

THE IMPORTANCE OF CREDITWORTHINESS EVALUATION IN THE CONTEXT OF LITHUANIAN SME PERFORMANCE MEASUREMENT

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Abstract. *The paper deals with the methodology of Lithuanian small and medium enterprises (here and further – SME) creditworthiness evaluation and part of empirical research which reveals the importance and motives of creditworthiness evaluation in the Lithuanian SME performance measurement process. **The aim of this study is to analyse the importance of creditworthiness evaluation in performance measurement and its influence on stable company's growth.** The three main goals of the paper are: 1) to reveal the methodology of Lithuanian SME creditworthiness evaluation, 2) to analyse the periodicity of Lithuanian SME creditworthiness evaluation and the motives of one's integration into the performance measurement process, and 3) to identify creditworthiness evaluation factors which correlate with stable SME growth results. Analysis of related literature, information comparison and generalization are used for the credit risk and creditworthiness evaluation methodology overview. Empirical research is performed using the survey method, for data evaluation the descriptive statistics method, as well as qualitative (systematization, classification, causal, functional and structural links) and quantitative data analysis (quantitative indicators calculation) were applied. The research results have revealed that the companies evaluating partners' and their own creditworthiness have by 10% higher three last year revenues and the number of employees growth. The paper concludes that creditworthiness evaluation and stable company's growth correlate and enable SMEs to pursue stable growth results while increasing competitiveness and considering confidence and trust among business partners.*

Key words: *credit risk, creditworthiness, creditworthiness evaluation, SME performance measurement*

1. Introduction

Employees of small and medium enterprises comprise the most numerous Lithuanian social group. The near-term forecasts of the European Union allow for SME growth in all business sectors; in parallel, the availability of financial data will decrease due to the EU initiative regarding SME. Meanwhile, the SME performance measurement still lack the financial and non-financial indicators' balance. A company's good solvency in the scientific literature is being identified as one of the key factors influencing the successful company's activity and high competitiveness in the business environment (Boguslauskas, 2006; Mackevičius, 2010).

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Stakeholders (employees, customers, shareholders, etc.) normally perform business only with financially reliable companies because in case of ones' insolvency stakeholders are unable to recuperate their investments or credits which eventually cause their own insolvency or even bankruptcy. Therefore, creditworthiness evaluation must be integrated into the SME performance measurement process: companies must monitor their creditworthiness and apprehend the creditworthiness evaluation methodology thus creating possibilities and ensuring the strategically important financial reliability. The aim of this study was to analyse the importance of creditworthiness evaluation in performance measurement and its influence on the stable company's growth. The three main goals of research are: 1) to reveal the methodology of Lithuanian SME creditworthiness evaluation, 2) to analyse the periodicity of Lithuanian SME creditworthiness evaluation and the motives of one's integration into the performance measurement process, and 3) to identify the creditworthiness evaluation factors which correlate with stable SME growth results. Analysis of the related literature, information comparison and generalization are used for credit risk and creditworthiness evaluation methodology overview. Empirical research is performed using the survey method, for data evaluation the descriptive statistics method as well as qualitative (systematization, classification, causal, functional and structural links) and quantitative data analysis (calculation of quantitative indicators) are applied.

The empirical research has revealed that the majority of companies which are evaluating their own creditworthiness practice it constantly and mainly on their own initiative. Such companies logically and practically relate creditworthiness with the stable growth and performance measurement. An unexpected and unpredicted correlation between creditworthiness evaluation and ensuring a reliable partnership as well as competitiveness increase was identified during the research. The highest growth regarding both the revenues and the number of employees is reached by the companies which measure performance corporately including both partners' and their own creditworthiness evaluation, the latter being performed quarterly or more frequently. Therefore creditworthiness evaluation should be relevant for companies aiming for a stable growth.

The structure of this paper is as follows. The conception of credit risk and creditworthiness evaluation and interrelation is generalised in the next (second) chapter. The methodology of Lithuanian SME creditworthiness evaluation is revealed in the third chapter. In the fourth chapter, empirical research results are presented. This part of the study identifies the motives of Lithuanian SME creditworthiness evaluation and their importance for achieving different company's goals. The paper closes with findings and conclusions.

