The Business Audit as an Alternative to Discriminant Analysis in Assessing Risks of Going Concern

Marlena Ciechan-Kujawa

Abstract The ability of a business entity to develop and at least to survive is crucial for all stakeholders. Nowadays, mostly statistical methods are applied in its assessment. Efficiency of these methods is restrained by multiple and changing factors influencing the risk of disruption of continuation as a going concern, which raises the necessity of seeking an alternative solution. A new solution should be aimed at the analysis of the ability and not only the assessment of threats to continuing operation. The objective of the work is to present the research findings which justify the necessity of a multidimensional evaluation of an entity to define its ability to keep operating under the conditions of sustainable development. The article presents the findings of the expert research and surveys conducted in the years 2013–2015. As an alternative to discriminant analysis models, the author presents the concept of a multidimensional assessment of an entity, its scope, and the interpretation of its results. The presented model allows the assessment of the maturity level of an organization in the implementation of a sustainable development strategy, the assessment of an entity's ability to continue as a going concern, and its potential to create value for stakeholders.

Keywords Business audit • Discriminant analysis • Going concern • Sustainable development • External audit

1 Introduction

An economic entity's ability to develop or at least to survive is crucial to internal and external stakeholders. It is for a reason that "the going concern assumption" is one of the primary rules of accounting. According to IAS 1, the assumption framework of financial reporting contains the requirement that the management conducts an analysis of the entity's performance in this respect (IFRS Foundation 2012). The confirmation of this evaluation is also confirmed by a statutory auditor. The audit is intended to show whether while applying accounting principles

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M.H. Bilgin et al. (eds.), *Financial Environment and Business Development*,
Eurasian Studies in Business and Economics 4, DOI 10.1007/978-3-319-39919-5_10

(policies) an entity will be able to continue its operations in the foreseeable future, without significant changes in the scope of its activity and without declaring liquidation or bankruptcy. According to ISA 570, threats to continuing operation may result either from financial threats, internal or external operational threats, and other business threats (IFAC 2015).

The research conducted both in Poland (e.g., Szczerbak 2007) and worldwide (e.g., Black et al. 2000) confirms that the main reason for the loss of the ability to continue operations is nonfinancial factors. Financial ones are simply their consequence. The key causes of bankruptcy include first of all the loss of markets and mismanagement and only then the lack of sufficient financial control, negative financial results, and a high level of debt and overdue liabilities. Other significant causes of bankruptcy are deliberate action to the detriment of the company, taking remedial action too late, overinvestment, unfavorable credit policies of banks, and dependence on a single customer. Evaluation of the reliability of the management's declaration concerning the continuing of operation requires not only considering of the declaration itself but also actual circumstances and plans underlying it.[1]

The main methods used for assessing the threats to continuing operation are primarily statistical ones, the most important one being a multidimensional linear discriminant analysis (Goldmann 2009). For years these methods have been subject to criticism (for instance, see Hamrol and Chodakowski 2008; Mączyńska and Zawadzki 2006; Prusak 2011; Fanning and Cogger 1994). The following are emphasized:

– The lack of universality resulting in limitations in the assessment of the risk of bankruptcy of companies conducting various activities under different macroeconomic and legal conditions and under different accounting systems
– High ability to make correct forecasts only a short time before the bankruptcy
– Methodology applied for their development (e.g., flattening in models the sample of companies not threatened by bankruptcy with the group of companies recognized as bankrupts which may lead to the distortion of the results, because in reality the number of companies not jeopardized by bankruptcy significantly exceeds the number of bankrupt companies)

Despite this criticism and the emergence of other solutions, such as, for instance, neural networks, the subject literature presents a view that for the average user, discriminatory methods, if compared with newer generation methods, are less expensive, more communicative, and transparent, and their results are easier to interpret and compare (Mączyńska and Zawadzki 2006).

Approximately 60 % of the discriminant analysis models use only financial indicators, and 7 % supplement them with data from the cash flow statement. In

[1] However, according to the research conducted, declarations made by the management to continue as a going concern are usually very general in nature, whereas statutory auditors' conclusions expressed in the opinion of the vast majority of cases confirm the validity of the assumption of the management (e.g., see, Wielogórska-Leszczyńska 2012).

other cases references made to some extent to industry factors, macroeconomic factors, and location can be found (Adnan and Humayon 2004). Therefore, in the majority of models, universal ratios were applied. The dominant role is played by three areas: ratios of profitability, liquidity, and financial support, with particular consideration within this group of the indicators of the capital and asset structure. Ratios that consider added value are also used. Variables that directly depict a company's environment (the state of the economy, the phase of the business cycle, etc.) or variables derived from the capital market are used relatively infrequently (Mączyńska and Zawadzki 2006). Also, an overview of Polish discriminatory models indicates that they are based on financial factors included in company reports. Attempts made by researchers to use quality variables (Prusak 2005) were not effective. Qualitative factors are, in fact, taken into account by external bodies (such as, for instance, banks) while assessing threats to going concern; however, they usually constitute approximately 20–30 % of the total weight (Urbańczyk and Klemke-Pitek 2004, 2005; Kitowski 2014).

