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## Development of Company's Creditworthiness Analysis Model Based on the Characteristics of the National Market

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**Abstract:** *The main issue for all creditors in the Republic of Serbia is how to effectively lend to companies, with adequate increase of rate of return. Namely, domestic creditors are using traditional credit analysis methods, which are very slow and very expensive, or on the other hand using one of the world most developed models for assessing company's creditworthiness, which are still not adapted to the characteristics and performance of domestic companies. It is emphasized from a professional and practical standpoint, that the models for assessing company's creditworthiness developed for individual market, give significantly better results than other "standardized models", and this represents the basic assumption of this research. Financial statements of domestic companies, together with their analytical indicators, in best way reflect their characteristics. As such, they are the basis for developing a model for assessing companies' creditworthiness, which is the main goal of the research. The hypothesis of the paper is "Respecting the characteristics of domestic companies, it is possible to develop a creditworthiness analysis model for the Republic of Serbia, that will be more efficient than generally known models". The result of the research is a model that can be practically applied, which contributes to increasing efficiency in decision making, and which should represent "condition sine qua non" of each lender in Serbia.*

**Keywords:** *Creditworthiness, loan placement, financial statements, analytical indicators.*

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## **Razvoj modela za ocenu kreditne sposobnosti prema karakteristikama nacionalnog tržišnog sistema**

**Apstrakt:** *Kako efikasno i efektivno plasirati kredit preduzećima, uz adekvatno povećanje stope povraćaja, i dalje predstavlja ključno pitanje svih kreditora u Republici Srbiji. Naime, domaći kreditori ili se koriste tradicionalnim metodama kreditne analize, koja zahteva velike troškove i spora je, ili primenjuju neke od svetski razvijenih modela za ocenu kreditne sposobnosti preduzeća, koje ipak nisu prilagođene karakteristikama i performansama domaćih preduzeća. Stručna i praktična stanovišta napominju da modeli za ocenu kreditne sposobnosti preduzeća kreirani za pojedinačno tržište u znatnoj meri daju bolje rezultate od ostalih „standardizovanih modela“, te ovo predstavlja osnovnu pretpostavku i ovog istraživanja. Finansijski izveštaji domaćih preduzeća zajedno sa njihovim analitičkim pokazateljima u najboljoj meri prikazuju njihove karakteristike. Kao takvi, predstavljaju osnov za razvoj modela za ocenu kreditne sposobnosti preduzeća, što i predstavlja osnovni cilj istraživanja. Postavljena hipoteza rada je „Uvažavajući specifičnosti domaćih preduzeća moguće je razviti model za ocenu kreditne sposobnosti za Republiku Srbiju koji će biti efikasniji od opšte poznatih modela“. Rezultat istraživanja jeste model koji je moguće praktično primeniti a koji pri tome doprinosi povećanju efikasnosti prilikom donošenja odluka, i koji bi trebalo da predstavlja „conditio sine qua non“ svakog kreditora u Srbiji.*

**Ključne reči:** *Kreditna sposobnost, plasiranje kredita, finansijski izveštaji, analitički pokazatelji*

### **1. Introduction**

The most common way for acquisition of new funds for companies is borrowing from lenders. Baesens (2003) states that lenders have to make one of the most important decisions on a company that is good enough for crediting. In order to lend assets to companies, lenders firstly have to analyse financial strength of a company and to determine whether it will be able to pay future obligations.

In today's economic world, where lenders have dozens of loan requests per day, it is almost impossible to access the traditional analysis of the company's financial strength. Consequently, specialized models based on a set of data from financial statements and analytical indicators, can contribute by making an adequate decision in lending process. Dahiya, Handa & Singh (2015) stated that in last few decades various types of methods were proposed for evaluating companies' financial strength. Regardless of the type of analysis

applied, each of them brings great benefits for lenders. However, despite all the benefits that these models provide, they are still highly criticized. The main characteristic of each of these models and analyses is that most of them are based on bankruptcy prediction.

Domestic lenders do not use modern company's creditworthiness analysis models too much. Reasons for this lie in the insufficient number of professional employees who can understand the results generated by the model, beside that there is also mistrust in the results obtained from the automated process, as well as potential process changes that these models could bring.

