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SUMMARY OF

DOCTORAL THESYS:

COMERCIAL BANKS CREDIT POLICY IN FINANCING ECONOMIC ENTITIES

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CONTENT

Keywords:
Segmentation, banks, loan, guarantees, crisis, Basel III, financial analysis, rating, score function, logistic regression, probability of default, scoring, SME financing.

Gratitudes:

I dedicate this study to my mother who inspired my permanent desire for knowledge, tolerance, kindness to others and my partner's life which, with understanding, persuasion, encouraged me to continue to strongly believe in the reality and correctness of the chances of affirmation and performance value in spite of all obstacles.

INTRODUCTION SUMMARY

The loan policy of commercial banks has fascinated for decades both economy specialists and the management of financial institutions around the world, since achieving wealth through economic growth involves accumulating capital.

Adding to this the subject matter of economic entities, especially small and medium enterprises (SME), the research subject is not only of interest, but it also addresses a large area of interests. These aspects derive from the importance of SMEs in market economies, the fact that they are the core of any economy, with a leading role in all driving mechanisms, cash flow and economic growth, including the wealth of nations and individuals.

Companies, defined as the various economic entities that exist today in the market economy, do not have sufficient financial resources to support their activities or to invest, so they resort to bank loans.

To underline the above, we show that the **main objectives** of this thesis are to present:

- the emergence, development, definition and the role of important economic concepts such as: economic agent, credit, financial institution, Basel III capital agreement, the CRD IV directive concerning capital requirements, loan risk management, non-reimbursement policy;
- loan policy, as it is remodeled by the present economic crisis;
- the tendency to adapt banking loan policies and the return to traditional banking;
- loan evolution and the changes caused by the present economic context after the implementing of the new Basel III agreement worldwide and the new European legislative CRD IV measures;
- the present economic context in our country and one of the essential factors in the outcome of the situation that is the ability of banking institutions to finance SMEs;
- loan policy, credit risk in developing countries and the measures adopted by central banks in order to diminish the effects of the crisis on financial institutions;
- the impact of the financial crisis on loan policy for companies in the euro zone;
- the financial crisis influence on the financial sector in our country;
- a theoretical comparative study regarding the loan policy adopted during the crisis by some of the major commercial banks in Romania;
- the main similarities and differences in the financing of SME in Romania;

- a case study on the financing of companies in two major Romanian banks: one with foreign and one with domestic capital;
- personal suggestions and a case study concerning an econometric model that allows decision making on financing economic agents by determining the default probabilities.

In order to achieve a better perception on the research activity, in general, and the one of the thesis, in particular, we need to formulate **secondary objectives**, to have a better image on the theme of the research. These secondary objectives refer to:

- a retrospective of the previous approaches on the subject matter;

to note the concern of banks for business sustainability and client loyalty as well as new concepts, such as „customer centricity[1]", „friendly bank"[2], „quality"[3], "client relationship management"[4];

- achieving a clear definition of the lending policies of the commercial banks for economic agents;
- to present the complexity of the theme, that involved a thorough research throughout many years of profound documentation and a careful use of information;
- to draw up conclusions and suggestions on the subject matter, including two case studies.

The structure of the thesis is thus built as to answer the objectives using specific research methods. Therefore, throughout the thesis the **research methodology** uses the following techniques and instruments:

- comparison:
  - national vs. international (on the loan policies at the beginning of the financial crisis, a case study on the financial analysis of a SME);
  - past vs. present (regarding the definition and the general frame of loan activity).
- deduction – research method from the general to the particular, from theory to practice, from a macro to a microeconomic level: loan policy also provides the

[1] Customer centricity = centering the whole activity on the client and client needs. This policy has been implemented since 2010 by Raiffeisen Bank, UniCredit Bank, and the rest of the banks and it comes to replace product policy that meant centering the entire activity on products.
[2] Friendly bank = during the crisis, the image of banks had to suffer therefore a major concern is to be able to implement the concept of friendly banking.
[3] Quality = quality services and staff make the difference in a highly competitive environment.
[4] Client relationship management = managing client relationship became ever more important since the decrease of the number of clients and the degree of loyalty thereof.

exposure of a bank on different industries. Also, the case study is based on this method, especially in its theoretical substantiation;

- induction: research method from the particular to the general (from practice to theory): the scoring application that calculates the default probability is based and adjusted according to the activity/ analysis of every bank for a customer/ customer segment;
- induction and deduction is a method used in the last case study in particular, characterized by three stages:
    - observation of facts;
    - hypothesis verification;
    - explaining the causal relationship between facts – results and results and economic phenomena.
- quantitative and qualitative analysis: the financial analysis of economic entities is bidimensional, as it involves both qualitative and quantitative factors, even if the financial analysis bears the greatest share.

The **motivation** for choosing the theme, its topicality, derives from the following reasoning:

- the duplication of the analysis made while drafting the thesis, during one of the largest global crisis, with major economic and social (lately military as well) effects that are still felt worldwide
- ”Commercial Banks Credit Policy in Financing Economic Entities” is permanently changing and developing, as it is applied and generates measurable reactions and implications, that must be managed as well as possible;
- the loan policy of commercial banks has been a major concern for both the management of financial institutions and the authorities, as the crisis proved that financial engineering and derivates, sub-prime market, can have major effects on world economy.

Thus, we consider that it is important to select a research subject that includes all these aspects and this is why it is entitled ”**Commercial Banks Credit Policy in Financing Economic Entities**”. We also emphasize the **bidimensional arguments** for choosing this subject matter, as:

- I have studied one of the major present concerns on the typology and the mechanisms of financing companies in an unfavorable economic climate, but also

due to the risk policy harmonization in the European Union through Basel II and lately the Basel III agreement.

- the topic is an important theoretical and practical mix, due to the unapproachable banking operations, in general, and the financing of companies in particular. This is based on my activity for over a decade, in major banks in Romania, working in the loan activity for economic agents.

The thesis "Commercial Banks Credit Policy in Financing Economic Entities" is **structured in four chapters**, as follows:

CHAPTER 1 – *Considerations on economic entities and loan policies*, in which i highlight: the definition and the presentation of economic agents in specialty literature, similarities and differences, the role of financial companies on the market, loan typology.

