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Bulletin of Taras Shevchenko National University of Kyiv. Economics, 2018; 6(201): 35-41

УДК 336.7

JEL classification: M2; M4

DOI: <https://doi.org/10.17721/1728-2667.2018/201-6/5>

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THE ASSESSMENT OF THE INSOLVENCY RISK AT THE COMPANIES FROM THE MANUFACTURING INDUSTRY, LISTED ON THE BUCHAREST STOCK EXCHANGE

The paper presents both theoretically and empirically the insolvency risk for 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at premium and standard categories, during 2007-2016, through four models: Springate, Taffler, Altman, and French Commercial Credit. The results of the research have revealed that during the period 2007-2016, over 50% of the companies were facing a high insolvency risk, the most risky of them being Cemacon S.A. and Prefab S.A. The less risky companies during the mentioned period of time were Aerostar S.A. and Conted S.A.

Key words: insolvency risk, Springate model, Taffler model, Altman model, French Commercial Credit model.

Introduction. The insolvency risk is widely developed and debated in many researches, most of the studies aiming to identify the endogenous and exogenous factors that contribute to the triggering of the insolvency. The economic and financial crisis has significantly contributed to the increase of the number of Romanian companies that have declared insolvency. Over the period 2011–2015, Romania registered over 100.000 insolvent companies, with an

incidence at 1.000 active companies of four times above the average from Central and Eastern Europe [12]. Only maximum 3% from the financial recovery plans have been successfully completed, ten times below the average from the developed countries of the European Union. This is the reason why it was necessary to modify the legislative framework, by adopting the Law no. 85/2014, according to which "insolvency is the state of the debtor's patrimony

characterized by insufficient funds available for the payment of certain, liquid and due debts" (Art. No 5.29 from the Law no. 85/2014 [11]).

Since the 1960's, researchers have been interested in forecasting the company's insolvency, but the classic studies found in the literature review have not been adapted to the economic and financial context (Scott, 1981; Zavgren, 1983; Altman, 1984; Jones, 1987). As consequence, there was a need to develop new models of insolvency prediction [1, pp. 18].

Literature review. The literature review highlights several scoring models regarding the prediction of the insolvency risk, developed by foreign researchers, most often being used the following models: Altman, Canon and Holder, Loeb and Portier, the model of the Bank of France, etc. [3, pp. 162] as well as some scoring models developed by Romanian researchers: Anghel model, Băileşteanu model, Ivoniciu model, Statev model, etc.

The prediction of a company's insolvency risk is important in the context of the development of a strong

market economy, a series of studies presenting early models of insolvency forecasting. However, the economic and financial crisis has caused a substantial change in the results obtained through the score function and the scoring models proposed so far need to be updated. Therefore, we agree with Hyman Minsky who considers that an economy performance is largely influenced by the borrowers ability to pay their debts [8, pp. 209–245].

Using multiple discriminant analysis, E.I. Altman has developed the score function of predicting the insolvency risk in 1968, based on the financial data collected from 66 US companies, half of them facing with insolvency risk and the other half without financial difficulties, for the period 1946–1965 [10, pp. 263–270, pp. 265]. The wide use of Altman's Z score is due to the ease of it's calculation.

According to the Altman model, Z score can be determined as below [6, pp. 125]:

$$Z = 1,2R1 + 1,4R2 + 3,3R3 + 0,6R4 + 0,999R5, \quad (1)$$

$$\text{where } R1 = \frac{\text{Current Assets}}{\text{Total Assets}},$$

$$R2 = \frac{\text{Reinvested profit}}{\text{Total Asset}},$$

$$R3 = \frac{\text{Operating Income}}{\text{Total Assets}},$$

$$R4 = \frac{\text{Market capitalisation}}{\text{Total Debts}},$$

$$R5 = \frac{\text{Turnover}}{\text{Total Assets}}.$$

A Z score lower than 1.8 indicates a high insolvency risk, a Z score between 1.8 to 2.99 – a medium insolvency risk and a Z score higher than 2.99 – a low insolvency risk [2, pp. 86–102].

