization / globalization, electronization / computerization and innovation. Public access tends to become a direct one, disintermediation being a trend in which brokers and investment banks have to climb, discovering new services and opportunities. On the other hand, competition between stock exchanges and between them and new transactional vehicles becomes fierce. The solutions used are demultiplexing, self-listing, mergers, regional alliances. Ultimately, scholarships must have the strength to analyze and - starting from assuming the foundations - including phylogenetics - to restructure by assuming their own paradigmatic specificity.

- The capital market is vast and diverse, in addition it represents a vibrant economic environment in a continuous and dynamic evolution. Trying to surprise it on a single criterion or in a unitary perspective is not a valid, functional one. That's why a kaleidoscopic look, an approach that surprises fragments and then assembles them in search of an overall view, seems the most appropriate. This explains the title and the approach of the research, as well as the various fields of analysis contained in the chapters.

- A confluence of technological advances has caused tectonic changes in the financial landscape, creating winners and losers overnight. The winners are tech savvy as investors who understand their own risk preferences and financial goals and can appreciate the full range of risks and rewards offered by the exciting range of smart and index products today.

- The construction rules of an index fund clearly identify the type of companies suitable for the fund.

- Companies are bought and held within the index fund when they meet the specific index rules or parameters and are sold when moving outside of these rules or parameters. Some indicator providers announce company changes to their index before the change date, and other index providers do not make such ads.

- The main advantage of index funds for investors is that they do not need much time to manage because investors do not have to spend time analyzing different stock or stock portfolios. Many investors find it difficult to beat the performance of the S & P 500 index due to lack of experience / ability to invest.

- Index funds are passively managed funds, while mutual funds are actively managed.

- Index funds offer very good diversification benefits as these funds have shares in all sectors and some are therefore parts of the economy of a country. These funds have very low spending rates because of the low portfolio ratio. The risk involved in these funds ranges between moderate and high, depending on the index. Investors who are more interested in the more modest aim of having a component of equity growth in their portfolio rather than the more aggressive target to exceed the benchmark of the equity market would be better to invest in a type fund index.

All of these conclusions are concentrated in the final conclusions of the thesis and are presented in the thesis at pages 89-91.

CHAPTER III. PRINCIPLES AND THEORIES WITH REGARD TO PORTFOLIO MANAGEMENT

3.1. Portfolio Management Principles

The primary objective of the investment is to balance between risk and return, consistent with personal goals, risk tolerance, but also time horizons. So personal expectations will be taken into account as well as market expectations of yield forecasting and resource allocation after asset growth. The most used assets are, of course, shares, followed by bonds and then by money market instruments. Because we can not predict exactly the evolution, a broad diversification needs to be made, but not diversified so that we can no longer protect our investments. Developed economies benefit from a faster recovery from the recession.

For a successful choice in the investment process, we will check the history of the company where we want to invest and its management if the objectives of the company are met, if the company has profits, and if we can easily get out of the investment made or even seem to be on a good road this is overstated. Constant supervision over the company and the price of its shares is required. Therefore, achieving an efficient portfolio requires a lot of time and documentation to optimize it.

3.2. Effective Market Theory and Its Impact on Portfolio Management

The expansion of foreign investment indicates that international capital markets have become more than a mechanism for mobilizing funds, reallocating available capital from the economy, and securing investment liquidity. International capital markets give rise to arbitration and speculation opportunities through more and more complex financial instruments and techniques. Due to these considerations, it has been identified as necessary to manage these capitals by their optimal allocation in portfolios that generate the expected returns, but this capital allocation must also take into account the market conditions, thus questioning whether or not the efficient market exists studies on the validation of the efficient market hypothesis.

Researchers in the field of finance have tried to prove the existence of an efficient market, including Markowitz, Sharpe, Fama, French, MacBeth.

3.3. Theoretical trends regarding investors' risk aversion or risk preference in investment decisions

Regarding investor's risk aversion or preference, it can be stated that any rational investor aims to obtain the highest expected return. Thus, in the specialty literature it is specified that a rational investor means an investor who has a choice between two identical investment portfolios from all points of view except for the randamnet offered, he will prefer the portfolio offering the highest yield. But if the investor has a choice between two portfolios that involve a different degree of risk, it will not be enough to take into account only the highest yield, but these two issues will be taken together (yield - risk) in making the decision to invest.

3.4. Creating and evaluating portfolios using Capital Asset Pricing Model, Arbitrage Pricing Theory

Modern Portfolio Theory (TMP) addresses how a venture investor can build portfolios to optimize or maximize expected returns based on a certain level of market risk, underlining that risk is an inherent component of earnings bigger. Modern portfolio theory models asset performance as a normal distribution function, defines the risk that the standard deviation of return and portfolio structure is given by combinations of asset weights taken into account so that portfolio yield is a combination of weighted returns of those assets.

3.5. Opinions on post-modern theory construction of portfolios

After years of using asset valuation models developed by those who have laid the foundation for modern portfolio theory, researchers of the late twentieth century laid the foundations for a new theory, a continuation of the TMP, which we find under the name of theory post-modern portfolio portfolio (TPMP). Both theories have as their primary objectives the identification / elaboration of models to help rational investors by using diversification to optimize their portfolio and valuation of risky assets.[5]

Financial market researchers have been able to develop new models to better assess the evolution of financial markets. In terms of defining and establishing the TPMP concept, Frank Sortino has made the greatest contribution, showing that post-modern portfolio theory is not a model of capital market equilibrium, but a normative model.

At the end of the third chapter I presented the conclusions and personal contributions with main reference to:

- The activity on the Romanian capital market is an efficient one in relation to the economy of our country, but in order for it to meet the European standards it is necessary to take a series of measures aimed at improving the existing legislative framework by harmonizing it with the EU Directives in the field of the capital market, increasing the interest of the big companies in the capital market by providing the most complete and accurate information on the activity carried out and the use of all the facilities of the capital market, increasing the interest in the capital market by attracting important companies operating in the Romanian economy, drafting laws and regulations to ensure increased market activity and avoiding market withdrawals. Ensure the implementation of corporate governance principles in most of the listed listed issuers.

- As has been shown, the European approach involves "universal" banks that integrate all categories of financial services (banking, insurance and investment services). Currently, the trend is expanding, also taking over in the US where, in the past, analyzing activity, setting the price of securities, sources, and last but not least, funding itself was offered only by investment banks). Investment banking, sometimes considered a true art, is at the juncture between banking, consultancy and analysis, and trading on the market. Today, it is increasingly becoming an important part of the activity of "universal" banks.

