

**“LUCIAN BLAGA” UNIVERSITY OF SIBIU
FACULTY OF ECONOMICS
DOCTORAL SCHOOL**

- Doctoral Dissertation –

*Evolutions and Trends in the Financial Position and
Performance of Economic Entities Belonging to the
Pharmaceutical Industry*

- Summary -

Ph.D. Advisor: Prof. Nicolae Balteş. Ph.D.

Ph.D. Student: Georgiana Daniela Minculete (Piko)

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CONTENTS

INTRODUCTION.....	6
CHAPTER 1: ANNUAL FINANCIAL STATEMENTS – A SOURCE OF INFORMATION ON ASSESSING THE FINANCIAL POSITION AND PERFORMANCE OF THE ECONOMIC ENTITY	17
1.1 The Role, Importance and Evolution of the Legal Framework for Drawing Up Annual Financial Statements	17
1.2 Qualitative Characteristics of the Information Stated in Financial Statements and Categories of Users	28
1.3 General Principles of Financial Reporting	29
1.4 The Benefits of Adopting International Financial Reporting Standards.....	30
Conclusions and Personal Contributions.....	31
CHAPTER 2: CAPITALIZING ON THE FINANCIAL INFORMATION IN ASSESSING THE FINANCIAL POSITION OF ECONOMIC ENTITIES.....	32
2.1 Evolutions in the National and International Pharmaceutical Market	33
2.2 Selective Ratios for Assessing the Financial Position of the Economic Entity	34
2.2.1 Financial Structure Ratios	35
2.2.2 Financial Position Ratios.....	36
2.3 Models for Assessing the Insolvency Risk	40
2.4 Research on the Evolution of Ratios for Financial Structure Analysis in Economic Entities Belonging to the Farmaceutical Industry	44
2.4.1 Evolution of Ratios for Financial Structure Analysis in Economic Entities Belonging to the Global Pharmaceutical Industry	44
2.4.2 Evolution of Ratios for Financial Structure Analysis in Economic Entities Belonging to the Romanian Pharmaceutical Industry.....	50
2.4.3 Comparative Study on the Financial Structure of Economic Entities Belonging to the Pharmaceutical Industry: Global versus National.....	59
2.5 Research on the Evolution of Ratios for Financial Statement Analysis in Economic Entities Belonging to the Farmaceutical Industry	62
2.5.1 Evolution of Ratios for Financial Statement Analysis in Economic Entities Belonging to the Global Farmaceutical Industry	63
2.5.2 Evolution of Ratios for Financial Statement Analysis in Economic Entities Belonging to the Romanian Farmaceutical Industry.....	64

2.5.3 Comparative Study on the Financial Statement of Economic Entities Belonging to the Pharmaceutical Industry: Global versus National	65
2.6 Research on the Insolvency Risk in Economic Entities Belonging to the Pharmaceutical Industry.....	69
2.6.1 Insolvency Risk in Economic Entities Belonging to the Global Pharmaceutical Industry	69
2.6.2 Insolvency Risk in Economic Entities Belonging to the National Pharmaceutical Industry.....	70
Conclusions and Personal Contributions.....	72
CHAPTER 3: CAPITALIZING ON ACCOUNTING INFORMATION IN ASSESSING THE FINANCIAL PERFORMANCE OF ECONOMIC ENTITIES.....	75
3.1 Selective Ratios for Assessing the Financial Performance of Economic Entities	76
3.1.1 Return on Assets – ROA	77
3.1.2 Return on Equity - ROE.....	78
3.1.3 Economic Value Added - EVA.....	79
3.2 Sustainable Growth Rate – the PRAT Model	81
3.3 Research on the Evolution of Financial Performance Ratios in Economic Entities Belonging to the Pharmaceutical Industry	82
3.3.1 Evolution of Financial Performance Ratios in Economic Entities Belonging to the Global Pharmaceutical Industry	82
3.3.2 Evolution of Financial Performance Ratios in Economic Entities Belonging to the National Pharmaceutical Industry	86
3.3.3 Comparative Study on the Financial Performance of Economic Entities Belonging to the Pharmaceutical Industry: Global versus National	89
3.4 Research on the Sustainable Growth Rate in Economic Entities Belonging to the Pharmaceutical Industry.....	94
3.4.1 Study on the Sustainable Growth Rate in Economic Entities Belonging to the Global Pharmaceutical Industry.....	94
3.4.2 Study on the Sustainable Growth Rate in Economic Entities Belonging to the Romanian Pharmaceutical Industry.....	96
Conclusions and Personal Contributions.....	98
CHAPTER 4: COMPARATIVE STUDY ON THE FINANCIAL POSITION AND PERFORMANCE OF ECONOMIC ENTITIES BELONGING TO THE PHARMACEUTICAL INDUSTRY IN ROMANIA	100

4.1 Evolution in the Financial Position Ratios of Entities Belonging to the National Pharmaceutical Industry: Listed versus Unlisted on the Bucharest Stock Exchange	102
4.1.1 Liquidity	102
4.1.2 Solvency	106
4.1.3 Indebtedness	108
4.2 Evolution in the Financial Performance Ratios of Entities Belonging to the National Pharmaceutical Industry: Listed versus Unlisted on the Bucharest Stock Exchange	117
4.2.1 Return on Assets – ROA	117
4.2.2 Return on Equity – ROE	125
Conclusions and Personal Contributions.....	129
CHAPTER 5: THE FINANCIAL POSITION AND PERFORMANCE OF ECONOMIC ENTITIES BELONGING TO THE PHARMACEUTICAL INDUSTRY IN ROMANIA AND LISTED ON THE BUCHAREST STOCK EXCHANGE	132
5.1 Conceptual Boundaries of the Capital Market.....	133
5.2 Financial Position and Performance Ratios Typical of the Capital Market.....	140
5.3 Research on the Evolution of Capital Market Ratios for the Pharmaceutical Companies Listed on the Bucharest Stock Exchange	144
5.3.1 Total Enterprise Value – TEV	144
5.3.2 Earning per Share	146
5.3.3 Price/Earning Ratio	151
5.3.4 Market Value Added – MVA.....	154
5.3.5 Market to Book Ratio – MBR	155
5.3.6 Capital Asset Pricing Model Model (CAPM).....	156
Conclusions and Personal Contributions.....	158
CONCLUSIONS, PERSONAL CONTRIBUTIONS AND DEVELOPMENTS.....	161
SELECTIVE BIBLIOGRAPHY	169
LIST OF ABBREVIATIONS.....	185
LIST OF FIGURES	187
LIST OF GRAPHS.....	188
LIST OF TABLES	193
LIST OF APPENDIXES.....	195

Keywords: *financial position, financial structure, financial performance, liquidity risk, insolvency risk, sustainable growth rate, solvency, indebtedness, return rates, CAPM, capital market ratios*

SUMMARY

The study of the financial position and performance is a topic that is often discussed and debated in the specialist literature and practice. The emergence of the economic and financial crisis had a major impact on the economic and legislative environment, and this made it increasingly difficult for economic entities to pursue their activities in a proper way.