The French Commercial Credit model (1985) was developed as a result of a study on a sample of 3.000 industrial companies with less than 500 employees, during the period 1977–1979. The Z score determined through this model has the following calculation formula [5, pp. 7]:

$$Z = 6,47 - 9R1 - 1,1R2, \quad (2)$$

$$\text{where } R1 = \frac{\text{Financial Expenses}}{\text{Operating income}},$$

$$R2 = \frac{\text{Loans+Interests}}{\text{Equity}}.$$

A positive Z score value indicates that the companies are financially healthy and a negative value, that they have financial difficulties.

Springate model (1978), uses four financial rates, which include: current assets, current liabilities, total assets, operating profit, gross profit and the turnover [9, p. 1548, pp.

1546–1550). The research conducted by Talebnia G., Karmozi F., Rahimi S., on the Iranian capital market, during the period 2009–2013, highlighted that the Springate model was better suited to identify the insolvency risk, in comparison with the other models used in the research.

The Springate model is determined as below:

$$Z = 1,03R1 + 3,07R2 + 0,66R3 + 0,4R4, \quad (3)$$

$$\text{where } R1 = \frac{\text{Current Assets} - \text{Current Debts}}{\text{Total Assets}},$$

$$R2 = \frac{\text{Operating profit}}{\text{Total Assets}},$$

$$R3 = \frac{\text{Gross Profit}}{\text{Currents Debts}},$$

$$R4 = \frac{\text{Turnover}}{\text{Total Assets}}.$$

If Z's value is lower than 0.862, it is assumed that the company has high insolvency risk.

Taffler model was developed in 1977 by Taffler and Tisshaw economists, on a sample of small and medium-sized companies from UK. They analyzed 90 indicators, and only 4 of them who were considered to be the most relevant,

were used in the model. Taffler model has no gray area to indicate a medium risk of insolvency. By using this model, the companies are evaluated only as having a high or low insolvency risk.

The Taffler model is determined according to the below formula [4, pp. 248–259]:

$$Z = 0,53R1 + 0,13R2 + 0,18R3 + 0,16R4, \quad (4)$$

$$\text{where } R1 = \frac{\text{Gross profit}}{\text{Current debts}},$$

$$R2 = \frac{\text{Current Assets}}{\text{Total debts}},$$

$$R3 = \frac{\text{Current Debts}}{\text{Total Assets}},$$

$$R4 = \frac{\text{Turnover}}{\text{Total Assets}}.$$

A Z score ≤ 0.2 indicates a high insolvency risk, a Z score between 0.2 and 0.3 – a medium insolvency risk and a $Z \geq 0.3$ – a low insolvency risk [7, pp. 188–194, pp.190].

Data analysis and results. In this research, by using scoring models, the insolvency risk was determined for 35 companies belonging to the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, during the period 2007–2016.

The assessment of the insolvency risk through the Springate model. In the Figure 1. it is presented the companies structure, depending on the insolvency risk, determined through the Springate model.

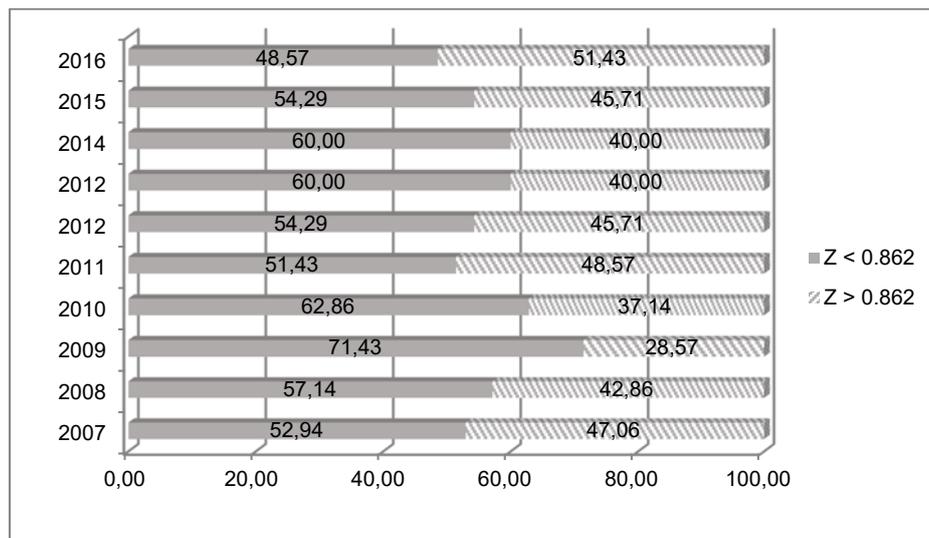


Fig. 1. The companies structure depending on the insolvency risk, determined through the Springate model, 2007–2016

Source: Authors processing based on the data provided by the www.bvb.ro portal.