- In the world of financial transactions, complex institutions have emerged, heavily capitalized themselves, managing huge funds and acting transnationally. The process is a dynamic one, evolving towards the proximity of the banking and securities sectors, by creating a global "supermarket" offering all types of financial products. This seems to be a necessary compromise due to the increase in the volume and complexity of financial flows. When faced with the need for new funding, in addition to bank credit, companies have four other sources: reinvestment of profits, bond issue, issue of preference shares, issue of new shares.

[5] http://www.revistadestatistica.ro/Suplimente/2013/1_2013/srrs1_2013a36.pdf

- If we look at young companies, they often prefer bank loans or reinvesting profits. Companies with experience in the stock market (seasoned / spicy) can have different strategies depending on when they are in the process of development, the industry they operate in, the market situation, and other considerations. Excessive adverse moments are overcome with the help of investment banks, either through the development of new financial products, or through the exit of international financial markets. Over the last fifty years, companies have funded the financial industry, oscillating between bond issues and stock issues, the latter especially when markets were in the "Bull" phase ("bull" - in English) , when there are capital and the willingness of investors to invest. When markets are strong, companies tend to take advantage of equity financing. During the periods of weakness of the bear / bear markets, such as "70," 80, companies were based on domestically generated bonds or bond issues.

- Shares and bonds evolve differently according to quantifiable criteria but also according to some conjunctural criteria. So, training courses and the evolution of the scholarship are an expression of how a complexity of factors of economic, financial, political, etc. influences demand and supply of financial securities. The scholarship is a barometer of the economy precisely because it responds sensitively to all the events, changes, assessments taking place in the business world, social-political life.

- The goal of any fund manager is to try to eliminate as much as possible the non-diversified risk or market risk. The risk of a particular sector or title can be eliminated through diversification, including portfolio holdings in all sectors, while market risk can not be diversified and reduced. Another issue is finding an appropriate calculation method for stock indices. From this point of view, there are several well-established methods for determining stock indices, namely: price indices calculated only on the basis of prices, stock indices calculated from a value variable and calculating course indices. The stock indices are primarily statistical indices (express variance of a size), having to satisfy certain properties, such as: monotony, price dimensionality, commensurability, propensity, identity. In practice, it is difficult to find an "ideal" stock index that satisfies all these properties as well as others. But it is important to find and use an index that satisfies as many as possible.

- Stock indices also allow the construction of derivative products such as stock-index futures and stock option contracts. These stock exchange contracts have emerged as a consequence of the lack of adequate instruments in market risk management, allowing operators, through a single transaction, to buy or sell a set of titles contained in the stock market basket without having to , for example, sell the securities in its portfolio and place the money in other saving instruments (in the event of a general stock market fall).

- Whatever the stock market index, it can not accurately represent the stock market, the reasons being multiple and taking into account the dynamics of the national economies, the interdependencies on the world market, the failure to take into account some difficult quantifiable factors (political, social, psychological, etc.).). We can say, in conclusion, that the fundamental analysis is the one that ensures the filtering of the issuers and finding those solid companies with medium and long-term profit potential or on the contrary that do not have good indicators. On the other hand, the fundamental analysis is not sufficient to justify the choice of an action. Taking into account the fact that the market price is established as a result of the meeting between supply and demand, the interest of the players may be different, and then the fundamental analysis with the technical analysis that determines the moment of entry and exit must be combined. The fundamental analysis therefore mainly aims to explain the medium and long-term movements. It is realized both at the level of the individual actions, respectively of the issuing companies, as well as at the level of the stock market (the stock market), respectively of the economic life in general.

- Knowing beforehand the changes that will occur as a result of adjusting the composition of an index is of particular interest to market players as it can influence their investment strategies, resulting in overall results.

- In conclusion, we draw the similarities and differences between the two described models, namely APT and CAPM.

All of these conclusions are concentrated in the final conclusions of the thesis and are presented in the thesis on pages 125-129.

CHAPTER. IV. STRATEGIES ON PORTFOLIO MANAGEMENT ON THE CAPITAL MARKET

4.1. Analysis strategies for selecting companies for capital market investments

Technical analysis:

In contrast to the analysis of the financial indicators that characterize the price evolution of an action, the technical analysis highlights the movement of an exchange rate as a result of supply and demand, and provides information that is likely and pertaining to the future course evolution.

The technical analysis attempts to determine an event and how much this event happens. Usually, technical analysis does not predict, but it only reflects the course movement. The exchange rate can be considered as a signal that influences the behavior of investors, and they adapt to market conditions.

The fundamental analysis implies:

Fundamental evaluation is based on financial indicators that are most used in the following:

a) Earnings per share, expressing the issuer's ability to achieve profit

b) Dividend distribution ratio, which reflects the share of the profit of the financial year distributed to the shareholders.

c) Dividend per share, calculated both as gross dividend distributed and net dividend

d) The yield of an action is generated both by dividends and by the increase in the market value of the share.

e) Price to earning ratio (PER) is the most used indicator showing the effectiveness of the placement in shares.

f) Dividends expected in the future - calculated by updating the cash flows, representing the future profitability of dividend placement.

4.2. Owning portfolio styles

We will look fundamentally to ensure the success of a company from an economic point of view. Choosing the right portfolio companies is the basis for portfolio composition and provides risk mitigation in investment. Although it is difficult to find a company that will show excellence at all the points we show in the next series, we can orient ourselves in the investment process towards the companies that meet these requirements as much as possible.

If a company has a profit margin (sales minus the cost of goods sold) higher than that of its competitors, it shows that this company is probably doing well with its customers as well as its costs. But competitive analysis is rather cumbersome, there is no average profit margin per industry, so competing competitors can be difficult because there are not two companies exactly the same. So it is very easy to mix the indicators between each other in the competitors' analysis. It is important to see in which direction the profit margin moves up or down. A growing profit margin may mean that the business does things well and becomes stronger on the market or in its industry. Neither is this perfect, but as the economy moved from an economic boom to a drastic fall, several excellent companies have cut their profit margins and especially operating margin (sales minus the cost of goods minus operating expenses) because they have dropped out of employees and used a smaller workspace capacity. However, in a stable economic environment, it is common sense for companies that have a growing profit margin to be favored by investors. In a declining market, companies that protect their profit margin will win.

