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STATISTICAL ANALYSIS AND FORECAST OF CREDIT RISK

Thesis Summary

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Contents

Introduction

The topic research of the thesis is credit risk analysis and forecast, analyzing financial institutions in terms of credit risk by using financial indicators and using specific statistical methods of analysis and forecasting. The goal is to create a viable and efficient financial system.

The paper treats the credit risk in terms of the creditor. The lender refers to the legal entity that lends money or provides a service under certain conditions in order to make a profit. He credits both individuals and legal entities and he assumes the risk that on maturity, the customer can not pay his obligations .

The purpose of the study concerns the credit risk analysis and forecast in Romania and Europe for identifying the factors that influence credit risk, establishing links between the influence factors and credit risk and forecast for credit risk. This approach is now needed because credit risk increased and creditors should know what to consider in order to face it.

The research objectives are:

- definition of credit risk;
- identify and analyze the key indicators of credit risk assessment;
- identify the factors that influence credit risk;
- establish the evaluation methods for credit risk;
- analysis of the main economic and financial indicators of credit risk in Romania;

- analysis of key financial indicators on credit risk across Europe;
- analysis the cases of failures, identifying the causes of them.

This work is part of the few macroeconomic research on credit risk and I believe it can be continued by future research.

The research has been influenced by some limitations. One of these limits refers to the error due to missing records. Another limitation is the lack of a comprehensive database on credit risk and its influence factors in the regions of Romania and in the countries of Europe. The limit that hampered the research is that in Romania there is a registered set of indicators that evaluate credit risk different than in Europe. This limit made the comparison between Romania and Europe quite cumbersome.

As a result of these limitations, I believe that the work may be extended, representing a future potential of research. The work can be continued in several directions, both on microeconomic and macroeconomic level.

One of the future prospects of is to expand the research worldwide. Thus we highlight the characteristics of credit risk, other than those of Europe, and the trajectory of the credit risk of the financial crisis after installation for the whole world.

Another future prospects is the analysis of credit risk for the microeconomic level, analyzing, in statistical terms, the credit risk of a financial institution until the loan is granted, the analysis underlying the lending decision.

Since credit risk began to be more on the attention of the economists after installing the financial crisis, this paper underlies a

relatively new topical issue treated less on macroeconomic level, both for romanian and foreign researchers. Therefore, the research results can be used to better understand the credit risk.

The summary of the main parts of the thesis

The thesis is divided into five chapters, organically related, conclusions and proposals on credit risk.

Chapter I, Conceptual elements on credit risk, presents the concepts of risk, uncertainty, lending and credit risk, highlighting the concepts and theories that underly their definition.

Chapter II, Identification of the credit risk, includes methodological issues concerning the identification and measurement of credit risk, the aim is to clarify the concept of risk assessment.

Chapter III, Statistical methods of credit risk analysis and forecasting, deals with specific statistical methods for analyzing and forecasting the credit risk and its usefulness. Statistical methods of credit risk analysis used are: regression analysis, ANOVA, cluster analysis, principal component analysis, discriminat analysis and for statistical forecast is used the Box-Jenkins methodology.

Chapter IV of the paper contains a case study applying the methods described in Chapter III on official database containing financial and economic indicators that describe the credit risk, drawing a picture of the current state of the credit risk in Romania and its forecast for a horizon of three quarters. These analyzes shows the correlations between the analyzed indicators for credit risk, the geographic distribution of credit risk, a classification based on the number of credits and the forecast so that we can analyze the situation informed.

Chapter V of the paper contains a case study applying the methods described in Chapter III on official database containing financial and economic indicators that influence credit risk in Europe and its forecast for a horizon of two years. This is followed by conclusions, final considerations and solutions to improve the credit risk analysis.

Chapter I. Conceptual elements on credit risk

The economic literature defines the risk as the probability that the future profitability is lower than the expected yield.

We consider the risk as 50% loss and 50% gain, it can be both a threat and an opportunity and we measure as probability.

Uncertainty requires very vague anticipation of items so that we can not make any prediction about what will happen, the only certainty in defining uncertainty is "nothing is certain or predictable."

In this paper we consider the uncertainty a future situation for which, for various reasons, we can not predict the likelihood, therefore we can not analyze or predict and we can not take action to eliminate or decrease it.

The paper considers that the difference between uncertainty and risk is that uncertainty is not possible to be calculated, while the risk is quantifiable. This distinction allows us to identify, in terms of lending, only the risk, eliminating the uncertainty.

Lending is any purchase made today with the promise to pay later.

Lending is based on debtors' ability to generate revenue, respectively, liquidity, representing the main warranty and source of repayment the loans and payment the interests, the condition is that their cash flow is transferred to the financial institutions.

Among the many risks faced by a creditor, this paper treats the credit risk.

The credit risk is the most important risk from the product market and is the result of bankruptcy or loan default.