2. Credit risk and creditworthiness evaluation

In their daily business activities, companies face various risks: political, commercial, fraud, industrial, juridical, financial, and others. In scientific literature, there are various classifications based on different criteria (source, impact, business area, time, level, organisation etc). Accordingly, there is no common classification so far; the risks most frequently mentioned in scientific literature are business and financial. The company activity risk arises when business processes (Mackevičius, 2005):

- are not clearly defined;
- are poorly related to business strategy;
- do not meet customers' needs;
- do not increase capital;
- do not protect resources from thriftless usage.

Thus, the high business activity risk signals that business processes are not combined with strategy, do not meet customers' needs or are inefficient. This type of risk arises when human resources are inappropriate to realize the business strategy, there is a lack of know-how, the product development process is inefficient or the business cycle is protracted. In economic literature, there are five levels of business risk probability and impact (see Fig. 1). Business activity risk is significant at the third or higher level when a prompt and operative reaction and clearly defined risk management means are necessary.

When the probability of business activity risk is low, the impact on a company and its financial condition can be irrelevant, although when the probability increases, the company can face a significant financial downturn and activity losses, there can occur a threat for activity success. A bankruptcy is forecasted for the company with the highest activity risk level where the probability is over 80% (see Table 1).

Financial risk outlines an insufficient counterbalance of financing costs (Mackevičius, 2005). Companies with a high financial risk have inefficient processes in managing price, liquidity, and credit risks. The latter (credit risk) evaluation and management are the most relevant topics in the financial risk management area (Boguslauskas et al., 2011). Credit risk is a financial risk when the creditor faces losses because the debtor does not

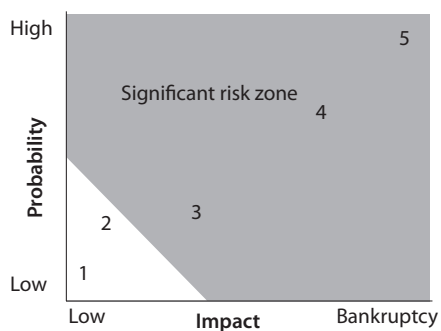


FIG. 1. Levels of business risk probability and impact

Prepared by the author based on Leonavičiūtė et al., 2001; Osborne, 2012.

TABLE 1. Business activity risk probability and levels

Level	Impact	Probability, %
1 – low	Insignificant impact for company	Lower than 5
2 – hardly probable (may occur during next five years)	Slight influence on financial condition	5–25
3 – probable (may occur during next three years)	Significant financial status down, activity losses	25–50
4 – probable (may occur every year)	Threat for activity succession	50–80
5 – the highest	Company’s bankruptcy	Over 80

Prepared by author based on Leonavičiūtė et al., 2001; Osborne, 2012.

repay obligations or carries out them unduly, in other words, as J. Bessis (2011) defines these risk sources, because of debtors’ reverse of creditworthiness quality, although obligations can be ignored also deliberately (Leipus, Valužis, 2006; Boguslauskas et al., 2011). Common risk rules are applicable also to credit risk: it is related to profit, high profit and low risk are contradictory goals. The interrelations among the credit risk, company’s revenues and profit are presented in Fig. 2.

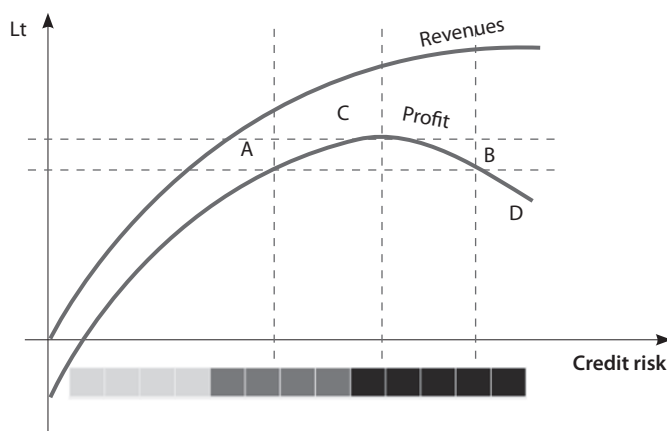


FIG. 2. Interrelation among credit risk, revenues, and profit

Source: internal Lithuanian credit bureau information.