An important aspect of the research, presented in an original fashion, intended to complete specialty literature, is dedicated to marketing in banking and its influences on loan analysis. We have found and presented the best answers to important concerns of banking top management.

Up to the present, financing has been researched only from the point of view of the financial institutions, so my research approaches and targets financing from the companies' perspective.

CHAPTER 2 – ***Loan risk management***, is a natural follow up of the first chapter, and it studies and explains the complex aspects of the financing process, correctly identifying and explaining important concepts and stages such as: banking risk (focusing on loan risk), synthesis of legal regulations on banking risk management and the financing of economic agents.

Every banking institution is presently concerned with credit risk, and calls for: (especially created) support institutions to thoroughly assess credit risk, credit risk diminishing techniques (credit derivatives) and quality credit risk management systems. These allow for early risk deduction, as it is well known that prevention is better that treatment.

In this chapter I also present in an original manner consideration on loan guarantees, since the analysis of the major factors leading to the financial crisis include the guarantees accepted by creditors. I started collecting theoretical data, that was afterwards processed to express my personal opinion based on my studies and on my personal experience.

An aspect that is presently concerning specialists and the financial environment as a whole, bearing the author's imprint, is the study on the appearance, implementation and particularly the influence of the new Basel III agreement on the banking system and the SME loan activity.

CHAPTER 3 – ***Comparative study concerning loan activities during the crisis***, refers, as the title suggests, at a comparative study on the influence of monetary policy decisions on loan activity and the measures to diminish the effects of the crisis adopted in developed countries, the Euro zone and in our country, where I have studied several of the major Romanian Banks.

The study is theoretical in nature, due to the statistics and questionnaires used, in order to prepare for the practical case studies in the next chapter. Thus I present the efforts made by commercial and central banks, as well as the measures taken to diminish the negative effects of the crisis.

The research continues with the study of the evolution, effects and impact of the financial crisis on the loan policy for the companies in the Euro zone.

Unfortunately, the impact of the crisis on the Romanian banking system and activities have been majors, as they had lasting effects, especially on the economic activity.

Therewith, we present the main categories of financial indicators (the calculation method) that are generally used by commercial banks in scoring applications, the data they comprise and their theoretical impact on default Probabilities. We explain the major indicators and the possible weight they carry. By multiplying the notes attached to a predefined set of criteria with certain risk factors, the scoring application gives us a weighted result, that determines which of the five possible performance categories fits a company, according to NBR regulations.

As a result of this comparative study, I have determined how different banks in Romania have adopted different credit policies, according to their specific and orientation, such as Banca Transilvania, Raiffeisen and Unicredit.

CHAPTER 4 – ***Empirical study on the factors influencing the loan decision*** is built on two case studies: the first on the financing of economic agents in Romania and the second representing the making of an econometric model used in credit decision making. Both case studies, created by the author, accomplish the research activities, due to the conclusions, the suggestions and the original contribution on the research.

The first case study on the financing of economic agents in Romania, achieved in two banks, makes a comparative analysis, by calculating the main data for ”X” Ltd for three financial years, the much more complex decision making process in two major banks in our country: an international bank and a Romanian bank. The conclusion of the financial analysis is that ”X” ltd, due to factors such as profitability, liquidity and activity scored as good or very good, has a good rating, which allows for the approval of the loan, as the default probability is very low.

The second case study, the econometric model used in credit decision making, intends to build a model, based on logical regression. In this study, I have presumed that the explicative variables multiplied with the relevant coefficients are linearly correlated with the natural logarithm of the default rate. To measure the default probability is, in the end, to calculate a score on a mathematical formula and to determine if a default may appear in a 12 month period. The econometric model calculates by logical regression, based on a financial basic module made of 7 financial indicators (Gearing, Leverage III, Interest Coverage, Return of Equity, EBITDA Margin, Quick Ratio, Inventory Ratio), if a default will appear in the next 12 months for a SME working in transportation applying for a loan. We use 100 observations (25 companies x 4 years = 100), and the financial data used when calculating the 7 indicators are collected on a period of four years, for each of the 25 companies (700 indicators in total).

At the same time, I present the methods I used to increase the performance of the econometric model, as well as the results after each recorded stage.

In conclusion, the results of the model confirm the correlation between the 7 selected financial indicators and the inability of the company to pay its debts to the bank. After the final results, these are validated by the calculation of the default rate probability.

SUMMARY OF CHAPTER 1. CONSIDERATIONS REGARDING ECONOMIC ENTITIES AND CREDIT POLICY

Researching in specialized economic literature, I noticed various approaches and somewhat different, regarding the definition of legal economic entities as: entities of social (Dobrotă, 1999), any economic operator (Biber, 2002), a term designating legal persons (Buse, 1994), legal persons performing activities (Moise, 2011), various types of companies (law 31/1990, republished and updated), etc.

Most often, economic operators cover their financial capital needs, resorting to various forms of bank lending, which is one of the most important methods of financing their businesses.

In specialized literature the loan is described over time in various forms. Doing a back time review of theoretical approaches about the loan to economic agents, we found that this appears under various shapes. Given the importance of credit, the activity of granting in lending is considered the "queen of banking".

Financial institutions are very important in any economy. Their role is similar to that of blood arterial in the human body, as the financial institutions (FIs) are pumping financial resources from the depositories, to the economic growth (Shanmugan and Bourke, 1990). Commercial banks are financial institutions and are key suppliers of financial information within economy. Also a role at least as important as have central banks that regulate and establish the general conduct in business of commercial banks.

Own contribution consists in presenting of:

- different approaches concerning credit and financial - bank institutions, starting from how they have been registered in the past (presented as elements of economic doctrine) and reaching nowadays when we talk about new forms of credit, such as the syndicated loan;
- some aspects less known or observed so far, but important, such as:
  - "lending relationship" established between the financial institution and borrowed economic entity, its benefits in times of economic crisis;
  - factors influencing stability and efficiency, vulnerability in "relationship lending".
- role, importance of financial institutions and risks arising from their malfunction;
- credit that is the main form of completing the financing needs of economic entities;
- lending proceedings of commercial banks to finance economic operators**,** which shall sum a set of rules.

