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THESIS SUMMARY

EVOLUTIONS REGARDING THE POSITION AND THE FINANCIAL PERFORMANCE AT THE ECONOMIC ENTITIES FROM THE MANUFACTURING INDUSTRY IN ROMANIA

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SUMMARY

The motivation for choosing the theme of the doctoral thesis starts from the fact that the markets globalization and liberalization, as well as the development of the technology, have led to the modernization of the global economic and financial system, significantly increasing the interconnections between the world economies, and implicitly the risks from the markets. The emergence of the global economic and financial crisis, determined by the breaking of America's real estate bubble and its spread across the world, confirms the need to study the financial performance and the risk of the companies.

In the recent years, the managers of the big corporations have focused their attention on increasing the market value and implicitly the companies financial performance, being designed numerous strategies and methods in order to optimize the performance-risk relationship and to maximize the companies value.

At microeconomic level, increasing the financial performance while minimizing the risk is one of the primary goals of any company, an objective difficult to achieve, given the macroeconomic situation in a permanent process of change.

The manufacturing industry includes companies that have as activity object the manufacturing of raw materials. As on the short and medium term, the re-launch of the manufacturing industry is anticipated, it is necessary to adopt relevant strategies and policies
such as: technological upgrades, the improvement of the products quality, and the acceleration of their entrance on the world market.

The emergence of the global economic and financial crisis has required the change of the paradigms across companies, which have to identify consistent and effective ways to improve the performance and strengthen the financial position while minimizing the risk.

The doctoral thesis „Evolutions regarding the position and the financial performance at the economic entities from the manufacturing industry in Romania” presents the most up-to-date elements: financial performance, financial position and risk, developing new opinions about these concepts. It was considered that highlighting the history of the evolution of the classic and modern indicators that measure the performance, the financial position and the risk in a company, is imperative in order to take the necessary measures to achieve higher economic results in the future. Also, in the context of the sustainable development, modern economic entities are also evaluated from the point of view of the social and environmental policies, increasing their responsibility towards society.

The novelty elements of the doctoral thesis consist in highlighting the ways to improve the performance and strengthen the financial position of the companies, as well as the risk management and reduction methods.

The research actuality is based on the studies conducted both at the microeconomic level, at the companies belonging to the manufacturing industry from Romania, listed on the Bucharest Stock Exchange, but also on the macroeconomic level, by introducing in the studies certain macroeconomic variables (GDP, inflation, etc.). The studies conducted in the doctoral thesis include a period of 10 financial years (2007-2016), as well as a forecast regarding the performance, the financial position and the risk evolution during the period of time 2017 - 2021. The selected time horizon allowed us to capture three periods: the economic boom period, the economic and financial crisis period and the post-crisis period.

The necessity and the importance of the researched theme lies in: the desire to give to the decision makers and also to all stakeholders, a complete and updated picture of the financial situation of the studied companies; identifying the vulnerabilities that threaten the Romanian manufacturing companies, which makes it possible to reduce them as quickly as possible by making the right decisions at the management level; applying on the selected sample, models of construction of a portfolio of financial titles, given the investors willingness to achieve a
maximum profitability at the same time with a minimum risk; making predictions about the performance and the financial position of the studied companies, as well as about their insolvency risk.

The assessment of the financial performance and position as well as the risk assessment, is a matter of great importance, widely debated in the literature review, since after the emergence of the economic and financial crisis, the national economies suffered, the companies having low profitability or even losses, which led to a reduction of their activity or to insolvency.

The topic presented in the doctoral thesis „Evolutions regarding the position and the financial performance at the economic entities from the manufacturing industry in Romania” has been closely studied by both Romanian and foreign researchers. Many books and scientific articles have been consulted in order to accomplish this research, our approach leading to the update of the state of knowledge. Thus, over 250 bibliographic references belonging to both Romanian and foreign authors have been consulted in the fields of: finance, accounting, financial management, economics, statistics, econometrics, etc. At the same time, were also studied the works of other Romanian and foreign PhD students, presented in their doctoral thesis. The bibliographic references consulted in order to elaborate the theoretical part of the doctoral thesis, are highlighted in the section "Bibliography" of the paper.

The research objectives

The main objective of the doctoral thesis, is represented by the presentation of a complete and updated image of the financial performance and position of the companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, during the period of time 2007-2016, from the perspective of their ability to adapt to the new conditions imposed by the market. In order to achieve the main objective, several secondary objectives were considered, such as:

- the systematization of the conceptual approaches found in the national and international literature;
- highlighting the importance of the financial statements in making appropriate decisions by the users of accounting information;
- presenting the different methods of assessing the position and the financial performance, as well as the risk;
- the evaluation of the financial position and performance depending on the evolution of the Economic Value Added, of the Market Value Added and of the Return on Investment, at the companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, during the period of time 2007-2016, as well as the influence of the factors that led to the change of the indicators during the analyzed period;

- the evaluation of the position and financial performance of the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, depending on the values registered by the capital market indicators, during the period of time 2007-2016;

- comparative study between the performance of the studied companies and the annual average performance of the capital market, based on the indicators: Price Earnings Ratio (PER), Price to Book Value (PBV), Dividend Yield (DIVY) and Turnover Velocity (TV);

- comparative study between the Dividend yield and the banks annual average interest rate;

- a score model in order to determine the position and the financial performance of the studied companies, based on the capital market indicators;

- identifying through the Markowitz model, the optimal portfolio for investors, at the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange;

- determining the profitability and the market risk at the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, through the CAPM model;

- the evaluation of the maximum estimated potential loss, respectively of the risk of the portfolio of financial titles at the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, through the Value at Risk (VaR) model;

- grouping the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, depending on the insolvency risk determined through: Altman, Springate, Taffler and French Commercial Credit models, during the period of time 2007-2016 and making a forecast regarding the insolvency risk for the period of time 2017-2021.