At point A in Fig. 2, the company’s portfolio credit risk is low, revenues and profit are in the growing stage, at point B revenues are extremely high, although the high portfolio credit risk reduces the profit, C – stable growth of revenues, because the credit risk is not the highest and doesn’t reduce the profit, D – high risk clients increase revenues but reduce the profit. As we can see in Fig. 2, there is a very low probability to get high profit when the risk is very low. When the risk increases, also losses do, thus it is extremely important to evaluate the risk, define the cutoff (acceptable risk level) considering

business goals, to explore the risk influencing factors and reasons and according to a set cutoff proportionally react to it and thus ensure an effective credit risk management (Mackevičius, 2005; Crouhy et al., 2006; Kanapickienė, 2008; Breden, 2010; Giriūnas, 2012; Osborne, 2012; Passenheim, 2013). This is necessary for a stable growth.

Risk management requires using the means that enable a forecast of risky events and means to reduce the risk level. The risk management process includes:

- 1) identification of risk from which the company is not secured;
- 2) selection and application of the appropriate risk management means;
- 3) the effectiveness control of applied risk management means.

Credit risk management means can be internal and external. The completeness of properly selected internal and external credit risk management means ensures the maximum effective credit risk management. It is recommended periodically to evaluate the effectiveness of applied risk management means whether they enable to reduce or maintain the risk at a desirable level. Credit risk is managed by partners' and suppliers' creditworthiness evaluation.

Creditworthiness is the ability of an individual or a juridical subject to apply financial obligations in time. Creditworthiness is a synonym of solvency (the latter concept is much more frequently used in scientific literature). Business partners and stakeholders are interested in having business relations with a financially reliable and solvent company. The insolvency of one business subject makes a significant influence on others because irrecoverable investments from an insolvent business partner cause the lack of cash flow for others, procuring insolvency or even bankruptcy (Rugenytė et al., 2010). Thus, in scientific literature, a good company's creditworthiness or solvency is indicated as one of the factors of successful company's activity and competitiveness (Boguslauskas, 2006; Mackevičius, 2010). Financially reliable companies are much more confident and trusted by partners. This finally impacts the higher sales and revenues. Therefore, creditworthiness should be integrated into the SME performance measurement process: companies should follow their creditworthiness and creditworthiness evaluation methodology, thus ensuring a strategically important financial reliability.

3. The methodology of Lithuanian SME creditworthiness evaluation

In the conditions of the dynamic and competitive business environment, especially before and after a financial crisis, many companies face insolvency problems. The subsequence of insolvency is bankruptcy: in the Republic of Lithuania companies bankruptcy law, bankruptcy is defined as an insolvent company's status when the company is sued for bankruptcy or creditors are prosecuting the procedures of bankruptcy in non-judicial order (article 2, point 1). According to the bankruptcy law (IX – 216), a company is insolvent when its obligations are not settled (debts are not repaid, the in advance paid

activity is not performed, etc.) and the overdue company's obligations exceed half of its capital value shown in the balance sheet (article 2, point 8). Bankruptcy causes a negative after-effect on the company itself as well as on the country, because a company which is next door to bankruptcy does not recover debts to partners, creditors, its employees lose workplaces; thus, the importance of bankruptcy forecast is obvious and recognised as the key credit risk management measure seeking to avoid this phenomenon and its consequences (Butkus et al., 2014). Various advanced credit risk management, external creditworthiness evaluation (insolvency, bankruptcy and other financial instability variety forecasts) methodologies are being developed and improved. In the theoretical aspect, they have been comprehensively analysed by V. Valvonis (2006), V. Leipus and M. Valužis (2006), V. Boguslauskas (2006, 2011), R. Mileris (2012) and other authors. However, in most cases the objects of analysis and researches are restricted to the financial sector companies, and the methodologies are used for internal credit risk management functions, whereas Lithuanian SMEs creditworthiness evaluation, done by forecasting the probability of bankruptcy not for internal usage, is performed only by the Lithuanian credit bureau. Based on the up-to-date World Bank information ("Doing business 2015"), in the Lithuanian credit bureau there is cumulated information about 97.7% of the financially active community, the daily number of inquiries about Lithuanian individuals and juridical subjects from the system usually exceeds 20 000, Lithuania has the highest (8 points from 8 available) score for the creditworthiness information infrastructure and content. Only a few countries all over the world have such a comprehensive and easily accessible creditworthiness information. Thus, for Lithuanian SME, creditworthiness evaluation information of the globally highest quality is operated, which significantly impacts the high quality of evaluation. Another part of evaluation quality depends on credit experts' competence and evaluation methodology. There are three main types of companies' creditworthiness evaluation:

- expert assessment of a company. It is based on credit experts' know-how, includes all similarly complicated cases and does not require much statistical data, although such an assessment tends to be subjective and therefore less accurate, more time-consuming and does not use all available information or data if there is much of them. However, expert methods are more suitable for large and medium companies' creditworthiness evaluation (Valvonis, 2006);
- The statistical (econometrical) company's evaluation is based on real data, it processes a huge information amount, is objective, effective, and adequate. To create such a model, much data and specific modelling know-how are necessary. Statistical evaluation does not include exceptional, complicated and unique cases. Most common are the following statistical forecasting methods: discriminative analysis, common linear models (linear regression, logit, probit, etc.), generalised additive models (logit WoE), decision trees, etc.;

- hybrid company's evaluation is appropriate when data amount is insufficient for statistical assessment; then the available information and experts' experience are applied. Such evaluation requires at least some part of data for model constructing and specific know-how for an effective modelling.

Due to reliability, objectiveness and the possibility to process huge data amount, the major part of SME population creditworthiness is being evaluated using statistical methods processing and operating all available and statistically significant factors which influence the company's creditworthiness. Based on the two-last-year information, using the logistic regression method, for a company's creditworthiness evaluation the bankruptcy during the next twelve months is being forecasted. The logistic regression method is used, because additional calculation procedures enable to avoid many requirements which usually are necessary when using linear regression (Boguslauskas, 2010). Logistic regression is appropriate when common assumptions are considered – among independent variables correlated variables must be avoided, the regularity of these variables is not required, linear interdependence is present between dependent and independent variables. Logistic regression is processed for the dependent variable value forecast. The variable usually means an incident (e.g., is a company at the threat of bankruptcy or not), which may both occur and not, therefore, while using logistic regression, the probability of this incident is being calculated, which is influenced by independent variables (relative ratios). A generalised additive model logit WoE is used (see Fig. 3).

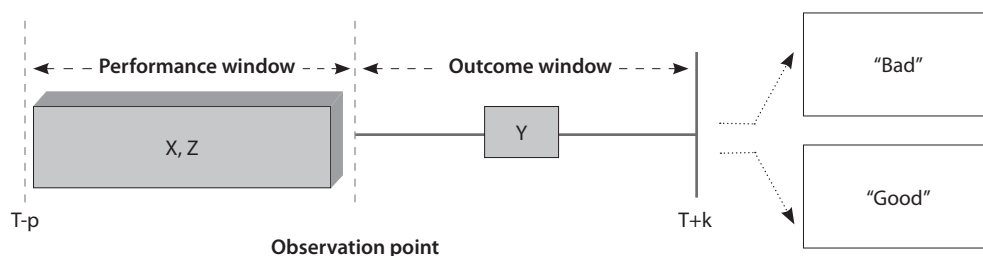


FIG. 3. The horizon of company's bankruptcy forecast

Source: Internal Lithuanian Credit Bureau information.

Performance window – contains information available up to the observation point, it is used for the forecast.

Outcome window – time interval after the observation point, used for the company's classification into "good" or "bad".

X – internal information available up to the observation point used for the forecast.

Z – external information, available up to the observation point used for the forecast.

Y – forecasted incident – a company's bankruptcy.

$$y = \begin{cases} 1, & \text{if a company is "bad"} \\ 0, & \text{if a company is "good"} \end{cases}$$

The model forecasts the probability of default using all available information:

$$PD: = P (y=1|X; Z) \in (0, 1).$$

The model's expression:

$$P (y=1|X; Z) = \frac{1}{1 + e^{-(\beta\beta_0 + \beta_1\lambda(x_1) + \dots + \beta_l\lambda(x_l) + \dots + y_1p_1(z_1) + \dots + y_kp_k(z_k))}}$$

The Lithuanian credit bureau forecasts the probability of bankruptcy:

$$PD (Y = \text{"Bad"}|X; Z) = ?$$

The forecasted incident is clearly defined when all available information is combined and systemised.

Then all statistically significant variables are evaluated for a company's bankruptcy probability calculation, which is segmented and grouped into eleven risk classes (see Table 2). A higher probability of bankruptcy means a higher company's credit risk class and worse creditworthiness. With a high credit risk, usually not credited by partners, are companies having the risk class 8 or more.

