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SUMMARY
of the doctoral dissertation

“THE IMPLICATIONS OF FIRMS’ FINANCIAL POLICIES ON ECONOMIC EFFICIENCY”

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2. KEY WORDS: economic efficiency, firm's financial policies, financing policy, investments policy, capital structure, financial indicators, economic-financial analysis, stochastic frontier approach, econometric modelling, performance regression model

3. SYNTHESIS OF THE MAIN PARTS OF THE DOCTORATE DISSERTATION

In this thesis, I have tackled the issue of analysing the concept of efficiency and the influence of firms' financial policies on efficiency at a microeconomic level, because this has remained a major challenge for the researchers if we take into consideration that currently there is no unanimously acknowledged theory on efficiency and, implicitly, there is no optimal theory concerning the way in which financial policies adopted by firms influence the efficiency of the firms' activity.

The significant attention given to finding out more about the level of efficiency in the academic and business environments provides the concept with a dynamic and complex nature, acknowledging at the same time the continuous endeavour of the development of the measurement and performance management apparatus. The ever-changing nature of the global economic tendencies, accentuated by the peculiarities and the difficulties specific to times of crisis, consolidates the necessity of finding out the real state of performance of a company and the opportunities and threats that may arise from this. Therefore, in the attempt to understand and control the success or the failure recorded by a company, the issue of analysing the efficiency and the influence of financial policy on it continues to be a major issue of actuality, open to challenges, commitment and perseverance.

The rich scientific heritage offered by the literature on efficiency presents however an accentuated subjective tone and it is characterized by particular traits from an economy to another. These arguments support how necessary and beneficial the analysis of the implementation of various estimation and measuring models of efficiency is, on practical cases, and also, on the necessity of developing new models and techniques of measuring it.

To find out more about the scientific approach on this concept, to reach my work hypotheses that would explain the economic phenomena, the analysis and measurement methods employed, I appealed to the bibliographic documentation, this being an important part of my research process, which also gave direction to my entire work. Moreover, in my thesis I made use of logical means, such as induction and deduction, but also methods of quantifying measurement. A strength point of the methodology used is the diversity and complexity of the econometric models employed, most of them being designed by following own specifications and estimated by using specialized programs.

Despite the theoretical controversies, the research on the level of efficiency of the firms is very important. It allows explaining the actions taken by some firms with the purpose of increasing their profits and reducing the economic costs. Our study tackles this perspective. Our intention is not to justify some financial policy choices, nor to emphasize on the most appropriate strategy for each company. On the contrary, we have tried to assess the effects of these policies on the efficiency of the companies through modern econometric models. This research proves to be extremely useful because in order to maximize benefits and reduce the cost of obtaining those benefits we must firstly identify the determinant factors of efficiency and, implicitly, to determine the influence that the financial policies of the firms have on efficiency.

Subservient to the title of the thesis, the approach of the issue of efficiency and its determinant factors is modularly designed in four chapters, logically expressed and properly dimensioned.

Therefore, I found absolutely necessary providing in **chapter one** a detailing of the main elements that make up my thesis by making reference to the specialized literature. By appealing to the specialized literature we have the possibility to get familiar with the scientific research, the work hypotheses used for explaining economic phenomena, econometric models, conclusions and scientific theories specific to this field.

I found it necessary to begin my theoretical approach from the first chapter by emphasizing on the importance of the notion of efficiency. As we see it, the success or failure in business, regardless the chosen field of activity depends on the economic efficiency of the performed activity. The elimination or improvement of an inefficient activity will lead to a reduced cost of the resources and, implicitly, to the increase in efficiency. The evaluation of the performance, and also, the comparison of the performance to a recognized standard, could help the economic processes to be more productive and more efficient. The evaluation of the performance is very important to improve the instruments used for maintaining competitiveness. Thus, efficiency is a variable whose implications play a significant role in the activity of the firms. In the literature overview, there is a wide range of opinions and approaches concerning the concept of efficiency, in general, and concerning the concept of economic efficiency at a macroeconomic level, in particular. In economics, the concept of efficiency characterizes the way in which firms make use of the resources in their production process. The issues related to the efficiency of the economic activity wouldn't exist if the resources were unlimited. However, the majority of the available resources in our society have a limited nature. This limitation of the resources makes the issues of efficiency more and more important, because, by resolving them, the entrepreneurs should find an answer to a series of complicated questions concerning how much, what and when they should produce. Considering this, some economists reckon that

the essence of efficiency lays not in the ratio between expenses and outcome, as it is commonly defined, but in the production relations, allocation and exchange, which determine the reduction of the efforts to achieve a useful effect.