4.3. Strategies underlying Portfolio Construction

4.3.1. Long-Short Strategy

Long-short portfolios build strategies are based on the purchase of shares for which a high return is expected over the next period while short selling is expected to be lower than the stock. Such strategies provide a leverage effect generated by additional surplus sales and at the same time have the advantage of generating returns with a low correlation with the market.

1. Building the plus index and the minus index.
2. Build tracking portfolios for: Plus plus (9 portfolios) and minus index (9 portfolios)
3. Build Long-Short Investing Strategy

4.3.2. Markov strategy

Similar to the long-short investment strategy, Markov's strategy involves obtaining profit under arbitration by building two different yield portfolios. The differences from the previous strategy are given by the way the two portfolios are built and the investment rules in them. The first portfolio used in the strategy is a replica of the benchmark (each share has an equal weight within the portfolio). The second portfolio is built to replicate the return on the index, but it contains fewer shares than the index, and the shares of shares are determined on the basis of the cointegration relationship between shares and indices. By comparing the yields of this portfolio with the reference index, it has been noticed that the cointegration relationship is not perfect, and in some periods significant differences between the performance of the tracking portfolio and the index-generated yield (tracking error) are observed. Given that the source of these differences can be identified and anticipated, an arbitrage relationship can be built by buying the portfolio for which higher returns are expected and short selling of the other portfolio.

4.4. Organization of Portfolio Management and Description of the Investment Process

The investment process is the plan investors put forward to ensure their performance in the investment field. We often hear that one person or another is successful in the investment he has generated, so we can translate a generalization of the investment process. Performance may be subjective depending on the investor. There are, however, some generalities that most investors practice.

First, investors define their financial goals very well.

Second, the investor will determine the asset allocation in its portfolio.

Diversification of investment across multiple classes of assets may protect the investor if he does not fully forecast financial developments.

Identifying components in the portfolio core is an important activity for the investor. The core of the portfolio is derived from local assets such as short-term fixed-income shares, bonds or fixed income instruments.

Empowering companies without spending capital is a powerful measure. Increased efficiency capital can keep the economy up, even if interest rates rise.

What an investor should consider to invest in the capital market are risks, company history, liquidity, valuation indicators, and company monitoring.

4.5. Prospects for investments in collective investment undertakings

Collective investment funds are represented by investment management companies (ISMs) dealing with the management of investment funds that are distributed or sold to investors or redeemed by investors.

Units are the object of the buy or buyback action that investors make. Fund units are issued by collective investment undertakings through which asset management companies operate. The price of the fund units is determined by the value of the net asset of the respective body. Fund units also bear the name of the participation title and these are proof of investment in a particular investment fund.

The only way to invest in such a fund is by acquiring units.

4.5.1. Differences and similarities between open and closed investment funds

Din punctul de vedere al emisiunii unităților de fond, cele două se diferențiază prin faptul că la fondurile deschise emisiunea se realizează în mod continuu pe când la fondurile închise emisiunea unităților de fond se realizează doar la anumite date ce se stabilesc în prospectul de emisiune.

From the point of view of the issuance of the fund units, the two are distinguished by the fact that for the open funds the issue is carried out continuously while the closed-down funds are issued only at certain dates set in the issue prospectus.

The life of open-ended funds is usually unlimited, while the duration of closed funds is limited exactly after the dates set in the issue prospectus.

The limits under which they can be invested are different for the two types of funds. In the case of open funds, there is a permissive policy that is imposed by law. Closed-ended funds have a strict investment policy.

From the point of view of listing investment funds, it is only possible to list closed funds, while listing open funds is difficult to achieve.

The number of investors in open-end investment funds is unlimited. Closed funds have a number regulated by investor law that must be less than 500.

The amount that can be invested in open-end investment funds depends on the ability of investors and the value of fund units. In the case of closed funds, the amount to be invested is limited and is set out in the prospectus.

4.5.2. Investments in open-end investment funds

Open-ended investment funds are known in English as "open end funds".

In order to give us an opinion on the evolution of open-ended investment funds, we chose open funds with the largest number of subscriptions. The funds with the highest number of subscriptions are BRD Symphony, Erste Bond Flexible Ron and BT Bonds.

The most popular investment fund for Romanians is one of the funds managed by BRD. This fund manages to attract the most subscriptions among investors in our country.

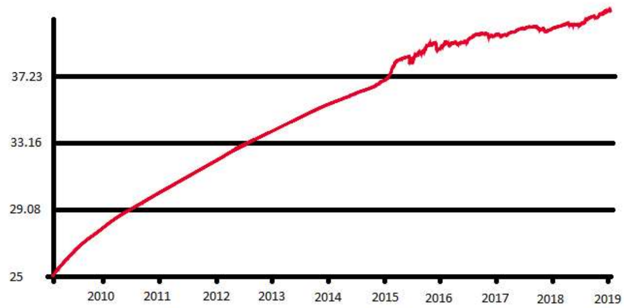


Fig. no. 32. BRD Simfonia

Source: Graph realized by the author based on site data from www.brdam.ro (April 2009 - April 2019)

We see a constant in the evolution of the BRD Symphony Fund. Since 2015, fund fluctuations have become more pronounced. The Fund has moved on to more aggressive investments, changing its portfolios. The advantages of a more pronounced fluctuation show that investors can buy units of fund when their price is lower, thus earning higher profits.

Fund performance is 6.48% per annum for the period outlined in the above chart.

Erste Fund, owned by the Erste - BCR Group. This fund is the second open-end investment fund as the number of underwritings.

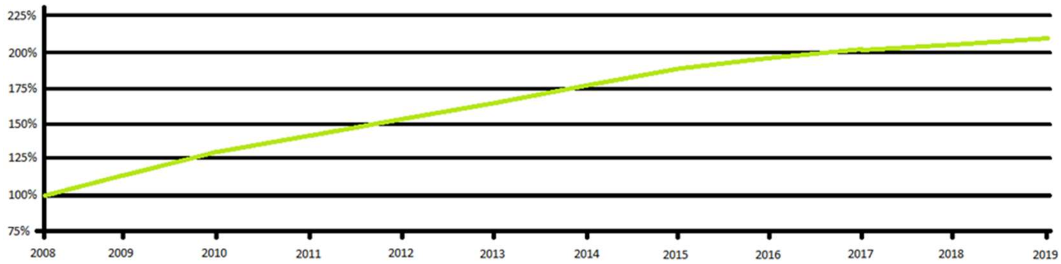


Fig. no. 33. Erste Bond Flexible Ron

Source: Graph realized by the author based on data from www.erste-am.ro (April 2008 - April 2019)

The Erste Fund brings the highest constancy among investment funds. Over the years, it has been maintained with consistent and intrusive transparency for investors. The Fund invests over 80% in fixed income financial instruments as bonds and the other 20% in other types of instruments and bank deposits. The Erste Bond Fund brings a performance of 6.79 / year for the period outlined in the chart above.