TABLE 2. Distribution of risk classes according to the probability of default

Risk class	Probability of default, %	Company's status
1	0%–0.27%	Excellent
2	0.27%–0.43%	Very good
3	0.43%–0.69%	Good
4	0.69%–1.1%	Low risk
5	1.1%–1.75%	Moderate risk
6	1.75%–2.8%	Higher than average risk
7	2.8%–4.5%	Satisfactory risk / watch
8	4.5%–7.25%	High risk
9	7.25%–17%	Very high risk
10	17%–100%	Highest risk
99		Default

Source: the Internal Lithuanian Credit Bureau information.

Statistical company evaluation models constructed by the Lithuanian Credit Bureau have a high forecasting power, contain a wide information spectrum including sectorial

characteristics, interrelations with the board and management and other related companies, thus comprehensively evaluating a company's creditworthiness. Statistical companies' assessment models have high statistical reliability which is caused by huge analysed data amount. They produce statistically reliable external company's creditworthiness evaluation even without the company's financial data (balance sheet and profit / loss account). Therefore, for small companies which in the near future will declare less financial data, it is extremely important to know and follow their creditworthiness, thus protecting it from uncontrolled consequences and ensuring partners' confidence and trust and subsequently a stable company's growth.

4. Lithuanian SME creditworthiness evaluation motives and importance for stable growth

Aiming to identify the motives and importance for a stable company's growth, a reconnaissance research is performed. The results of this empirical research will not be extrapolated to all Lithuanian SME population; instead, they will be used to set the relevance of creditworthiness evaluation and the need for integration into the performance measurement process. The research is performed by the survey method.

The target survey group consists of the highest level SME managers (CEO). The Panniot formula was applied to set a representative sample size, and finally it was concluded that for the research up to 123 respondents would be enough (Valackienė, 2004). As the research selection belongs to small ones, additionally the sample representativeness was evaluated. The sample size of empirical research when the population is higher than 5000, with the margin of error the 9–10%, there was selected 96–123 sample size interval. According to K. Kardelis (2002), when the sample size is set, it is relevant to consider the goal of research and how precisely the proposition must be evident. As the empirical research results will not be used for extrapolation to all population, they will be used only as a confirmation / negation whether the creditworthiness evaluation is relevant to small and medium companies and the margin of error 9–10% is appropriate.

The data for empirical research were collected during 2014; 101 highest level managers (CEO) participated in the survey, 75 of them were owners of their companies. A higher sample size was burdensome because the respondents of this survey could be only the highest level managers or owners, which is quite complicated. The distribution of respondents is heterogenic in business sectors and companies size according to number of employees perspectives therefore it is representative and enables to make reasonable conclusions about creditworthiness motives and importance to Lithuanian SME stable growth. A scheme of the research methodology is shown in Fig. 4.

