



# Empirical Study on the Efficiency of the Companies Financing Process through Statistical Analysis

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## Abstract

The current economic context, characterized by strong slippages, at the real and financial flows, request, in order to maintain stability and favorable evolution of the enterprise, a fair and efficient substantiation of the decision process. Such need is found, especially, in the area of corporate finance. In this respect, managers must be given tools used in assessing the adequacy of existing financial structure construction and to indicate future directions of action regarding release of funds demand. This article addresses this area by focusing on two coordinates: the study of links that are established between the characteristics of entities (capital structure ratios, activity field) and the development of the dimension of corporate value, expressed by increase / decrease index of asset capitalization, obtaining in this way a profile of the enterprises related to the efficiency of the financing policy, and develop a mathematical model to classify firms in performance group, using the as the same efficiency criterion in choosing the financing sources. Data considered in the study are taken from financial statements of listed companies to Bucharest Stock Exchange, considering a sample of 80 units that constitute the working group. To achieve the research objectives were used as working methods: ratios technique, multiple correspondence factorial analysis, principal component analysis and discriminant analysis. Data processing was performed using the statistical software SPSS 19.00.

**Keywords:** funding process, financial structure, econometric model, performance groups, discriminant analysis.

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## Introduction

In the current economic climate, characterized by strong slide-slips both at the level of the real flows and at that of the financial flows, the funding policy adopted by the company, the manner in which the various capital categories are chosen and dimensioned in order to cover the necessary to be funded are a major condition that will impact the ability to perform the basic activity as well as to meet the development objectives established by the owners.

The stability of the companies and their favorable evolution generate benefits

expected by all the stakeholders, contributing, at the same time, to creating a healthy economic area, from which the social and environmental component also expect significant contributions and earnings.

In these circumstances, managers need to be offered, for a proper support of the decisions concerning the funding process, instruments that can be used in evaluating the relevance of the construction of the existing financial structure and which would provide them clues for future directions of action in what concerns launching the demand for financial resources.

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The present paper aims to analyze the impact of the financial structure on the company's ability to continue its activity, and on this base to obtain a mathematical model that would allow evaluating the degree of efficiency, of optimization, of this capital construction. This study was performed using financial and non-financial information of the companies quoted in the Bucharest Stock Exchange.

### **Funding the Company - A Complex Decision Process**

Each funding source used attracts specific costs and risks, rights and obligations, which will have an impact on the company's activity. The entity's management is responsible for choosing a strategy in this field, which would create a sustainable balance at the level of the associated restrictions and benefits and, at the same time, guarantee the profitability of the resources made available, together with a profitable organizational activity.

At the same time, an important part in capitalizing upon this process is played by the company's ability to correlate the typology of the financial resources with their destination. The capital payable in over a year must meet the funding needs specific to the investment cycle, an activity that is the basis of performing the current activity of the company. However, the duality that characterizes the sources specific to this category of funds, the stock market and the banking market, sends to financial managers a significant decision-making difficulty concerning their use.

A funding strategy based on debt attracts significant financial expenses as well as a diminution of the degree of decision-making independence, determined by the guarantees that need to be built in order to obtain loans. Also, these financial obligations must be paid irrespective of the company's economic and financial results, although they record losses.

A simpler solution may be, at the first sight, to attract financial resources from the shareholders, by issuing shares, considering that the shareholders are not

paid unless the entity records profits. This situation is only apparently more favorable, since shareholders expect, in their turn, in exchange for the capital made available by the company, a corresponding payment. In case they are not satisfied with the obtained benefits, they will try to recover their investment by selling their shares, an approach which will result in the titles losing their value, with dramatic consequences on the company (Carp, 2011).

The decision concerning the usage of the offer of resources specific to the two mentioned sources is subject to multiple influences. In this case, it is relevant to make a correlation between the moment when the resources become available and that when the necessary to be funded appears. In this sense, companies that are not in the first stage of their life cycle can attract capital by resorting to the financial and to the banking market, since they own historical activities and significant structures of fixed assets, which may become the guarantees required in exchange for granting credits. Unlike them, newly created companies mainly have access to the capital market, since the banking sector is less open to performing operations that imply an increased degree of risk.

Another decisive dimension in forming an efficient funding policy is the cost-profitability ratio. Actually, *the optimal financial structure* expresses the opposition of capitals that allows the company to maximize its profitability or share price at the lowest cost and with a minimum risk (Mironiuc, 2009).

The operational activity specific to each company benefits, in order to meet the established performance criteria, from the material support created within the investment and monetary cycle provided by the funding activity, especially through resources payable in less than a year. On the manner of structuring the short-term resources depends, in its turn, the well performance of the production process and of the organizational activity, in general, due to the significant contribution they

have to creating an optimal level of liquidity and solvency of the company.

Although for short-term credits the costs are higher than for long-term credits (because a higher risk is taken and because of the lower time period for which they are granted), resorting to such resources may represent a particularly efficient and effective measure due to the possibility to adapt the type of financial instrument to whatever needs to be funded. There is, in this sense, a vast array of products especially created in order to meet the various typologies of demands of resources that can be used in less than a year.

In addition to the financial resources associated with costs (interests or dividends) in the funding strategy, a decisive role is played by the commercial policy adopted and guided by the company's management. By not attracting supplementary costs, commercial debts play an essential part in insuring financial stability and performance. However, this possible advantage should also be evaluated by taking into account the incidence of the potential opportunity costs that are generated (high prices for the raw materials, their low quality, creating a negative image on the market etc.) by resorting to such a funding method.