Economic recovery after a long period of crisis involves financing the economy and economic operators by commercial banks. The loan must become again one of the most important banking products under circumstances when interests on

deposits reached historic lows. How will succeed banks to stimulate lending and grant more loans safe? What is the range of products and services offered in this regard? How will succeed to meet the new Basel III regulations in this context? These are actual questions that concern the entire financial and banking sector.

Starting from the forms of lending, we can say that there are many possibilities for classification of bank loans. Following research undertaken, personal experience built up in lending, we believe that whatever the name of banks that grant funding to economic operators, or trade name which they dress, the most important criteria and forms of loan classification, are grouped according to:

- maturity: the time period under which is granted;
- the level of standardization: the creditor's parameters observing;
- the refund mode: pay annuities and interest rates;
- their way of disbursement: miscellaneous payments, cash withdrawal, release of letters of guarantee;
- modes of guarantee: mortgages, pledges, assignments etc.

A topic generally much less discussed, yet undisclosed to the public in Romania, is the implications that marketing activity generates over the credit policy of commercial banks (Magda F., 2013). Nowadays, it starts from the foundations of the marketing mix, positioning, to maximize efficiency and stay on the market, or strengthen, increase market share by leveraging opportunities and minimizing the negative effects of the unfavourable economic climate. Thus, presently, we can identify processes of analysis, based on risk models differentiated, starting point being even marketing activity through the process of market segmentation and the concepts of "customer centricity", "customer relationship management", "quality", "friendly bank ".

Current concept of success reveals the importance of "customer centricity", so that the entire banking will focus customer satisfaction. The starting point is the concept of "customer relationship management". Customer relationship management system enables: managing client assets, tracking the use of banking products and services, implementation of computer applications enabling better management of customer relationships, customer portfolio loyalty, and maximizing of revenues.

Therefore, periodically we try to find the best answers to the following questions: How best to segment our customers? What are the most important criteria

to be considered by commercial banks to segment their clientele? How can we differentiate from the competition in terms of relatively standardized products or services? How much and how important it is to differentiate by price or quality? How will position in this regard banks in Romania?

From the research conducted, we believe that:

- risk analysis and credit policy tend to take increasingly more account of customer category to which it relates;
- coming up from customer segmentation, a prerequisite for maximizing profits is that banks to practice differentiated approaches, and to provide service packages and products suited for each segment identified;
- customer segmentation, starting from identifying their needs and relying also on relevant information provided by the model of risk analysis practiced and whose results are consolidated in batches relatively homogeneous, specific by customer categories, will cause patterns of service and price, differentiated.

Psychology positioning or re-positioning, led to the conclusion that positioning strategy may require changes in the name, price or product packaging in order to preserve, handle, gain a good position in the consumer's mind. Few years ago, CEC one of the two state-owned banks in Romania, has undergone a process of modernization in this regard. As a result, it adopted a new symbol (oak leaf over a battle breast shield) and logo, but retained the name that has been minded over the years by Romanian consumers, especially the elderly ones. Basically, in the consumer's mind this bank is a national brand, associated with a safe and good bank for savings, as well as one of the few banks that assumes the credit risk in financing of economic sectors bypassed by other financiers.

Another successful positioning is the "Banca Transilvania, a bank of enterprising people", despite the constraints of not belonging to a powerful financial group (hence the limited funds in foreign currency), succeed to occupy several years a place market of leader in the segment of SMEs with Romanian capital, becoming in this segment the most innovative bank, who launched products / services devoted most successful for small entrepreneurs. Of great notoriety enjoys the advertising campaign that has centred on the character named "Zânul".

The opposite was formerly HVB bank, or UniCredit. Following the double mergers between Banca Tiriac and HVB, and later between HVB Tiriac and UniCredit by joining Unicredit and name Tiriac, which became a brand on the market

in Romania has been observed in recent years, a position relatively close to what and wants Unicredit group. After this period, when the general public has become familiar with this brand, in 2015 the bank gave up the name UniCreditŢiriac, preserving as the identity element only the name of the group to which it belongs, UniCredit, with the release of the shareholding of Mr Ion Tiriac. However, the "Credit for anything" was able to increase awareness of group on the local market, by inspired election of the characters in advertising, as the dwarfs virtually association and reflection to honest situation group market in our country.

The research results achieved prove that:

- a large part of banks in Romania who are declared as universal, will start to specialize only on specific customer segments and market, even attempting to adapt the credit analysis;
- as perspective, in Romania, there will still be some universal banks that will serve a broad spectrum of customers (such as BCR, BRD, UniCredit, Raiffeisen), while most other banks will focus primarily on specific customer segments (eg, Pro Credit to SMEs, RBS on corporate customers, etc.).
- will continue the process of concentration of the banking market through mergers and acquisitions;
- customer care and their problems, tends to become the starting point for developing new service models applied by banks and even to achieve new credit analysis based on internal rating models;
- banks will best understand that success is the result of satisfying the wishes and demands of customers, who will be able to induce this belief in each employee, will dominate the competition.

Further, research aim funding issues from the perspective of economic agents. Thus, in any company, the quality of the two decisions is very important: the investment decision and the financing decision. First make the choice between physical domestic investment (equipment, materials, etc.) and financial investment (securities). Only after deciding on an investment achievement, will adopt the financing decision, which is mainly intended to choose the source of funding, the main criteria used for this purpose being the cost and risk (Nistor et al., 2011). **At the end of this chapter the author's own contribution is to present the main advantages and disadvantages arising from use of funding sources, internal and external** by economic entities.

SUMMARY OF CHAPTER 2. CREDIT RISK MANAGEMENT

Lending process has become an extremely complex phenomenon nowadays because of factors, resources involved, and also extremely important because of the effects they generate. This importance was, once again, emphasized that major financial crises are always at their center of banking crises.

Main risk is considered to be risk of credit, which is defined as the probability that the borrower may not be able to pay interest rates and loan, on its maturity. Credit risk has proved most often as be the primary cause of bank failures, which leads to the need to impose minimum prudential requirements in its management.

The research undertaken, we found that each banking institution currently take a major concern to credit risk management, by using in this regard to:

- support institutions (specially designed) to correctly assess of credit risk;
- systems more and efficient mode of Credit Risk Management to enable them detect early any risk;
- their own designs developed over time and measuring credit risk limit referred as Scoring Applications;
- application of complex techniques, but healthy credit risk mitigation knowing that, most often, it is easier to prevent whether to treat.