The BT Bond Fund is a product targeted at cautious investors. The Fund invests in fixed income instruments and less in shares. Adhesions to this fund are popular and bring an advantageous constancy. The evolution of the BT Bond Fund can be seen in Fig. 34.

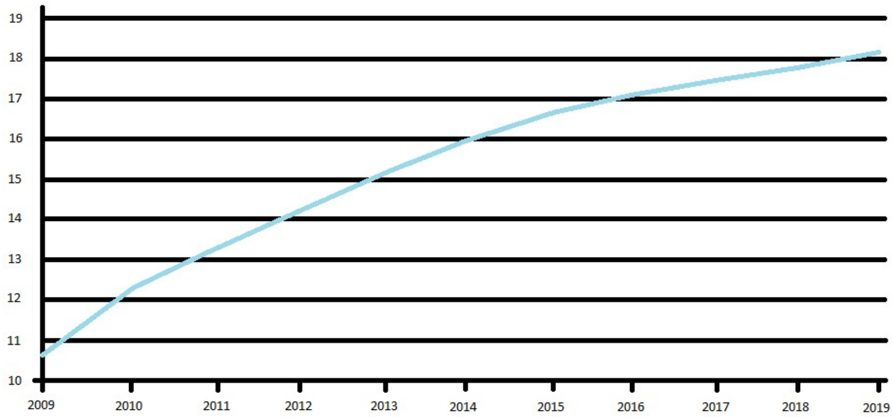


Fig. no. 34. BT Obligațiuni

Source: Graph realized by the author based on data from www.btassetmanagement.ro (April 2009 - April 2019)

Investors who choose this fund have the option to invest online in an easy-to-use internet banking platform. This fund is built in such a way that investors can win by exploiting market imbalances. Transparency and effectiveness of the fund shape it to be a very popular fund among conservative investors. The performance of the BT Bond Open Fund for the period specified in Fig. 34 is 6.40% per year.

The depositary makes an action called custody in order to secure the securities that are in the asset of the investment fund, thus correlating between the value of the fund unit and the value of the assets.

4.5.3. Investments in closed-end investment funds

Closed investment funds are known in English as "closed end funds".

These funds have a different system than open ones, being more restrictive with investors in terms of access to the fund and the action of deinvestment. Closed funds have certain fixed dates where it is permissible to buy or redeem units. They present documents on the basis of which they work in which are stipulated the dates at which purchase and redemption are allowed. The life of closed funds is limited and, at the end of the period, financial resources are often divided into investors according to the proportion held in the investment fund.

The closed-end investment fund has a limited number of investors that are subject to a minimum threshold to invest in this financial instrument.

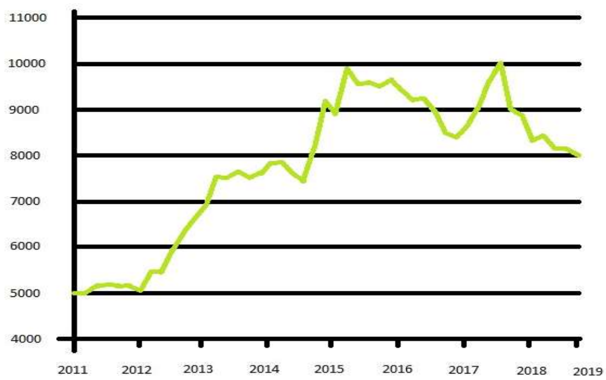


Fig. no. 35. FÎI Herald

Source: Graph realized by the author based on data from www.atlas-am.ro (April 2011 - April 2019)

Closed Herald Investment Fund of Fig. 35 recorded a performance of 6.68% a year over the period provided in the above graph. This performance attracted investors, although between 2015-2019 it had a more aggressive fluctuation in the market. So investors need to be very careful about what commission they pay for their investment.

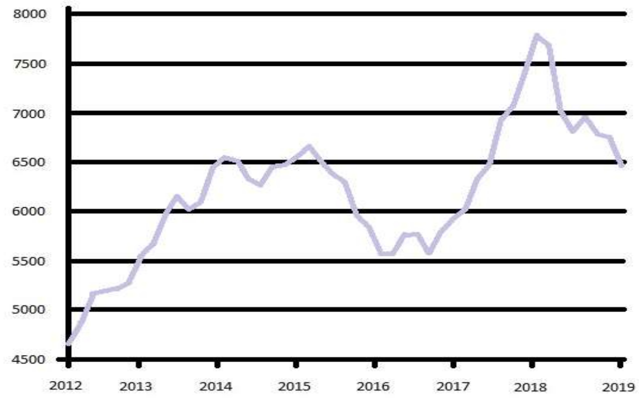


Fig. no. 36. FII DCP Investiții

Source: Graph realized by the author based on data from www.atlas-am.ro (April 2011 - April 2019)

The DCP Investment Fund managed to perform 6.55% per year between 2012 and 2019. Subscription to this fund is made with a commission of 0.11% of the subscribed amount. The Fund does not charge a redemption fee. This investment fund is of high risk. The DCP Investment Fund has gone through fluctuations but has managed to recover in a later period. The risk profile of each investor, as well as the careful calculation of the costs and commissions of the investment fund, which are public, determines the investor to choose the appropriate investment instrument.

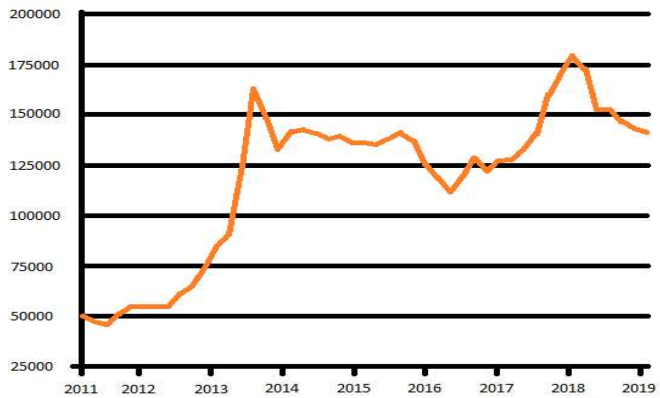


Fig. no. 37. Hermes RON

Source: Graph realized by the author based on data from www.atlas-am.ro (April 2011 - April 2019)

The Hermes Fund above (Figure 37) had an upward slope between 2011-2013, followed by a 5-year decline until correction. However, this massive increase in the early years has made the long-term investment in this fund to achieve a performance of 22.85% per year.