In what concerns the debts payable in up to one year, Mironiuc (2006) states that increasing the weight of these resources in the total liabilities is considered favorable when the result of increasing the obligations' payment deadline for the providers and the payments in advance cased in for the orders, which constrain the company less in terms of due debts and costs, and the effect of the bank credits on the short term, especially of cash credits.

In all this approach of insuring the necessary funds we should not ignore, however, the specificity of the field in

which the company performs its activity, its development stage, and the strategic objectives it aims.

#### **Optimizing the Financial Structure - A Dominant Objective of Entrepreneurial Policy**

Although it has been stated, initially, that in the conditions of a perfect financial market and in the lack of taxation there is no connection between the manner of organizing the company's capitals and its value (Modigliani and Miller, 1958), subsequent specialized literature has proven and supported the strong correlation and interdependency that exists between the two concepts. Numerous authors, such as Myers and Majluf (1984), Jensen and Meckling (1976), Baker and Wurgler (2002), Fama and French (2002), Carpentier (2006), Frank and Goyal *et al.* (2008) researched this field, trying to identify the ideal strategy through which companies could design a financial structure able to insure the best development premises.

Their researches were based both on studying the causes and the triggers in coagulating the construction of capitals, as well as on the effects generated by the adoption of the various funding policies on the value and the stable development perspectives of the entity. Despite all these efforts, it was not possible to identify all the factors that motivate and influence the decisions concerning resorting to the various categories of funds used in the company's activity. Actually, Koller *et al.* (2010) state that, in the conditions of knowing and accepting the costs and benefits generated by the financial leverage, as an indicator of the financial structure, the path to obtaining an optimal financial structure of the company is not at all clear. Apparently, there is no exact answer to the question *How should company managers decide in order to obtain the most efficient degree of indebtedness?*

In the same direction, Lipson and Mortal (2009) examine the relation between the company's liquidity and its financial structure, noticing that as liquidity increases, the degree of indebtedness diminishes, which determines a reduction of the financial costs, determining, at the same time, an increase in the extent to which, in order to attract new financial resources, these companies resort to issuing new shares. After researching the factors that contribute to creating the structure of the capitals, Smith (2010) identifies a positive connection between the degree of indebtedness, as an indicator of the financial structure, and the fixed assets ratio, the development perspectives and the size of the company, as well as a negative reverse connection between the mentioned dependent variable and its age, liquidity, and profitability.

Analyzing the relation between the financial leverage, the company's performance, and the structure of the shareholders, Margaritis and Psillaki (2010), Langberg (2006), Rahaman (2010), Berger and Bonaccorsi di Patti (2006) signal the intense connection between these variables. An increase in the degree of indebtedness is associated with an improvement of the company's results, whereas, the lower the concentration of the shareholders, the lower the company's performances become. At the same time, the authors notice the superiority of the results obtained by companies owned by the same family compared to those of non-family companies.

The hypothesis of the possibility to draw an optimal financial structure, at the level of a company, depends on the degree of development of the economic environment to which it belongs, as well as on specific national factors (Lin et al., 2009). In the same sense, Hennessy & Whited (2005) state that we cannot speak of an optimal financial structure independent of the national and local specificity, as well as of the economic conditions specific to the analyzed period.

Kayo and Kimura (2011) study the influence received by the financial leverage

from the indicators specific to the companies, to the sector where they perform their activity, as well as from the national economic environment, under the influence of the time factor. They claim that the temporal evolution of the company-specific indicators and its activity field explain to a great extent the variation of the financial leverage. Surprisingly, national specificity has a low importance in the process of selecting the financial resources.

### **Modeling - Technique in Designing Investment Strategy**

The complexity of the field and the diversity of the variables involved in the funding process have drawn the attention of numerous researchers who, in an attempt to explain the causes and effects of the various phenomena approached, have largely used statistical and econometric methods and techniques. Jaba and Jemna (2006) state that econometry is the product of the dynamic relation between the economic reality and research, with the main purpose of explaining the manner in which econometric phenomena occur and are conditioned one upon another.

The difficulty and depth of the methods, techniques, and procedures used in this analysis approach vary according to the specificity of the phenomenon, of the training of the researcher, as well as on the objectives aimed by them. However, their degree of usefulness can be evaluated only by the ability to provide the searched explanations and answers and not by the complexity and volume of required operations.

In this sense, pertinent results are reached by authors that have used in their researches simple work methods and models, such as: the simple and multiple correlation and regression analysis (Chiang et al. 2010), (El-Sayed Ebaid, 2009), (Carpentier, 2006), (Seppa, 2008), the ANOVA or ANCOVA models (Smolarski et al., 2011), (Beiner et al. 2006) or techniques applicable on time series, AR, MA, ARMA, ARIMA (Langberg, 2006).

Because of the ever more stringent need to characterize, classify, and predict the evolution and to identify the solutions necessary to eliminate any obstacles that may mark the existence of the entities, much more complex statistical approaches, such as *the discriminant analysis, the logistic regression analysis, using panel data models*, have revealed valences in researching and explaining economic phenomena.

The most significant researches in this sense have marked the field of evaluation and prediction of the occurrence of the risk of bankruptcy of the business, on which the financial structure of the company has an important effect. For this reason, its correct sizing is an essential element in the concerns of all the company's stakeholders. Evaluating the evolution of the organization, its ability to adapt and meet the changes in the specific economic environment, to use as much as possible all the available resources, especially capital, are important elements, which support the investment decision. The possibility to resort to specific funding sources and the cost of the attracted resources depend on the company's "rating", on the level of the risk of insolvency taken.