The pharmaceutical industry used to be one of the best performing industries at both national and global levels. Lately, however, the paradigms and role of the pharmaceutical industry have suffered major changes due to the failure of risk management procedures. Thus, the liquidity risk grew as a result of the major structural deficit in the health sector, the National Health Insurance House prolonging payment deadlines for medicine discounts. Another risk in the national pharmaceutical industry was caused by the entry into force of GEO no. 77/2011 on the clawback tax, intended to increase the revenues of the public health system. This legal provision had a direct impact on the profitability of entities belonging to the pharmaceutical industry. Thus, establishing an optimal relationship between the risks assumed and financial stability, and the performance recorded, is one of the main objectives of financial management specific to pharmaceutical entities.

On the basis of these arguments, the Ph.D. dissertation entitled ***“Evolutions and Trends in the Financial Position and Performance of Economic Entities Belonging to the Pharmaceutical Industry”*** aims to capture several points of novelty of the specialist literature, illustrated by a system of classic and modern financial ratios for the analysis of the financial position and performance, from simple to complex, from entity to industry.

The points of novelty of the Ph.D. dissertation consist in highlighting the main malfunctions of the entities belonging to the pharmaceutical industry by undertaking individual and comparative studies between global and national entities in order to illustrate the main causes that led to their emergence; the impact of modifying the legislative framework on the financial performance of pharmaceutical companies; the influence of endogenous and exogenous factors on the financial results; and the correlation and explanation of mathematical models depending on the actual risks.

The research was conducted for a period of seven financial years (2009-2015), on a sample of 30 Romanian economic entities belonging to the pharmaceutical industry (with a market share of over 90%) and 15 international pharmaceutical groups (with a market share of over 40% of the world’s pharmaceutical industry).

The comparative study (national versus global) allowed gaining a holistic picture of the main risks in the two categories of entities, as well as a clear picture of the financial position and performance of the entities belonging to the pharmaceutical industry.

The research topic is often approached and debated in specialist literature and practice, being the concern of numerous researchers and specialists in the field of finance and not only; this has enabled the highlighting of the complexity and multidisciplinary of the subject.

The present doctoral dissertation is based mainly on relatively recent research studies in the national and international specialist literature which have significantly contributed to the updating of current specialist knowledge. Furthermore, the PhD dissertations studied have helped in capturing and going deeply into the issues related to the assessment of the financial position and performance. All these bibliographical elements, which have contributed to the substantiation of the doctoral dissertation, are highlighted at the end of the dissertation, in the Bibliography section.

Research Objectives and Assumptions

The primary objective of the PhD dissertation entitled *“Evolutions and Trends in the Financial Position and Performance of Economic Entities Belonging to the Pharmaceutical Industry”* is to offer a financial X-ray of the global and national pharmaceutical industry. Detailed secondary objectives for each chapter are subscribed to this main objective.

The first chapter of the research summarizes the main theoretical aspects of annual financial statements. In writing the subchapters and developing the issues addressed within the first chapter of the PhD dissertation, entitled *“Annual Financial Statements – a Source of Information on Assessing the Position and Financial Performance of the Economic Entity”*, we have considered the following objectives:

O1: highlighting the main regulatory documents on the preparation of annual financial statements by economic entities, from 1990 to 2016;

O2: defining the concepts referring to annual financial statements, the importance and role of preparing them;

O3: identifying the benefits of adopting International Financial Reporting Standards;

O4: principles of financial reporting;

O5: presenting the qualitative characteristics of the information provided by the annual financial statements and identifying their users;

O6: personal considerations regarding the role and importance of annual financial statements.

In the second chapter, entitled “*Capitalizing on the Financial Information in Assessing the Financial Position of Economic Entities*”, the main aspects of the financial position of the entities included in the research have been taken into account both at global and national level. The main ratios for the financial position analysis have been presented and interpreted having in mind the following objectives:

O1: identifying the main ratios for financial structure analysis;

O2: presenting the evolution of financial structure ratios in the entities operating within the global and national pharmaceutical industry, between 2009 and 2015;

O3: highlighting the main financial position ratios;

O4: evolution of the financial position ratios in companies operating within the global and national pharmaceutical industry over the period 2009-2015;

O5: comparative study on the evolution of financial position ratios in the national and global pharmaceutical industry, from 2009 to 2015.

The following *hypotheses* have been formulated in carrying out the research:

H1: The entities operating within the national and global pharmaceutical industry have a balanced financial structure over the period 2009-2015;

H2: The pharmaceutical companies analysed at both national and global level recorded adequate values of the financial position ratios between 2009 and 2015;

H3: The comparative studies on the evolution of financial position ratios identify a more stable and balanced financial situation for entities operating globally compared to national ones from 2009 to 2015.

The third chapter of the current doctoral dissertation, entitled “*Capitalizing on Accounting Information in Assessing the Financial Performance of Economic Entities*”, addresses the theoretical and practical aspects regarding the analysis of the financial performance for the entities belonging to the pharmaceutical industry, in terms of the following objectives:

O1: identifying the key financial performance ratios;

O2: the evolution of financial profitability ratios in global and national pharmaceutical companies, between 2009 and 2015;

O3: comparative research on the evolution of financial performance ratios in companies belonging to the national and global pharmaceutical industry, from 2009 to 2015;

O4: identifying the opportunities for the companies included in the research to support their sales with their own resources, from 2009 to 2015;

O5: the study of the correlation between the current liquidity ratio and the return on assets ratio.

The following *hypotheses* have been considered in conducting the research included in the third chapter:

H1: The entities belonging to the national and global pharmaceutical industry were financially efficient between 2009 and 2015;

H2: Comparative studies on the evolution of financial performance ratios identify a favourable financial situation for entities operating globally compared to national ones for the period 2009-2015;

H3: The pharmaceutical entities included in the research were able to support their sales to a large extent on the basis of their own resources between 2009 and 2015;

H4: There is a moderate association between the current liquidity ratio and the return on assets ratio for the entities belonging to the pharmaceutical industry for the period 2009-2015.

In the fourth chapter, entitled “*Comparative Study on the Financial Position and Performance of Economic Entities Belonging to the Pharmaceutical Industry in Romania*”, a comparative analysis of the financial position and performance of entities belonging to the national pharmaceutical industry (listed and unlisted) has been carried out, having the following main objectives:

O1: The evolution of financial position ratios in listed and unlisted national pharmaceutical companies between 2009 and 2015;

O2: The evolution of financial performance ratios in listed and unlisted national pharmaceutical companies between 2009 and 2015;

O3: Comparisons of the evolution of financial position and performance ratios in listed and unlisted national pharmaceutical entities between 2009 and 2015.

Based on the objectives presented, the following hypotheses have been formulated:

H1: The entities listed on the Bucharest Stock Exchange hold a more stable financial position compared to unlisted entities between 2009 and 2015;

H2: The financial performance of the companies listed on the Bucharest Stock Exchange, assessed by means of classical indicators, is higher compared to that of unlisted entities for the period 2009-2015.