Excepting last year, over the entire studied period of time, over 50% of the companies were presenting insolvency risk. The companies that have recorded a score level that indicates the existence of an insolvency risk over the entire analyzed period of time were: Grupul Industrial Electrocontact S.A. (ECT), Retrasib S.A. (RTRA), Altur S.A. (ALT), Electroputere S.A. (EPT), Prefab S.A. (PREH), Romcarbon S.A. (ROCE), Rompetrol S.A. (RRC), Stirom S.A. (STIB), Sinteza S.A. (STZ), and Turbomecanica S.A. (TBM).

After analysing the financial statements of these companies, for the period 2007-2016, some conclusions can be drawn, such as: slowing the stocks, suppliers and receivables rotation, with negative consequences on the companies liquidity and profitability; the reduction in the value of the: profit, turnover, current assets and payment capacity.

The assessment of the insolvency risk through the Taffler model. The companies structure depending on the Z score value, is presented in the Figure 2.

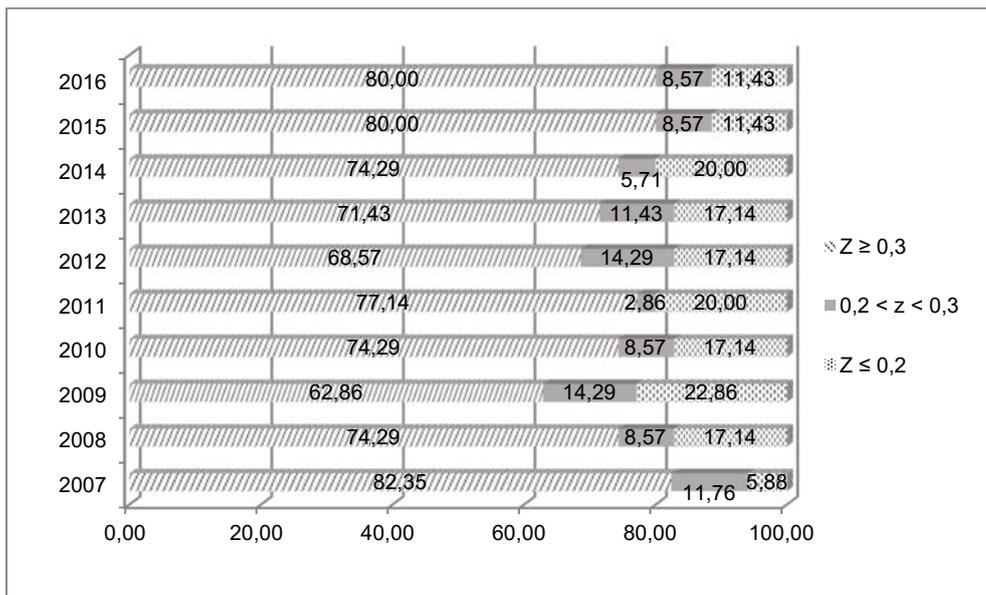


Fig. 2. The companies structure depending on the insolvency risk, determined through the Taffler model, 2007–2016

Source: Authors processing based on the data provided by the www.bvb.ro portal.

During the period 2007–2016, between 62,86% and 82,35% from the studied companies are financially healthy and between 5.88% and 22.86% of them are facing with high insolvency risk. The company that presented high risk of insolvency over the entire analyzed period of time is Electroputere S.A. (EPT). Romcarbon S.A. (ROCE) had high insolvency risk during 2007–2012; Cemacon S.A. (CEON) during 2009–2014, Turbomecanica S.A. (TBM) during 2008–2014.