**Research methodology**

In order to achieve the proposed objectives, this research used several scientific research methods, necessary in the elaboration of the case studies, such as: documentation method, analytical method or economic analysis, statistical-mathematical and econometric methods,
dynamic analysis, synthesis method, induction, deduction method, descriptive method, comparison method, and quantitative analysis method. In conducting the case studies, we used data from the reports published on the Bucharest Stock Exchange website (www.bvb.ro), from the financial statements found on the websites of the studied companies, from the database of the National Bank of Romania (www.bnr.ro), of the National Institute of Statistics (www.insse.ro) and Eurostat. In order to process the data, to obtain the results and to validate the hypotheses, the econometric software EViews, as well as the statistical and mathematical software Excel were used.

Research limits

In our opinion, the researched field is particularly wide and almost impossible to be entirely studied within a doctoral thesis. One of the limits in studying the performance and the financial position is to access the data and the information for a longer period of time. Besides the time horizon, another limit of the research is that only 35 companies, representing 40% of all companies listed on the Bucharest Stock Exchange, were surveyed. At the same time, the lack of access to the information regarding the managerial accounting has generated other limits, attenuated by the data found in the Board of Directors reports, in the auditors reports, etc.

The sample selection aimed to achieve the main objective of our scientific approach. For this reason, the research sample consisted of 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the standard and premium categories. Taking into account the fact that the listing of a company on the Bucharest Stock Exchange is a confirmation of its performance, we consider that the chosen sample is a representative one and the above-mentioned limits can be transformed into research perspectives.

Without claiming to make full use of the methods used to assess the financial performance and position, extremely extensive concepts, that make it almost impossible to carry out an exhaustive research, the doctoral thesis is organized in: introduction, 5 chapters, presentation of the research results, personal contributions and future research directions.

SUMMARY OF CHAPTERS

The first chapter „Classic financial indicators regarding the position and the financial performance evaluation at the economic entity” is structured in two parts. The theoretical part presents the concepts of financial performance and position, highlighting also the main changes
to the national and international legislative framework. In the second part, through the case studies, the evolution of the financial position and performance at the companies from the manufacturing industry in Romania, was studied during the period of time 2007-2016.

In this chapter, a personal contribution of the author consisted in elaborating a case study regarding the evolution of the liquidity rates at the companies from the manufacturing industry in Romania. As a result of the research, the pre-established research hypothesis according to which „the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard category, recorded during the period of time 2007-2016 an adequate level of liquidity, having no difficulties in paying the current debts”, has been partially confirmed.

Figure no. 1 (left): The companies structure based on the annual average of the Current liquidity ratio (%), figure no. 2 (right): The companies structure based on the annual average of the Quick Liquidity ratio (%), and figure no. 3 (middle): The companies structure based on the annual average of the Cash ratio (%)

Source: Author own processing, based on the data taken from the companies annual financial statements, available on www.bvb.ro and on the companies websites

Analyzing the figure no. 1, it can be noticed that at the level of each year of the studied period of time, around 80% of the companies obtained an appropriate annual average of the
Current liquidity ratio, managing to support their short-term liabilities from their current assets. Figure no. 2 highlights that during the period of time 2007 - 2016, between 40% and 70% of the studied companies obtained an appropriate level of the annual average of the Quick Liquidity ratio. Finally, the companies structure based on the annual average of the Cash ratio (figure no. 3), reveals that the weight of the companies that registered an appropriate ratio is relatively low (between 22.86% and 45.71%), which indicates that they had difficulties in paying their short-term debts from their cash availability.

In this chapter it was carried out a study regarding the evolution of the solvency ratios, which confirmed the pre-established research hypothesis, according to which "the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, obtained for the period of time 2007-2016, appropriate levels of the General Solvency Ratio (Rsg) and of the Patrimonial Solvency Ratio (RSP)".

Analyzing the figure no. 4 above, it can be noticed that the weight of the companies that obtained an annual average of the General solvency ratio below 1.4 is low (between 2.86% and 8.57%), which means that over 90% of the studied companies do not have difficulties in covering their debts based on their assets. Figure no. 5 shows that the weight of the companies that have recorded an annual average of the Patrimonial Solvency Ratio higher than the appropriate level of 0.5, exceeded 90% for the entire studied period of time, which means that the weight of their own capital in the total capital is an important one, the companies being financially autonomous.
The author's personal contributions and the novelties brought to the research field has materialized also in the application of the VAR (Vector Autoregression) model on the 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, for the period of time 2007-2016. This research has shown that, “there is a relationship between the macroeconomic variables - real economic growth and GDP deflator, and the companies patrimonial solvency”, the research hypothesis being validated.