The fifth chapter, entitled “*The Financial Position and Performance of Economic Entities Belonging to the Pharmaceutical Industry in Romania Listed on the Bucharest Stock Exchange*”, highlights in a compact manner the evolution of the main capital market ratios for the pharmaceutical companies listed on the Bucharest Stock Exchange, between 2009 and 2015.

The objectives underlying this chapter have been the following:

O1: identifying the key capital market ratios;

O2: presenting the evolution of the main capital market ratios for the pharmaceutical entities listed on the Bucharest Stock Exchange, between 2009 and 2015;

O3: the study of the correlation Profit per share – Return on equity – Liquidity rate;

O4: the risk of financial security portfolios belonging to the entities included in the research.

The following hypotheses have been formulated in conducting the research:

H1: The position and performance of the pharmaceutical companies listed on the Bucharest Stock Exchange, assessed on the basis of capital market ratios, are appropriate for the period 2009-2015;

H2: Earnings per share (EPS) are directly influenced by the change in the Return on Capital Employed and the Quick Liquidity Rate.

Research Methodology

In order to make a comprehensive analysis of the financial position and performance of entities belonging to the pharmaceutical industry, we have employed several research methods. The following techniques and procedures have been used to meet the objectives: documentation and documentary analysis indicated in the bibliographical references, statistical methods, the use of the variation coefficient, the scoring approach, the use of multiple linear regression, the graphical representation of events and phenomena investigated, and, last but not least, methods that are specific to economic and financial analysis (the comparison method, the chain substitution method, operational research etc.).

For each entity included in the research, financial position and performance analysis ratios have been calculated for each year from 2009 to 2015, based on the data provided by the financial statements, for the period 2009-2015, published on the official websites of the companies belonging to the global pharmaceutical industry and on www.bvb.ro and www.mfinante.ro for the entities operating within the national pharmaceutical industry.

Research Boundaries

The present doctoral dissertation keeps within certain research boundaries that open up new directions and future research opportunities.

A first boundary in the analysis of the financial position and performance of entities belonging to the pharmaceutical industry lies in restricted access to certain data and information, which has led to the limitation of the research period. Thus, in the case of unlisted companies,

the information available on the official website www.mfinante.ro offers a limited study interval (only the last five years); furthermore, the financial statements are presented in abridged form, so that certain financial ratios cannot be calculated for these categories of entities. Within the research, the evolution of the main regulatory documents is briefly highlighted starting with the 1990s until 2016. Thus, new directions of research are opened up, the legislation in this field gaining a point of interest for all categories of people (shareholders, investors, researchers etc.).

Another constraint of the present PhD dissertation is the lack of data necessary for calculating certain ratios (the insolvency risk, PRAT, WACC, ROIC etc.) for unlisted national entities, the research being conducted only on companies listed on the Bucharest Stock Exchange and on global ones.

The research paper is structured into 5 chapters, introduction, conclusions and future research directions.

Summary of Chapters

The first chapter entitled “*Annual Financial Statements – a Source of Information on Assessing the Position and Financial Performance of the Economic Entity*” is an overview of the main concepts regarding financial statements, of the main regulatory documents, and of the benefits of adopting the International Financial Reporting Standards. Changes in the legal framework concerning the elements and content of financial statements have had a positive impact on financial information users from the perspective of developing a common universal language and of improving the transparency of the information provided (through the adoption of International Financial Reporting Standards).

The second chapter entitled “*Capitalizing on the Financial Information in Assessing the Financial Position of Economic Entities*” highlights the evolution of the main financial position ratios for pharmaceutical entities, with both individual and comparative studies on the two categories of analyzed companies (global and national).

The points of novelty and personal contribution brought to the specialist literature through the studies conducted between 2009 and 2015 helped to identify the main malfunctions in the two categories of entities (national and global).

A first conclusion drawn from the research conducted by means of the key financial structure ratios reinforced the idea that global pharmaceutical entities are investing heavily in research and development (Figure 1). On the other hand, Romanian entities hold a high share of current assets within total assets (Figure 2).

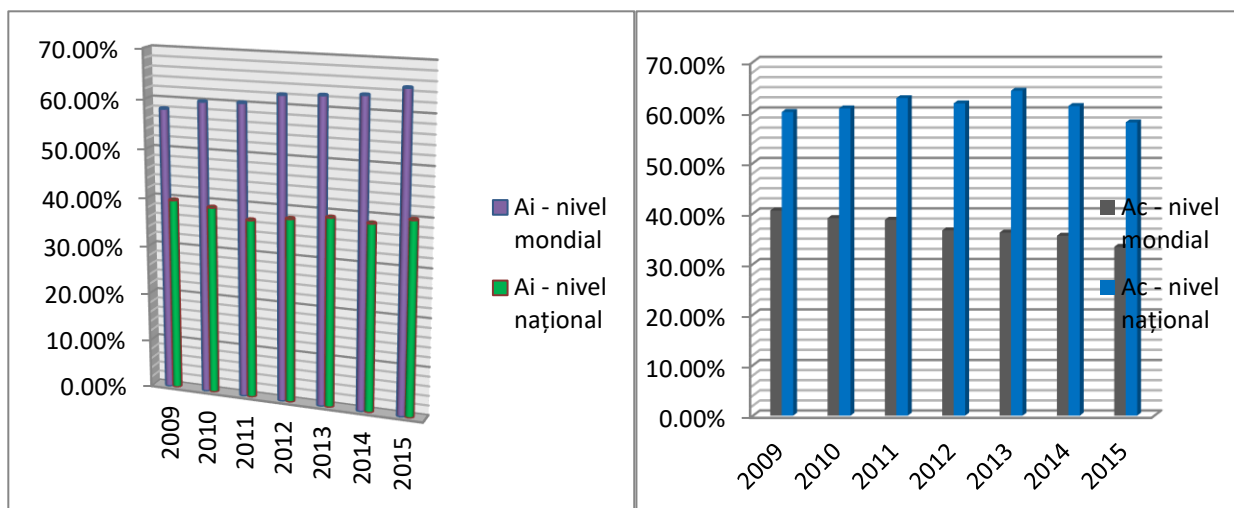


Figure 1: Evolution of the average fixed assets ratio at national versus global level from 2009 to 2015 (%) – Figure 1 (left) and Evolution of the average current assets ratio at national versus global level from 2009 to 2015 (%) – Figure 2 (right)