Due to the lack of national company's creditworthiness analysis model, domestic lenders are forced to follow the global trend and use models which are based on bankruptcy prediction. Consequently, there is a need to develop a new model that corresponds to the characteristics of domestic companies.

The main goal of the research is to create a national model for company's creditworthiness analysis, with the aim of providing a comprehensive analysis of companies' financial statements for finding out which analytical indicator in best way represents company's financial strength and whether as such analytical indicators can be used to develop the national model.

In order to meet objectives of the research, the research passes through several different phases. The theoretical-methodological phase of the research shows the professional and practical review; the empirical phase of the research includes analysis of the most common analytical indicators of the Republic of Serbia as well as the developing creditworthiness model; and the analytical phase of the research shows advantages of such a developed model for assessing creditworthiness of enterprises from the Republic of Serbia, against models developed for other markets. Therefore, the hypothesis of the research is "Respecting the characteristics of company's business operations in Republic of Serbia, it is possible to develop a creditworthiness analysis model at the national level, which gives better results than models developed for other markets."

## **2. Literature review**

Due to the complex and time-consuming process, the traditional principle of the company's analysis, which includes a detailed analysis of the financial statements, had to be improved. Ilić and Saković (2017) stated several reasons for the development of companies' creditworthiness analysis:

- significant increase in company's bankruptcy,

- more competitive margins
- real estate values decreasing around the world, etc.

Vukadinović, Cerović, Matović & Stevanović (2018) stated that this had a significant influence on the experts and the practice in contributing to mitigation and acceleration of making an effective decision for the lender. As Steenackers and Goovaerts (1989) stated this was the main reason why credit analysts turned to automated processes based on new models.

Numerous studies confirm the effectiveness in assessing the company's creditworthiness analysis based on statistical models. Orgler (1970) is one of the first researchers which understood the significance of statistical models in assessing company's creditworthiness analysis. He created a model based on a multivariate regression analysis, from data of existing commercial loans. Falbo (1991) managed to reduce wide spectrum of indicators with discriminatory analysis to only five. Gehrlein and Wagner (1997) created a model that was based on logistic regression and a linear discriminatory analysis. Caracota, Dimitriu & Dinu (2010) created a bankruptcy model, with a logistic regression, which was based on the variables of capital/total assets, net profit/total assets, EBIT/total assets, net value/total liabilities, sales/total assets. Feng, Gourieroux & Jasiak (2008) defined ratings for each company, and based on these ratings they could decide which company is good enough for loan approval. They build the companies ratings with the help of latent processes, based on the correlation between the bankruptcy variables. Lessman, Baesens, Seow & Thomas (2015) based their research on the classification of good or bad clients, using modified logistic regression.

In the last few years, many authors have pointed out that many of these models are based on indicators and financial results from highly developed markets. Consequently, the model cannot be fully used in developing countries.

Altman and Sabato (2007) created a model that combined logistic regression and multivariate discriminatory analysis, and is intended exclusively for small and medium sized enterprises in the USA. By dividing the companies into large corporate enterprises and small and medium sized enterprises, the results were better by 30% in predicted bankruptcy of the model for all companies.

A survey on bankruptcy of companies in the Austrian market was conducted by Hayden (2003). This author examined whether bankruptcy can be predicted through traditional statistical methods, and in doing so, it relies on the definition of bankruptcy according to Basel 2 definitions.

Unlike previous authors, Gupta, Wilson, Gregoriou & Healy (2014) created a model for assessing corporate creditworthiness based on models from highly

developed countries. By using dynamic logistic regression, these authors provided a model for assessing company's creditworthiness on the territory of Great Britain. Although the results of the so-created model did not deviate much from the models of highly developed countries, the possibility of predicting bankruptcy nevertheless yielded slightly better results.

Barreto Fernandes and Artes (2016) developed a model for company's creditworthiness that is characteristic of Brazil's regions by applying logistic regression. Considering the spaciousness of Brazil, the authors included spatial risk in logistic regression. A similar study was done by Smaranda (2014) for the Romanian region. Namely, the author created a model that predicted bankruptcy of the company, using the logistic regression, which is the most suitable for companies from Romania. The developed model yields results with a precision of 87.2% which sent a questionnaire to the creators from this area to review current models for assessing the creditworthiness of the companies they are applying to.