The research results consist in the following regression equations:

\[
DGDP\_DEFLATOR = -0.767486 \times DGDP\_DEFLATOR(-1) + 0.677155 \times DQUARTERLY\_GDP(-1) + 0.271793 \times DSP(-1) - 0.003498
\]

\[
DQUARTERLY\_GDP = -0.221466 \times DGDP\_DEFLATOR(-1) + 0.496421 \times DQUARTERLY\_GDP(-1) + 0.226279 \times DSP(-1) - 0.000103
\]

\[
DSP = -0.044572 \times DGDP\_DEFLATOR(-1) + 0.145304 \times DQUARTERLY\_GDP(-1) - 0.465637 \times DSP(-1) - 0.004793
\]

After applying the VAR model, it was found that: the dependence of the GDP deflator on its past values and on the past values of the real economic growth and of the patrimonial solvency variables is strong, 51.39% of the GDP deflator dispersion being explained by the change of these variables; the dependence of the real economic growth variable on its past values and on the past values of the GDP deflator and of the patrimonial solvency variables is relatively low (17.79%); the dependence of the patrimonial solvency variable on its past values and on the past values of the GDP deflator and of the real economic growth is medium (27.99%);

- the change with one unit of the real economic growth, causes a positive change of the GDP deflator with 0.677155 units; the change with one unit of the real economic growth leads to a positive change of the patrimonial solvency with 0.145304 units; the change with one unit of the GDP deflator causes a change in the opposite direction with -0.044572 units of the patrimonial solvency;

The study regarding the evolution of the indebtedness degree at the companies from the manufacturing industry shows a strong capitalization, the pre-established research hypothesis, “the companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, have recorded during the period of time 2007-2016, a moderate level of indebtedness, being relatively financially independent”, has being validated.
The annual average score developed by the author for the financial leverage, shows that in the period of time 2007-2016, the companies recorded an appropriate financial situation as the financial leverage did not exceed 60%.

![The financial leverage score during the period of time 2007-2016](source)

The research regarding the evolutions of the result of the financial year, shows that if in 2007, before the crisis, 88.24% from the analyzed companies registered profit, starting with 2008, their weight reduces significantly and an improvement of their financial situation is noticed during the period of time 2014-2016 (figure no. 7). Therefore, the pre-established research hypothesis „the financial performance of the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, appreciated on the basis of the evolution of the annual average result of the financial year, decreased significantly with the beginning of the economic and financial crisis in 2008, starting to improve since 2014 ‟, has been validated.

![The companies structure depending on the annual average result of the financial year (%), 2007-2016](source)
The forecast regarding the evolution of the annual average result of the financial year (figure no. 8) suggests that in the next five years (2017-2021), the companies from the manufacturing industry will carry out a profitable activity, materialized in a positive annual average result of the financial year, with an upward trend (excepting 2018).

Figure no. 8. Forecast regarding the evolution of the annual average result of the financial year, 2017-2021

Source: Author own processing

The author’s personal contributions also consisted in conducting a research regarding the evolutions of the rentability returns. With the beginning of the economic and financial crisis in 2008, we can notice a reduction of the score of the annual averages of the Return on Equity (ROE), Return on Assets (ROA), Income rate of return (RRV) and of the Rate of return of the consumed resources (RRC), mainly due to the decrease of the result of the financial year obtained by the studied companies. Beginning with 2010, the score value of those rates of return records a slight increase until the end of 2016 (figure no. 9).

Figure no. 9. The score evolution of the return rates, during the period of time 2007-2016

Source: Author own processing, based on the data taken from the companies annual financial statements, available on www.bvb.ro and on the companies websites
Based on the above-mentioned arguments, the research hypothesis „the financial performance of the 35 companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, appreciated on the basis of the profitability rates, decreased significantly with the beginning of the economic and financial crisis in 2008, an improvement being noticed over the last studied years”, is confirmed. Also, the profitability rates recorded positive values over the entire studied period of time, the manufacturing industry managing to adapt to the unfavourable macroeconomic conditions determined by the crisis.

The forecast regarding the profitability rates confirms the research hypothesis „the companies included in the research will record positive rates of return, with an upward trend over the period of time 2017-2021” (figure no. 10).

![Figure no. 10. Forecast on the evolution of the annual average of the rates of return (%), 2017-2021](source)

*Source: Author own processing, based on the data taken from the companies annual financial statements, available on [www.bvb.ro](http://www.bvb.ro) and on the companies websites*

Another personal contribution of the author is represented by the construction of an econometric model, in order to identify the microeconomic variables that explain the change of the Income rate of return of the studied companies, for the period of time 2007-2016. Therefore, we started from the research hypothesis according to which „there is an interdependence between the annual averages of the Income rate of return and the independent variables: the Rotation of the current assets (ROTAC), the Rate of return of the consumed resources from exploitation (RRCEXPL), the Current Liquidity Rate (RLC), and the Return on Assets (ROA)". 
The obtained regression equation is the following one:

\[ RV = -7.5806 + 0.6989RLC + 0.45ROA + 1.1066ROTAC + 0.6568RRCEXPL \]

Since the coefficients values are significantly different from zero, and the probabilities associated to the independent variables are lower than the 5% statistical significance level, the established research assumption is accepted. Adjusted R-squared indicates a strong intensity of the relationship between the dependent variable and the four independent variables. Therefore, 78.45% of the variance of the Income rate of return (RRV) is determined by the variance of the independent variables, the rest of 21.55%, being caused by the variance of the residual variable.