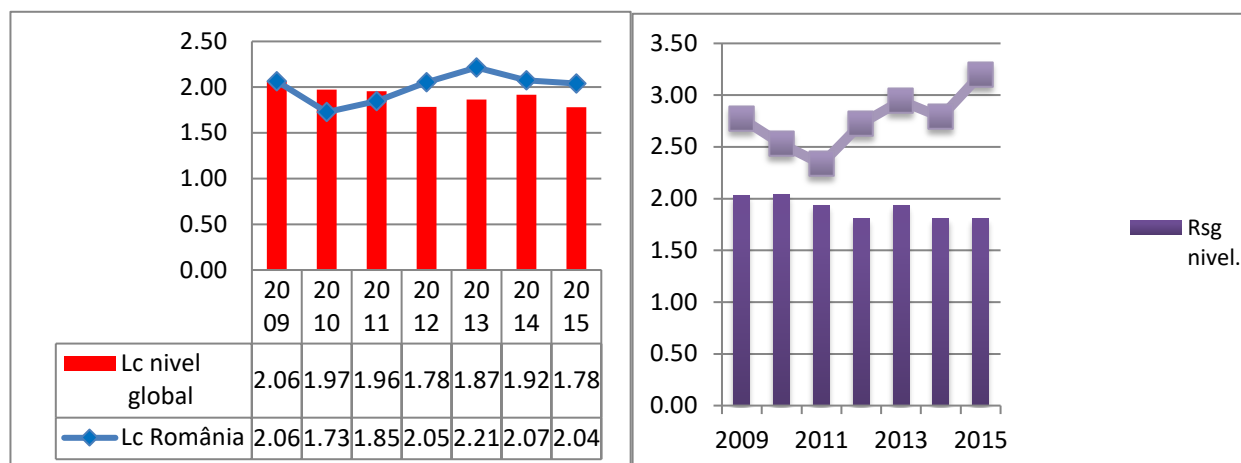
(Source: data processed by the author based on the annual financial statements, available on the company websites and www.bvb.ro and www.mfinante.ro)

The findings show that over the period 2009-2015 pharmaceutical companies operating globally had a high investment level (varying between 58% and 64%) compared to the national one (below 40%). This contributes decisively to a higher degree of indebtedness than that existing at national level, with direct consequences on the increase in the insolvency risk. In contrast, within the entities belonging to the national pharmaceutical industry, a high share of current assets within total assets is identified, mainly determined by the volume of trade receivables, whose recovery period averaged over 150 days over the whole period under investigation. This aspect has a direct impact on the financial situation of economic entities, especially those not listed, being one of the main causes of insolvency risk in the pharmaceutical industry in Romania.

The findings provided by the studies allow the partial validation of the hypothesis (H1). Thus, the hypothesis (H1) according to which “Entities operating within the national and global pharmaceutical industry have a balanced financial structure over the period 2009-2015” is confirmed for companies belonging to the global pharmaceutical industry and invalidated for companies belonging to the Romanian pharmaceutical industry, mainly as a result of the high value of trade receivables.

By making a comparative analysis of the evolution of the main financial position ratios for the investigated entities (global and national), the hypothesis (H2) according to which “Pharmaceutical companies investigated at national and global level recorded appropriate values of the financial position ratios over the period 2009-2015” has been partially confirmed. Thus, for global companies, the H2 hypothesis is confirmed, while for national companies it is invalidated. Between 2009 and 2015, studies on the main financial statement ratios (liquidity and

solvency) revealed results that fall within the limits accepted by the specialist literature. However, a more in-depth analysis of debt recovery, correlated with research on liquidity and solvency ratios, highlighted a liquidity risk at national level (Figures 3-5).



Evolution of the average current liquidity ratio at global and national levels over the period 2009-2015 – Figure 3 (left) and Evolution of the average general solvency ratio at national and global levels, from 2009 and 2015 – Figure 4 (right)

(Source: data processed by the author based on annual financial statements, available on the company websites and www.bvb.ro, www.mfinante.ro)

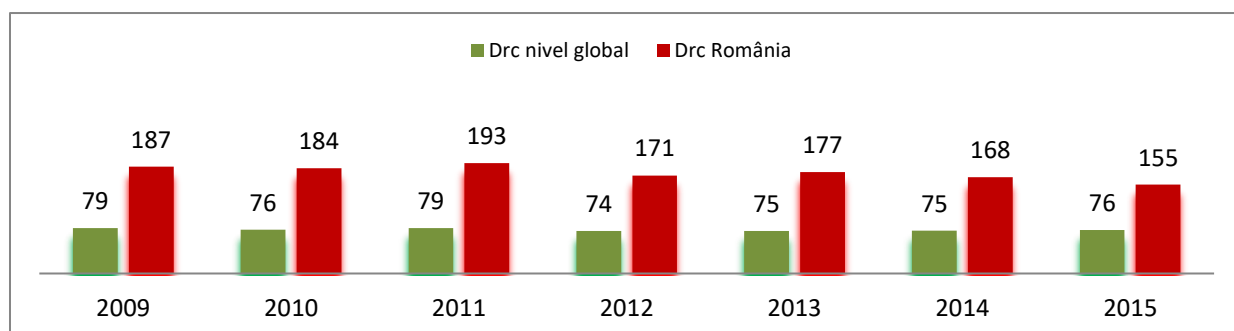


Figure 5 – Average debt recovery time at national and global levels between 2009 and 2015 (in days)

(Source: data processed by the author based on annual financial statements, available on the company websites and www.bvb.ro, www.mfinante.ro)

The analysis the evolution of liquidity and solvency ratios correlated with the study of the debt recovery time in the Romanian pharmaceutical companies indicated a liquidity risk (the high share of receivables within total current assets is mainly determined by the delays of the Health Insurance House in invoicing disbursement). The evolution of the overall solvency ratio over the period 2009-2015 showed that most of the investigated pharmaceutical entities have a high capacity to deal with third-party payment obligations (the ratio is above the safety margin). It should be noted that, just as with liquidity, the trend of the ratio for the entities belonging to the national pharmaceutical industry is influenced by the evolution of the volume of receivables.

The results of the studies carried out in the second chapter allow the validation of the hypothesis (H3) according to which “The comparative studies on the evolution of financial

position ratios identify a more stable and balanced financial situation for entities operating worldwide compared to national ones between 2009 and 2015”.