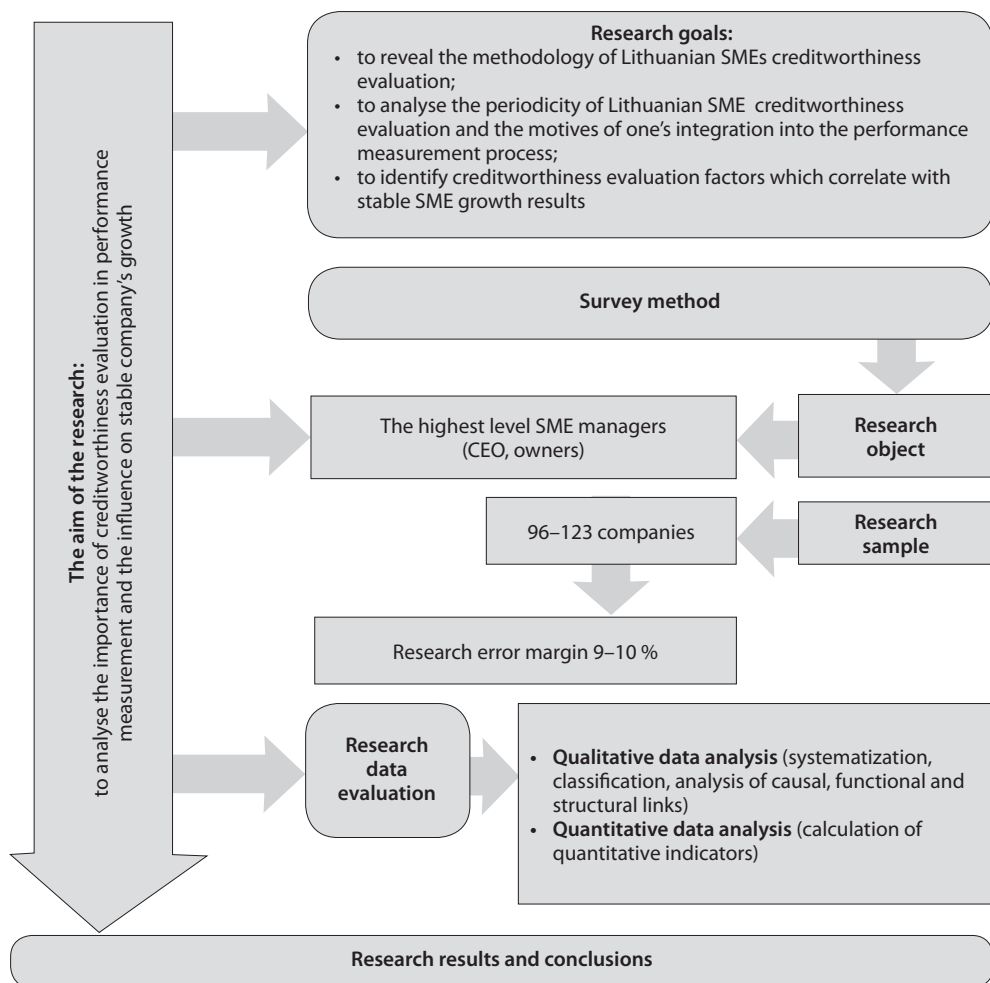


FIG. 4. Research methodology scheme

Prepared by the author.

Business evaluation complexity, company and its partners' creditworthiness assessment (frequency, impact on the other company objectives), correlation with the stable company growth will be analysed and summarized from responders' answers to questions.

Creditworthiness evaluation motives and frequency. The research goal was to ascertain the periodicity and motives driving the creditworthiness assessment carried out by SMEs in Lithuania. 40% of the companies that participated in the research actually assess their own company credit solvency. More than a half of companies exercising self-evaluation of creditworthiness do it twice a year or more frequently, i.e. sufficiently often. It should be noted that among those companies which frequently assess their own creditworthiness, even 91% are companies showing stable growth (they grow for at least

three consecutive years). Analysis of creditworthiness assessment reasons and motives has shown that mostly creditworthiness assessment is perceived and carried out as a continual process or as part of the overall performance measurement. Figure 5 shows that among the companies monitoring their creditworthiness on a constant basis there is the highest percentage of growing companies. A smaller part of the companies carry out creditworthiness evaluations because of creditors' requirements in order to be aware how they are seen in partners', creditors' or other third parties' eyes.

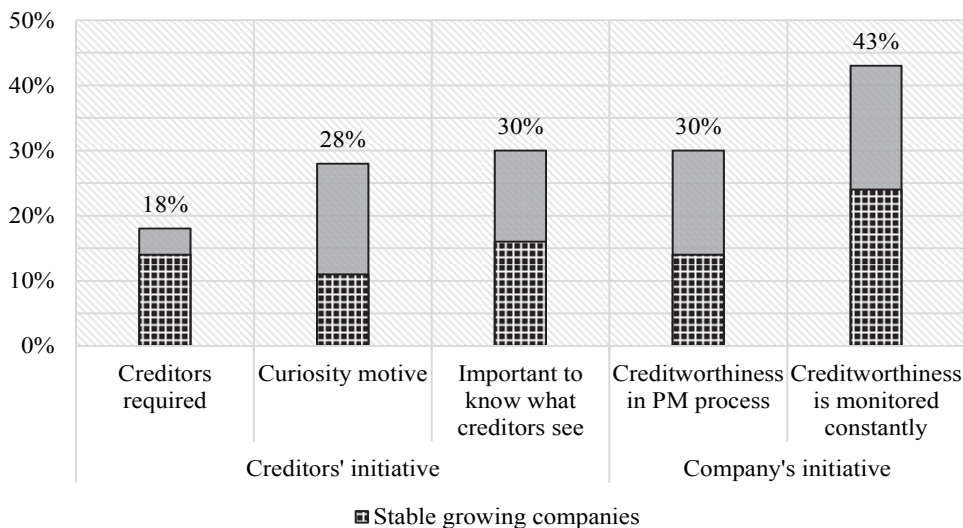


FIG. 5. Reasons for and motives of creditworthiness evaluation

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To summarise, most of the companies performing their own creditworthiness evaluations do it on a constant basis and on their own initiative. The proportion of growing companies in this group is the highest, allowing the conclusion that the creditworthiness evaluation factor has a direct positive impact on the company growth results.