Another personal contribution of the author consisted in determining the influence of the change of the capital structure on the financial position and performance, at the companies from the manufacturing industry, as well as at the companies from Romania, listed on the Bucharest Stock Exchange, at the premium and standard category, during the period of time 2007-2016.

As shown in the figure no. 11, the financial performance of the studied companies, expressed through the Return on Equity (ROE), decreases simultaneously with the increase of the financial leverage (total liabilities/equity), respectively with the decrease of the solvency. After determining the correlation coefficient, it was demonstrated that in 2007, there was a positive relationship between the Financial leverage (Lf) and the Return on Equity (ROE). Starting with 2008, with the beginning of the economic and financial crisis and until the last
analyzed year, it can be noticed a strong and negative connection between those two variables, the decrease of the value of the Return on Equity being influenced by the increase of the Financial leverage, respectively by the over-indebtedness.

In this research, there were also estimated the profits that could be obtained by the Romanian companies, listed on the Bucharest Stock Exchange, at the premium and standard categories, in the absence of the economic and financial crisis. It was highlighted that the trend of the net nominal profit registered in the pre-crisis period, namely during the period of time 2004-2008, was an upward one.

The potential loss of the net nominal profit recorded in 2009-2016, was also determined (figure no. 12).

The potential loss at the national level, respectively at the Romanian companies listed on the Bucharest Stock Exchange, at the premium and standard category, was about 47%, due to the beginning of the crisis as well as to the debts accumulated in the pre-crisis period. It was also shown that, before the last two economic and financial crises in Romania, there was a decrease in the weight of profits in GDP, which was explained by the inadequate financial structure of the companies, which due to the financing reduction from the banks, could no longer entirely pay their debts. As a consequence, in the years when the crisis starts, the weight of profits in GDP is increasing, due to the GDP reduction compared to the years before the crisis.
The study has validated the pre-established research hypothesis that "a company's performance depends largely on the debtors' ability to pay their debts". Therefore, although the economies are depending on credit, there is a level beyond which the debt growth has negative effects on the profits sustainability as well as on the economy in general.

In the second chapter of the doctoral thesis "The evaluation of the position and financial performance of the economic entity based on modern indicators of value creation", there were presented the main theoretical aspects regarding the modern value creation indicators, important in the estimation of the financial performance, and also it was carried out a case study at the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard category, during the period of time 2007-2016.

The evolution of these indicators was presented, and the obtained results showed that during the period of time 2007-2016, the weight of the companies that registered a negative Economic Value Added (EVA) is high - from 71.43% to 94.12% (Figure no. 14). Those companies recorded a Return of the total invested capital lower than the Weighted average cost of capital, reducing the value for the shareholders.

![Figure no. 14 (left): The companies structure depending on the level of the Economic Value Added (EVA) (%), Figure no. 15 (right): The evolution of the invested capital (Ci) (%)](source)

Source: Author own processing, based on the data taken from the companies annual financial statements, available on [www.bvb.ro](http://www.bvb.ro) and on the companies websites

The relationship between the Economic Value Added and the profit or the losses registered during the period 2007-2016, shows that the lowest percentage is held by the companies that registered net profit and positive EVA (2.86%). The weight of the companies that recorded net profit and a negative EVA is high (from 65.71% to 88.24%). An important weight
(around 25.71% in 2012 and 2013) is also held by the companies that registered losses and a positive EVA (Figure no. 16).

Because EVA’s individual values recorded a high variation, it was determined an annual average score based on the relationship between this indicator and the result of the financial year.

During the analyzed period of time, the annual average score does not fluctuate significantly, obtaining values between 1 and 1.25, which means that most of the companies recorded net profit simultaneously with a negative EVA, according to the score model (figure no. 17).
Therefore, according with this study, the research hypothesis was confirmed, „the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, recorded during the period of time 2007-2016, an inappropriate level of the Economic Value Added, the Weighted average cost of capital not being entirely covered by the Rentability of the invested capital”.

The study regarding the evolution of the Market Value Added (MVA) indicator showed that in 2007 it was registered the highest weight of the companies with a positive value of this indicator (58.82%), and in 2008, with the beginning of the economic and financial crisis, it was registered the lowest weight (17.14%). In the coming years, it can be noticed an increase of the weight of the companies with a positive MVA (Figure no. 18).

<table>
<thead>
<tr>
<th>Year</th>
<th>MVA &gt; 0</th>
<th>MVA &lt; 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>23.57</td>
<td>76.43</td>
</tr>
<tr>
<td>2015</td>
<td>23.71</td>
<td>76.29</td>
</tr>
<tr>
<td>2014</td>
<td>29.59</td>
<td>71.41</td>
</tr>
<tr>
<td>2013</td>
<td>33.57</td>
<td>66.43</td>
</tr>
<tr>
<td>2012</td>
<td>22.36</td>
<td>77.14</td>
</tr>
<tr>
<td>2011</td>
<td>22.36</td>
<td>77.14</td>
</tr>
<tr>
<td>2010</td>
<td>31.43</td>
<td>68.57</td>
</tr>
<tr>
<td>2009</td>
<td>35.29</td>
<td>64.71</td>
</tr>
<tr>
<td>2008</td>
<td>17.14</td>
<td>82.86</td>
</tr>
<tr>
<td>2007</td>
<td>23.82</td>
<td>76.18</td>
</tr>
</tbody>
</table>