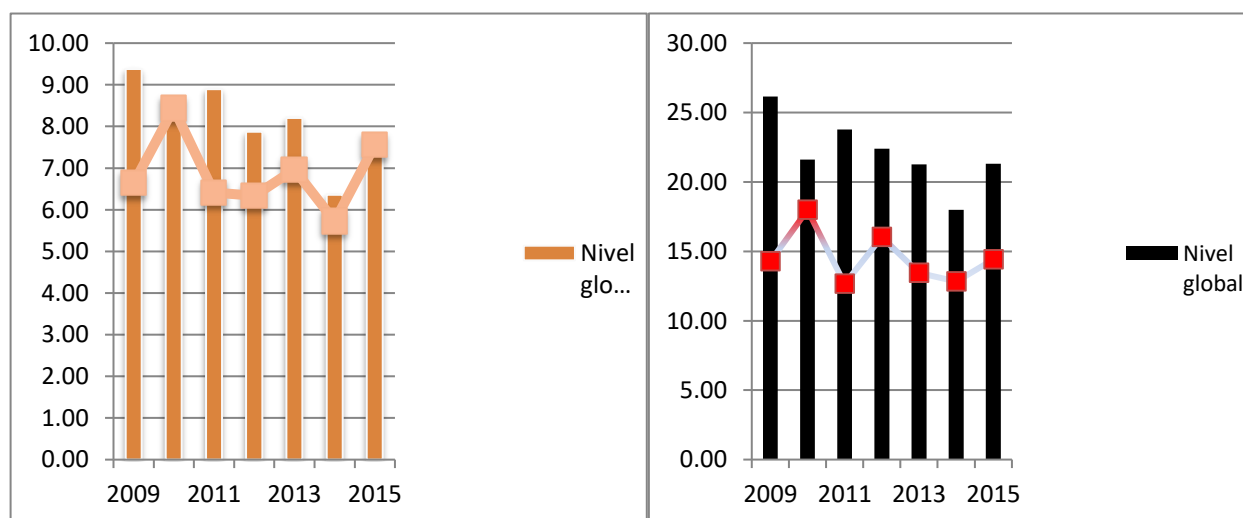
The author’s personal contribution was also materialized in the econometric studies performed, which managed to capture points of novelty by identifying the factors of influence on the leverage of national pharmaceutical entities. The research findings took the shape of the following regression equation:

$$\hat{R}ig = 0.393 - 0.034Cs + 0.012Pdm + 0.018Sfm$$

Thus, global indebtedness is positively influenced by the change in the monetary policy interest rate and by the average unemployment rate in Romania, as well as negatively by the USD/RON average exchange rate (by optimizing the debt on the basis of the decrease in the exchange rate). With a 1% increase in independent variables, the indebtedness rate will increase by 1.2% (the monetary policy interest rate) and 1.8% (the unemployment rate). A 1% fall in the exchange rate will result in a decrease of 3.4% in the leverage.

The third chapter of the PhD dissertation, entitled “*Capitalizing on Accounting Information in Assessing the Financial Performance of Economic Entities*”, addresses the main theoretical and practical aspects regarding the financial performance analysis for both global and national pharmaceutical entities.

A first finding has revealed that there is better performance in global entities than in national ones. This is due to the entry into force of GEO no. 77/2011 in Romania, which had a direct impact on the increase of the expenses of pharmaceutical companies.



Evolution of the average return on assets (ROA) both globally and nationally between 2009 and 2015 (%) – Figure 6 (left) and Evolution of the average return on equity (ROE) both globally and nationally between 2009 and 2015 (%) – Figure 7 (right)

(Source: data processed by the author on the basis of annual financial statements, available on the company websites and on www.bvb.ro and www.mfinante.ro)

The comparative analysis of the evolution of the average ROA and the average ROE highlights that over the period 2009-2015 most of the entities studied were able to use their

assets or their own capital effectively in order to make a profit. The research indicates lower ratios levels for the entities belonging to the national pharmaceutical industry as a result of the increase in total expenditure volume (by introducing a clawback fee).

The hypothesis (H2) according to which “*Comparative Studies on the Evolution of financial performance ratios identify a favourable financial situation for entities operating globally compared to those national ones for the period 2009-2015*” is confirmed.

A point of novelty that this chapter has brought to the specialist literature is a study on the estimation of the dependency relationship: Rate of Return – Current Liquidity Ratio. The findings of the research have yielded in the following equations:

$$\begin{aligned}
 - \text{ Global level} \quad r &= \frac{[(7*108,61) - (56,8*13,34)]}{\sqrt{[(7*467,07) - 3.226] * \sqrt{[(7*25,49) - 177,96]}}} = 0,5812 \\
 - \text{ National level} \quad r &= \frac{[(7*95,78) - (48,07*14,01)]}{\sqrt{[(7*334,91) - 2.311] * \sqrt{[(7*28,19) - 196,28]}}} = -0,5023
 \end{aligned}$$

The research findings confirm the hypothesis that “*There is a moderate association between the current liquidity ratio and the rate of return on assets for the entities belonging to the pharmaceutical industry, over the period 2009-2015*”.

We have noted that for global entities the change in average rate of return is 58.12% explained by the change in average current liquidity. By contrast, for national entities, we have identified a negative and moderate association between the two ratios. The relatively high share of current assets in total assets, mainly driven by the volume of trade receivables, whose recovery period averaged over 150 days between 2009 and 2015, had a negative impact on the financial performance of companies belonging to the national pharmaceutical industry (measured by means of the average return rate ratio).

Another personal contribution of the author consisted in carrying out studies to measure the performance of pharmaceutical entities by means of modern ratios in order to confirm or invalidate the results recorded by using traditional performance ratios (Figures 8-9).

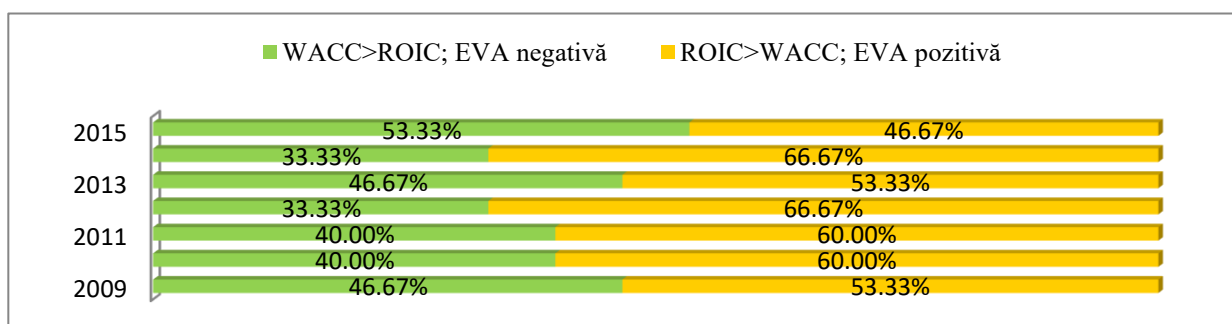


Figure 8 – Grouping of entities belonging to the global pharmaceutical industry according to the influence of the ROIC and WACC ratios on Economic Value Added (EVA), over the period 2009-2015

(Source: data processed by the author based on annual financial statements, available on the company websites)