During 2007–2016, Aerostar S.A. (ARS), Artego S.A. (ARTE), Antibiotice S.A. (ATB), Bermas S.A. (BRM),

Carbochim S.A. (CBC), Comelf S.A. (CMF), Conted S.A. (CNTE), Electroargeş S.A. (ELGS), Prodplast S.A. (PPL), Rompetrol Rafinare S.A. (RRC), Zentiva S.A. (SCD), and Vrancart S.A. (VNCs) had low insolvency risk, with an average score of more than 0.3.

The assessment of the insolvency risk through the Altman's model. In the Figure 3 it is presented the companies structure depending on the insolvency risk determined through the Altman model.

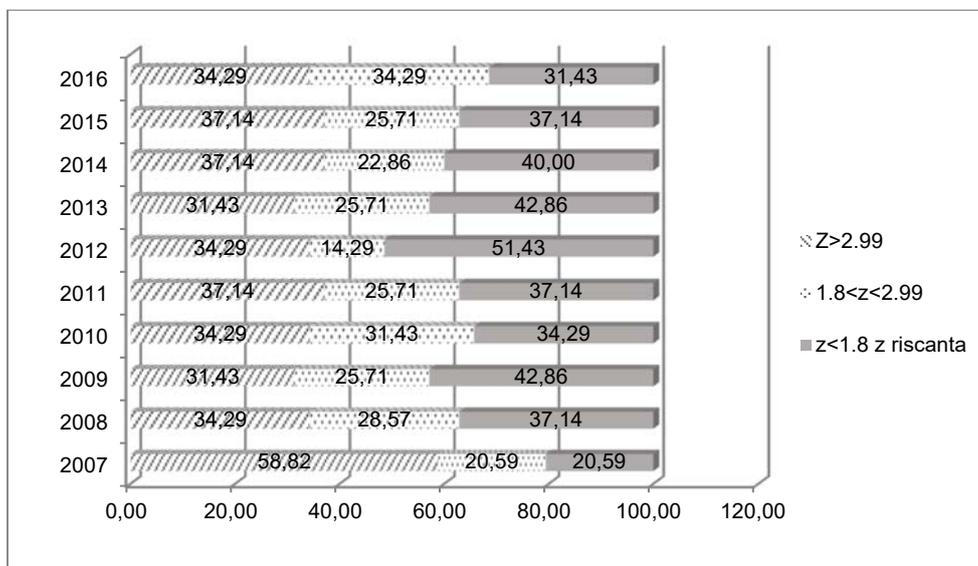


Fig. 3. The companies structure depending on the insolvency risk, determined through Altman's model, 2007–2016

Source: Authors processing based on the data provided by the www.bvb.ro portal.

Aerostar S.A (ARS), Biofarm S.A. (BIO), Carbochim S.A. (CBC), S.C. Conted S.A. Dorohoi (CNTE), Electroargeş S.A. (ELGS), Electromagnetica S.A. (ELMA) and Prodplast S.A. (PPL) were in a safe area, with almost no insolvency risk ($Z > 2.99$), during the period 2007–2016. By the opposite side were the companies: Compa S.A. (CMP), Electroputere S.A.

(EPT), Stirom S.A. (STIB), and Uztel S.A. (UZT), which recorded a Z score lower than 1.8 in all the analyzed years.

The assessment of the insolvency risk through the French Commercial Credit model. In Figure 4. it is presented the companies structure, depending on the values of the Z score determined through the French Commercial Credit model.