Figure no. 18. The companies structure according to the level of the Market Value Added (%), 2007-2016

Source: Author own processing, based on the data taken from the companies annual financial statements, available on www.bvb.ro and on the companies websites

The highest score of this indicator was recorded in 2007. In 2008, with the beginning of the economic and financial crisis, it can be noticed a significant decrease of its value, mostly due to the reduction of the companies market capitalization. The situation is improving starting with 2009 to the end of the studied period of time, the score having relatively close values (from 0.23 to 0.34). Also these values point out that most of the companies recorded a negative value of the Market Value Added, because in determining the score, the companies with a positive indicator received 1 point and those with a negative indicator 0 points (figure no. 19).
Following the empirical research, the hypothesis that "the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, recorded a low value of the Market Value Added indicator during the period of time 2007-2016", is confirmed.

The study regarding the evolution of the Return on investment (Rli) shows that if in 2007, about 85% of the companies registered a positive value of this indicator, in the coming years, the Return on investment had a fluctuating trend, followed by a slight recovery at the end of the analyzed period of time (figure no. 20). The evolution of this indicator was largely influenced by the value of the result of the financial year registered by the companies during the period of time included in the research. The increase of the weight of the companies that recorded a negative value of the Return on Investment, demonstrates a decrease of the value created for shareholders.
Since the maximum score was 1, the indicator’s score recorded values above the average (over 0.5) during the entire studied period of time, which indicates that the companies generated cash flows. The indicator’s evolution is oscillating, the highest value being recorded in 2007, namely 0.85. Although its value increased over the last analyzed years, it does not reach the level recorded in 2007 (Figure no. 21).

![Graph showing the evolution of the annual average score of the Return on investment, during the period of time 2007-2016.](image)

Figure no. 21. The evolution of the annual average score of the Return on investment, during the period of time 2007-2016

*Source: Author own processing*

Based on the empirical research carried out, the research hypothesis is validated, being admitted that „*the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, recorded during 2007-2016, a relatively low value of the Return on investment*”.

The third chapter „*The evaluation of the financial position and performance at the economic entity through the capital market indicators*”, presents the evolution of these indicators during the period of time 2007-2016, at the companies from the manufacturing industry in Romania, as well as at all the companies from Romania, listed on the Bucharest Stock Exchange.

The evolution of the Price earnings ratio (PER) and Price to book value (PBV) indicators is oscillating during the period of time 2007 - 2016, at the level of the Bucharest Stock Exchange as well as at the manufacturing industry. With the beginning of the economic and financial crisis in 2008, the indicators value decreased compared to 2007. Starting with 2009, their value is increasing, without returning until the end of the studied period, to the level reached before the crisis (Figure no. 22 and Figure no. 23).
Figure no. 22 (left): The PER’s evolution at the Bucharest Stock Exchange and at the manufacturing industry (lei), and figure no. 23 (right): The PBV’s evolution at the Bucharest Stock Exchange and at the manufacturing industry (lei)

Source: Author own processing, based on the data taken from the companies annual financial statements, available on www.bvb.ro and on the companies websites

In 2007 and 2008, 56%, respectively 69% of the companies from the manufacturing industry in Romania obtained a higher PER than the one registered at the Bucharest Stock Exchange. This situation was mostly determined by the PER’s decrease at the Bucharest Stock Exchange with around 70% in 2008 compared to 2007 (Figure no. 24).

The Earnings per share decreased significantly during the studied period of time, the PER’s increase being mostly determined by this fact and not by the increase of the market price.

Regarding the Price to Book Value (PBV), in 2007, only 4% of the companies from the manufacturing industry registered a higher level than the one recorded on the capital market. In 2008, the companies weight increases significantly (19.23%). This evolution was determined by
the emergence of the economic and financial crisis, which affected the indicator’s level on the capital market, his value being reduced with more than 70% compared to 2007. In the last years, it can be noticed an upward trend of the companies that obtained an annual average of the PBV higher than the one registerd on the capital market (Figure no. 25).

It can be noticed that during the period of time 2007-2016, between 60% and 85.29% of the companies from the manufacturing industry, obtained a Dividend yield (DIVY) lower than the one recorded by the capital market (Figure no. 26).

Another point of novelty brought by the doctoral dissertation to the literature review, is represented by the comparison between the evolution of the Dividend yield on the capital market and at the companies from the manufacturing industry, and the evolution of the annual average of the interest rate applied by the commercial banks from Romania to RON deposits.
Starting with 2007 and until 2010, the Dividend yield (DIVY) of the companies from the manufacturing industry in Romania is higher than the Dividend yield from the capital market, and in 2008 it is also higher than the annual average of the interest rate practiced by the banks. Instead, from 2009 to 2011, the effects of the economic and financial crisis on the capital market are visible, the investments on the money market being more profitable. Due to the fact that the investors' confidence in the capital market increased, starting with 2012 and until the end of the studied period of time, the capital market investments in the companies listed on the Bucharest Stock Exchange as well as in the companies from the manufacturing industry, brought a higher profit than the one obtained from the money market investments.