Through a more restrictive policy of managing closed funds, investors have a more limited scope to operationalize transactions, buy or redeem fund units. However, through these restrictions and higher administration costs, some funds manage to yield returns for investors with higher risk tolerance.

4.5.4. Investments in SIF-type companies

Financial investment companies are firms that operate similarly to closed-end investment funds. These are set up under the constitutive act. SIF companies are regulated by the Financial Supervisory Authority. They are listed on the stock exchange and the price of their shares varies depending on the demands and offers on the market. In our country there are five SIFs, named after the regions of the country - SIF Banat Crisana symbol (SIF1), SIF Moldolva (SIF2), SIF Transilvania (SIF3), SIF Muntenia (SIF4) and SIF Oltenia (SIF5). All these companies have been listed on the BVB since 1999 and are part of the BET-FI stock index.

Companies hold in the portfolio primarily shares in that area according to the name.

Of the five financial investment companies, only two managed to bring good performance to investors. The best performers are SIF 1 Banat Crişana and SIF 2 Moldova.

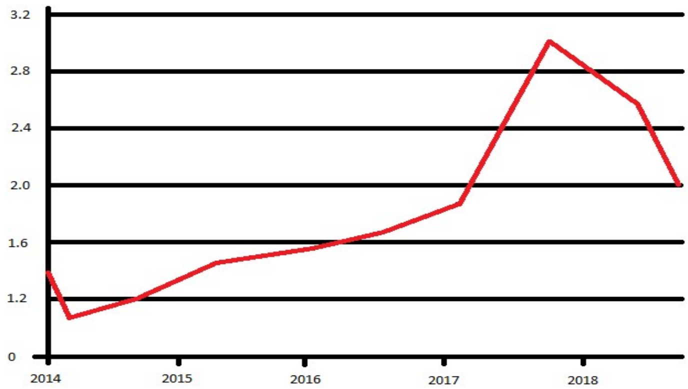


Fig. no. 38. SIF 1 Banat Crişana

Source: Graph realized by the author based on data from www.sif1.ro (April 2014 - April 2019)

SIF 1 recorded during the period provided in Fig. 38 a performance of 8.57% per annum, yielding a favorable return to investors.

The Banat Crişana Financial Investment Company is the successor of the Private Property Fund I, which was born in 1992. The largest components of SIF 1 are Banca Transilvania, Erste Group Bank AG, BRD Groupe Societe Generale, SIF Imobiliare, Vrancart, Biofarm, SIF Hotels , Azuga Tourism, SIF Moldova and SNGN Romgaz.

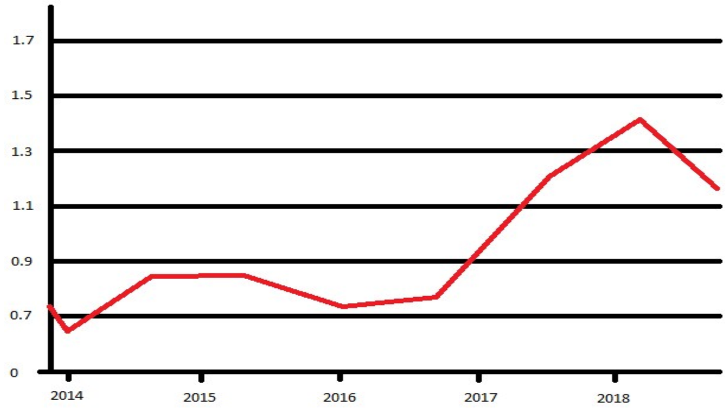


Fig. no. 39. SIF 2 Moldova

Source: Graph realized by the author based on data from www.sifm.ro (April 2014 - April 2019)

SIF 2 Moldova is a company that has registered an increase with acceptable volatility for risk-tolerant investors. SIF 2 managed to record a performance of 11.08% per year over the projected period (Figure 39).

The companies that are part of SIF 2 Moldova are: Mecanica Ceahlau SA, Regal Galati SA, Reunite Textile SA, Casa SA, Asset Invest SA, Agrointens SA, Agroland Capital SA, Hotel Sport Cluj SA.

4.5.5. Investments in Fondul Proprietatea

Fondul Proprietatea is a joint stock company and operates similarly to closed-end investment funds. It is listed on the BSE since 2011. The Fund operates under the internal and European regulations in force regarding alternative investment fund managers.

The government of the country has made efforts to make this fund one of the best for the country's investors. However, Fondul Proprietatea managed to achieve a performance for investors of only 3.51% per annum for the projected period (Figure 40). It is a small return on other financial instruments that are privately managed.

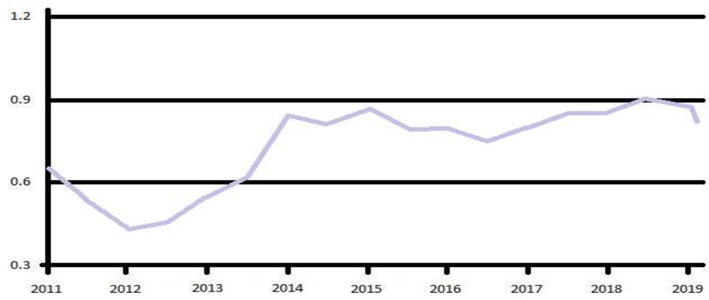


Fig. no. 40. Fondul Proprietatea

Source: Graph realized by the author based on data from *www.fondulproprietatea.ro* *(April 2014 - April 2019)*

Fondul Proprietatea was listed on the Specialist Fund Market on April 29, 2015 via the London Stock Exchange, through Global Deposit Certificates (GDRs).

4.6. The simplified markowitz applied to a portfolio

One of the most scientifically recognized finance models is that developed by Harry Markowitz [1952] considered by many specialists as the founder of modern finance. The model provides a solution for efficient portfolio management for rational investors characterized by risk aversion (quantified by dispersion of expected returns), as they require a certain return. For the portfolio manager, it is sufficient for the client investor of the investment fund to formulate concretely its requirements regarding the minimum profitability level accepted and the model allows the identification of such a portfolio structure that results in obtaining this level of the indicator under minimal risk conditions.