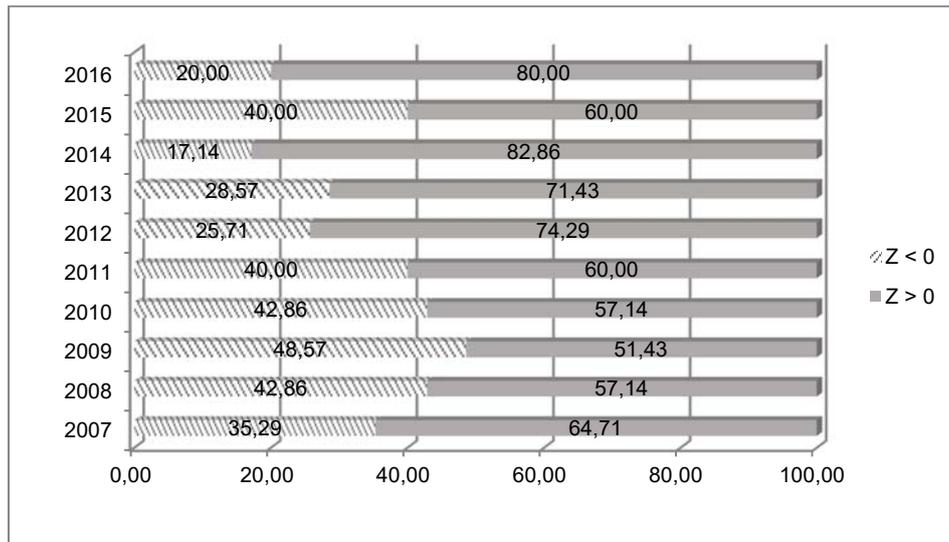


Fig. 4. The companies structure depending on the insolvency risk, determined through the French Commercial Credit model, 2007–2016

Source: Authors processing based on the data provided by the www.bvb.ro portal.

In the period 2007–2016, between 51.43% and 82.86% of the studied companies were presenting a good financial situation ($Z > 0$). Aerostar S.A. (ARS), Bermas S.A. (BRM), Conted S.A. (CNTE) and Electromagnetica S.A. (ELMA) are the companies that obtained over the entire studied period of time, values of the Z score which placed them in the category of the companies without major financial difficulties. TMK – Artrom S.A. (ART) and Romcarbon S.A. (ROCE) recorded negative values of the Z score, during the whole period, being valued as companies with major financial difficulties and high risk of insolvency.

If in 2007, more than 50% of the companies from the manufacturing industry included in the research, obtained a

relatively low level of the insolvency risk, after the beginning of the economic and financial crisis, the share of the companies with high insolvency risk has significantly increased. In the last years, the share of the companies with major financial difficulties has followed a downward trend.

By applying Altman, Springate, Taffler, and French Commercial Credit model, we reached to the conclusion that 11 of the 35 companies had a high insolvency risk during the period 2007–2016.

In the Table 1. it is presented the structure of the companies with relatively high insolvency risk during the period 2007–2016:

Table 1. The structure of the companies with high insolvency risk, during the period 2007–2016

The companies evaluated as risky after the application of all 4 models	The companies evaluated as risky after the application of 3 of the 4 models	The companies evaluated as risky after the application of 2 of the 4 models	The companies evaluated as risky after the application of only one model
–	Electroputere S.A.	Stirom S.A. Romcarbon S.A.	Compa S.A. Uztel S.A. Altur S.A. Grupul Industrial Electrocontact S.A. Prefab S.A. Romp petrol Rafinare S.A. Turbomecanica S.A. TMK – Artrom S.A.

Source: Authors processing based on the companies annual financial statements published on www.bvb.ro and on the companies websites.

The above table, shows that after applying the 4 models of determining the insolvency risk during the period 2007–2016, there is any company in a risky area; one company is evaluated as risky, after applying 3 of the 4 models (Electroputere S.A.); 2 companies are evaluated as risky after applying 2 of the 4 models (Stirom S.A. and Romcarbon S.A.) and 8 companies are evaluated as risky

after applying only 1 model (Compa S.A., Uztel S.A., Altur S.A., Grupul Industrial Electrocontact S.A., Prefab S.A., Rom petrol Rafinare S.A., Turbomecanica S.A. and TMK – Artrom S.A.).

The research revealed that 14 of 35 companies registered a relatively low insolvency risk over the period 2007–2016 (Table 2).

Table 2. The structure of the companies with low insolvency risk, during the period 2007–2016

Companies with low insolvency risk after the application of all 4 models	Companies with low insolvency risk after the application of 3 of the 4 models	Companies with low insolvency risk after the application of 2 of the 4 models	Companies with low insolvency risk after the application of only one model
Aerostar S.A. Conted S.A.	Electroargeş S.A.	Vrancart S.A. Carbochim S.A. Prodplast S.A. Bermas S.A.	Artego S.A. Antibiotice S.A. Comelf S.A. Romp petrol Rafinare S.A. Biofarm S.A. Zentiva S.A. Electromagnetica S.A.