The evolutions of the annual average scores of the capital market indicators, as well as of the general performance score, developed by the author for the companies from the manufacturing industry, listed on the Bucharest Stock Exchange, are shown in the figure no. 28.
The annual average score of the Price earnings ratio (PER) recorded the highest values over the whole studied period of time, compared to the other performance indicators. It was considered that a score of 0.5 corresponds to a medium performance. Most of the companies from the manufacturing industry, listed on the Bucharest Stock Exchange (between 84.85% and 100%) recorded during the period of time 2007-2016, an annual average general score of performance lower than 0.5, meaning a relatively low financial performance.

The results of the case studies confirm the research hypothesis according to which, "the 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, are facing during the period of time 2007-2016 with a decrease of the financial performance appreciated from the perspective of the capital market indicators". Although in the last 2-3 years included in the research, the indicators evolutions highlight that the financial performance of the studied companies is improving, its level is lower than the one recorded in the years before the crisis.

Another personal contribution of the author consists in the construction of a simple linear regression with panel data at the level of the companies from the manufacturing industry, listed on the Bucharest Stock Exchange. Therefore, it was demonstrated that 21.29% from the variance of the Price to Book Value (PBV) is explained by the Return on Assets (ROA) variance, between the two variables existing a positive and medium correlation, according to the below regression equation:

$$PBV = 0.022478 \times ROA + 0.741252$$

The obtained results confirmed the research hypothesis according to which „there is interdependence between the Price to Book Value and the Return on Assets, at the manufacturing industry in Romania“.

The fourth chapter „The evaluation of the insolvency risk at the economic entity“, presents both theoretically and empirically, the insolvency risk at the companies from the manufacturing industry, listed on the Bucharest Stock Exchange, during the period of time 2007-2016, as well as the forecast of this type of risk for the period of time 2017-2021, throught the dedicated score models.

In the figure no. 29, it is presented the companies structure, depending on the insolvency risk, determined through the Springate model. Excepting 2016, over the entire studied period of time, over 50% of the companies were presenting insolvency risk. After analysing the financial
statements of these companies, it seems that the insolvency risk is caused by: the slowing of the stocks, suppliers and receivables rotation, with negative consequences on the companies liquidity and profitability; the reduction in the value of the profit and turnover, etc.

The companies structure, depending on the insolvency risk, determined through the Taffler model (figure no. 30), highlights that during the period of time 2007-2016, between 62.86% and 82.35% from the studied companies were financially healthy. It can be noticed that, after 2008, with the beginning of the crisis, between 31.43% and 37.14% of the companies get a Z score determined through the Altman model, which highlights the lack of the insolvency risk (figure no. 31). According to the Z score obtained through the French Commercial Credit model, between 51.43% and 82.86% of the companies had a good financial situation (Z > 0) during the period of time 2007-2016.

Figure no. 29. (left) The companies structure depending on the insolvency risk – Springate model (%), and Figure no. 30. (right) The companies structure depending on the insolvency risk – Taffler model (%)

![Image](image1.png)

Figure no. 31. (left): The companies structure depending on the insolvency risk – Altman model (%), and figure no. 32. (right): The companies structure depending on the insolvency risk – French Commercial Credit model (%)

Source: Author own processing, based on the data obtained from the companies annual financial statements, available on www.bvb.ro and on the companies websites

By applying those 4 models of determining the insolvency risk, it was shown that 11 of the 35 companies had a high insolvency risk during the period of time 2007-2016 (table no. 1).
Table no. 1. The structure of the companies with high insolvency risk, 2007-2016

<table>
<thead>
<tr>
<th>The companies evaluated as risky after the application of all 4 models</th>
<th>The companies evaluated as risky after the application of 3 of the 4 models</th>
<th>The companies evaluated as risky after the application of 2 of the 4 models</th>
<th>The companies evaluated as risky after the application of only one model</th>
</tr>
</thead>
</table>

Source: Author own processing, based on the data obtained from the companies annual financial statements, available on www.bvb.ro and on the companies websites

The table no. 2 highlighted that 14 of the 35 companies had a relatively low insolvency risk over the period of time 2007-2016.

Table no. 2. The structure of the companies with low insolvency risk, 2007-2016

<table>
<thead>
<tr>
<th>Companies with low insolvency risk after the application of all 4 models</th>
<th>Companies with low insolvency risk after the application of 3 of the 4 models</th>
<th>Companies with low insolvency risk after the application of 2 of the 4 models</th>
<th>Companies with low insolvency risk after the application of only one model</th>
</tr>
</thead>
</table>

Source: Author own processing, based on the data obtained from the companies annual financial statements, available on www.bvb.ro and on the companies websites

After the application of the four models of determining the insolvency risk, the research hypothesis according to which „the 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, recorded during the period of time 2007-2016, a relatively high insolvency risk”, was partially validated.

At the level of these companies, it was also made a forecast regarding the insolvency risk for the period of time 2017-2021 (Figures no. 33-36).
Figure no. 33 – 36: The insolvency risk forecast through Altman, Springate, Taffler and French Commercial Credit models

Source: Author own processing, based on the data available on www.bvb.ro website, in Eviews program

The prediction of the insolvency risk through the Altman model, led to the invalidation of **H₁** research hypothesis: „the predicted Z-score values determined through the Altman model will be higher than the score minimum, the probability of insolvency being relatively low”, as it was demonstrated that the insolvency risk of the manufacturing industry will be medium during the period of time 2017-2021. The research allowed the validation of **H₂** hypothesis, according to which „the predicted Z-score values determined through the Springate model will be lower than the score minimum, the probability of insolvency being relatively high”. **H₃** hypothesis: „the predicted Z-score values determined through the Taffler model, will be higher than the score minimum, the probability of insolvency being relatively low”, was confirmed, since it was considered that the studied companies will not be threatened by major risks during the period of time 2017-2021. **H₄** hypothesis was also confirmed: „the predicted Z-score values determined through the French Commercial Credit model will be higher than the score minimum, the probability of insolvency being relatively low”. 