Assumptions of Markowitz:

a) The criterion for selecting effective combinations of "n" titles is "hope-dispersion" (profitability-risk).

b) All "n" titles are risky, characterized by a certain hope of profitability (Ei), dispersion (s) and covariance with each of the other titles in the portfolio (sij).

c) The expected profitability of the portfolio (E * p) is an exogenous variable to the model, provided by investors.

The structure of portfolios on the Markowitz border will be determined by minimizing portfolios risk under a few restrictions determined by the model assumptions:

- the budgetary constraint requiring that all invested capital be included in the securities purchased from the portfolio: $\sum x_i = 1$ (1)

- the portfolio performance requirement, respectively, a certain E * p expected return, which is the average expected return on portfolio securities: $\sum x^{t} E^{t} = E_{*}^{b}$ (2)

- Portfolio risk minimization can be achieved through the Lagrange combined function:

$$L = \frac{1}{2}\sum_i \sum_j x_i x_j \sigma_{ij} + \lambda_1\left(\sum_i x_i E_i - E^*{}_p\right) + \lambda_2\left(\sum_i x_i - 1\right) \quad (3)$$

$$\begin{bmatrix} \sigma_1{}^2 & \sigma_{12} & \Lambda & \sigma_{1n} & E_1 & 1 \\ \sigma_{21} & \sigma_2{}^2 & \Lambda & \sigma_{2n} & E_2 & 1 \\ M & & & & & \\ \sigma_{n1} & \sigma_{n2} & \Lambda & \sigma_n{}^2 & E_n & 1 \\ E_1 & E_2 & \Lambda & E_n & 0 & 0 \\ 1 & 1 & K & 1 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} x_1 \\ x_2 \\ M \\ x_n \\ \lambda_1 \\ \lambda_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ M \\ 0 \\ E^*{}_p \\ 1 \end{bmatrix} \Leftrightarrow X = W^{-1} \times K \quad (4)$$

W x X = K

$$\begin{bmatrix} \sigma_1{}^2 & \sigma_{12} & \Lambda & \sigma_{1n} & 1 \\ \sigma_{21} & \sigma_2{}^2 & \Lambda & \sigma_{2n} & 1 \\ M & & & & \\ \sigma_{n1} & \sigma_{n2} & \Lambda & \sigma_n{}^2 & 1 \\ & & & & \\ 1 & 1 & K & 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} x_1 \\ x_2 \\ M \\ x_n \\ \\ \lambda_1 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ M \\ 0 \\ \\ 1 \end{bmatrix} \Leftrightarrow X = W^{-1} \times K \quad (5)$$

W x X = K

It is used to determine the PVMA component

Thus the shares of the various titles in the E * p expected profitability portfolio on the efficient Markowitz border become known and the risk of this portfolio can also be found.

$$\sigma^2{}_p = \sum_{i=1}^{n} \sum_{j=1}^{n} x_i x_j \sigma_{ij} \quad (6)$$

To simulate a portfolio in our case study, we chose BRD Groupe Societe Generale SA, Banca Transilvania S.A., Turbomecanica S.A. and S.N. Nuclearelectrica S.A. Companies were chosen from different sectors for a wider diversification of the model.

In the first stage, companies' quotations were collected for a period of 6 months, as given in Annex 1.

In the next step, daily yields were calculated to calculate a company's average return on equity.

Following the construction of the covariance matrix, the inverse of the covariance matrix was then made to find out the minimum variance point of the portfolio chosen by us.

A simulation of the returns proposed in accordance with the minimum variance was achieved in order to achieve a profitable portfolio.

Following the model, simulations were made with a proposed return of 35%, 55% and 75%, and the share of each item in the portfolio that is needed for the investment in question.

The formulas used in Microsoft Excel for the values obtained were:

E=(E1-E2)/E3

=covar()

=minverse()

=mmult()

=average()

Therefore, following the model development, the portfolio weights in the x1, x2, x3, x4 shares are shown in the last centralized table no. 11.

Table no. 10. Markowitz Model

	Rentabilittate medie E						
BRD	TLV	TBM	SNN				
-0,11%	-0,05%	0,23%	0,24%				
	Matrice de covarianță						
	BRD	TLV	TBM	SNN			
BRD	0,000816	0,000722138	0,000163001	0,000236604	1		
TLV	0,000722	0,000923436	0,000210231	0,000271722	1		
TBM	0,000163	0,000210231	0,000392937	0,000155089	1		
SNN	0,000237	0,000271722	0,000155089	0,00055912	1		
	1	1	1	1	0		
	Invers matrice de covarianță						
BRD	3832,098	-3022,849526	-359,5456119	-449,7032697	0,221885752		0
TLV	-3022,85	3706,695573	-421,9790343	-261,8670133	-0,08011339		0
TBM	-359,5456	-421,9790343	1968,204912	-1186,680266	0,557980656		0
SNN	-449,7033	-261,8670133	-1186,680266	1898,250549	0,300246982		0
	0,221886	-0,08011339	0,557980656	0,300246982	-0,000285141		1
	Punctul de variație minimă absolută				PVMA		
BRD	0,221886	0,221885752	0,221885752	0,221885752	0,221885752	x1	
TLV	-0,080113	-0,08011339	-0,08011339	-0,08011339	-0,08011339	x2	
TBM	0,557981	0,557980656	0,557980656	0,557980656	0,557980656	x3	
SNN	0,300247	0,300246982	0,300246982	0,300246982	0,300246982	x4	
	-0,000285	-0,000285141	-0,000285141	-0,000285141	-0,000285141		
	Simulare rentabilități propuse						
	Ep	x1	x2	x3	x4		
Epvma=	0,18%	22,18%	-8,01%	55,79%	30,02%		
Em=	0,54	34,17%	3,69%	85,93%	46,24%		
	1,00%	22,41%	7,93%	56,36%	30,32%		
	1,05%	22,42%	7,93%	30,34%	30,34%		
	3%	22,85%	7,77%	57,47%	30,93%		
	Modelul markowitz in formă matriceală						
	0,000816	0,000722138	0,000163001	0,000236604	0,54	1	
	0,000722	0,000923436	0,000210231	0,000271722	1	1	
	0,000163	0,000210231	0,000392937	0,000155089	1,05	1	
	0,000237	0,000271722	0,000155089	0,00055912	3	1	
	0,54	1	1,05	3	0	0	
	1	1	1	1	0	0	