The first attempts to predict the occurrence of the risk of bankruptcy have used the statistical classification techniques called MDA (*Multiple Discriminate Analysis*) on samples that included both bankrupt companies and entities with a profitable activity. The limits of this approach are the studies of Beaver (1966) and Altman (1968) who, analyzing the mono-varied connections between the various predictors of the risk of insolvency, have provided the support for future multiple analyses, performed by themselves or by other authors. Beaver builds, in 1968, his own *Z-score* model using the multi-varied analysis. In the same direction and in the same year, Altman develops his classical model for predicting the risk of bankruptcy, applicable to companies in the publicity industry in the USA (Bandyopadhyay, 2006).

If the first model (1968) offers a prevision period for the occurrence of the risk of bankruptcy of only two years, in Altman (1977) the author suggests an improved variant of the model, named ZETA, drawn for the American companies in the processing industry and in commerce, where the prediction interval increases to five years and in which, besides the discriminant analysis, non-linear models are used as well.

Motivated by Altman's work and results, many researchers have been concerned with applying the discriminant analysis or other statistical methods and techniques for quantifying and predicting the risks to which companies are subject. MacKie-Mason (1990) suggests a modified variant of Altman's model that can be used to calculate the delay until bankruptcy, developing, thus, an instrument for coordinating organizational activity and strategy. In the same sense, studies have been performed using modern techniques, such as the *Logit* and *Probit* models (Westgaard and Wijst, 2001; Grunert et al., 2005, Bandyopadhyay, 2006) applicable on various financial markets and in various economic locations.

The field of organizational financing has required using the statistical instrument from the moment when the debates started concerning their financial structure. By resorting, in time, to the entire array of common statistical methods and techniques in order to reflect the connections and influences between the specific factors of the study area, contemporary researchers reveal ever more their appetite for complex methods and models. Some benchmarks in this respect are represented by the use of models with panel data by Lipson and Mortal (2009), in evaluating the impact of the company's liquidity on the company's funding strategy, of the discriminant analysis (MDA) by Ibrahimo and Barros (2009), for testing the balance theory in attracting financial resources, Zaher (2010)

For evaluating the impact of the degree of indebtedness on the investment decision, Smith (2010), for characterizing the connection and reflecting the influences of the triggers in coagulating the financial structure.

At the same time, advanced statistical methods, such as *the logistic regression analysis* are also used by Tse and Jia (2007) in analyzing the efficiency of using the sizing of the financial structure under the impact of the structure of the shareholders, considered as a signal indicator in adopting management decisions. Fama and French (2002), Kayo and Kimura (2011) resort to *hierarchical linear modeling* (HLM) in studying the triggers that come into play in the process of selecting and establishing the volume of the various typologies of financial resources, stating that because of their nature, they must be classified into groups of various degrees of importance, this method allowing them to take into account the influences received from the activity field and the national specificity.

Although the issue of assigning the financial resources of the companies is an intensely analyzed segment, most researches focus on studying the process of building the financial structure, the factors that lie at its basis, respectively the interdependencies and influences between the variables, explaining the causes and effects of this approach.

Few papers focus on the essential relation, in our opinion, identified between the manner of organizing debts, on the one hand, and the evolution of the organization, of its value and perspectives of stable growth, on the other hand. Generally, studies aim to notice and explain, based on historical data, the various connections between the two dimensions taken into account. In our opinion, the predictive dimension, developed through models, which would allow evaluating, in relation to the evolution of the value of the entity, of the degree of the efficiency of the financing policy is neglected, which hinders the process of obtaining clues that could be used in coordinating this activity.

At present, there are numerous manners of evaluating the performance of the various categories of financial resources, multiple strategies for managing portfolios, but which provide sequential information, sometimes divergent from the central objective of all economic entities, value creation.

Mironiuc (2007) notices that, although at the basis of selecting an optimal financial structure lie consecrated criteria, such as the profitability-risk criterion and the resource destination criterion, this process cannot be determined as an exact value, but rather as a value interval. The effect of the chosen financial structure on the company's value can be quantified only approximately. This is why we can see a need for drawing econometric models that would allow evaluating the efficiency of the funding activity, by classifying the company into performance groups, which would provide, at the same time, an early signal of any deviation from the selected development strategy.

We must mention that this type of models used in analyzing and predicting economic phenomena is created with the purpose of increasing their relevance and usefulness on specific activity fields and can be applied in determined economic areas. In what concerns Romanian economy, few studies have helped developing such instruments, most of them aiming to forecast the occurrence of the risk of bankruptcy, and in this respect we can mention the model A- Anghel, the Mănecuță - Nicolae model, the B-Băileșteanu model, the Robu - Mironiuc model, etc.

### **Methodology of the Research**

The objective of this paper is to analyze and quantify the connections identified between the financing strategy of the companies quoted in the Bucharest Stock Exchange, reflected on them through the financial structure, and their value, as a fundamental objective for all the stakeholders.

The correlation between the manner of insuring the monetary resources and the value of the company can only be achieved, in our opinion, by including in the reasoning the dimension of the results of the organizational activity, reflected through the efficiency indicators of all the activities: commercial, operational, financial, and even of the values that signal the destination of the selected funds.

The approach is made with the purpose of drawing an econometric model that would allow to internal as well as external decision makers (current and potential investors, creditors, and managers) to evaluate the degree of efficiency of the process of selecting the various categories of capitals. At the same time, the model will be able to be used as an instrument for coordinating the funding activity at the level of Romanian economy, providing clues, by classifying companies into performance groups, on the actions that need to be taken in order to achieve the common desideratum of all the factors involved in its evolution, maximizing the company's value.