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Chapter 5, “Optimizing the structure of the financial titles portfolio”, presents the main models used in analyzing the risk of the portfolio of titles, through case studies conducted on the companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, for the period of time 01.01.-31.12.2016. By applying the Markowitz model, based on the weekly closing price of the companies' titles, the efficient portfolio of titles and the portfolio with minimum absolute variance (PVMA) were identified together with Markowitz's efficient frontier.

The analysis regarding the structure of the efficient portfolios revealed that it is necessary to sell a part of the titles of 18 companies of the 33 companies from the manufacturing industry in Romania, and to purchase the titles of the rest of 15 companies. As well, the analysis in order to identify the portfolio with minimum risk, highlights that it is preferable to invest in the titles of the companies: Alro SA, Antibiotice SA, Biofarm SA, Conted SA, Industrial Electrocontact SA, Prefab SA, Sinteza SA, Turbomecanica SA, Teraplast SA, Uamt SA, and Vrancart SA, as these companies are the less risky ones.

In order to identify the portfolio with minimum absolute variance, Markowitz's efficient frontier was determined for the first eight companies (Electroputere SA, Turbomecanica SA, Ves SA, Boromir Prod SA, Compa SA, Vrancart SA, Sinteza SA, Carbochim SA) that obtained the highest weekly average return during the studied period of time (Figure no. 37).

The portfolio with the lowest risk of 3.30% consists of 48.87% shares of Turbomecanica S.A., 16.84% shares of Ves S.A., 0.06% shares of Vrancat S.A. and 34.23% shares of SINTEZA.
S.A., and its return is 1.02%. The investors with high risk aversion will prefer the portfolio from the top of the curve, or a portfolio near it.

In order to evaluate the titles of the studied companies, based on the weekly closing prices of the reference period and on the weekly values of the general index of the Bucharest Stock Exchange - BET, the Capital Assets Pricing Model - CAPM model was applied.

It has been found that the titles of Alro S.A., Electricul S.A. and Teraplast S.A. companies were overvalued, respectively, during the period of time 01.01.2016 - 31.12.2016, they obtained an expected return of the portfolio (Ei) higher than the expected return of the portfolio market, determined according to the evolution of the BET index (EM = 3.512%), being recommended to sale them (Figure no 39). Those companies recorded volatilities higher than 1, which indicates that they had unstable prices, and were more volatile with the capital market (Figure no. 38). Mecanica Ceahlău's titles obtained an expected return of the portfolio equal to the expected return of the market portfolio and had a volatility equal to 1. The titles of the rest of the studied companies were undervalued, being recommended to purchase them, which would lead to an increase in their titles price. These titles had volatilities lower than 1, therefore they had stable prices, being less volatile with the capital market.

![Figure no. 38. The companies titles volatility (β) and figure no. 39. Evaluating the companies titles through SML](www.bvb.ro)

In order to determine the market risk that exists at the level of the portfolio of titles corresponding to the studied companies, listed on the Bucharest Stock Exchange, at the premium and standard categories, as well as for the titles with the highest closing price at the end of the analyzed period of time (Conted Dorohoi SA), the Value at Risk (VaR) model was applied, using
the following methods: analytical, nonparametric historical simulations, Monte Carlo simulations, and finally comparing the results. There were considered the daily closing prices of the titles of the studied companies, for the period of time 01.01.2016 - 31.12.2016, the number of the statistical observations being 260. By applying those three methods, for Conted Dorohoi S.A. it was obtained a loss between 2.68% and 2.97% (tables 3, 4 and 5) and for the whole portfolio of titles, the loss was smaller, between 0.25% and 1.07% (tables 6, 7 and 8). Therefore, by diversifying the investment in a portfolio of titles, the risk determined through the maximum potential expected loss Value at Risk (VaR) can be substantially reduced.

<table>
<thead>
<tr>
<th>Table no. 3. VaR applied to CNTE company - nonparametric method</th>
<th>Table no. 4. VaR applied to CNTE company – parametric method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numărul de observaţii</td>
<td>260</td>
</tr>
<tr>
<td>Randamentul minim zilnic</td>
<td>-11.11%</td>
</tr>
<tr>
<td>Randamentul maxim zilnic</td>
<td>8.08%</td>
</tr>
<tr>
<td>Media randamentului</td>
<td>-0.07%</td>
</tr>
<tr>
<td>Interval</td>
<td>19.19%</td>
</tr>
<tr>
<td>Deviaţia standard</td>
<td>0.0174</td>
</tr>
<tr>
<td>Nivelul de încredere</td>
<td>95%</td>
</tr>
<tr>
<td>Cele mai mici 5% nr de observaţii</td>
<td>13</td>
</tr>
<tr>
<td>5% VaR</td>
<td>-2.68%</td>
</tr>
<tr>
<td>Ultima valoare de închidere</td>
<td>45.2</td>
</tr>
<tr>
<td>Valoarea investită</td>
<td>1.000.000</td>
</tr>
<tr>
<td>Pierderea potenţială zilnică (5% VaR)</td>
<td>(26.763)</td>
</tr>
<tr>
<td>Pierderea potenţială săptămânală</td>
<td>(59.846)</td>
</tr>
<tr>
<td>Pierderea potenţială lunară (22 zile)</td>
<td>(125.534)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table no. 5. VaR applied to CNTE company Monte Carlo simulation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivel de încredere 95%</td>
</tr>
<tr>
<td>5% observaţii</td>
</tr>
<tr>
<td>5% VaR</td>
</tr>
<tr>
<td>Valoarea investitiei</td>
</tr>
<tr>
<td>5% VaR Value</td>
</tr>
<tr>
<td>Bin size</td>
</tr>
</tbody>
</table>
Table no. 6. VaR applied to the portfolio of titles - nonparametric method