	Rentabilitate propusă 0.35%							
	3035,333	-2771,443091	-986,6837271	722,7937084	-0,297283946	0,675637835		0
	-2771,443	3627,368329	-224,0957202	-631,8295179	0,093803153	-0,223287539		0
	-986,6837	-224,0957202	1474,581235	-263,8017881	-0,233993742	0,915131284		0
	722,7937	-631,8295179	-263,8017881	172,8375976	0,437474536	-0,36748158		0
	-0,297284	0,093803153	-0,233993742	0,437474536	-0,000110921	0,000169301		0,35
	0,675638	-0,223287539	0,915131284	-0,36748158	0,000169301	-0,00054355		1
	Rentabilitate propusă 0.35%							
BRD	0,571588	0,571588454	0,571588454	0,571588454	0,571588454	0,571588454	x1	
TLV	-0,190456	-0,190456435	-0,190456435	-0,190456435	-0,190456435	-0,190456435	x2	
TBM	0,833233	0,833233474	0,833233474	0,833233474	0,833233474	0,833233474	x3	
SNN	-0,214365	-0,214365493	-0,214365493	-0,214365493	-0,214365493	-0,214365493	x4	
	0,00013	0,000130479	0,000130479	0,000130479	0,000130479	0,000130479		
	-0,000484	-0,000484294	-0,000484294	-0,000484294	-0,000484294	-0,000484294		
	Rentabilitate propusă 0.55%							
	3035,333	-2771,443091	-986,6837271	722,7937084	-0,297283946	0,675637835		0
	-2771,443	3627,368329	-224,0957202	-631,8295179	0,093803153	-0,223287539		0
	-986,6837	-224,0957202	1474,581235	-263,8017881	-0,233993742	0,915131284		0
	722,7937	-631,8295179	-263,8017881	172,8375976	0,437474536	-0,36748158		0
	-0,297284	0,093803153	-0,233993742	0,437474536	-0,000110921	0,000169301		0,55
	0,675638	-0,223287539	0,915131284	-0,36748158	0,000169301	-0,00054355		1
	Rentabilitate propusă 0.55%							
BRD	0,512132	0,512131664	0,512131664	0,512131664	0,512131664	0,512131664	x1	
TLV	-0,171696	-0,171695804	-0,171695804	-0,171695804	-0,171695804	-0,171695804	x2	
TBM	0,786435	0,786434725	0,786434725	0,786434725	0,786434725	0,786434725	x3	
SNN	-0,126871	-0,126870585	-0,126870585	-0,126870585	-0,126870585	-0,126870585	x4	
	0,000108	0,000108295	0,000108295	0,000108295	0,000108295	0,000108295		
	-0,00045	-0,000450434	-0,000450434	-0,000450434	-0,000450434	-0,000450434		
	Rentabilitate propusă 0.75%							
	3035,333	-2771,443091	-986,6837271	722,7937084	-0,297283946	0,675637835		0
	-2771,443	3627,368329	-224,0957202	-631,8295179	0,093803153	-0,223287539		0
	-986,6837	-224,0957202	1474,581235	-263,8017881	-0,233993742	0,915131284		0
	722,7937	-631,8295179	-263,8017881	172,8375976	0,437474536	-0,36748158		0
	-0,297284	0,093803153	-0,233993742	0,437474536	-0,000110921	0,000169301		0,75
	0,675638	-0,223287539	0,915131284	-0,36748158	0,000169301	-0,00054355		1
	Rentabilitate propusă 0.75%							
BRD	0,452675	0,452674875	0,452674875	0,452674875	0,452674875	0,452674875	x1	
TLV	-0,152935	-0,152935174	-0,152935174	-0,152935174	-0,152935174	-0,152935174	x2	
TBM	0,739636	0,739635977	0,739635977	0,739635977	0,739635977	0,739635977	x3	
SNN	-0,039376	-0,039375678	-0,039375678	-0,039375678	-0,039375678	-0,039375678	x4	
	8,61E-05	8,61106E-05	8,61106E-05	8,61106E-05	8,61106E-05	8,61106E-05		
	-0,000417	-0,000416574	-0,000416574	-0,000416574	-0,000416574	-0,000416574		

Source: made by the author based on the data on www.bvb.ro, which is in the Appendix.

Table no. 11. Weights to simulate the expected return

Rent aștep. E*	x1	x2	x3	x4
35,00%	57,16%	-19,05%	83,32%	-21,44%
55,00%	51,21%	-17,17%	78,64%	-12,69%
75,00%	45,27%	-15,29%	73,96%	-3,94%

Source: made by the author based on the data on www.bvb.ro, which is in the Appendix.

At the end of the fourth chapter I presented the conclusions and personal contributions, referring to the following:

- We come to the conclusion that investors in a diversified market, such as the S & P 500 (or a stock market fund), and the holding of their bonds in a total market index are the best investors. (However, high-level investors would have a portfolio of very low quasi-indicators of high-quality municipal bonds in the medium term). While such an indicator-based strategy may not be the best investment strategy ever developed, the number of worse investment strategies is infinite.

- Warren Buffett tells us: "Most institutional and individual investors will find that the best way to hold joint shares is through an index fund that charges minimum fees. that they will beat the net (after tax and expense) results delivered by the vast majority of investment professionals. "(Do not forget that a minimum-duty index is also for most investors, the best way to hold bonds own.).

- For all the inevitable uncertainty, in the middle of the ever-dense fog around the world, to invest, there remain many things we know.

- As we look for success in investment, we realize that we can never know how stocks and bonds will return in the years to come, nor the future profits that could be obtained through alternatives to the index portfolio. We can consider these common sense realities:

  - we know that we need to start investing as soon as possible and continue to put money on a regular basis;
  - we know that the investment raises risks, but we also know that we do not want to make financial mistakes;
  - we know the sources of yield on the stock and bond markets and this is the beginning of wisdom;
  - we know that the risk of selecting individual securities as well as the risk of selecting fund managers and investment styles can be eliminated by the total diversification offered by the traditional index fund, with only market risk;
  - we know that the costs have a long-term problem and we know that we have to minimize them;
  - we know that taxes matter and that they must also be minimized;
  - we know that neither the beating of the market nor the success of the market can be generalized without self-contradiction, which can work for the few that can not work for many.