### **3. Research Methodology**

The main objective of the research is to mitigate credit risk through the development of models based on analytical indicators that reflect the specifics of the national market. A model created in this way will be based on the current values and performance of the companies. As such, the model should be tested in relation to existing models in order to prove that the results obtained by it are more adequate and better. It is necessary to note that the aim of the research is to draw the maximum from the financial statements and analytical indicators. Therefore, the aim of the paper is to investigate:

- the existing application of financial statements and analytical indicators used in the assessment of the creditworthiness of enterprises, the possibility of developing and applying a new model for assessing the creditworthiness of companies from the domicile market,
- the level of reliability and accuracy of the new model for the company's creditworthiness in classifying them to those who can obtain credit funds and to those that cannot.

In order to achieve defined goals, the research was carried out through several different stages:

- Theoretical and methodological phase,
- Empirical phase, and
- Analytical phase.

The theoretical and methodological phase involves researching both domestic and foreign scientific and professional literature in the field of financial statements analysis, business analysis, credit risk, company's creditworthiness analysis, usage of existing models for assessing company's creditworthiness, as well as possibilities for developing new models for domestic market.

The empirical phase of the research implies the usage of the logistic regression method in order to develop model for assessing the company's creditworthiness as well as testing the developed model. Statistical model for assessing company's creditworthiness at the national level will be developed with the help of logistic regression. After presenting descriptive statistics, the relationship between depended dichotomous variable on the approved loan and the independent variables – financial indicators (total liabilities and capital, coefficient of own financing, ROI (return on investment), average number of days of stock holding in stock, the level of coverage) will be analysed. The dependence of variables will be determined by logistic regression, whereby all relevant variables will be analysed.—The model estimation will be determined by testing on an independent set of variables.

The basic aim of the research is to make the most suitable model that has been adapted to available data. Analytical indicators that are similar and contain the same positions will be avoided, and in addition, the appearance of standard errors will be minimized by eliminating duplicate information. Since there is a possibility that the resulting model for assessing company's creditworthiness will be valid only for companies that are included in the initial sample, it will be necessary to check the correctness of the created model in terms of creditworthiness analysis of all companies in the domestic market. In addition, the results obtained by the developed model will be compared with the results of the existing model.

The analytical phase of the research implies testing of the defined hypothesis as well as making concluding observations using methods of observation, comparison, measurement, interpretation and analysis.

## **4. 4. Results**

### **4.1. Sample selection**

In order to implement the selected model, a sample of 540 companies operating in the territory of the Republic of Serbia in the 2011-2017 period is applied. The sample consists of companies from different sectors and from different size range (small, medium and large companies). All companies from

the sample, according to the expert assessment, are classified into 4 basic categories, from 1 to 4. Category 1 stands for the lowest risk companies, while companies in category 4 are at the highest risk. The following table shows the total number of companies from the sample according to the risk ranges.

*Table 1. Risk groups of surveyed companies*

<b>Risk groups</b>	<b>Number of companies</b>
1 – extremely low risk	247
2 – low risk	75
3 – medium risk	30
4 – high risk	188
<b>Total</b>	<b>540</b>

*Source: Authors*

For selected sample companies, the financial statements from different lenders on the domestic market were used, as well as the classification by those lenders where they characterized companies as capable or incapable of obtaining loan. The structure of the companies from the sample according to the approved loan is shown in Table 2.

*Table 2. The structure of surveyed companies by number of employees*

<b>Approved loan</b>	<b>Number of companies</b>
Yes	310
No	230
<b>Total</b>	<b>540</b>

*Source: Authors*

Logistic regression implies the division of the sample into two parts. First part was used for the development of the model and the second one was used for testing the model. In empirical research, 70% of the sample was used for development, and 30% for testing the model.

Statistical sampling in the process of evaluating the company's creditworthiness is the process of drawing conclusion on the financial statements as a whole, on the basis of its most representative part. Thus, a credit analyst can draw a conclusion about the whole set by examining the most representative sample.

#### **4.2. Determining the significance of analytical indicators for decision making process of the company's creditworthiness**

An analysis that included the characteristics of the company's business, market conditions, and the recommendations of the lenders from the domestic market helped to define the relevant analytical indicators that serve to develop the model for assessing the creditworthiness of enterprises. However, in order to determine the significance of analytical indicators, it was necessary to test each of them on a prepared sample of 540 companies from the domestic market.