Creditworthiness evaluation importance to company objectives. The analysis of answers of the respondents who perform creditworthiness evaluation shows that creditworthiness evaluation and monitoring are carried out because it enables to reach various company objectives (see Fig. 6). The absolute majority of companies carrying out creditworthiness evaluation believe that this evaluation criterion is important or the most important for a stable company growth, increasing its competitiveness, performance measurement, trusted partnership establishment, better credit conditions. However, the companies that carry out creditworthiness evaluation on their own initiative emphasize the functions of trusted partnership establishment, increasing competitiveness, stable growth and performance

measurement. It should be noted that among the respondents who consider creditworthiness evaluation as an important factor for performance measurement and stable growth, more than a half (56%) were companies with a stable growth.

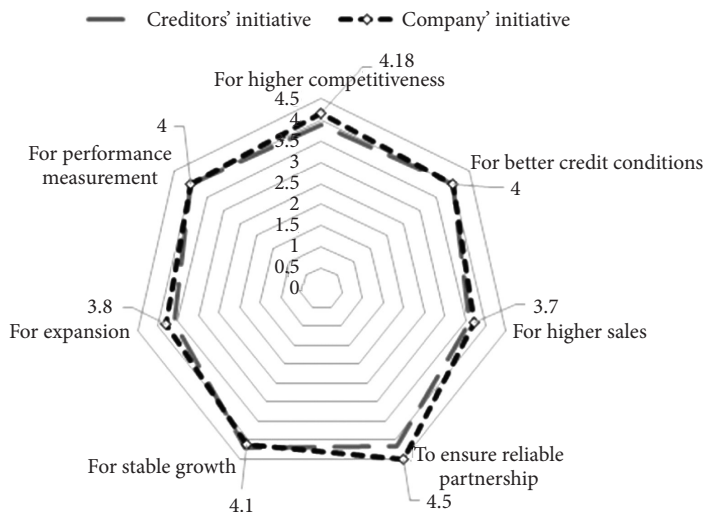


FIG. 6. The importance of creditworthiness evaluation for different goals

Prepared by the author.

Summarising the results, it can be stated that companies doing creditworthiness evaluation on their own initiative relate it to the stable growth and performance measurement. Creditworthiness evaluation is associated also with establishing trusted partnerships and increasing competitiveness, which was not expected before starting the research. Therefore, the companies seeking stable growth should consider creditworthiness evaluation as an important factor.

Performance measurement complexity and company growth. Evaluating performance measurement complexity, companies were asked whether they were evaluating partner creditworthiness in addition to their own. Even 65% responded positively to this question, while 40% of companies from the research evaluated their own creditworthiness as it was shown before. The one-factor variable analysis for company growth has shown that creditworthiness evaluation has a direct correlation with the stable growth and is an essential component of performance measurement of small and medium enterprises (see Fig. 7).

Companies are considered carrying out a complex performance measurement if they evaluate their own creditworthiness as well as their partners' and believe that creditworthiness evaluation in performance measurement is an important or very important component. As is shown in Fig. 7, companies which grow most by the revenues as by their

number of employees are those which do complex performance measurement including their own and partners' creditworthiness evaluations and doing their own creditworthiness evaluation very frequently – four or more times a year. The growth rate of these companies' revenues is two times higher and the number of employees three times bigger than of other companies from the research showing stable growth three years in a row.