Credit risk measurement means, finally, an accurate evaluation of the borrower. This can be achieved by using qualitative and quantitative techniques. Valuation models dealing with financial performance of a company (Magda and Dănuleţiu, 2014) sums up both the qualitative and quantitative part. The correct evaluation of credit risk is only one component of a broader strategy adopted by each bank. Therefore banks must implement a well-documented policy of CRM (credit risk management) through which manages all products offered and all activities to be carried out, in keeping credit risk under control.

Analysis of factors that led to one of the biggest financial crisis in the world, firstly in America and then in Europe has identified both **guarantees** accepted by lenders as one of the triggering factors, and general principles of **guarantee used in lending**. In this context, the research is aimed at highlighting considerations and personal views on the defining and classification in a way fairer and simpler of collateral accepted by commercial banks, their typology, and elements that should be used in vocation guarantee setting, characteristics and coefficients used in

determining their value. As a result, the types of collateral used in lending to economic operators, they are presented briefly in Table 6.

Table no. 6: **Types of Guarantees**

Types of Guarantees
Real Guarantees
1. Mortgage over fixed assets
2. Pledge over personal assets (equipment, inventories, means of transport) or over the balance of current accounts or deposit accounts
3. Pledge over the shares or social parts of the credited company
4. Debt assignment
5. Bank guarantee letters, bank counter-guarantees
6. Governmental guarantees and other types of guarantees (for instance FNGCIMM)
Personal Guarantees
1. Suretyship
2. The promissory note endorsed by personally

Source: author's compilation

Besides guarantees can be used credit derivatives, as technique in credit risk mitigation. They belong to the category of financial instruments. According to National Romanian Bank Regulation No. 19 of 14.12.2006, the technique of credit risk mitigation is the use of a credit institution to reduce the credit risk of one or more exposures that the institution holds. Techniques may be recognized as eligible for credit risk mitigation:

- credit default swap instruments;
- total return swap instruments;
- credit linked note instruments, to the extent of their cash funding.

To hedge the risk of interest using the following methods:

- Interest rate options such as: CAP, FLOOR, COOLAR etc;
- *Interest rate swaps* which may take forms such as: Coupon SWAP, Basis SWAP, Cross Currency Swap etc.

They can also be used **other techniques of credit risk mitigation** among the most important being: *Funded credit protection (*reducing credit risk exposure of a credit institution derives from the right of the credit institution to liquidate certain assets or amounts) *Unfunded credit protection (*reducing credit risk exposure of a credit institution derives from commitment to a third party to pay a sum in event of default event)*, Basel 2 Eligibility (*refers to requirements to be met for them to be recognized as risk-reducing).

In addition, to have the desired effect, these techniques of credit risk mitigation should be extended to the main types of risks associated to credit risk.

Wishing to prevent damage to the bank environment, as a result of possible systemic risk, generated by the poor quality of the portfolio of loans granted by financial institutions - banks, available until the emergence of the great financial crisis of 2009, the most important recommendations in credit risk management and credit policy were included in the Basel II capital agreement. Implementing worldwide the Basel II capital agreement, should ensure both sustainable growth and healthy, firstly for banks, as well as to prevent any systemic risk globally. Given that this has not happened since the onset of the global crisis in 2010, the Basel Committee on Banking Supervision has set new international guidelines, for banks, as response to it under a new agreement capital. In contrast to Basel II (2006) **Basel III (2010) does not involve a major change in the approach of the previous one, but rather two agreements complement each other, simplifies and strengthens the capital ratio enumerator, introducing some macro prudential components on framework regulation. The main requirements, guidelines of Basel III presented and explained above can be highlighted briefly in comparison to those under the previous agreement of capital, Basel II, in Table 16.**

Table no. 16: The main requirements of Basel III and Basel II capital agreements

(All numbers are percentages)

Under Basel II	**REQUIREMENTS**	**Under Basel III**
8	Minimum Ratio of Total Capital to RWAs	10,5
2	Minimum Ratio of Common Equity to RWAs	4,5 – 7
4	Tier 1 Capital to RWAs	6
2	Core Tier 1 Common Equity to RWAs	4,5
Nu este	Capital Conservation Buffers to RWAs	2,5
Nu este	Countercyclical Buffer	0 – 2,5
Nu este	Leverage Ratio	3

Source: author's compilation

In conclusion, the research conducted is current as identifies and highlights the principal measures that are currently applied and timing of their implementation. However, the research conducted, it appears that the implementation of Basel III in our country must be linked to finding the best economic and legislative means to boost SMEs lending. We therefore believe that the return on SMEs lending can be done primarily by:

- decrease in financing costs: the ongoing decline of ROBOR interest, and the intervention interest, practiced by National Bank of Romania, decrease of CDS for

Romania due to the economic growth achieved, coupled with decreasing of interest margins;

- increase of liquidity on the market: by reducing minimal reserve requirements in lei and foreign currency to commercial banks, increasing the percentage of absorption of European funds, the successful implementation of government funding programs;

- providing special guarantee schemes for SMEs operating in the agricultural sector, tourism etc.

SUMMARY OF CHAPTER 3. COMPARATIVE STUDY ON THE CREDIT IN CRISIS CONTEXT

Reactions in countries affected by the crisis and the measures taken by central banks differed quite a lot, depending on the economic vision and strategy adopted by each of them. In global crisis context, initially central banks and then commercial banks took a set of measures, notably through credit policy, to minimize the negative effects. As a result of research conducted, it shows that:

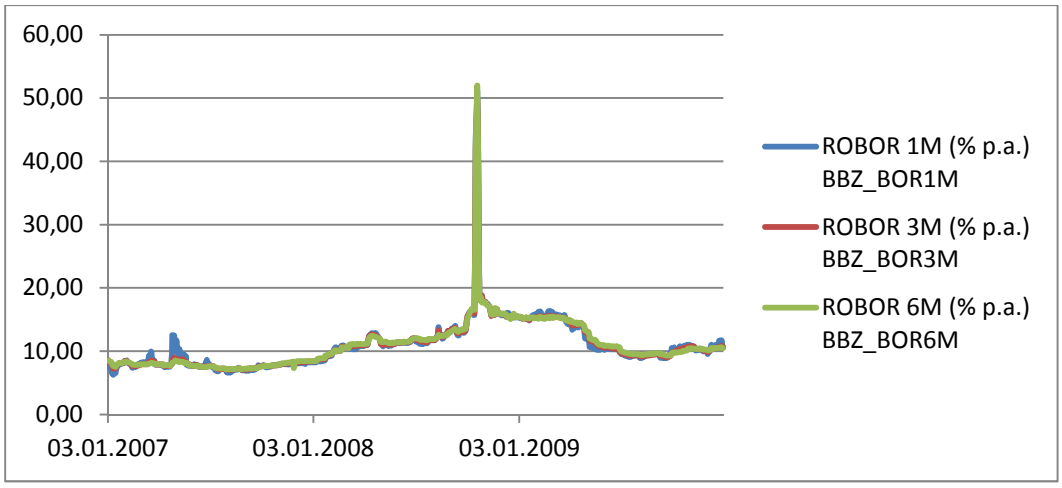
- the most extensive intervention way by central banks was done through credit policy mainly before disappearance of Lehman Brothers Bank (Borio and Nelson, 2008) to alleviate tensions on interbank markets;
- measures taken by central banks have included the expansion of eligible collateral and counterparty coverage, lengthen the maturities on refinancing operations and establishing inter-swap funding lines to alleviate funding pressures, especially on financing the dollar. (Hördahl & King, 2008);
- within one turbulent financial market (after the collapse of Lehman Brothers), emphasis was placed on much stronger second group of credit policy measures, which focused on improving credit conditions in the non-banking sector.

Including central banks in the less important countries have adopted similar measures to counteract the negative effects of the global crisis, in order to increase access to finance economic entities to ensure their survival.

In Romania an indicator that could reflect the measures taken by the NBR is ROBOR (Romanian Interbank Offer Rate) which is the average interest rate at which Romanian banks lend one to another in lei. At ROBOR quotation (1M / 3M / 6M) plus a fixed margin set by the lender to determine loan interest. The analysis undertaken (years 2007-2009) showed the Romanian central bank effort to stabilize quotation for

this indicator at one time seemed to explode and therefore loans could not be granted / refunded due to very high levels of interest. ROBOR developments analysis results are shown in Chart 1.

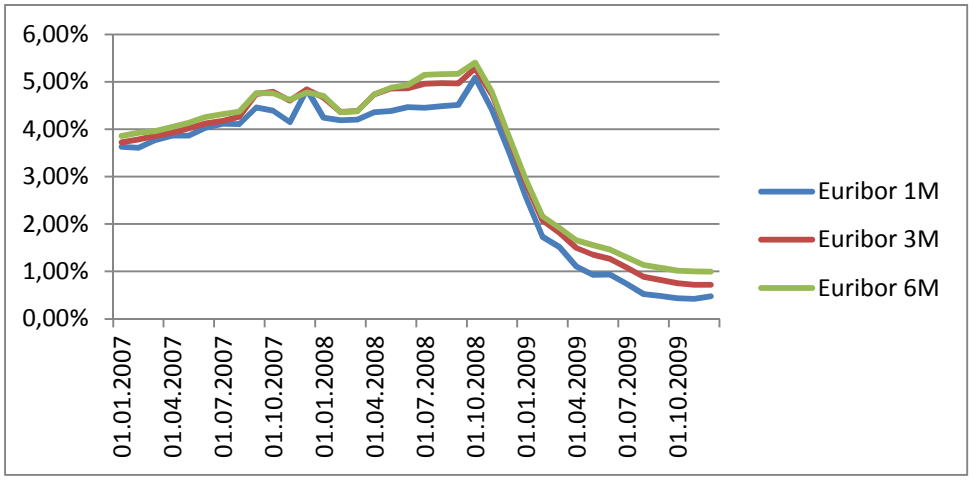
Grapf no. 1: **ROBOR evolution during the crisis**



Source: author's compilation

At European level, EURIBOR (Euro Interbank Offered Rate) is the determinant index, used as a reference for determining the level of interest. EURIBOR is a reference index independent, internationally recognized, representing the interest rates on loans to banks participating in EURO currency area EU grants loans. Interest on loans is formed as a rule by summing EURIBOR (quotation 1M, 3M and 6M) with a fixed margin set by the lender. The analysis undertaken for this indicator (years 2007-2009) showed the ECB effort to significantly reduce its quotation. Results of the analysis of evolution benchmark EURIBOR are presented in Chart 2.

Grapf no. 2: **EURIBOR evolution during the crises**



Source: author's compilation

Unfortunately, were major crisis in our country, especially in the economic and were fully felt for a long time, bringing out the vulnerability of domestic banking and financial system. As a result of research conducted, arise main negative effects of the crisis on the Romanian financial system, which occurred in the reporting period:

- decrease in loan portfolio quality during the previous years, especially în 2009 and 2010 amid economic recession recorded in our country;
- additional burden represented by those who are not insured against currency risk, namely borrowers who took loans in foreign currency;
- high growth rate of non-performing loans of banks in Romania. This is concerning although, overall, is at a manageable level.

Like the positive side, I mention that despite these threats, in our country banks have sufficient own resources, enabling them to smoothly cover unexpected losses arising from credit risk. To these matters, lack of toxic assets (such as those in the US) from the balance of banks operating in Romania led to avoiding interventions funded with public money.

At the level of commercial banks in our country as a result of the comparative study conducted, we found that policy on lending of economic operators has been applied somewhat differently, depending on the specific, orientation.

Thus, if **Banca Transilvania**:

- noted concern for maintaining and developing the relationship with the SMEs segment, of small and medium enterprises, particularly those with local capital;
- granting loans remained mostly in lei, preferred currency to finance the bank with majority domestic capital;
- remained the major advantage of the flexibility in credit decision, and speed, succeeding in this way to leverage from maximum power given to local branches and good knowledge of the local market;
- succeed to stabilize the provisions which at one time seemed to threaten seriously enough bank balance;
- invested in information system modernization, net exceeded that of competitors, in an effort to prepare a sustainable and rapid growth.