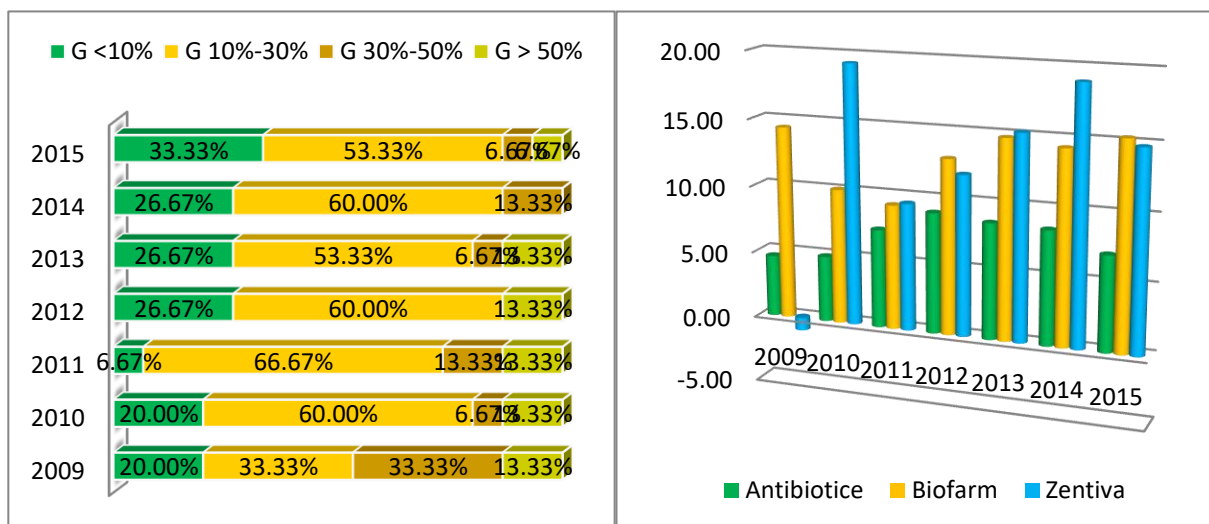
Figure 9 - Evolution of Return on Equity Ratio (ROIC) and of Weighted Average Cost of Capital (WACC) for BSE-listed entities, 2009-2015

(Source: data processed by the author on the basis of annual financial statements, available on www.bvb.ro)

The dynamic analysis of ratios indicating the creation of value highlighted the fact that between 33% and 53% of the companies belonging to the global pharmaceutical industry registered negative values of the EVA in the period 2009-2015, with a direct impact on the decrease in market value of companies. The study of financial performance based on modern ratios (return on invested capital and the weighted average cost of capital) within the three listed national entities, for the period 2009-2015, points to the diminishing of the value of the companies (negative economic value added), except for Antibiotice over 2009-2010 and 2012-2015.

Considering the findings of the studies, the hypothesis (H1) according to which “*Entities belonging to the national and global pharmaceutical industry are financially efficient over the period 2009-2015*” is confirmed, based on the results obtained through traditional ratios for assessing financial performance (ROA and ROE) and is invalidated by means of modern ratios (ROIC, WACC).

Another point of novelty addressed in the present doctoral dissertation has been illustrated by the PRAT model. The research on sustainable financial growth shows that over the 2009-2015 period the two categories of entities (national and global) finance their sales on external sources to a large extent and less on equity, the H3 hypothesis stating that “*The pharmaceutical entities included in the research were able to support their sales on the basis of their own resources to a large extent over the period 2009-2015*” being thus invalidated (Figures 10-11).



Grouping of entities belonging to the global pharmaceutical industry according to the evolution of the sustainable growth rate (G), 2009-2015 (%) – Figure 10 (left) and Evolution of the sustainable growth rate for pharmaceutical companies listed on the Bucharest Stock Exchange over 2009-2015 (%) – Figure 11 (right)

(Source: data processed by the author based on annual financial statements, available on the company websites and on www.bvb.ro)

The fourth chapter of the doctoral dissertation entitled “Comparative Study on the Financial Position and Performance of Economic Entities Belonging to the Pharmaceutical Industry in Romania” presents the dynamic evolution of the main financial position and performance ratios based on the scoring model.

The author’s personal contributions have been materialized in conducting individual and comparative case studies on the financial position and performance analysis by means of traditional ratios for listed and unlisted entities belonging to the Romanian pharmaceutical industry for a period of 7 financial years (2009-2015). On the basis the research findings, table 1 identifies the synthesis of the financial diagnosis of listed and unlisted national pharmaceutical entities over the period 2009-2015 through the interpretation grid of financial diagnosis correlated with the SWOT analysis.

Table 1: Synthesis of financial diagnosis and external environment

Indices	Observations	SWOT Diagnostics (listed)	SWOT Diagnostics (unlisted)	Importance
Diagnosis of financial position	The high debt volume has a negative impact on the financial situation of national pharmaceutical entities.	Precarious points (1,5-2)	Precarious points (1,5)	35%

Diagnosis of financial performance	The decrease in profit margins and the increase in production costs unfavourably influenced the rates of return.	Strong points (3)	Precarious points (1,5)	35%
Diagnosis of external environment	Legislative changes in the pharmaceutical industry (entry into force of GEO 77/2011).	Uncertainty (2)	Threat (1,5)	30%

(Source: data processed by author)

For the period 2009-2015, studies on liquidity ratios correlated with those on debt recovery time revealed the presence of a liquidity risk (due to delays in invoice disbursement, which averaged more than 150 days).

The research highlights that the value of total assets is higher than the total debt for all entities included into the research, with most pharmaceutical entities having a high capacity to deal with third-party payment obligations (the ratio level is above the safety threshold). We should note that, just as in the case of liquidity, the ratio trend is influenced by the evolution of the volume of receivables.

The study of the evolution of patrimonial solvency in the case of listed companies highlights good capitalization. A significant part of the entities unlisted on the Bucharest Stock Exchange registered values of the indicator under the safety limit in 2009-2015, illustrating the acute need for capital increases in order to deal with economic environment shocks.

The analysis of the main rates of return for the period 2009-2015 indicated the possibility of listed and unlisted entities to use their assets efficiently in order to make a profit as well as a constant capacity to generate profit with the help of their own equity. Although in 2009-2015 return ratios were within acceptable limits for most entities, amid deterioration in macroeconomic conditions, diminishing profit margins, and increased overall expenditure volume (by the enactment of GEO 77/2011), ratios decreased over the period of research.

A point of novelty brought to the specialist literature is a case study on the analysis of the correlation between the degree of indebtedness and the insolvency risk for listed entities. The research findings have resulted in the following regression equations:

$$\mathbf{RI\ Zentiva = 6.863 - 0.106 * R\hat{i}g}$$

$$\mathbf{RI\ Biofarm = 8.598 - 0.224 * R\hat{i}g}$$

$$\mathbf{RI\ Antibiotice = 5.460 - 0.079 * R\hat{i}g}$$

The final results of the regression equation revealed that, for the three entities analyzed, the increase in indebtedness leads to an increase in the insolvency risk (by diminishing the value

of the Z score), the alternative hypothesis according to which “*The variation of the Z function of the insolvency risk is influenced by the global indebtedness rate variation*” being thus validated.

The fifth chapter of the PhD dissertation entitled “*The Financial Position And Performance of Economic Entities Belonging to the Pharmaceutical Industry in Romania Listed on the Bucharest Stock Exchange*” offers an overview of the evolution of the main capital market ratios for the pharmaceutical companies listed on the Bucharest Stock Exchange between 2009 and 2015.