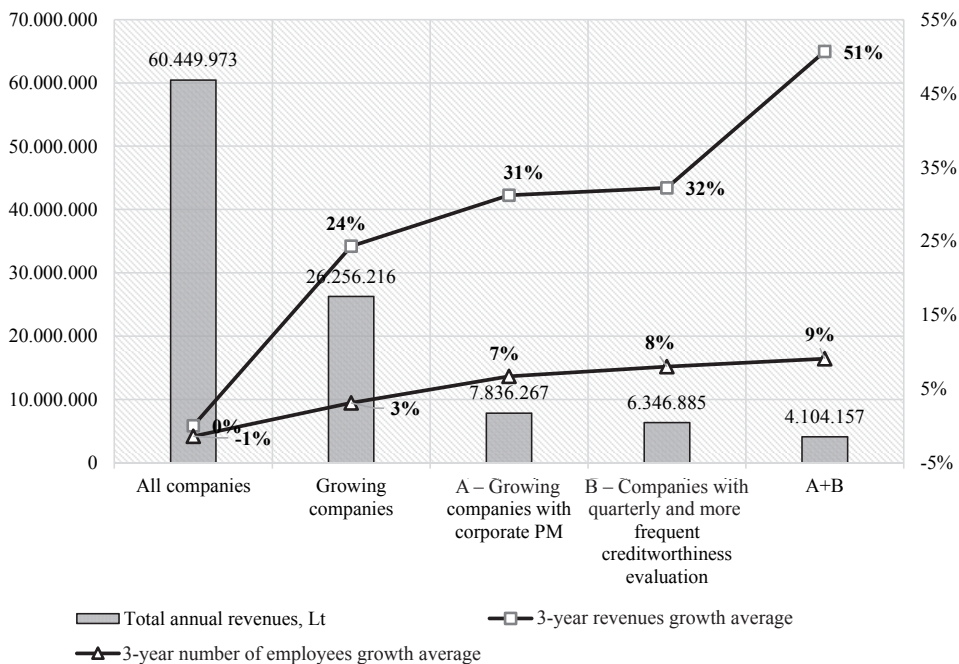


FIG. 7. Interrelations among corporate performance measurement, creditworthiness evaluation and companies' growth

Prepared by the author.

For a small enterprise, differently from the market-influencing medium and big companies, it is vital to acquire the partners', suppliers' and creditors' confidence. Companies doing creditworthiness evaluation on their own initiative emphasize that creditworthiness evaluation is used as an effective tool for trusted partnership establishment. Therefore, it is of uttermost importance for small enterprises to evaluate and seek for the better creditworthiness which will allow them to gain partners' and suppliers' trust and show a stable growth. The research identified the increasing competitiveness as one of the functions of creditworthiness evaluation. Companies compete with the quality of products or services, but no less attention should be paid to their own creditworthiness as this allows to ameliorate credit conditions, longer payment terms, a higher employee satisfaction, better possibilities to attract a strategic investor. Based on the research done by the SEB Bank and the Lithuanian Credit Bureau,

a company which fulfils its commitments to financial institutions, partners and the state on time, small enterprise with a high creditworthiness rating, while taking a credit for an investment project can save up to 30 000 euros.

The results of this research allow to confirm that companies which carry out their own and partners' creditworthiness evaluations on average during the last three years show 10% higher growth rates of revenues and the number of employees which proves a correlation between creditworthiness evaluation and the company's growth. Surprisingly, the research has also showed a clear link between creditworthiness evaluation frequency and company growth: companies very often carrying out their creditworthiness evaluations demonstrate higher growth rates. This leads to the conclusion that a company's and its partners' creditworthiness evaluation correlates with stable growth results while building trusted partnerships and increasing competitiveness.

5. Conclusions

Statistical companies' evaluation models constructed by the Lithuanian Credit Bureau have a high forecasting power, contain a wide information spectrum including sectorial characteristics, interrelations with the board and management and other related companies, thus comprehensively evaluating the company's creditworthiness. Statistical companies' assessment models have a high statistical reliability which is caused by a huge analysed data amount. They produce a statistically reliable external company's creditworthiness evaluation even without the company's financial data (balance sheet and profit / loss account).

Most of the companies performing their own creditworthiness evaluations do it on a constant basis and on their own initiative. The proportion of growing companies in this respondent group is the highest, allowing to conclude that the creditworthiness evaluation factor has a direct positive impact on company growth results.

Companies doing creditworthiness evaluation on their own initiative relate it to a stable growth and performance measurement. Creditworthiness evaluation is associated also with establishing trusted partnerships and increasing competitiveness, which was not expected before carrying out the research.

Companies which carry out their own and partners' creditworthiness evaluations on average during the last three years show 10% higher growth rates of revenues and of the number of employees, which proves a correlation between creditworthiness evaluation and company growth.

The research has also showed a clear link between creditworthiness evaluation frequency and company growth: companies very often carrying out their creditworthiness evaluations demonstrate higher growth rates.

Further investigations should focus on creating a corporate performance measurement system for SMEs so that they could use it for ensuring stable growth. The key elements of such a system have to be discovered.

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