Given the unfavourable conditions caused by prolonged economic crisis in our country, **Raiffeisen Bank** had adjusted accordingly credit policy, and following new adopted changes:

- renounced granting loans without real estate collateral;

- shorten funding period, so that were generally funded working capital needs / treasury of economic operators;
- were readjusted coefficients LTV (loan to value) of securities to counter the real estate market collapse as well as the lack of transactions and liquidation of guarantees more difficult. However, it was waived taking lands as guarantee;
- diminished greatly in currency lending by granting such funding only to those who are covered in terms of risk;
- credit policy remained unchanged in terms of centralizing and approval credit decision (at Head Office).

UniCredit Bank had a different approach in terms of changes to credit policy, as a consequence of facing economic crisis, as of it:
- noted the focus for careful selection of clients;
- granting loans remained in foreign currency, even for those non covered against currency risk;
- noted the willingness to improve portfolio quality and standard products to SMEs by offering even complex financing facilities (here I refer to the multi-currency and multipurpose credit lines) and the emergence of new operational packages;
- coefficients LTV (loan to value) were readjusted of guarantees but not renounced for taking as guarantee of stocks of raw materials and goods, and lands can be taken if there are constructions built on them;
- credit policy, may state that has suffered far more courageous and major change regarding the competence of loan approval and partial decentralization to its territory, to regional centers to increase market share and assets.

SUMMARY OF CHAPTER 4. EMPIRIC RESEARCH REGARDING INFLUENCE FACTORS OF FINANCING DECISIONS

Qualitative analysis is a complex of activities carried out by the official banking officer / analyst loan, with the view of obtaining information on the situation of the legal person credited markets where acts, staff and management and history of banking relationships customer analysis. Qualitative analysis can hold in simpler scoring models, accounting for approximately 40% of total lending decision (each indicator is given a grade from 1 to 5, where 1 is the highest mark).

Quantitative analysis of corporate credit applicant holds a share of approximately 60% of total lending decision and relies exclusively on information

sources represented by the annual financial statements (if applicable and half) and trial balances of customers.

From the research conducted, we can draw the following conclusions:

- credit report (credit application) assessing the credit risk of a company through a performance assessment model which sums up both the qualitative and quantitative part;
- by multiplying notes attached to a predefined set of criteria with certain risk weights Scoring App calculates a weighted result, determining compliance with the five categories of a company's financial performance, according to NBR regulations.

Further research continues with the development of the first practical case study. Thus, we chose the same company called SC "X" LLC, performing wholesale, to do a study of selected key financial indicators. Therefore, the indicators were calculated for two annual historical periods completed in December 2009 and 2010, and for September 2011. Given that the two selected banks in Romania, using models of financial analysis different indicators taken into account, even if part of the same group (profitability, activity and liquidity) are not entirely identical, some of them having no a equivalent indicator, right in Romanian. In order not to distort study results, financial ratios calculated were presented in Romanian language for Romanian bank and in English for the international bank.

In conclusion, as a result of financial analysis made by the two banks, international and romanian, results that 'X' SRL, thanks indicators of profitability, activity and liquidity in good and very good record over the review period (years 2009, 2010 and September 2011), get a good rating. These aspects allow both banks to respond positively to requests for financing received from this company, because in the case its probability of default (PD) is low.

The second practical case study aims to determine the **probability of default (PD)** and thus the credit decision.

A wide range of statistical methods may be used to make scoring functions, among which the most common and used over time were decision trees, neural networks and expert systems, linear regression and lately, logistic regression.

Starting from the limitations of scoring models used over time, nowadays, logistic regression is the most common method used. In practice, the logistic regression is the most widely used method as it models the relation between a set of

(categorical, continuous) independent variables and a (nominal, binary) dichotomous dependent variable which usually appears when it indicates the affiliation to two categories (presence / absence, yes / no). Supposing that the values of the binary variable are coded 0/1, where value 1 generally expresses the occurrence of a certain event, it means that the result of the model is an estimate of the probability of this event actually happening, depending on the values of the independent variables.

Therefore, in this case study we assumed that the explanatory variables multiplied by the relevant coefficients are linearly correlated with the natural logarithm of the default rate (Mays, 2001):

$$Ln\frac{PD}{1-PD} = b_0 + \sum_{i=1}^{n} b_i X_i \qquad (1)$$

where:
PD – probability of default of a company over a time horizon of 1 year,
x_i – company's financial ratios,
b_0 – constant,
b_i – coefficients of relevant financial ratios of the score function.

In our case study, default will stand for the company's incapacity to meet its debt obligations / to pay the loans granted by the bank.

Eventually, calculating the PD means calculating a score, according to the formula (2) bellow, which normally determines the rating of each loan applicant and depending on this and on the classification in certain rating categories / intervals one also determines the probability of default over a 12 month horizon.

$$PD = \frac{1}{1+e^{-b_0-\sum_{i=1}^{n} X_i Y_i}} \qquad (2)$$

Within the calculated score, the most important rating is (greatly) held by the financial ratios and that is why, further on, we shall only refer to these ones, as they can be precisely calculated and the results obtained are accurate and not influenced by subjective factors. Financial ratios are considered financial risk factors and together they make up the financial module, which is the most important when it comes to assess the customer risk.

The 7 financial indicators that we have selected and were chosen as components of module score Financial are presented in Table 32, where the show including assessment and impact expected of them in terms of theory, the probability of default (PD) the borrower.

Table no. 32: **Financial ratios used in scoring model and their expected / assumed impact over the PD**

Ratio	Definition	Notation	PD (Expected impact)[5]
Gearing	[ST Interest Bearing Debt (ST Bank Loan + Other ST Loans) + LT Interest Bearing Debt (LT Bank Loans + Other LT Loans) – Cash & Bank Deposits] / Equity	**R12**	**+**
Leverage III	$\frac{Debt}{Assets}$	**LRL**	**+**
Interest coverage	$\frac{EBITDA}{Interest\ expences}$	**R14**	**-**
Return of equity	$\frac{net\ profit}{equity}$	**ROE**	**-**
EBITDA MARGIN	$\frac{\text{Earnings before interest, tax, depreciation and amortisation}}{\text{total revenues}}$	**Ebitda _margin**	**-**
Quick ratio	$\frac{\text{Cash + ST Receivables}}{\text{Current Liabilities}}$	**rli**	**-**
Inventory ratio	$\frac{\text{Inventories}}{\text{sales}} \times 365$	**Inventory _ratio**	**+**

Source: author's compilation

According to this econometric model, it is assumed that the explanatory variables represented by the 7 financial ratios, multiplied by relevant coefficients, are linearly correlated with the natural logarithm of the default rate, so that by using the function (1) previous described, the amount of the left is called the logit transformation of the probability of default (PD). Afterwards, this equation is used in order to obtain the formula of the probability of default. The formula may be transcribed using the logit curve by applying formula (2) presented above.