For determining the significance of analytical indicators, the number of data per individual indicator varies from 509 to 540 observation units. It is important to note that 503 observation units contain all indicators.

The analysis of Mahalanobius' distances revealed the presence of multivariate outliers. All observation units with a distance greater than 51.18 were removed from further analysis. In this way, the sample of the company is reduced to 458 observation units. After that, a re-analysis of all the predefined analytical indicators was performed in order to determine their significance.

After removing multivariate outliers, it is noted that the values of the asymmetry coefficients and the scattering coefficients are significantly lower. In line with the testing of analytical indicators that showed the need to remove multivariate outliers, there was a change in the overall sample to risk groups. In this way, an improved quality sample was provided, which enabled further uninterrupted testing in order to develop a model for assessing company's creditworthiness.

Table 3 shows the total number of companies from the sample according to the risk level and after removal of multivariate outliers.

*Table 3. Sample of companies according to risk classification after removal of multivariate outliers*

<b>Risk groups</b>	<b>Number of companies</b>
1 – extremely low risk	237
2 – low risk	68
3 – medium risk	24
4 – high risk	129
<b>Total</b>	<b>468</b>

Source: Authors



During the analysis of the data, certain changes in the sample were conducted, consequently there were changes in the classification of companies according to the approved loan (Table 4).

Finally, the testing of multicollinearity through the conditional index and the proportion of variance was performed. Due to the high index of 66,993 and the variable variance of 1 for net income and operating income, as well as the 49,566 index and the ratio of the variance of 0.99 for ROI and ROA, it was necessary to deduct net revenues as well as the ROI from further consideration. Therefore, the total of 22 analytical indicators were defined, which are significant for further processing in the development of the model for assessing the creditworthiness of enterprises.

*Table 4. The structure of surveyed companies by approved loan*

Approved loan	Number of companies
Yes	294
No	164
<b>Total</b>	<b>468</b>

*Source: Authors*

### **4.3. Model for loan approval decision**

In order to develop the model for assessing company's creditworthiness a logistic regression was applied.

Calculation of logistic regression is done using the following formula:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (1)$$

Results obtained through logistic regression need to be tested for accuracy.

Before forming a model for deciding on credit approval, by the implementation of logistic regression, it was required to perform the analysis of analytical indicators to determine the value for each individual indicator. In order to perform the above analysis, a t-test was applied.

The following table (Table 5) shows the comparison of analytical indicators according to the decision on the loan approval.

On the basis of p values, it can be determined that there are statistically significant differences in all indicators except Debt and Equity ratio.

*Table 5. Analytical indicators comparison according to loan approval decision*

Analytical indicator	Statistics of the test (t)	Number of freedom degree	P - value
Net income	9,0920	163	<0.001
Business income	6,9320	163	<0.001
EBIT	-3,6100	163	<0.001
Net profit/loss	-7,3380	163	<0.001
Total liabilities & capital	13,5130	163	<0.001
Profit margin (%)	-8,7790	450,619	<0.001
ROE (%)	-4,0190	334,195	<0.001
ROCE (%)	-4,6450	381,899	<0.001
EBIT / interest cost	-3,9590	456	<0.001
Rigorous liquidity indicator	-6,9280	432,233	<0.001
Average no. of days of stock holding in stock	3,0460	270,643	0.003
Average no. of receiv. collection	6,3450	203,255	<0.001
Average no. of days for payment obligation	2,6580	456	0.008
Current liquidity indicator	-10,8560	418,438	<0.001
Financial stability indicator	-8,9890	453,832	<0.001
Revers. capital	-9,5540	374,434	<0.001
ROA	-5,6130	339,193	<0.001
Coeff. of indebt.	5,4320	242,674	<0.001
Coeff. of own financing	-7,8760	456	<0.001
Debt & capital ratio	1,7830	167,744	0.076
Coverage degree I	-4,8680	396,719	<0.001
Coverage degree II	-3,3040	455,947	0.001

Source: Authors

Table 6 shows that 318 enterprises from the total sample were used to form a model, while 140 were used to test and validate the model.