In this paper we choose case studies of credit risk, both for Romania and for Europe, analyzing and forecasting the credit risk as non-payment of debts on time.

Chapter II. Identification of credit risk

To prevent the risk of credit, the creditor shall take appropriate measures to identify, assess and monitor the risk. These measures arise from the knowledge and strict selection of borrowers and credit risk monitoring and controlling.

The problem of accurate and real-time assessment of the risk of loss and their intensity is quite complicated and requires concrete data for deduce the specific nature of the risk and the predictability of the event.

There are two types of indicators that measure the credit risk: generals and specifics.

The general indicators that measure the credit risk are: the rate of credit risk, the rate of overdue loans, the rate of bad credit, the rate of reserves for losses, the rate of provisions to loss and the rate of provisions in proffit.

The specific indicators of credit risk assessment are: the rate of return, the solvency indicator, the return on assets, the return on capital and the leverage.

Although none of these indicators is not a perfect predictor, the inadequacy of one or more of them is a barometer of future credit problems.

In this paper we used credit risk quantified numerically as the rate of credit risk. Indicators that influence the risk of lending in Romania in the analysis are: the rate of bad credit, the return on

assets, the leverage, the solvency indicator, the return on assets and the return on capital.

Chapter III. Statistical methods for analyzing and forecasting the credit risk

The decision of credit rating and estimation of default probability have been the most challenging problems in credit risk management since 1930. Prior the development of mathematical and statistical models, the decisions of credit were made based on feedback, not reliable because they depend on the creditors interpretation.

The statistical methods of analysis used in the paper are: the regression analysis, ANOVA, the principal component analysis, the discriminant analysis and the cluster analysis. These methods are used to outline a picture of the current state of the credit risk in Romania and Europe.

In credit risk analysis is important to know the effect of the influence factors for the lending issue. This problem is addressed by using the regression analysis.

We used ANOVA of regression in the analysis of regression to select the best regression model. Using this method we have seen which regression model explains best the influence of the determinants on producing the credit risk.

We used the principal components method to analyze the correlation between the statistical variables recorded and eliminate the multicolinearity that may occur between the explanatory variables.

We used the cluster analysis in the paper to identify the features on credit risk. Using the cluster analysis we classify the regions according to the variables considered in the assumption that each of them has by geographical characteristic elements.

In this paper we used discriminant analysis to classify regions according to the degree of risk, taking into account the determinants.

Using the discriminant analysis we identify typologies according to the level of credits.

The random nature of credit risk requires as forecasting method Box-Jenkins methodology. In this paper I realized the forecast of the rate of credit risk for an horizon of three quarters for Romania and the forecast of private debts for Europe for an the horizon of two years.

Chapter IV. Credit risk analysis and forecast in Romania

In analysis of credit risk is very important the effect of the influence factors of lending. This problem can be tackled using the regression analysis.

The analysis showed that the model consisting of the independent variable, the the rate of bad credits is effective, so, the rate of credit risk depends on the the rate of bad credits.

With the analysis of forecasting is established trend of the series the rate of credit risk and I realized the credit risk prediction for an horizon of three quarters, to know what to expect in the future and what steps we can take to prevent or mitigate the consequences of this phenomenon. For this is applied the Box-Jenkins methodology and used the program Eviews.

The predicted values are higher than those registered, which means that the rate of credit risk continue to rise.

Chapter V. Credit risk analysis and forecast in Europe

The aims of statistical analysis of the credit risk across Europe is to investigate the mechanisms by which the dynamics of the real economy and money market conditions influence the evolution of private debt.

The sensitivity of the private debt to the dynamics of economic situation differs from country to country. The analyzed factors are: private debt, public debt, private credit flows, exchange rate and unemployment rate.

In conclusion, the considered independent variables had not been explanatory variables for the private debts in the European countries for the analyzed period.

For forecasting we consider the time series composed from records provided by Eurostat (ec.europa.eu/eurostat) for the variable private debt in the European countries for the period 1995-2013.

The estimated forecasting models show an increasing trend in the rate of credit risk for the years 2014 and 2015.

Conclusions

The economic and financial system are constantly changing and the financial institutions are provided with numerous risks, including credit risk, the main element of this work.

Both in Romania and across Europe, credit and credit risk should be analyzed not only individually, they must be analyzed also in the economic context. Romania and the European Union must adjust the macroeconomic policies according with the context of the international financial crisis.

The vulnerability of the economy of Romania and the European Union to the international financial turbulent leads to the need for recalibration of economic policy mix. Rebalancing of macroeconomic policy package refers primarily to the gradual reduction of the exchange rate, GDP growth, reducing the unemployment rate, increasing the flow of the credits and reducing the public and private debts. Rebalancing means a strong economy, stable and viable, leading to the existence of a solid and efficient financial system.

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