Source: Authors processing based on the companies annual financial statements, published on www.bvb.ro and on the companies websites.

Table 2. shows that during the period 2007–2016, 2 companies (Aerostar S.A. and Conted S.A.) did not experienced major financial difficulties based on the application of all the 4 models; one company had no major financial difficulties, based on the application of 3 of the 4 models (Electroargeş S.A.); 4 companies had low insolvency risk based on the application of 2 of the 4 models (Vrancart S.A., Carbochim S.A., Prodplast S.A. and Bermas S.A.); 7 companies (Artego S.A., Antibiotice S.A., Comelf S.A., Rompetrol Rafinare S.A., Biofarm S.A., Zentiva S.A. and Electromagnetica S.A.), had high insolvency risk that resulted after the application of only one model.

Conclusions & Discussion. The economic and financial crisis has significantly contributed to the increase of the number of Romanian companies that have declared insolvency. The paper presents both theoretically and empirically the insolvency risk for 35 companies from the manufacturing industry in Romania, listed on the Bucharest Stock Exchange, at premium and standard categories, during 2007–2016, through four models: Springate, Taffler, Altman, and French Commercial Credit. The results of the research have revealed that during the period 2007-2016, over 50% of the companies were facing a high insolvency risk, the most risky of them being Cemacon S.A. and Prefab S.A. The less risky companies during the mentioned period of time were Aerostar S.A. and Conted S.A.

By applying the Altman, Springate, Taffler, and French Commercial Credit models, it also resulted that during the period 2007–2016, 11 of 35 companies had high insolvency risk; 14 companies had relatively low insolvency risk and 10 companies registered Z-score values that placed them in a safe area, as well as values that placed them in a risky area, especially during the economic and financial crisis.

Further research on this topic is needed. Firstly, more companies from different sectors can be included in the analysis. Secondly, we can develop case studies regarding the prediction of the insolvency risk of the studied

companies for the following years, in order to reflect in a more accurate manner their characteristics.

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Received: 17/05/2018

1st Revision: 26/08/2018

Accepted: 20/09/2018

Author's declaration on the sources of funding of research presented in the scientific article or of the preparation of the scientific article: budget of university's scientific project

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ОЦІНЮВАННЯ РИЗИКУ НЕПЛАТОСПРОМОЖНОСТІ ДЛЯ ПІДПРИЄМСТВ ОБРОБНОЇ ПРОМИСЛОВОСТІ, ЗАРЕЄСТРОВАНІХ НА БУХАРЕСТСЬКІЙ ФОНДОВІЙ БІРЖІ

Подаються досліджені як теоретично, так і емпірично за допомогою чотирьох моделей: Спрінгейт, Таффлера, Альтмана і Французький комерційний кредит, ризику неплатоспроможності для 35 компаній переробної промисловості в Румунії, що котирувалися на Бухарестській фондовій біржі у преміальній і стандартній категоріях у період із 2007 по 2016 рік. Результати дослідження показали, що в період з 2007 по 2016 рік понад 50 % компаній зіткнулися з високим ризиком неплатоспроможності, найбільша ймовірність якого була для Cemacon S.A. and Prefab S.A. Менша ймовірність такого ризику протягом зазначеного періоду була для компаній Aerostar S.A і Conted S.A.

Ключові слова: ризик неплатоспроможності, модель Спрінгейта, модель Таффлера, модель Альтмана, модель Французький комерційний кредит.

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ОЦЕНКА РИСКА НЕПЛАТЕЖЕСПОСОБНОСТИ ДЛЯ ПРЕДПРИЯТИЙ ОБРАБАТЫВАЮЩЕЙ ПРОМЫШЛЕННОСТИ, ЗАРЕГИСТРИРОВАННЫХ НА БУХАРЕСТСКОЙ ФОНДОВОЙ БИРЖЕ

Представлены исследованные как теоретически, так и эмпирически при помощи четырех моделей: Спрингейт, Таффлер, Альтман и Французский коммерческий кредит, риски неплатежеспособности для 35 компаний перерабатывающей промышленности в Румынии, котирувавшихся на Бухарестской фондовой бирже в премиальной и стандартной категориях в период с 2007 по 2016 год. Результаты исследования показали, что в период с 2007 по 2016 год более 50 % компаний столкнулись с высоким риском неплатежеспособности, наибольшая вероятность которого была для Cemascon S.A. and Prefab S.A. Меньшая вероятность такого риска в течение указанного периода была для компаний Aerostar S.A и Conted S.A.