This study takes on an empirical aura and, focusing on mainly quantitative analyses, aims to validate the work hypotheses through a deductive-inductive process. This effort is made by using theoretical benchmarks, and especially the technical methods for data analysis, specific to financial analysis, mathematics and statistics.

### ***Tested Work Hypotheses***

With the purpose of meeting the objectives of this study, starting from the current level of knowledge and taking into consideration the connection that exists between the funding method and the company's value, we aim to test the following hypotheses:

**H1:** *A profile of the efficiency of the funding policy is identified, reflected in the structure ratios of the liabilities and in the direction of the value dynamics of the companies, expressed through the increase/decrease index of the price-to-book ratio.*

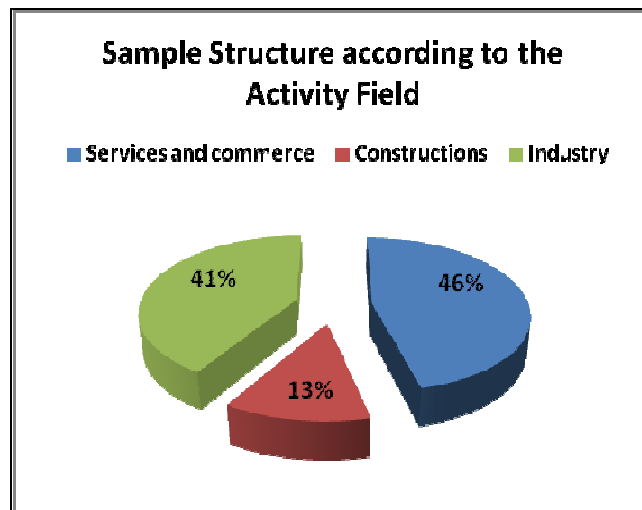
**H2:** *There is a score function, obtained based on the increase/decrease indexes of the value of the analyzed entities, expressed through the increase/decrease index of the price-to-book ratio, which classifies them into two groups (firms with performance and firms without performance), with the purpose of identifying the degree of efficiency of the financing policy based on the liability structure indicators, of the rates related to the destination of the resources and the profitability of their activity.*

### ***Data, Sample, and Analyzed Population***

The analyzed population is made up of the set of companies quoted in the Bucharest Stock Exchange, and their selection in the analyzed sample was done *in layers*. Of the population targeted by the present study have been eliminated the companies that perform their activity in the financial banking field. In selecting the studied elements, the benchmark set was the contribution of the activity field of the company to the *gross domestic product* (GDP), and the number of extracted companies is directly proportional with the weight of each field in it. The reference data used in the sampling activity have been provided by the National Institute of Statistics, respectively the Press Release no. 124 for the first quarter of 2011.

In order to insure the sample's representative character of partial collectivity, the selection of the component units has been made *randomly simply*. The study group is made up of 80 companies that perform their activity in the fields of *industry, constructions, and respectively commerce and services*. The data have been collected from their financial statements, corresponding to the fiscal years 2008-2009 and 2009-2010.

The distribution of the elements of the studied sample according to the activity field is illustrated in *Figure no.1*.



**Figure no. 1 Sample Structure According to the Activity Field of the Companies**

(Source: own processing)

### **Description of the Analyzed Variables**

Used in order to explain the studied phenomenon, in meeting the objective of the research by validating the mentioned work hypotheses, the variables that reflect the characteristics of the analyzed population are presented in what follows. They are grouped according to the dimension they represent and to their role in the research.

*The discriminant dimension* includes measures that show the status according to which the elements of the analyzed population are classified:

- *The increase/ decrease index of the price-to-book ratio -  $I_{PBR}$ ,  $PBR = \text{Price earning (CB)} / \text{net accounting asset (ANC)}$  - which reflects the dynamics of the value of the company, from one period to another, under the influence of funding strategies. The price-to-book ratio shows the value level given by the stock market to the shares of the entity in relation to their accounting value, with an effect on the evaluation of the opportunity to invest. The exchange rate of the shares includes the reactions and perceptions of the market to the quantum of the assets and liabilities of the entity, unlike the nominal value of the titles, obtained mathematically by dividing the net accounting asset to*

their number [Penman, 2005]. For this reason, price earning is rarely lower than the book value. In the case of a low coefficient, a signal is launched on the market, according to which the company is under-evaluated and therefore attractive for investors, but this clue still requires an interpretation correlated with the growth perspectives of the company and of the activity field to which it belongs. A market value much higher than the net accounting asset may indicate an over-evaluation of the shares of the company, which, for the title owner, is a signal to sell [Mironiuc et al. 2011].

*The structural dimension* contains the indicators that reflect the organization of the capitals of the company, respectively the strategy that lied at the basis of the decision to draw in the financial resources, in order to develop it:

- *The global financial autonomy ratio-  $R_{afg} = \text{Total Equities (EQ}_i) / \text{Total Assets (A}_i)$  - reflects the company's ability to fund its own activity, respectively its investments, through its own resources. An increase in the weight of the shareholder's equity in the total liabilities favors the development of the financial and decision-making independence of the entity, a decrease in financial risk, and an improvement of*



its rating. At the same time, this may become a limitation to the company's development by inadequacies caused by the time differences that exist between the moment when the funding need appeared and that when resources were acquired.