- Finally, we know what we do not know. We can never be sure what our world will look like tomorrow, and we know much less about how it will look the next decade. But with intelligent asset allocation and sensitive investment options, we can be prepared for the unavoidable inconvenience along the way, and we should slip through them.

- The traditional index fund is an investment that guarantees this goal. The investor will not be among the losers, whose return on investment will fall far less than the profitability achieved on the stock market. Investors can benefit if they take into account these investment principles.

- We can see from the data on collective investment undertakings that they are efficient methods of placing long-term financial resources, as long as the investor is at a risk tolerance and cost specific to this financial area.

- If we look long-term, investing in collective investment funds is among the best ways to invest financial resources for variable earnings from 3% to 10-15% per annum in very good performance.

- The choice of instruments to invest must be in line with the ability of the instrument to make future profits.

- We note that there is a direct correlation between the risk assumed by the investor and the potential gains from investments in financial instruments.

- Open funds are easy to access for investors.

- Open Funds have a high degree of liquidity. They produce relatively stable earnings exceeding bank interest rates.

- In our highly digitized times, innovating financial instruments are being accessed by more people than traditional paper-based systems.

- Open-end investment funds are often associated with a high degree of risk, but it is not always true.

The financial reality makes us very attentive to money resources and we are increasingly analyzing existing revenue outcomes to make a positive choice for personal financial resources.

All of these conclusions are concentrated in the final conclusions and are presented in the thesis at pages 159-160.

FINAL CONCLUSIONS, PERSONAL CONSIDERATIONS AND FUTURE DEVELOPMENTS

Developing a solid investment process is a personal challenge for investors. To create an efficient investment plan, the investor needs to look at the world's best investors, the true masters. They must be chosen and studied with great care; reading and listening to them and trying to collect everything from them. This is how a successful investor approaches this vast economic field. This approach is refined by the experience of the investor's day-to-day life that helps him in the investment. This is how the investor develops firm and consistent beliefs that allow investors to be courageous and turn the back of the flock, being patient and accepting uncertainty, and ultimately keeping their minds clear when those around them are agitated.

Arming with an adequate intellectual framework and developing the personality traits necessary for a solid investment process can lead to the goal of preserving and increasing the purchasing power of savings.

Through this research we do not predict economic growth or consumer behavior, but we can add considerations to distinguish the implications of market interventions and prepare us to solve them.

Markets function reasonably because they are just exchanges between freely acting people. Some of the market participants or others will always recognize when there is a disorder on the market, and through their actions they will approach it.

This provides us with a basis for addressing the investment process, which aims to add value that others will not see or see. Real estate assets, especially shares of listed companies, are best for maintaining the purchasing power of our long-term savings. The stock market is not the field of speculators. Instead, it is a place where all the virtues and misfortunes of mankind play together - our true self, and where, thanks to the analysis of behavioral science, we can find the irrational (or emotional) side of human beings, allowing us to get back to paths which gives us peace of mind and independence in the future.

Indeed, the focus of our analysis is humanity itself. The businesses we analyze are created and developed by people who sell their products and services to others. We do not analyze strange beings or mythical or legendary markets, we analyze people.

Some people manage to create and develop exceptional businesses that are hard to reproduce. Other businesses are mute failures. The former are more interesting for potential investments, especially when circumstances mean they can be purchased at affordable prices. These are the business that should be the focus of our time; analyzing their competitive position and resistance to future developments.

If we do this we are asked to have a strong force on our emotional, primordial claims. We must have patience, curiosity, modesty and boldness. Let's be patient, because it may take some time for others to wake up to what we see, which is why we need to have a long-term perspective. Investors have to be incisive because they have to be careful about everything that's happening around them, you're modding because the errors are common, but the key is to draw the right conclusions from these errors. Bold is important because sometimes they will appear as travelers, traveling in the opposite direction to the flow of traffic, but also consistent. The investor is preparing step by step, day by day, such as preparing for an ongoing exam which forces him to be stuck in an unceasing study of a subject that is expanding and continuously changing.

Following the information presented in this doctoral thesis, we come up with several conclusions about the capital market investments. The first conclusion is that the investor must be concerned about the environment of the economy, unless he has a clear idea of how the capital market economy affects. The intuition that predicts what will really happen in the market can be trusted to the investor only once every few years. It is worth noting that it is good for the investor to be a debtor, and not a lender, and to invest in assets that can produce value. The investor must decide to allocate his resources to the financial instruments he only knows. The amount of cash invested is not necessarily relevant, but it is important for the investor to know its limits, no matter what sector he decides to invest. No one is forced to invest in something, and it can often be more profitable for people to invest but to invest.

If the investor does not have extensive market information, it is suitable for him / her to invest in indices. It is to be appreciated that in order for an investor to become more skilled in this art, he must have shares of a company in one form or another.

An investor who decides to invest in shares will spend time analyzing the competitive position of the company in which he decides to invest. The rest of the information may be an overload for the investor. After all, it's about studying societies, not about studying the whole market. Buying a share in a company should be the same as buying the whole of the company. If the investor would not want to buy the whole of society then he should not even invest in an action of society.

Companies with a long-term activity are much more likely to keep return than new firms. A long-term investor will turn to stable societies to avoid potential problems. The investor must ensure that the company will be able to support its position over the next 10 years. If technology is likely to suffer moral wear or be replaced, it is better not to invest.

If there is a company that creates value each year, the investor does not have to worry if the market does not focus on that company. There is another opportunity to continue investing at a good price. The lower the price of a well-researched share, the higher the positive potential of the investment, and the lower the risk.

The investor must adjust to past performance and pay attention to extrapolations. Things change and problems can occur in the least expected places. Speculators and volatility are the best friends, and the higher the volatility, the more the investor needs to be more careful in the long run to get reasonable profits. Lack of liquidity is an investor's ally. Some investors pay a lot for liquidity. Understanding what motivates other investors to act and why they make the choices they make, investments will be better and better. If the investor does not have the right personality to invest, it's best not to get involved. It is very important for the investor to have clear investment convictions. It is a forever learning process.

Investments in listed shares involve an asymmetry of information between the buyer and the seller. In the private market, the seller knows how much an asset is worth, as most imigrant owners know how much their home is worth. With the listed shares, small investors spend too little time on the analysis, and institutional investors are subject to restrictions on these institutions. Making appropriate investment decisions depends not only on the performance forecast of a company, but also on how to distinguish between what the market thinks will happen and what will really happen.

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