The study regarding efficiency couldn't be carried on without making reference to the financial policies implemented by the companies, more precisely, to the decisions that govern the development of an efficient activity. In this regard we considered necessary to offer a more detailed description of the way in which capital structure influences efficiency. The decision regarding the capital structure is a complex issue in the activity of any company, considering that there are various ways of financing. In the specialized literature there are three parameters that best characterize the capital structure, namely: the debt rate, the debt maturity and the choice of the financing currency. The decision concerning the capital structure of a company is one of the most important business decisions because it affects the capital cost, capital budgeting decisions, and the value of the company. The researchers, in their studies, have always attempted to offer an answer regarding the optimal structure of the capital or optimal indebtedness. Most of the empirical research has the tendency to analyse on the decisions regarding the capital structure taken by the firms from developed and developing countries. Therefore, at the ground of a successful management, lays the development and the implementation of a solid set of business strategies, investment objectives, financial policies that are mutually consolidating each other. These strategies have to be chosen after a thorough analysis of the various economic compromises that will be accepted by the economic agent, both individually and also in correlation with one another.

Setting on the context of **the second chapter**, my thesis continues with emphasis on the main forms of expression of the efficiency, and also on the most commonly used methods employed to measure the level of efficiency of the firms. We have seen useful to provide a review of these methods, because they will be very important in the estimation process of the efficiency of the firms within chapter four. Considering that the main focus of this study is the efficiency of the firms' activity, a very important aspect is that of defining clearly the concept of efficiency and the most common methods of its determination. Further, we determined the influence of financial policies on firms' efficiency level.

The approaches regarding the measurement of efficiency are, generally, divided in: parametric analyses, which involve the econometric analysis and non parametric analyses, which imply methods of mathematical programming. Even if initially both techniques have been used to study the technical efficiency, today they are widely acknowledged as standard models designed to evaluate cost efficiency.

Focusing on the parametric techniques, these are designed on the notion of the stochastic nature of the data used in the estimation. In practice, there were used a

series of parametric techniques, but the most common by far was the stochastic Frontier Approach. The stochastic frontier approach allows: the time variation of the technical inefficiency and the elasticity of the inputs to detect the changes in the production structure; the existence of a function of the effects of inefficiency that consists in a set of variables simultaneously estimated by stochastic frontier. The approach is stochastic and firms can position themselves outside of the frontier, either because they are inefficient, or because of the random shocks or the quantification of the errors.

Regarding the non parametric techniques we focused on a detailed description of the data envelopment analysis (DEA). The purpose of this technique is to generate indicators that reflect better and more adequately the efficiency in each sector of activity. Therefore, initially, the method implies the specification of a model that would define the most important inputs and outputs for a decision unit. Then the data associated to the inputs and outputs is collected through linear programming, estimating the frontier of efficiency. Depending on the way in which each decision unit is placed in relation to this frontier we can determine the efficiency score. The DEA has priority as an alternative against other estimation methods of efficiency because: the outputs frontier can be easily found; it is not necessary to search for the type and form of the function, as the production possibilities frontier is determined through data envelopment.

Given that our main purpose in this thesis is to analyse the efficiency of the firms, we found it appropriate to present also the methods of identifying the determinant factors of efficiency. To be able to identify them we have used the model proposed by BATESSE and COELLI.