- *The term indebtedness ratio – Rit - Debts on Long Term ( $D_{LT}$ )/ Total Assets ( $A_t$ )-* is the weight of the liabilities whose due date is over a year in the total liabilities, showing at the same time the degree of dependence of the company on resources borrowed on the long term. An increase in this indicator may signal an increase in financial expenses, deductible, and, therefore, a possible increase in the net profit, as well as an increase in financial risk. This increase in the uncertainties related to the results of the entity is complemented by a decrease of the decision-making independence, mainly caused by the guarantees necessary for acquiring this type of resources.
- *The short-term indebtedness ratio - Rits - Financial Debts to Short Term ( $DF_{ST}$  )/ Total Assets ( $A_t$ ) –* reveals the dimension of the participation of financial resources due in less than one year to meeting the necessary to be funded, especially to covering the necessary working capital, as an indicator of the evolution of the operational activity. An increase in the analyzed ratio is positive for the company only if it is correlated to an intensification of the production process, associated with an increase of the market quota, and not with a decrease of the deadline for paying the suppliers or of those for collecting the debts, respectively an increase in the stored products.
- *The commercial debts ratio – Rdc- Commercial Debts ( $(D_c)$ )/ Total Assets ( $A_t$ ) –* shows the contribution of debts with no financial costs attracted in order to fund the company's activity. The weight of these resources in the total liabilities is the effect of the commercial policy adopted by the company, and although the indicator

should be interpreted together with measures that characterize the human resources involved, with relations with customer or with governmental agencies, its value may signal the financial strategies of companies and render it more efficient by reducing the expenses on interests.

*The resulting dimension* reflects the effects generated by the funding policy on the company's performance, through the profitability of the selling, operational, and funding activities, as well as the aimed and necessary balance between the nature of the attracted capitals and their destination.

- *ROS - Return on sales - Operating income ( $(R_{exp})$  / Turnover ( $CA$ ) –* Mironiuc et al. (2011) state that this indicator stresses the company's ability to capitalize, in optimal conditions, on the resulting products. In this sense, special importance is given to the price policies adopted and to the production strategies concerning quality. According to the economic conditions on the market, companies may rely on a policy of high prices, which would insure a significant profit margin compared to the income volume, or on low prices, tending towards increasing the market quota. In all these situations, a constant that guarantees the continuity and profitability of the company's activity is preserving or improving the quality of the products.
- *ROA - Return on assets - Operational Income ( $R_{exp}$ ) / Total Assets ( $A_t$ ) –* stresses the performance of the basic activity, its ability to fund the invested capitals irrespective of their source. This indicator is measured in tight correlation with exogenous measures, such as the interest ratio and the inflation ratio, whose surpassing insures the preservation of the company's wealth and of a high degree of attractiveness for its shares.
- *ROE - Return on equities - Net result ( $R_{net}$ ) / Total equities ( $C_{pr}$ ) –* this indicator reflects the company's ability

to recover, above the costs, the shareholders' equity made available. Maximizing financial profitability is an essential management objective, which insures the *balance* between the expectations of the minority shareholders, who wish to be paid through dividends for the capital issued by the company, and the company's need to grow, met by reinvesting the profit, as an expression of the interests of the majority shareholders.

- *The stable funding ratio of fixed assets - Rfsi – permanent capital (PC)/ net fixed assets (Nfa)* - the expression of the principle of the resources destination, this ratio allows evaluating the extent to which permanent resources insure the funding of net fixed assets and is the relative expression of net working capital. In order to reflect satisfying funds, this ratio must have values at least equal to one, as a value over one of the ratio insures a positive net working capital and the possibility to partially fund the current activity of the company (Mironiuc, 2009).

### **Data Analysis Methods**

In order to validate the work hypotheses that will help meeting the research objectives, we suggest using data analysis methods such as: *ratio analysis, the factor analysis of multiple correspondences, the analysis of the principal components and the discriminant analysis.*

According to Mironiuc (2006), *ratio analysis* is a method specific to financial analysis and consists in computing and interpreting indexes, determined by reporting positions or sets of positions in financial statements corresponding to the same fiscal year, in order to evaluate the status of a company.

The identification of a profile of the efficiency of the funding policy reflected through *liability structure ratio* and the sense of the evolution of the value dimension of the companies expressed through the *increase/decrease index of the price-to-book ratio* can be achieved based

on the *multiple correspondences factor analysis (MCFA)*. According to Lebart *et al.* (2006), MCFA is a multivariate analysis method developed for studying the associations between three or more category variables. In their study, Jaba and Robu (2011) consider that for a sample of  $n$  individuals, who can use the values recorded for  $m$  associated variables, it is possible to obtain the profile of an individual in a certain group, after studying the associations between the analyzed variables. This method synthesizes the initial information by studying the associations between the variables stressed in a dispersion diagram built on a system of factor axes ranked in decreasing order, according to their importance in explaining the total variance of the point cloud (Jaba and Robu, 2011). This method allows obtaining factor axes that characterize the dimensions of the profile. In the study, the two dimensions represented are a linear combination of the analyzed category variables, according to the frequency of occurrence of the characteristics of each considered variable.

*The principal components analysis (PCA)* is a multivariate descriptive method whose main purpose is to reduce the number of variables initially introduced into the analysis, by replacing them with 2-3 latent variables, eliminating at the same time collinearity and facilitating analysis (Larouse, 2006). According to Jaba and Robu (2011), the starting point of this method is the aggregate of initial variables,  $X_i$  ( $i=1...n$ ), based on which, using *PCA*, the new variables (**components**) are determined, having the form  $C_j$  ( $j=1...m$ ), where  $C_j = b_{j1}X_1 + b_{j2}X_2 + \dots + b_{jn}X_n$ , and  $m \leq n$ . In *ACP*, the principal components determined through the linear combination of the initial variables are independent from one another, and this hypothesis can be validated through several tests, such as: *the  $\chi^2$  test statistics* (to test the existence of a connection between the variables) and *the KMO statistics* (Kaiser-Meyer-Olkin, to determine the intensity of this connection) (Jaba and Robu, 2011). The KMO statistics can take values in the interval [0,1]. KMO values under the threshold of 0.5 indicate insignificant connections, values between

0.5 and 0.6 indicate the existence of average connections, values between 0.6 and 0.7 indicate connections of acceptable intensity, values between 0.7 and 0.8 indicate the existence of good connections, KMO values over the threshold of 0.8 indicate the presence of very good connections, and values over 0.9 indicate that the solution obtained after applying ACP is excellent (Lebart, 2006).