The multitude and changeability of factors of contemporary influence on the threat to continuing company's operation limit the effectiveness of the previously mentioned methods and make it necessary to search for alternative solutions. The aim of the work is to present the research findings which justify the necessity of a multidimensional evaluation of an entity in order to define its ability to continue operation under the conditions of sustainable development. While searching for alternatives to discriminant analysis, apart from literature studies, the author conducted a number of empirical studies during the last 2 years. These were:

1. Expert studies (by means of the Delphi method), aimed at identifying the factors influencing the threat to continuing company's operation, as well as an assessment of their significance
2. Questionnaire interviews addressed to statutory auditors, whose aim was to determine which factors that potentially influence continuing operation are actually studied by statutory auditors in practice
3. Survey studies of companies operating in Poland, in order to define the methods of evaluating the continuing of operation used in economic practice
4. The analysis of the statutory auditor's reports, in order to define the methods applied by auditors

2 Financial and Nonfinancial Factors Influencing Companies' Loss of Ability to Continue Operation

The expert study was conducted in 2013. 24 experts from different fields of academic science and economic practice were invited. They were members of supervisory boards, boards of directors, chief accountants, and auditors. Based on literature studies, several dozen aspects of potential influence on the threat to continuing operation were listed. As a result of the expert studies, a list of 53 aspects was finally developed and divided into eight areas on the basis of the content. Next, the experts evaluated the impact of the aspects defined on a company's ability to continue as a going concern, assigning them a measure of importance, where "0" meant no influence at all and "1" meant a crucial influence[2]. The average measure of importance was presented in Table 1.

Among the eight areas of an entity's operations, the area of accounting and finances is perceived as the most significant for ensuring the company's continuing operation, but a comparable role is also attributed to such areas as customers and markets and organization management. Their influence on the continuing of a given entity's operations was defined by the experts as at least high and highly probable. Detailed research findings are shown in Fig. 1.

The factors pointed to as having a decisive influence on continuing an entity's operation (evaluation 1) were as follows:

– Customer's portfolio quality—size, structure, and sustainability (4.1)
– Rules of managing liquidity, profitability, debt, and effectiveness (6.2)
– Revenue streams—their level, structure, and sustainability (6.3)
– Monitoring operation effects—the financial situation, balancing assets and liabilities, diversifying in terms of investment objects and subjects which are relevant from the point of view of operation safety and compliance with legal rules (6.5)
– Identification of and compliance with relevant legal regulations (8.1)

Table 1 The level of impact of the key areas of management systems on going concern

Number of the area	Name of the management system area	Number of key aspects in the area	Average measure of importance
I	Organization management	11	0.81
II	Structure and internal relations	7	0.61
III	System of control and surveillance	7	0.5
IV	Customers and markets	6	0.85
V	Processes and investment	5	0.66
VI	Finance and accounting	9	0.88
VII	Communication with stakeholders and social relations	4	0.68
VIII	Corporate governance	4	0.68

Source: elaborated by the author based on Ciechan-Kujawa (2014a)

[2]In the adopted measurement scale, the impact level was determined as a percentage, where 0 means no impact or no likelihood of impact; 0.1, almost no impact and unlikely; 0.2, fairly small impact and unlikely; 0.3, small and potentially possible; 0.4, less than average and potentially possible; 0.5, average and probable; 0.6, more than average and highly probable; 0.7, quite large and likely; 0.8, big and highly probable; 0.9, very large impact and very likely; and 1, decisive influence—a very large and certain.