In order to quantify the efficiency and to determine its influencing factors we have used the stochastic frontier method. There are two reasons supporting our choice for using the stochastic method to estimate the efficiency frontier. Firstly, we have considered reasonable the fact that in the analysis of the efficiency of the firms there are errors in the stochastic data series included in the analysis. Secondly, the data used as inputs in the model have accounting nature. When accounting data are employed, there is a risk generated by the inaccuracies from the accounting standards which would lead to a deviated measurement of the inputs and outputs caused by the economic inputs and outputs. It is important that the measuring errors caused by the previously mentioned factors should not be assimilated as inefficiency for the firms included in the study.

Within the modern economic literature, the growth of a company's activity depends on the presence or the existence of a network and on providing an innovative environment, which relies on the endogenous development capacities of the company. Even if the particular factors of the company are important determinants of the

innovation activity, the technological opportunities and the favourable entrepreneurial environment have also a positive impact on innovation.

Even though there are a series of econometric techniques to measure the level of the firms' efficiency, in the analysis of the activity's efficiency, an important investigation aspect consists of the economic indicators. Their role is to express the real content of the various characteristics of the economic phenomenon, included in the analysis, such as: the ratio between the sizes of these characteristics, the correlation between them, their time evolution and so on. The efficiency can also be determined through a series of indicators that might have different shapes and structures. Through these indicators we can analyse the expenses engaged in function of the line of work of the company, as also the effects obtained after making those expenses. Company-focused, we can speak about a set of general indicators of efficiency, amongst which, the most common are: the efficiency of the production factors, the efficiency of the physical resources consumption, the efficiency of the structure of the resources consumption and results and economic-financial efficiency.

The third chapter is designed to offer a perspective of the variables specific to the external environment, but also of those associated to the internal environment that influence the activity of the firms. Currently, the activity of the companies is marked by the effects of the global economic crisis. The crisis has a significant influence on the countries from the European Union, especially on some member states, developing countries, such as the Czech Republic, Hungary, Poland, Romania and Bulgaria. The reasons and the circumstances of the economic crisis, from various countries and from different time periods, vary. The global crisis has proven that not only the regional economies, but also those developed such as the European Union or the USA cannot cope with new challenges. Therefore, each member state of the European Union tries to take the best measures to fight against the effects of the economic crisis. The diversity of the economic and financial environment, the economic characteristics and the objectives of the economic policies generate the necessity of taking and implementing different measures to stop the effects of the crisis.

In **the second part** of this chapter we have tried to focus on the analysis of the indicators specific to financial policies, level of efficiency and performance, level of undertaken risk. We made this study based on the financial situations for firms from the manufacturing industry from five countries, Poland, the Czech Republic, Hungary, Romania and Bulgaria. Presently, the firms from the European Union are developing their activity in a difficult macroeconomic environment and are making struggling efforts to come back to the situation recorded in 2008 regarding the economic performances and the engaged personnel existing prior to the occurrence of the economic crisis. The companies from Europe are dealing with a major challenge

concerning the increase of the economic competitiveness through increasing the level of labour productivity. For that purpose, there have been launched new initiatives for supporting the competitiveness of the European Union that set out key components such as: innovation, increasing the production based on hi-tech technologies and of science-based services, new competences and qualifications and sustainable development.

For the European firms activating in the manufacturing industry, the efficient use of the resources is not only a critical issue, but it also plays an important role for their competitiveness. To best tackle this issue, we need to have a good grasp of the four principles of the concept resources: raw materials, energetic resources, necessary expendable goods for obtaining a product and the flows of wastes necessary to be collected or recycled as much as possible. All these are strongly interconnected in the life cycle of a product. Therefore increasing the efficiency of the utilisation of the resources implies an integrated optimization of these. The current economic situation varies significantly according to the different sectors from the manufacturing industry, and depending on the future perspectives and challenges.

In our research, we aimed at highlighting the way in which the analysed indicators influenced the efficiency of the firms. To reach this objective we analysed the following indicators: the assets growth rate; the turnover growth rate; the EBIT growth rate; the return on assets ratios; the return on equity ratio; the return on sales ratio; the global debt ratio; the financial leverage; the ratio of amortization and depreciation expenses to total fixed assets; the assets rotation rate; the tangibility ratio; the liquidity ratio; the solvency ratio. Following up on the results obtained through the analysis conducted, we can conclude that the impact of the economic and financial crisis on the manufacturing industry from the European Union was severe, because the incomes of this industry have dropped initially with approximately 20%, recording a slight increase in the second half of the last year. The effects of the economic crisis in Europe were also reflected in a decrease of the investments and the international demand.