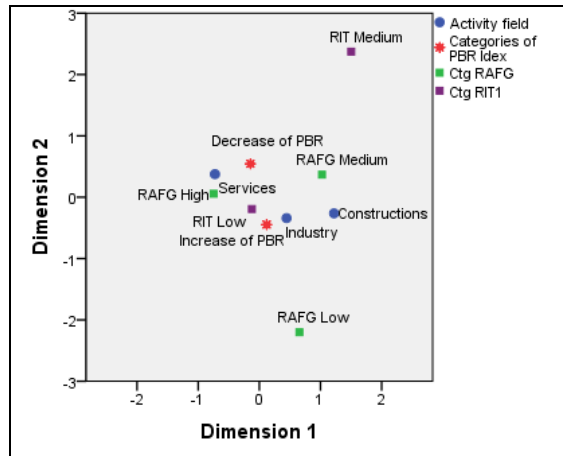
Jaba and Robu (2009) claim that the *discriminant analysis (DA)* is a multivariate classification method that aims to classify a population into predefined groups, based on score functions ( $Z$ ) that express the relations between the factor variables,  $X_i$ , specific to the studied population, and the categories of classification variables. *DA* aims to estimate the relation between a category dependent variable (dichotomic or multichotomic) and linear combinations of several independent metric variables, of the form:  $Z = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_n X_n$ , where  $Z$  is the score associated to each individual:  $X_i$  with ( $i=1, \dots, n$ ) are the independent variables and  $\alpha_i$  are the coefficients of the model (unknown) (Jaba and Robu, 2009). According to Lebart *et al.* (2006), the discriminant analysis implies: building the discriminant functions, establishing the independent variables that most contribute to explaining the differences between the groups, the predictive classification through the allocation to a specific group of the cases that are not part of the initially analyzed sample, and evaluating the accuracy of the classification.

### Results and Interpretation

In order to validate the **H1** work hypothesis, which identifies a profile of the efficiency of the funding policy reflected through the structure ratios of the liabilities and the direction of the evolution of the value of the companies, expressed through the increase/decrease index of the price-to-book ratio, it is necessary to use *MCFAs*. However, the identification of the

profile requires using these factor variables (numeric, scale) in a discretized form, and the categories corresponding to each ratio (RAFG and RIT) are obtained in SPSS 19.0 based on the considered intervals. Therefore, for RAFG, the following categories will be taken into consideration: RAF Low  $\in (0; 0.30]$ , RAFG Medium  $\in (0.30; 0.70]$  and RAFG High  $\in (0.70; 1]$ , and for RIT: RIT Low  $\in (0; 0.30]$ , RIT Medium  $\in (0.30; 0.70]$  and RAFG High  $\in (0.70; 1]$ .

After processing in SPSS 19.0, based on *MCFAs*, in the diagram in *figure 2*, the profile of the efficiency of the funding policy was identified. We can therefore state with a confidence of 95% that for the analyzed sample, the companies that recorded an increase in PBR (considered profitable) are companies that mainly activate in the industry and construction field, and less in services. Moreover, the profitable results of these companies were based on the adoption of funding policies mainly based on their own resources (RAFG values above the average in such companies) and less on foreign resources (low RIT values). However, this policy has not determined an increase in PBR in the case of companies in services. Although these companies mainly relied on own funds (RAFG values above the average) and less on foreign resources (RIT Low), the financial results that characterize financial performance have indicated a decrease in PBR, so that, in general, the activity of these companies can be considered unprofitable. We can thus identify a need to allocate foreign resources for funding the entities in this field, because of their higher ability to connect temporally and dimensionally with the need to be funded. In conclusion, we can state that in order to meet the financial performance objectives, funding policies must be drawn taking into account the activity field of the company, the growth perspectives of the field in which it activates, as well as its degree of compatibility with the characteristics of the available funding sources.



**Figure no. 2 Profile of the Efficiency of the Funding Policy**  
 (Source: own processing in SPSS 19.0)

The performance of a company is characterized by the size of the economic and financial results that compensate either the assets invested in the operational activity (stressed by the ROA), or the own capitals involved (stressed by the ROE), or even the level of the sales (stressed by the ROS), but also of the social and environmental dimension,. The three profitability ratios and the interdependencies established between their levels correspond to the resulting profitability dimension, which lies at the basis of characterizing the performance of the companies in the analyzed sample, quoted in the BSE.

A series of descriptive statistics, as well as statistical tests that verify the independence hypothesis applied in ACP

are synthesized in *table 1*. On the average, for the analyzed sample, companies have recorded rather low profitability values, with the lowest values for ROE (2.2% on the average). Moreover, these low ROE values can be explained based on the significant correlation with ROA: low ROA levels, eroded by the financial expenses corresponding to foreign resources, lead to low ROE values.

In ACP, identifying the *Profitability Component* explains approximately 59% of the variation of the of the point cloud represented in a tridimensional plan characterized by the three profitability indicators (ROA, ROE, ROS), with the rest of the variation being explained by the random factors.