Ключевые слова: риск неплатежеспособности, модель Спрингейт, модель Таффлера, модель Альтмана, модель Французский коммерческий кредит.

Bulletin of Taras Shevchenko National University of Kyiv. Economics, 2018; 6(201): 41-46

УДК 336

JEL classification: Z32, Z38

DOI: <https://doi.org/10.17721/1728-2667.2018/201-6/6>

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RELATIONSHIP BETWEEN COMMUNITY ATTACHMENT, PERCEPTIONS ON ECONOMIC IMPACTS OF TOURISM AND SUPPORT TO TOURISM DEVELOPMENT: AN IMPLEMENTATION IN A SETTLEMENT NEAR BUT DISTANT FROM TOURISM

Tourism is one of the most important economic sectors in world and its impacts on local communities are discussed in the literature frequently. Even though also socio-cultural and environmental impacts are also examined, the focus is on economic effects. This study investigates whether community attachment makes difference in perceptions on economic impacts and in supporting tourism development. The study utilizes multiple analysis methods and Path Analysis and is important in terms of examining relationship between community attachment and perceptions of local residents in a settlement which is very near to popular tourism destinations but also where is distant from the tourism activities. Thus it contributes to tourism planning literature. Findings reveal out that community attachment has relations with economic impacts and positive support for tourism development, while it has no relation with negative thoughts about tourism development.

Keywords: *Tourism impacts, local residents, Community attachment, CFA, Path Analysis, Turkey*

Introduction. Tourism development is a popular option/tool for improving the socio-economic situation of societies [9]. Tourism, however, is not only product/service consumption process, but also has remarkable social, economic, and environmental impacts [58] in global and local scale [67, 62, 61]. Even though impact categories overlap significantly, most of the researches have focused on economic effects [23, 2, 10].

The perceptions of tourism development and its impacts are not homogenous within societies and individuals in a particular society. These differences are influenced by many factors such as the history of societies, socio-cultural structures, the level and type of tourism development. Scholars have given attention to these impacts since 1970s and many opinions have been put forward. Pioneer models such as Doxey's Irridex [14], Butler's TALC [7] or Dogan [13] predict that the local residents' attitudes towards tourists and tourism would change on a linear continuum while tourism develops. They claimed that locals would be very friendly and kindly towards tourism at the beginning but in time, they would behave "hostile" towards tourists and even leave the destination temporarily since negative impacts would surpass the positive ones. Afterwards, approaches which underline that the attitudes change on a non-linear base were developed. These models point out that some certain stages were never reached or never encountered and different features were effective on perceptions of tourism impacts. In this context, Social Exchange Theory which is based on the

assumption that local people would be in favor of tourists and tourism when they perceive positive impacts higher than negative impacts, and the community attachment model which predicts that feeling to belong to the society will largely affect the perception and support of tourism, are amongst the models frequently used in the recent period.

In this study, firstly, the literature on tourism impacts and perception and attitudes of the local residents will be reviewed. Then, whether community attachment affect local residents' perceptions on economic impacts of tourism and support for tourism will be examined in case of Mugla center (Mentese) district which is very near to some popular tourism destinations of Turkey, but which has no intensive tourism activities. Finally, results and discussions will be presented.

Literature. Many countries accept tourism as basic tool for development. For this reason, the number and type of destinations increase day by day and also the number of tourists. In 2016, approximately 1.25 billion people participated in international tourism activities, and this number is expected to grow and to approach 2 billion soon [65].

Since tourism is very dynamic and multidimensional sector, it has many socio-cultural and environmental impacts besides its economic ones. Nevertheless, as in this study, the economic impacts of tourism have been more intensively studied in the literature. Scholars indicate that foreign tourist expenditure contributes to the balance of payments (Liu and Var [40], Dogan [13], Gee, Makens, Choy [18]; Jurowski, Uysal and Williams [23]; Tatoglu, et al. [60]), and by