In the attempt to offer additional information regarding the efficiency of the firms' activity and the influence of the financial policies on efficiency during the time period 2006-2011, we focused in **the fourth chapter** on providing a descriptive study of the financial indicators for the Romanian firms activating in the manufacturing industry and, by using two econometric models, on identifying the level of efficiency and its determinant factors. The two econometric models used allowed us to compare the level of efficiency of the Romanian firms with the one belonging to companies from other countries, and also to see how the specific indicators of the financial policies of the companies influence efficiency. However, we considered it necessary to, before presenting the econometric studies and the results obtained, highlight in more

detail the sector of the firms from Romania, and by using indicators from the third chapter, to comment on their evolution.

In 2011, the dynamics of the firms' financial situations experienced mixed evolutions: the overall financial situation of the firms was improved, but the evolutions were mixed, showing important weaknesses in the structure and the process of sustainable change of the model of economic growth being carried on. The favourable evolutions maintained had an unbalanced impact in economy, with important structural differences. First of all, the analysis of the firms based on the size criterion shows that small and medium sized firms have recorded an increasing credit risk level. The phenomenon of insolvency and bankruptcy was attenuated in 2011. The number of the firms newly-declared insolvent or bankrupt in 2011 dropped with approximately 5 per cent compared to 2010, however it is significant above the level registered in 2009 (with approximately 32 per cent higher). In these conditions, it is obvious that we can speak of a growth of the importance of the concept of efficiency, as a consequence of the economic crisis. In a turbulent environment, only companies that have a high level of efficiency will manage to develop a sustainable activity and to create long-term added value.

Within **the first econometric study**, we aimed at making a comparison of the level of efficiency between the firms from the emerging countries in the region, and also to emphasize on the impact of the financial policies on the level of efficiency during 2006-2011. The efficiency of the firms and the identification of its determinant factors were measured through SFA modelling. More precisely, in the estimation we used the SFA model proposed by Greene (2005). The contribution our study brings to the current literature is significant from many points of view. **Firstly**, we have included in the model a considerable number of observations for firms from five countries. **Secondly**, our study provided results regarding the differences in inefficiency between the countries, and also the factors that influence this level. We consider these records valuable and necessary, given the effects of the economic crisis on the activity of the firms. **Thirdly**, we reckon that the results obtained are important to understand the evolution of the activity of the firms during 2006-2011.

The results obtained indicated the fact that, in comparison with Romania, the majority of the countries included in our study obtained better results. Thus, firms from Poland, the Czech Republic and Hungary form a quite homogenous group judging by the results obtained. Firms from these countries, operate, comparatively to Romanian firms, much more efficiently, the differences being quite significant. On the other hand, companies from Romania and Bulgaria form a second group, between these two countries the differences are smaller. Practically, by associating the results with the level of development from the countries subject to our study we can observe

a similarity between the two variables. Therefore, the level of economic development and the efficiency of the firms are two interdependent variables.

Further on, we analysed the impact of the variables specific to the firms' financial policies on inefficiency, the study conducted reflecting important aspects. The results obtained indicate the fact that the return on equity rate and the solvency ratio influence negatively the inefficiency of the firms. The rate of tangible assets has a positive influence on inefficiency.

The second empiric study consisted in the estimation of a SFA model only for firms from Romania. The Romanian specialized literature, unlike other countries, did not use SFA models to study the level of the efficiency of the firms. Considering this, our attempt is even more important. Moreover, with the help of this model, we managed to present the way in which the level of efficiency was influenced by financial policies.

The results obtained indicate the fact that in the case of the production function, all coefficients associated to the input variables are positive and significant. Also, the square root coefficients of the input variables are positive. Considering this, we can say that, generally, an increase in the number of employees or the growth of the fixed assets (bigger inputs) will generate a growth in the added value, namely the output. The result obtained indicates a good perspective for the firms. On the other hand, this result must be supported by an increased efficiency as much as possible to maximize the results obtained.