The research findings allowed the highlighting of the points of novelty brought to the specialist literature. Thus, with the aim of underlining the differences between the market value of the entity measured by means of stock market capitalization (CB) and the value of the entity measured by means of balance sheet items (net assets - ANC), the comparative study CB-ANC illustrates the shareholders’ advantages or disadvantages following the comparison between the values of the two ratios.



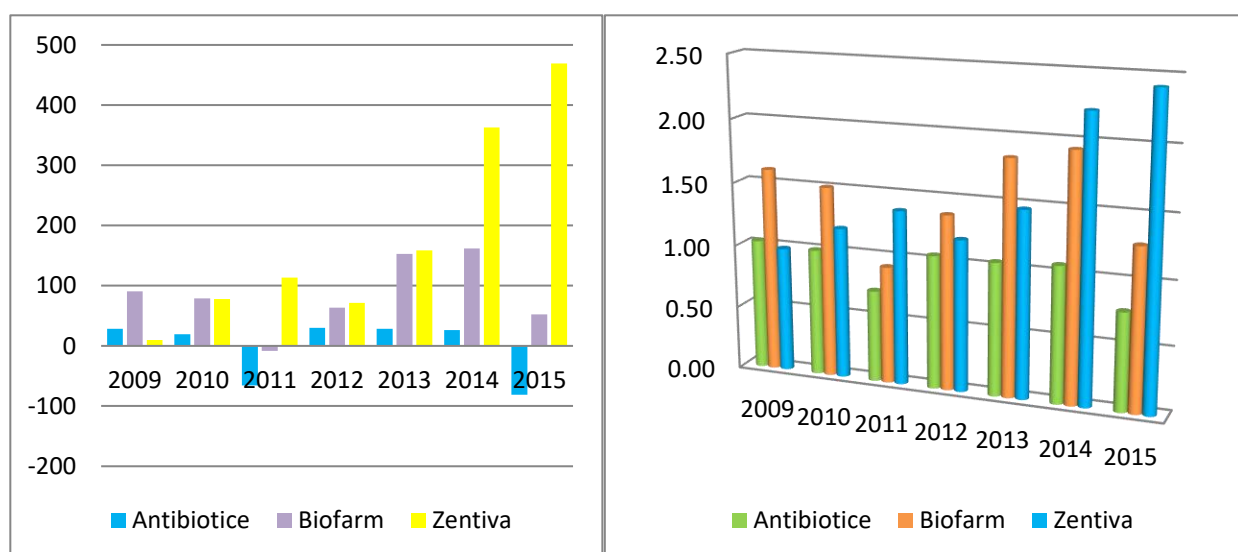
Figure 12 - Comparative Evolution of Stock Market Capitalization (CB) and Net Assets (ANC) for pharmaceutical companies listed on the Bucharest Stock Exchange, 2009-2015
 (Source: data processed by author based on annual financial statements, 2009-2015, available on www.bvb.ro)

The research conducted over the period 2009-2015 shows that the book value of companies (calculated using the ANC ratio) differs from their stock market capitalization. In the case of Zentiva SA (2010-2015), stock market capitalization is higher than the net assets, which shows an increase in the company market value.

As to Biofarm SA, the trend of the two ratios is oscillating. Thus, in the 2009-2010 and 2012-2015 periods, stock market capitalization is higher than the net assets, highlighting a favourable situation for the shareholders. In 2011, the company book value exceeded stock market capitalization, indicating that the share market price was below their nominal value.

For Antibiotice SA, the company book value in 2011 and 2015 is higher than stock market capitalization, indicating an unfavourable situation for the shareholders.

The research findings are also confirmed by studies based on the MVA and MBR ratios (Figures 13-14).



Evolution of MVA in companies listed on the Bucharest Stock Exchange, 2009-2015 (millions RON) – Figure 13 (left) and Evolution of MBR in companies listed on the Bucharest Stock Exchange between 2009 and 2015 – Figure 14 (right)

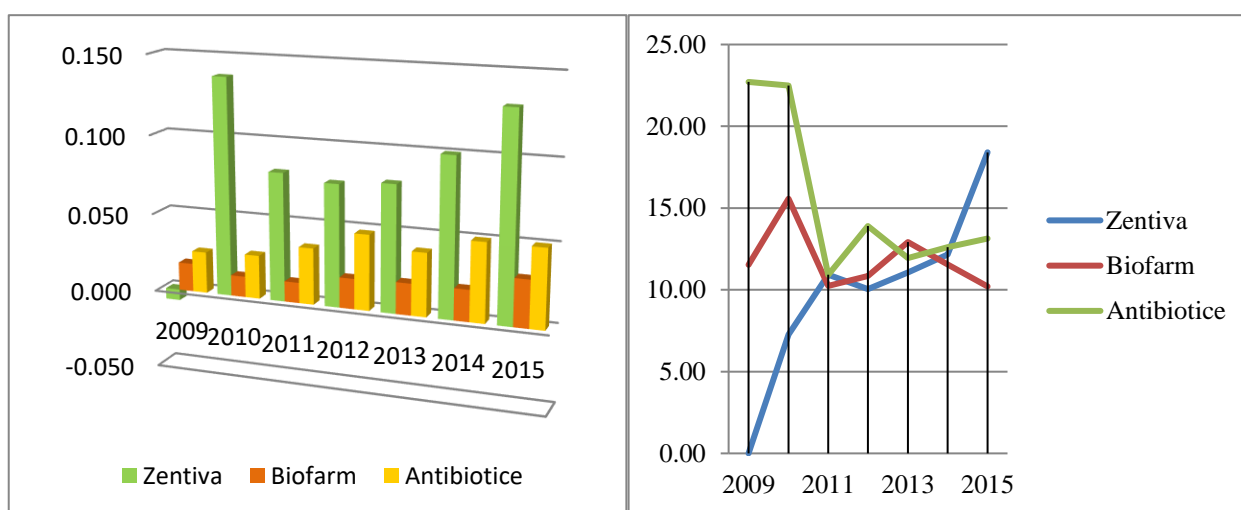
(Source: data processed by author based on the 2009-2015 annual financial statements, available on www.bvb.ro)

The evolution of the Market Value Added (MVA) ratio in 2009-2011 shows a decrease in the market value of Antibiotice SA relative to the value of the invested capital. The 2012-2014 period indicates positive values for the MVA ratio, followed by a lower ratio in 2015, amid falling stock market capitalization and drawing external sources. The 2009-2011 period highlights a decrease in MVA for Biofarm SA. The 2012-2014 period indicates an appreciation of the Market Value, followed by a drop in the ratio in 2015, amid falling stock market capitalization. The trend of the MVA ratio for Zentiva SA is an upward one between 2009 and 2011, indicating that the company creates added value. The year 2012 indicates a slight depreciation of MVA, followed by an increase in the ratio value until the end of the research period.

The evolution of MBR points out that Antibiotice SA is the only entity where the ratio registers sub-unit values throughout the research span, the market value of the company shares

being below their book value. For the other two entities (Zentiva SA and Biofarm SA), the evolution of the ratio highlights an appreciation of the value of the entity on the capital market (the stock market capitalization being higher than the book value, except for 2009 for Zentiva SA and for 2011 for Biofarm SA).