*Table 6. Data distribution for model formation and testing*

Approved loan	Data distribution for model formation	Data distribution for model testing	Total
Yes	208	86	294
No	110	54	164
<b>Total</b>	<b>318</b>	<b>140</b>	<b>458</b>

Source: Authors

The formation of a model for decision-making on loan approval was made by selecting statistically significant analytical indicators by excluding relevant

variables according to the criterion of inclusion of the variable with  $p = 0.05$  and exclusion with  $p = 0.10$ . The final model contains four analytical indicators:

- Business income,
- Total liabilities and capital,
- Financial stability indicator,
- Coefficient of indebtness.

In accordance with the above, calculation of model characteristics was performed (Table 7).

*Table 7. Characteristic of the model*

Step	-2 log likelihood	Determination coefficient (Koks Snel)	Determination coefficient (Nagelkerk)
1	98.979	0.62	0.861

Source: Authors

On the basis of the obtained results from the previous table, we conclude by Nagelkerk coefficient of determination that 86.10% of the variation on the approval of the loan is interpreted by logistic regression.

After calculating the characteristics of the model, it is also necessary to calculate the adequacy of the loan approval model (Table 8).

*Table 8. Model adequacy*

Step	Test statistic (hi-square)	Number of freedom degrees	P – value
1	6.928	6	0.328

Source: Authors

Test statistics  $X^2_6 = 6.928$  ( $p = 0.328$ ) shows that there is no statistically significant deviation between the model and the original data, or  $p$  - the value indicates that the model corresponds to the original data.

After the model was tested, the classification of the observation units was carried out on the basis of the defined model.

*Table 9. Classification of observed units*

Approved loan	Data distribution for model formation	Data distribution for model testing	Total
Yes	208	86	294
No	110	54	164
<b>Total</b>	<b>318</b>	<b>140</b>	<b>458</b>

Source: Authors

The classification of the observation units based on the credit appraisal model successfully classifies 100.00% of approved loans, and 86.40% of unauthorized loans. Therefore, the model's performance rating is 95.30%.

The following table shows the logistic regression parameters that are based on statistically significant analytical indicators (Table 10).

*Table 10. Logistic regression parameters*

Analytical indicator	Value parameter (B)	Standard error	Statistic parameter (Vald)	Number of freedom degrees	P - value	Exp (B)
Business income	0.002	0.001	11.221	1	0.001	<b>1.002</b>
Total liabilities & capital	-0.005	0.001	11.322	1	0.001	<b>0.995</b>
Financial stability indicator	5.054	1.905	7.038	1	0.008	<b>156.641</b>
Coeff. of indebt	-2.358	1.085	4.720	1	0.030	<b>0.095</b>
Constant	3.046	0.775	15.442	1	<0.001	<b>21.028</b>

Source: Authors

The statistically significant indicators listed in the previous table have the following impact on credit approval:

- By increasing operating revenues for one unit, the probability of a loan being granted increases by 1.002 times or by 0.2%,
- By increasing total liabilities and equity for one unit, the probability of a loan being granted is reduced by 0.995 times or by 0.5%,
- By increasing the financial stability coefficient for one unit, the probability of a loan being granted increases by 156.641 times or by 15,664.10%,

By increasing the indebtedness ratio for one unit, the probability of a loan being granted is reduced by 0.095 times or by 90.50%.

#### **4.4. Testing model for company's creditworthiness analysis**

The testing of the risk assessment was done on the defined test sample. The main goal is to determine whether the developed model is adequate when applied to the test sample.

Classification of the test sample for model evaluation is shown in the following table.

*Table 11. Classification of observed units*

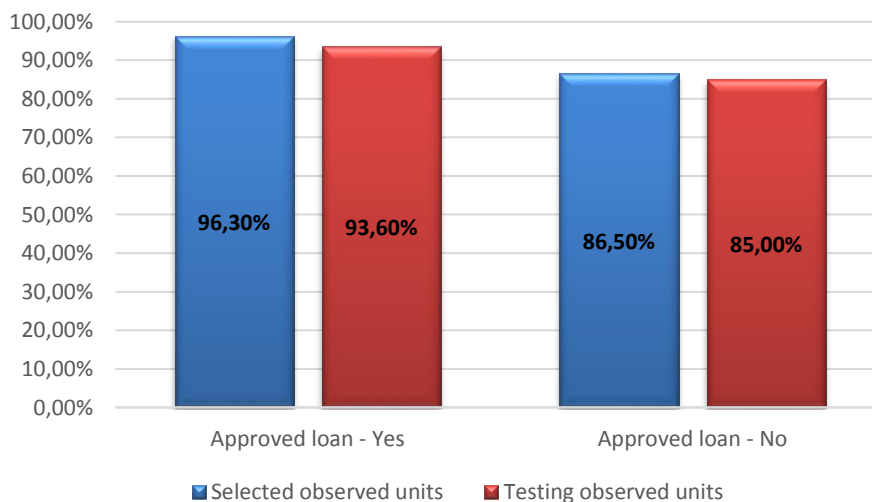
Approved loan	Approved loan YES	Approved loan NO	Successful classification %
Yes	85	1	98.80%
No	8	46	85.20%
<b>Total</b>			<b>93.60%</b>