As to the financial score, financial ratios based on accounting data are considered as explanatory variables. The model uses a dummy dependent variable (0/1) built with value 1 for companies in default and with value 0 for viable companies, which means that the score obtained in the econometric model corresponds to the probability of a company to face default.

I used a database of 100 observations (25 firms x 4 years = 100) which includes data from 25 companies in the transport sector, which were financed by an

[5] the "+" sign showing that the higher the ratio, the higher the PD, while the "-" sign shows that the higher the ratio the smaller the PD

international bank brands in Romania. Data were taken from the financial statements of companies for the period 2008-2011.

In order to estimate the PD using the econometric model made based on the seven financial ratios calculated according to the formula from table no. 32, three of the data used in the model were processed in relation with the initial data used so that the econometric model may become more robust, as follows:

- for the ratio R12 (gearing) we used the normalization calculated according to the formula:

$$\frac{indicator - \min}{\max - \min};$$

- for R14 (interest coverage) and Inventory_ratio (inventory ratio) a logarithm was used, because all the data of the sample are positive.

Afterwards, we built an OLS model based on linear regression, and the results are presented in table no. 38.

Table no. 38: **Results of linear regression**

Source	SS	df	MS		Number of obs =	100
Model	3.3360599	7	.333722843		F(7, 92) =	2.77
Residual	11.1039401	92	.120695001		Prob > F =	0.0118
Total	13.44	99	.135757576		R-squared =	0.1738
					Adj R-squared =	0.1110
					Root MSE =	.34741

Score	Coef	Std. Err.	t	P> I t I	[95% Coef.	Interval]
R12	-.104073	.3421407	-0.30	0.762	-.783594	.575448
LRL	.0739799	.3084856	0.24	0.811	-.5386991	.6866589
R14	-.040036	.0449522	-0.89	0.375	-.129315	.049243
ROE	.1545935	.130882	1.18	0.241	-.1053493	.4145364
Ebitda _margin	-.1203986	.2102282	-0.57	0.568	-.5379299	.2971328
rli	-.1036065	.0625121	-1.66	0.101	-.2277609	.0205479
Inventory _ratio	.0628169	.020355	3.09	0.003	.0223901	.1032437
constant	.1396044	.2875433	0.49	0.628	-.4314813	.7106902

Source: author's compilation using the STATA statistical processing software

By interpreting the results of the linear regression from table no. 7, we may conclude that for the calculated score function, the variables inventory rate is significant for a significance threshold of 5% (p=0.003 < 0.05.

Because of the disadvantages of the linear model (Christopher Dougherty, 2001) represented by problems with the term disruption, that the probability predicted may be greater than 1 or less than 0 for extreme values of Xi), we built a logit model

based on function logistic regression, so that table no. 39 presents the results obtained.

Table no. 39: **Results of Logistic Regression and Significance Thresholds**

Logistic regression Log likelihood = -31.466983				Number of obs =	100
				LR chi2(7) =	25.00
				Prob > chi2 =	0.0008
				Pseudo R 2 =	0.2843
Score	Coef	Std. Err.	z	P> I z I	[95% Conf. Interval]
R12	1.009765	3.018666	0.33	0.738	-4.906712 6.926242
LRL	-2.185196	3.469383	-0.63	0.529	-8.985061 4.61467
R14	-.4077934	.3798857	-1.07	0.283	-1.152356 .3367689
ROE	1.742624	1.400063	1.24	0.213	-1.001449 4.486697
Ebitda _margin	-9.607359	5.798962	-1.66	0.098	-20.97312 1.758398
rli	-1.772536	.92319	-1.92	0.055	-3.581955 .0368829
Inventory _ratio	.8338336	.3062988	2.72	0.006	.2334991 1.434168
constant	.4434332	3.194651	0.14	0.890	-5.817967 6.704833

Source: author's compilation using the STATA statistical processing software

After interpreting the data from table no. 39 we may conclude that the last three variables (financial ratios) are the one significant for the model of estimation of the PD:

- Ebitda_margin (ebitda margin) that has a significance threshold of 10% (p=0.098);
- rli (quick ratio) that has a significance threshold of 5% (p= 0.055);
- Inventory_ratio (inventory ratio) that has a significance threshold of 1% (p= 0.006).

Then in order to be able to interpret the logit function, we calculated the marginal effects and the result of the z function using the STATA statistical processing software. The model's results confirm the relation between the 7 financial ratios selected and the company's possibility to default, so that:

Z = C(1)*R12 + C(2)*LRL + C(3)*R14 + C(4)*ROE + C(5)*EBITDA_MARGIN + C(6)*RLI + C(7)*INVENTORY_RATIO + C(8)

The score function bellow, F(Zi), which actually indicates the probability of default (PD), over a 12 month time horizon, of the company that applied for a loan, is:

$$\mathbf{F(Zi) =} \frac{1}{1+e^{-Z_i}} = \frac{1}{1+e^{-2.151856923}} \mathbf{= 0.104157541} \qquad \mathbf{(3)}$$

As a result of our research and after interpreting the results obtained, we may **conclude** the following:

I) As to the financial ratios previously highlighted as significant for the PD over a 12 month period:

- an increase by one percent in the ratio noted rli, decreases the PD by 18.46%;
- an increase by one percent in the ratio noted Ebitda_margin, decreases the PD by 100%;
- an increase by one percent in the ratio noted Inventory_ratio, increases the PD by 8.68%.

II) As to the financial ratios that have little influence on the PD:

- an increase by one percent in the ratio noted R12, increases the PD by 10 %;
- an increase by one percent in the ratio noted LRL, decreases the PD by 22 %;
- an increase by one percent in the ratio noted R14, decreases the PD by 4.2 %;
- an increase by one percent in the ratio noted ROE, increases the PD by 18.15%.