By analyzing the determinant factors of efficiency, we have noticed a positive influence of the solvency ratio on inefficiency. In this case, the growth of the ratio of ownership equity in total liabilities generates an increase of the level of inefficiency (a decrease in efficiency). Moreover, we replaced in our model the solvency ratio with the global debt ratio, calculated as a ratio between total debts and total assets. The global debt rate has a negative influence on inefficiency, which means that a growth in the share of total debts to assets will lead to a higher rate of efficiency for firms.

The last econometric approach shows the impact of certain indicators reflecting the nature of the financial policies on the rate of return. The study was conducted on firms from Romania, which operate in the manufacturing industry, based on the data collected during 2006-2011. The indicators assessing profitability are amongst the most important indicators used by a company in its internal administration. Regardless the wording (the return on assets, return on equity or return on sales), these indicators are included in the set of indicators published by most of the firms.

In our model, the return on assets rate will be a dependent variable, and amongst the independent variables we have included different indicators that characterize certain policies (financing, investments) adopted by the firms. More

specifically, amongst the independent variables we have included: the liquidity ratio, the global debt ratio; the tangibility ratio; the return on equity ratio; productivity ratio; the return on sales ratio; the ratio of depreciation and amortization expenses to total fixed assets; the financial leverage; the turnover growth rate.

The global debt rate has a negative influence on the return on assets ratio. Therefore, a growth of the share of the debts in total assets will generate a decrease of the return on assets rate. As we see it, this can be one of the reasons that justifies why companies from Romania are less efficiency and generate a lower added value. The negative influence of the debts on the return on assets rate can also be explained by the inexistence of a mature financial market, by high costs associated to the generated loans and by the lack of a capital market as an alternative to the banking market, firms not succeeding to achieve a return on assets rate sufficiently high to increase efficiency. Moreover, the influence of the tangibility ratio comes to support this statement. The coefficient associated to the financial leverage is insignificant statistically speaking.

The ratio of the depreciation and amortization to fixed assets, an indicator reflecting the investment policy, has a negative influence on the return on assets ratio. The result is normal, if we take into consideration that a growth of the investments implies a growth of the expenses. Moreover, the source of these investments can be represented by the profit of the firms, which leads to a decrease in the return on assets ratio. In time, depending on the nature of the investments (on short, medium and long – term), they can lead to a growth of the return on assets ratio. The indicators reflecting the level of efficiency and the profitability of the firms (the return on sales ratio, the return on equity ratio and productivity) are correlated positively to the return on assets rate. Therefore, a growth of these indicators will lead to an increase in value of the ROA. From these three indicators, the most significant impact on the ROA is given by the return on sales rate, while the productivity rate has a lower influence. The result obtained meets the expectations, as in general, a growth in productivity or in the return on sales rate also leading to a growth in the return on assets rate. Surprisingly, the growth of the turnover does not necessarily lead to a growth of the return on assets rate. This result can be explained by two reasons: either this growth was done through investments, or the positive impact on the return on assets rate was absorbed by the performance rates.

The contribution that our research brings through this study is not only significant, but also original from many points of view. **First of all**, from our knowledge, the SFA models have not been used to quantify the level of efficiency and to identify its determinant factors for the firms activating in the manufacturing industry from Romania. **Secondly**, we have employed three econometric models to study thoroughly the efficiency of the firms. One of them represents a comparative study on

the firms activating in the manufacturing industry from Romania. Its purpose is to identify the differences in efficiency between the firms included in the study. The other two models are applied only on Romanian firms. **Thirdly**, the econometric research is accompanied by a detailed description of the indicators characterizing efficiency and the financial policies of the firms. In this way, by the results obtained and by the descriptive studies, I think I have succeeded in providing a thorough description of the efficiency of the firms from the manufacturing industry, stressing on the level of efficiency and its determinant factors. **Last, but not least**, we consider that the results obtained allow us to understand how the efficiency of the firms is influenced by the financial policies. In this way, we can identify more easily the possibilities of increasing the efficiency of the companies.