**Table no. 1. Coefficients and Test Statistics Concerning the Profitability Component (RC)**

Variables	Statistics		Coefficients of Profitability Dimension	KMO = 0.59		Sig = 0.00
	Mean	St. Dev.		Correlation Matrix		
				ROA	ROE	ROS
ROA	0.037	0.077	<b>0.48</b>	1.00	0.63	0.25
ROE	0.049	0.083	<b>0.49</b>	0.63	1.00	0.23
ROS	0.099	0.269	<b>0.30</b>	0.25	0.23	1.00

(Source: own processing in SPSS 19.0)

At the same time, for a significance of 95%, in ACP were also obtained the values of the coefficients based on which the scores (values) of the *Profitability Component* are obtained. Moreover, the values of the coefficients indicate the intensity as well as the direction of the influence of the profitability ratios on the obtained component. The equation based on which the scores of the *Profitability Component* are obtained can be synthesized as follows:

$$CR = 0.48ROA + 0.49ROE + 0.30ROS.$$

Based on the results above, we can state that *ROE* has a significant and positive influence on *CR*. In this respect, the net result that compensates the shareholders' equity invested is the key indicator that best illustrates the profitability of a company's activity at a given moment. On the other hand, the influence of *ROA* is significant but lower to that explained by the previous one, because of the non inclusion in the calculus of the cost of the borrowed resources (the interest rate). At the *ROS* level, we can notice that this rate also has a significant influence on *CR*, but to

a lesser extent than the influences explained by *ROE* or *ROA*, precisely because of the ease with which the level of the sales of a company can be manipulated during a fiscal year (goods returns, commercial or financial discounts, etc.).

The use of *AD* leads to the validation of the second work hypothesis by estimating the parameters of a score function, obtained based on the increase/decrease indexes of the value of the analyzed entities (expressed by the increase/decrease index of the price-to-book ratio, which classifies them into performance groups) with the purpose of identifying the degree of effectiveness of the funding policy based on liability structure ratios and on the values concerning the destination of the resources and the profitability of their activity.

Therefore, after processing the data in SPSS, a series of descriptive statistics were obtained concerning the analyzed variables (on performance groups and on the total sample), as well as the coefficients of the suggested model, synthesized in *table no. 2*.

**Table no. 2. Descriptive Statistics and Coefficients of the Variables Included in the Score Function**

Variables	Descriptive Statistics						Standardized coefficients of the score function
	Firms without Performance		Firms with Performance		Total Sample		
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	
<b>RAFG</b>	0.70	0.27	0.68	0.25	0.69	0.26	<b>1.05</b>
<b>RIT</b>	0.09	0.15	0.09	0.11	0.09	0.13	<b>0.63</b>
<b>RITS</b>	0.05	0.07	0.08	0.10	0.07	0.09	<b>-0.47</b>
<b>RDC</b>	0.15	0.17	0.14	0.17	0.14	0.17	<b>0.97</b>
<b>RFSI</b>	1.43	0.59	1.73	2.01	1.60	1.54	<b>-0.50</b>
<b>CR</b>	-0.08	1.27	0.07	0.72	0.00	1.00	<b>0.57</b>

(Source: own processing in SPSS 19.0)

Based on the obtained results, we can state that profitable as well as unprofitable companies have recorded, during the analyzed fiscal year, approximately the same funding level based on the shareholders' equity (although the difference between the two categories is insignificant, profitable companies have relied to a lesser extent on the shareholders' equity, only 6.8% compared to 7% recorded by unprofitable companies). However, at the performance level, the difference between the two categories of companies (profitable and unprofitable) has not resulted from the application of the funding policy based on the debts due in over one year, but from the manner in which the other categories of resources were used for covering the funding need. We can notice that unprofitable companies record low values of the short-term credits, which can generate deficiencies in performing the operational activity, caused by possible interruptions of the funding cycle, as well as additional costs determined by increases in the purchase prices for the raw materials, generated by the long term for paying the debts. The commercial debts rate, lower in the case of profitable companies, gives them a favorable perception in the economic environment in which they operate, providing them

advantages represented by financial savings, connected to costs and to the efficiency of the provisioning activity, as well as to their rating regarding the ability to manage and pay back credits, with an impact on the level of the paid interests.

Last but not least, a significant difference between the two categories also results from the high degree of asset immobilization. Although both categories of companies have high levels of fixed assets, in the case of profitable companies, the significant superiority of permanent capital available to the company, compared to the dimension of the fixed assets that support the operational activity, insure a significant financial contribution to covering the necessary to be funded for the current activity, determining thus positive results. All these have a decisive effect upon the resulting dimension, explained by very high values of the *profitability component* (0.07 for profitable companies compared to -0.08 for unprofitable companies), which completes and shapes the effort to differentiate the value evolution of the companies according to their own funding strategy.

Based on the coefficients of the score function presented in *table no. 2*, we can also estimate the influence of a factor on

the classification of a company into one of the two categories, according to the module value of the coefficients. For the analyzed sample, the score function obtained in SPSS is as follows:

$$Z_{\text{Performance}} = 1.05RAF\text{G} + 0.63RIT - 0.47RIT\text{S} + 0.97RDC - 0.50RFSI + 0.57RC$$

According to the resulting coefficients values, we can state that *RAF*G have a significant influence on classifying the companies into one of the two categories (as an indicator of the funding policy based on shareholder's equity), as well as *RDC* (the funding policy relies on commercial credits). Last but not least, a significant influence is that of the funding based on foreign resources in making the discrimination. Using this function and replacing the factors with punctual values specific to the analyzed companies, it is possible to obtain a series of intervals for classifying the companies into performance groups. In creating these intervals, the average level of the score obtained for the *Z* function for each individual group was taken into account. Therefore, profitable companies have recorded an average value of  $Z = -0.22$  (and  $\sigma^2 = 1.33$ ), while unprofitable companies have recorded, on the average, a value of  $Z = 0.27$  (and  $\sigma^2 = 0.59$ ). We can draw the conclusion that profitable companies are characterized by a negative score (tending, on the average, towards  $-0.22$ ), while unprofitable companies have a positive score (tending, on the average, towards  $0.27$ ).