Using STATA statistical processing program, we are able to validate the results obtained above, by calculating the odds ratio of the probability of default. So, to conclude, the results obtained by calculating the odds ratio of PD fully validate the results obtained with the logistic regression econometric model used for calculating the PD for a time horizon of 12 months, for a SME applying for financing.

Our explanation for the final results obtained is the following:

- 5 financial ratios (variables), the significant variables included, record the same results as the expected ones, in terms of their impact over the PD;

- 2 financial ratios (variables), which include only the variable considered not to have a significant impact on the econometric model built, record different results as compared to the expected ones, in terms of their impact over the PD. The results are different due to the limitations of the model, and further on we shall present these limitations too, but especially due to the fact that during the period analyzed, that is period of acute crisis, the freight transport was one of the most affected businesses (which is why they wanted to record lower profits or even loss as in accounting terms).

We would like to mention the following **limits of this model**:

- not taking into account the behavioral factors, which usually increase the predictive power;

- the use of only 100 observations. Actually, they are based on the calculation of 700 relevant financial ratios, and on the calculation of 7 financial ratios for each one of the

25 companies that contracted and maintained the credit relation over 4 complete financial years (2008 - 2011) respectively;
- unexpected results obtained by two of the seven financial ratios analyzed. But none of them has an important significance threshold so they can only have little influence on the econometric model used to estimate the PD;
- the relevance of the results estimating the PD only for the transport companies. The use of the model for companies operating in other fields of activity alters the PD predicting precision.

There are many **advantages** of this econometric model estimating the PD of a loan applicant, and the most important ones are the following:
- homogeneity of results is a strong point of the model, as we aimed at analyzing companies that operate in the same industry, namely freight transportation, that bear the same NACE code and a yearly turnover or a group turnover not exceeding EURO 5 million, thus being SMEs;
- the results are representative, as we took the financial data corresponding to financial analyses made for all clients who submitted their financial statements over a 4 year period. The 100 observations made over the 4 completed financial years were based on final financial reports (December balance sheet indicators);
- confirmation of the link between the solvency, profitability, liquidity, activity ratios and a company business failure;
- the selection of the 7 most important financial ratios in the financial module on which the model is based, representing the most important groups: solvency, profitability, liquidity, activity;
- expressing the degree of risk of the company by the final score obtained as a result of performing a correct financial analysis concerning the loan applicant. This is directly associated with the probability of the company going bankrupt.

As a result of our research we conclude that it is extremely important that the creditor uses it correctly, because at least it allows:
- to make the right credit decision;
- initially to maintain, and later on to increase the bank's profitability;
- calculation of Risk Weighted Assets and setting a fair price for loans: higher risk customers shall obtain more expensive loans, while lower risk customers will get less expensive funding.

SUMMARY OF THE FINAL CONCLUSIONS AND PERSPECTIVES OF THE RESEARCH

In the present, more than ever, the role of banks, their activity, gain new and modern meanings, that can be summarized with two words: risk management. From a modern perspective, the major role of banking institutions is to manage the risks they are facing, among which: loan, operational, fraud, political, economic and bankruptcy risks.

Banking and loan activity cannot be achieved whatsoever or at chance, as well as the success or the failure of a bank does not depend on it entirely. We consider that the banking activity must be sustained by the other institutional and governmental components, at a national, European or international level. The regulation role of the central banks and of the international institutions becomes mandatory and essential, in a context in which banking products and services have become more complex than ever and influence, due to globalization, the most important world economic systems.

Furthermore, the results of the research are applicable and original. In parallel to a long and thorough research made in several years and highlighted in three case studies (one theoretical and two practical), the thesis required a lot of attention and precision in putting together the information. It has also incorporated the author's experience and passion in financing SMEs in several major Romanian banks.

The research has led to the following **personal conclusions**:

It is imperative that no financial group functions without a clear perspective on risk management, focused on loan risks, in order to ensure and preserve the short and long term development potential. This strategy must ensure its subsistence, but also its rationality, efficiency, in a rather unfriendly global economic context due to the prolonged crisis that is to become more complex and dynamic.

In their relationship to consumers, banks must have a certain behavior, attitude, that materialize in defining strategic guidelines, practical means to achieve objectives, and are reflected mostly and particularly in applying the loan policy.

Financing companies is the cornerstone of the present economic context, and commercial banks must constantly adapt their loan policy and typology in order to face the economic challenges, while both diminishing provisions and making profitable placements, with safe guarantees.

The entire loan process must be governed by prudency. It begins with customer selection (the industrial sectors considered highly hazardous, therefore the least likely to be credited) and is based on the qualitative and quantitative analysis of the loan applicants to determine the default probability (the rating).

We recommend that banks use scoring models that evaluate the default risk by comparing relevant financial indicators of the loan applicant, with financial indicators of the previous analyzed applicants, taking into consideration their reimbursement history.

We recommend that creditors rightfully use the econometric model to estimate default probabilities for a loan applicant, as it allows to measure the risk weighted assets and to establish the right loan pricing.

We believe that the types of loans, based on the customer segmentation and the needs identified, taking into account the relevant information provided by the risk analysis application and whose results are consolidated in relatively homogenous groups specific for a certain category of customers, will determine different types of loan products and pricing in a single financial institution. Thus, there will be universal banks, with a vast offer of financing services for various types of customers (like Erste, Unicredit, BRD, Raiffeisen) or banks that will specialize on specific customer segments (ProCredit for SMEs, Citibank for corporate companies, etc).

The one to find the right solution will gain an important market share, on the whole local market, but also on the SME market, since the loan activity for private persons has had a much more descending tendency in the past years. However, starting in the second trimester in loan activity for private persons began to recover and it has maintained this tendency, so that in 2016 it has reached the same level as in 2008, before the crisis. However, the perspective is yet unclear, due to the legislative instability in our country.

From a researcher's point of view, the tendency may continue with the analysis and evaluation of the default probability for the loan applications, using solely the financial indicators from the economic and legislative stable periods, in the years when our country will have out passed the period and the effects of the crisis. In order to increase the prediction ability of the future econometric model, we will also take into account the (subjective) qualitative factors that evaluate management quality, the company's market position, the age and behavior of the administrators.

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