Source: Authors

According to the classification table, out of 140 tested observation units, 93.60% are correctly classified.

The following illustration shows the comparison of successfully classified units for the company's creditworthiness assessment that was applied to the development of the model and test sample. Figure 1 clearly shows a model with insignificant differences in the successful classification of enterprises that received credit and those did not, and that these results are somewhat better in the development of the model than in its testing.

*Figure 1. Percentage of successfully classified observation units*



Source: Authors

The final assessment is that the approval model is adequate and reliable. Therefore, it can be concluded that if the specificity of the operations of domestic companies is taken into account, it is possible to develop a model for assessing company's creditworthiness at the national level.

In this way, part of the hypothesis has been proven: "With respect to the specifics of the business of the companies in the Republic of Serbia, it is possible to develop a model for assessing the creditworthiness at the national level"

#### **4.5. Comparison of the developed model with existing models for assessing the company's creditworthiness**

The research has shown that the statistical model based on analytical indicators gives good and adequate results for assessing the creditworthiness of domestic companies. However, in order truly prove the activity of this model, it was necessary to compare the data obtained with the models used in the international practice:

- World recognized model – Zmijewski model (Fakhri Husein & Pambekti, 2004), and
- Model from the region – Smaranda model (Smaranda, 2014) for companies from the Romanian market.

The Zmijewski model for assessing the company's creditworthiness is actually a predictive model for assessing bankruptcy of the companies. It is based on analytical indicators of profitability, indebtedness and liquidity of the company. Sembring says (2015) that the model was developed on the basis of 800 companies that went bankrupt and 40 companies that were successful in doing business. The basic equation of the model is:

$$Y = -4,3 - 4,5X_1 + 5,7X_2 - 0,004X_3 \quad (2)$$

Whereas:

- $X_1$  = net profit / total assets
- $X_2$  = total debt / total assets
- $X_3$  = short-term assets / short-term liabilities.

A sample of 430 companies from the domestic market was used to test the Zmijewski model. The results are shown in the table 12.

The percentage of successful enterprise classification through the Zmijewski model is only 32.09%, where companies that did not get a loan are better classified than those who received them (73.17% versus 6.77%). Therefore, it can be concluded that a model created on the basis of analytical indicators of a domestic market gives better results than the Zmijewski model.

Table 12. Test results – Zmijewski model

Approved loan	Approved loan YES	Approved loan NO	Successful classification %
Yes	18	248	6.77%
No	44	120	73.17%
<b>Total</b>			<b>32.09%</b>

Source: Authors

Smaranda created a model for the territory of Romania. The model for assessing the creditworthiness of the companies, which is based on the predictions of whether one company will go bankrupt. By analysing all modern methods and tools, Smaranda eventually applied logistic regression to obtain adequate results. The starting assumptions were analytical indicators that are characteristics for the territory of Romania. The underlying reason lies in the fact that business and market characteristics are not the same as in highly developed countries.

The following model was developed as:

$$Y = -5,0036 + 0,0236X_1 + 0,047X_2 + 0,1074X_3 + 5,3504X_4 \quad (4)$$

Whereas:

- $X_1$  = total liabilities / total capital
- $X_2$  = ROE
- $X_3$  = operating income / total assets
- $X_4$  = net income / total liabilities.