Over the period 2009-2015, the evolution of exchange rate ratios PER (Price/Earning Ratio) and EPS (Earning per Share) consolidates the results obtained with the help of the other ratios (CB-ANC, MVA, MBR), indicating that Zentiva SA brought the highest value added to shareholders, followed by Biofarm SA and Antibiotice SA (Figures 15-16).

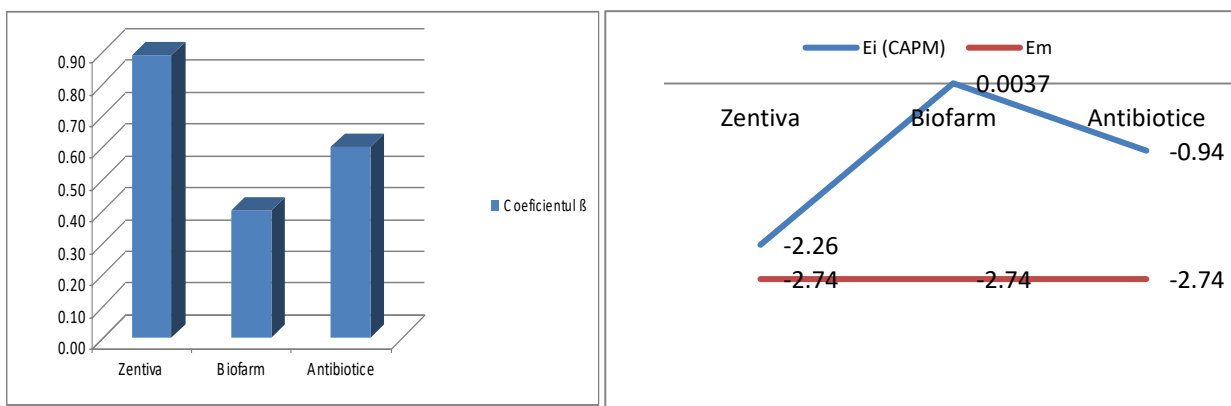


Evolution of earnings per share (EPS) in the pharmaceutical companies listed on the Bucharest Stock Exchange, 2009-2015 (lei/share) – Figure 15 (left) and Evolution of PER for the companies listed on the Bucharest Stock Exchange from 2009 to 2015 (lei) – Figure 16 (right)

(Source: data processed by author based on the 2009-2015 annual financial statements, available on www.bvb.ro)

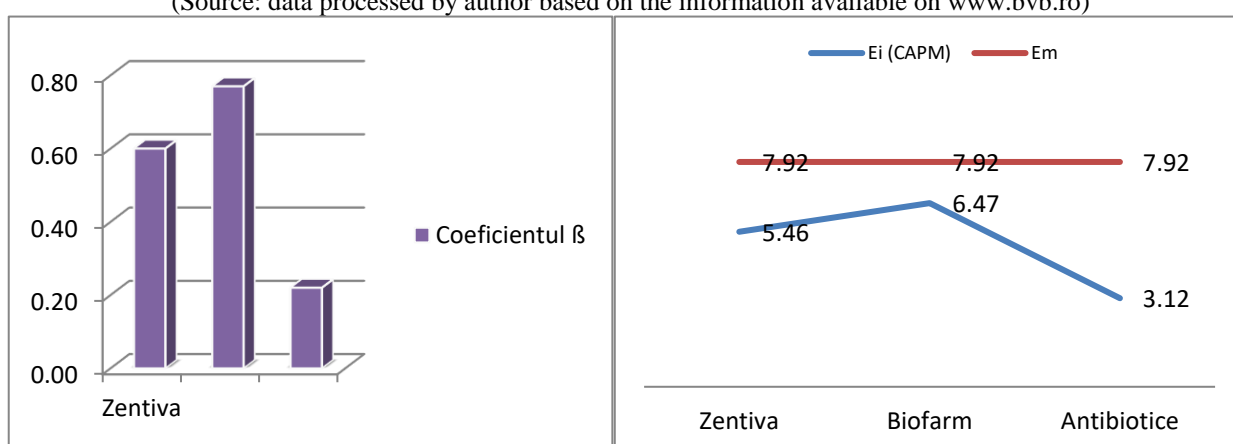
One of the novelty points highlighted in this chapter was a study that aimed to highlight the correlation between the ratios: Earnings per Share (EPS) – Return on Capital Employed (ROCE) – Quick Liquidity Ratio (RLI). Following the interpretation of the results obtained, we found that the highest contribution to the EPS variation is the return on capital employed. Thus, the higher the return trends of the company's long-term funds (equity or long-term debt), the more profitable the shares.

Another point of novelty highlighted in Chapter Five was the application of CAPM (*Capital Asset Pricing Model*) within the entities under investigation (Figures 17-20).



Evolution of coefficient β of the pharmaceutical entities listed on the Bucharest Stock Exchange, between 16.06.2015 and 04.09.2015 – Figure 17 (left) and Comparative evolution of the return on entity portfolios and on capital market portfolio between 16.06.2015 and 04.09.2015 – Figure 18 (right)

(Source: data processed by author based on the information available on www.bvb.ro)



Evolution of coefficient β of the pharmaceutical entities listed on the Bucharest Stock Exchange, between 16.06.2016 and 05.09.2016 – Figure 19 (left) and Comparative evolution of the return on entity portfolios and on capital market portfolio between 16.06.2016 and 05.09.2016 – Figure 20 (right)

(Source: data processed by author based on the information available on www.bvb.ro)

The study on the risk of the portfolio of financial securities conducted by means of CAPM for the three pharmaceutical entities listed on the Bucharest Stock Exchange for the periods 16.06.2015 – 04.09.2015 and 16.06.2016-05.09.2016 identifies that between June and August 2015 an overestimation of the pharmaceutical companies listed on the Bucharest Stock Exchange was noted, and that the same period of 2016 registers a sub-valuation of the shares of these entities.

Based on the oscillating evolutions of capital market ratios during the period under investigation, the hypothesis that “*The position and performance of the pharmaceutical entities quoted on the Bucharest Stock Exchange analysed on the basis of capital market ratios is appropriate over the period 2009-2015*” is invalidated.

The results of the research conducted in the present doctoral dissertation make it easier for shareholders, investors, researchers, and any people interested to get a clear picture of the

evolution of the financial position and performance of the entities belonging to the pharmaceutical industry between 2009 and 2015.

The issues addressed, correlated with the findings of the studies undertaken, allow the extension of the research and the opening up of new horizons regarding: the extension of the period and the sample included in the research; the identification of the influences of the legislative framework on the change in the financial position and performance of economic entities; the future analysis of the main financial position and performance ratios to validate or invalidate forecasts; conducting studies on the influence of macroeconomic factors on the main economic and financial ratios; and comparative analyses of modern and traditional ratios that assess the financial position and performance of economic entities.

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