Last but not least, in obtaining the classification intervals, the percentage intervals of the discrimination score *Z* have been taken into account, per category. Therefore, analyzing the percentage values 25, 50, and 75, the following percentage intervals have been determined:

- In the interval  $[-4.00; 0.15]$  we have 50% of the profitable companies, where the value  $-4.00$  is the minimum value of the general score *Z*;
- In the interval  $[-4.00; 0.42]$  we have 75% of the profitable companies;

- In the interval  $[0.29; 2.34]$  we have 50% of the profitable companies, where the value  $2.34$  is the maximum value of the general score *Z*;
- In the interval  $[-0.21; 2.34]$  we have 75% of the unprofitable companies.
- Intervals for classification into performance groups, based on the suggested score function and on the general interval  $Z = [-4.00; 2.34]$ , will be:
  1.  $[-4.00; -0.21]$  – profitable companies, resulted by subtracting from the distribution interval of the general score *Z* the interval that insures the coverage of 75% of the unprofitable companies;
  2.  $[-0.21; 0.15]$  – companies that tend towards performance, resulted from the intersection of the interval that insures the coverage of 50% of the profitable companies with the interval that insures the coverage of 75% of the unprofitable companies;
  3.  $(0.15; 0.29)$  – companies in the uncertainty area, resulted by subtracting from the distribution interval of the general score *Z* the interval that insures the coverage of 50% of the unprofitable companies and of the interval that insures the coverage of 50% of the profitable companies;
  4.  $[0.29; 0.42]$  – companies that tend towards unprofitability, from the intersection of the interval that insures the coverage of 50% of the unprofitable companies with the interval that insures the coverage of 75% of the profitable companies;
  5.  $[0.42; 2.34]$  – unprofitable companies, resulted by subtracting from the distribution interval of the general score *Z* the interval that insures the coverage of 75% of the profitable companies;

At the same time, for generalization, it is necessary to transform the intervals  $[-4.00; -0.21]$  and  $[0.42; 2.34]$  into the following:  $(-\infty; -0.21)$  and  $(0.42; +\infty)$ .

For the companies that are not included in the analyzed sample, by replacing the variables in the suggested score function  $Z$  with the values of the financial indicators (taking into account, at the same time, the profitability component computed based on the relation above in ACP), a specific score will be obtained for each company. The inclusion of the computed score into one of the 5 intervals will also dictate the company's status at the respective moment (profitable, almost profitable, uncertainty, almost unprofitable, and unprofitable). This way, by using the suggested model, it is possible to signal in a timely manner the deviations from the path to meeting the management objectives taken, thus allowing the identification of the measures that need to be taken in order to insure an increase in the company's value, in conditions of stability and sustainability of its activity.

### Conclusions

This paper approaches an essential topic for the existence and development of economic organizations, in the current economic context, which concerns the funding strategies adopted and the optimization of the financial structure resulted after their application.

The complexity of this field, determined by the multitude of internal and external factors that act upon the funding decision, requires a deeper analysis of the influences of these variables in order to explain and the process of insuring financial resources, and to render it more efficient, an approach whose fundamental objective is to obtain an optimal structure of the capitals, which would allow the company to increase its value, in conditions of stability.

The present article approaches this field relying on two coordinates: studying the connections established between the characteristics of the entities (liability structure ratios, activity field), and the evolution of the value dimension of the companies, expressed through the increase/decrease index of the price-to-book ratio, thus shaping a profile connected to the efficiency of the funding

policy and developing a mathematical model for classifying companies into performance groups, according to the same efficiency criterion in selecting the funding sources.

In this respect, by validating the first hypothesis, we can state with a certainty of 95% that, for the analyzed sample, companies that recorded an increase in PBR (considered profitable) mainly activate in the fields of industry and constructions and less in that of services, and their funding is based first of all on their own resources and less on borrowed resources. This analysis provides information for financial managers, in directing the actions that attract financial resources (by avoiding the inadequacies generated by the specificity of the activity field), as well as for the potential investors in analyzing the opportunities to release capital towards the targeted entities.

After validating the second hypothesis, this paper suggests an econometric model that would allow internal as well as external decision makers, current and potential investors, creditors, and managers to evaluate the degree of efficiency of the process of selecting the various categories of capitals. At the same time, the model will be able to be used as an instrument for coordinating the funding activity, specific of Romanian economy, by providing clues for classifying companies into performance groups, concerning the actions that should be taken to meet the common desideratum of all the factors involved in its evolution, which is maximizing the value of the business. The model includes the influence of the liability structure ratios, the ratios related to the destination of the resources, as well as the impact of the profitability ratios as a complementary factor, without which, in our opinion, it is not possible to make a correct evaluation of the funding policy at the company level.

The relatively small number of elements of the analyzed sample, as well as the non inclusion of the activity field as a variable in the suggested model, represents the limitations of our research. Wiping off their effects, using other data analysis methods,



and connecting the analysis of the efficiency of the funding policy to the influence of macroeconomic factors are our future directions of research.

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