A sample of 287 companies from the domestic market was used to test the Smaranda model. The results obtained by the Smaranda model when using the data from the companies from the domestic market are shown in the following table:

Table 13. Test results – Smaranda model

Approved loan	Approved loan YES	Approved loan NO	Successful classification %
Yes	9	14	39.13%
No	47	217	82.20
<b>Total</b>			<b>78.75</b>

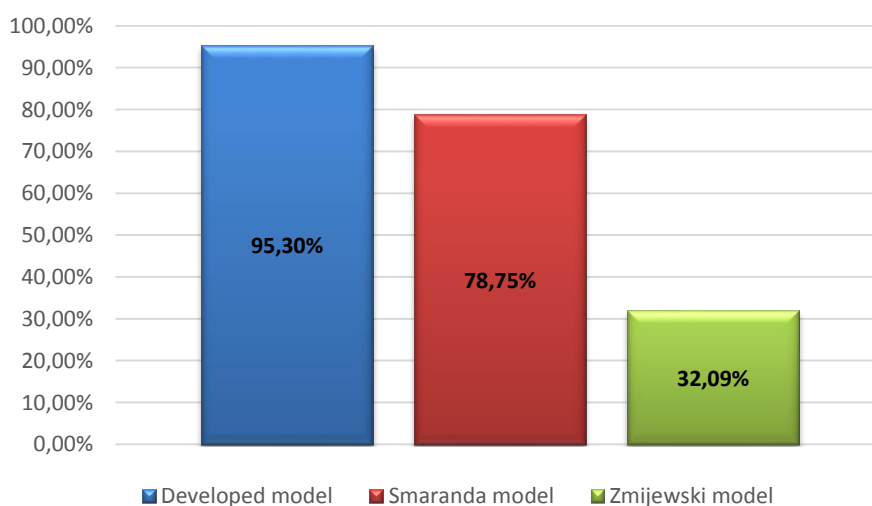
Source: Authors

The percentage of successful classification of domestic enterprises through the Smaranda model is 78.75%, where companies that did not receive the loan in relation to those who received the loan are much better classified

(83.20% versus 39.13%). Therefore, it can be concluded that the model created on the basis of analytical indicators for domestic companies gives better results than the Smaranda model.

When we compare the results of all tested models with the results of the credit rating model developed for the companies from domestic market, we conclude that a model developed for the domestic market gives better results than models created for other markets.

*Figure 2. The results of the company's creditworthiness assessment by model*



Source: Authors

The main reason that leads to these results is that no generalization and neglecting of the characteristics of business conditions in one country can lead to good results. In certain business spheres where 1% of the difference does not force large movements, the application of the generally accepted models is permitted. However, such situation is not usual for credit operations. Just a small miscalculation, for example difference of 0.5%, can lead to large losses.

The final estimate is that a model created for the domestic market gives better results than models created for other markets, and therefore the research hypothesis is fully confirmed.



## **5. Conclusion**

The main motive of the research was to examine the possibility of creating a unique model in the assessment of the company's creditworthiness, based on defined analytical indicators. This is to show that the created model, the assumptions of which are based on the actual financial strength and the performance of the companies, expressed through characteristics of analytical indicators from the domestic market, can be applied by the lender as a discriminating factor when deciding on the borrowing of funds, and that the model as such is a model for assessing the company's creditworthiness.

Empirical research phase has enabled us to prove the research hypothesis: "Respecting the characteristics of companies business operations in the Republic of Serbia, it is possible to develop a creditworthiness analysis model at the national level, which gives better results than models developed for other markets."

The research contribution is reflected by complementing existing knowledge in the field of financial statements analysis and business analysis of the company, in order to reduce the risk in lending decision making process, in a way of crediting companies that cannot financially support new borrowings or are financially unsuitable.

The scientific research contribution is reflected in a comprehensive and systematic analysis of analytical indicators that best illustrate the business of the company in the domestic market, as well as in their use in the process of developing a model for assessing the company's creditworthiness. A specific contribution relates to the development model which is based on the financial performance, i.e. the current capacity and the strength of the company, rather than on the prediction of the potential bankruptcy of the company.

The contribution of the research is reflected in the presentation of the necessity of applying the domestic model for assessing the company's creditworthiness. This is supported by the results of the model that give better results than existing models developed for the foreign market.

The first limitation of the research comes from the fact that the model uses only quantitative data from financial statements, i.e. analytical indicators of the company. The second limitation of the research is a fact that specifics from various sectors were neglected.

Mentioned limitations do not impair the achievement of the scientific and practical contribution, but point to certain possibilities that enable further improvements of the developed model.

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