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numărul de observații</td>
<td>260</td>
</tr>
<tr>
<td>Randamentul minim zilnic</td>
<td>-2.73%</td>
</tr>
<tr>
<td>Randamentul maxim zilnic</td>
<td>6.40%</td>
</tr>
<tr>
<td>Media randamentului</td>
<td>0.1084</td>
</tr>
<tr>
<td>Interval</td>
<td>9.13%</td>
</tr>
<tr>
<td>Nivelul de încredere</td>
<td>95%</td>
</tr>
<tr>
<td>Cele mai mici 5% nr de observații</td>
<td>13</td>
</tr>
<tr>
<td>5% VaR</td>
<td>-0.89%</td>
</tr>
<tr>
<td>Ultima valoare de închidere</td>
<td>2.1374</td>
</tr>
<tr>
<td>5% VaR a prețului de închidere</td>
<td>2.1185</td>
</tr>
<tr>
<td>Valoarea investiției</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Pierderea potențială zilnică (5%VaR Value)</td>
<td>(8,856,85)</td>
</tr>
<tr>
<td>Pierderea potențială săptămânală (5 zile)</td>
<td>(19,804,51)</td>
</tr>
<tr>
<td>Pierderea potențială lunară (22 zile)</td>
<td>(41,542,30)</td>
</tr>
</tbody>
</table>

Table no. 7. VaR applied to the portfolio of titles - parametric method

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Număr observații</td>
<td>260</td>
</tr>
<tr>
<td>Randamentul minim zilnic</td>
<td>-2.73%</td>
</tr>
<tr>
<td>Randamentul maxim zilnic</td>
<td>6.40%</td>
</tr>
<tr>
<td>Randamentul mediu zilnic</td>
<td>0.1084</td>
</tr>
<tr>
<td>Varianța portofoliului</td>
<td>0.01%</td>
</tr>
<tr>
<td>Deviația standardă a portofoliului</td>
<td>0.71%</td>
</tr>
<tr>
<td>5% VaR (pierderea estimată)</td>
<td>-1.07%</td>
</tr>
<tr>
<td>Investiția</td>
<td>1,000,000</td>
</tr>
<tr>
<td>5% VaR Value</td>
<td>(10,658,23)</td>
</tr>
<tr>
<td>Pierderea zilnică estimată</td>
<td>(23,832,52)</td>
</tr>
<tr>
<td>Pierderea potențială săptămânală (5 zile)</td>
<td>(49,991,52)</td>
</tr>
<tr>
<td>Pierderea potențială lunară (22 zile)</td>
<td>(2,513,47)</td>
</tr>
</tbody>
</table>

Table no. 8. VaR applied to the portfolio of titles - Monte Carlo simulation method

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence level 95%</td>
<td>95%</td>
</tr>
<tr>
<td>Bottom 5% obs</td>
<td>500.00</td>
</tr>
<tr>
<td>5% VaR</td>
<td>-0.25%</td>
</tr>
<tr>
<td>Valoarea investiției</td>
<td>1,000,000</td>
</tr>
<tr>
<td>5% VaR Value</td>
<td>(2,513,47)</td>
</tr>
</tbody>
</table>

Source: Author own processing, based on the data obtained from the companies annual financial statements, available on www.bvb.ro and on the companies websites

The risk of the portfolio of titles was also determined through the family of GARCH models. The research results indicate that EGARCH model is the best suited to determine the risk of the portfolio of titles, estimated through the maximum potential loss Value at Risk (VaR). The maximum losses estimated for one-day horizon through this model, were around 0.02%.

The results of the research developed in the doctoral dissertation contribute to the presentation of a complete and up-to-date picture regarding the evolution of the financial position and performance of the companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at the premium and standard categories, during the period of time 2007-2016, from the perspective of their ability to adapt to the new conditions imposed by the capital market.

In our opinion, the topic discussed in the doctoral dissertation and the obtained results, open up new research horizons, such as: extending the research on topics complementary to the
concepts of financial performance and position, as well as the sample and the time horizon; taking into account the possibility to evaluate the financial performance and position, by including some macroeconomic factors in the research; the development of innovative methods for determining the financial performance and position, by including information regarding the non-financial assets of the companies, as well as regarding the social and environmental performance; the development of new models for estimating the market risk; conducting a research on the managers of the companies involved in the research, in order to establish more accurately the causes that affect their financial performance and position.

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