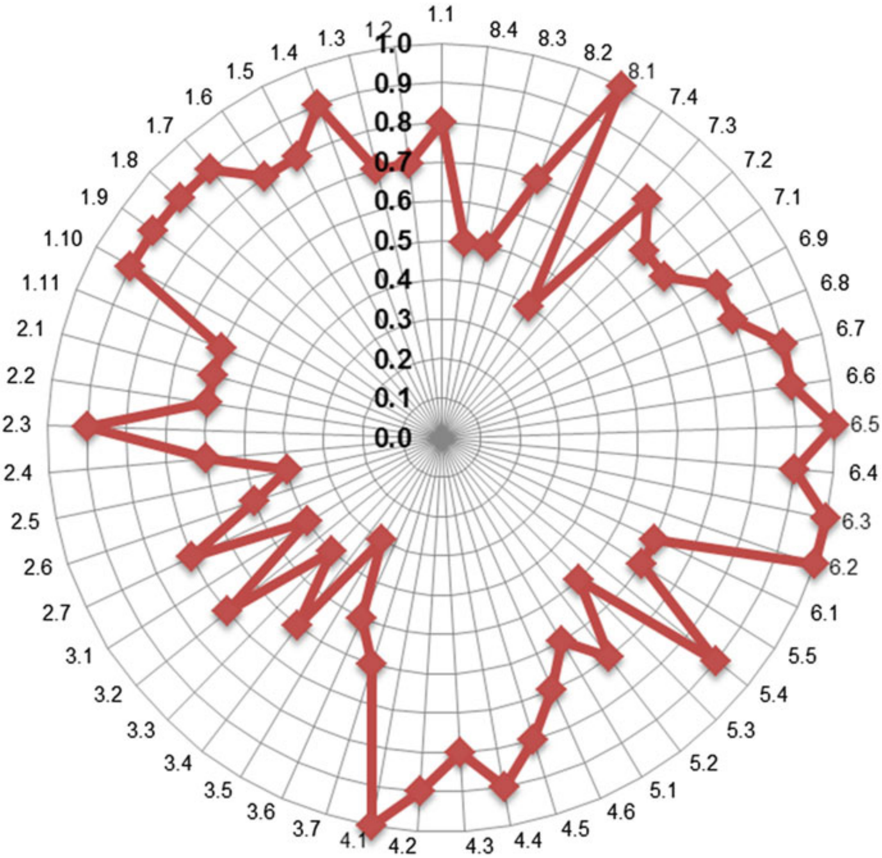


Fig. 1 The level of importance of the factors which affect an entity's ability to continue as a going concern

Furthermore, the following were indicated as issues with a very large impact and very likely (assessment: 0.9) excluding any factors from the accounting and finance areas:

– The adequacy of key financial and nonfinancial resources for the realization of the set objectives (point 1.4)
– Risk management—the effectiveness of methods, rules of identification, measurement, responding to risk, and reporting (1.7)
– The adequacy of arrangements for monitoring and effective oversight of the business processes (1.8)
– Adapting the structures, goals, processes, and products to changes in market conditions—the adequacy and efficiency of the implementation of the changes and the effectiveness of implemented solutions (1.9)
– The adequacy of the scope, extent, frequency, and quality of internal reporting (1.10)

- Explicitness, the adequacy of the safety procedures—procedures for accessing data, preventing loss, and ensuring integrity during processing (2.3)
- Customer service procedures and services—the relevance, timeliness, and compliance with the requirements (4.2)
- Sales and distribution channels—diversification, sustainability, and efficiency of structure (4.4)
- Procedures for planning, execution, and control of operational activities—the adequacy and compliance (5.4)

The complete list of the aspects included in the model was presented by Ciechan-Kujawa (2014c).

3 Level of Study of the Factors Affecting the Company Going Concern by Statutory Auditors

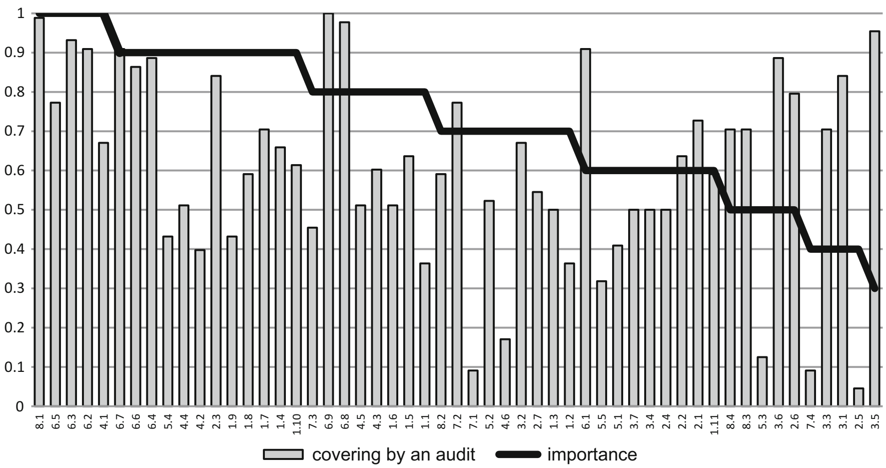
In order to identify which factors and to what extent they are evaluated by statutory auditors, another study was conducted, with 44 auditors participating. The study was based on a list of 53 aspects influencing the continuing of operation. The findings are presented in Table 2[3].

Table 2 The level of covering aspects affecting the company going concern during financial audit in comparison with their significance

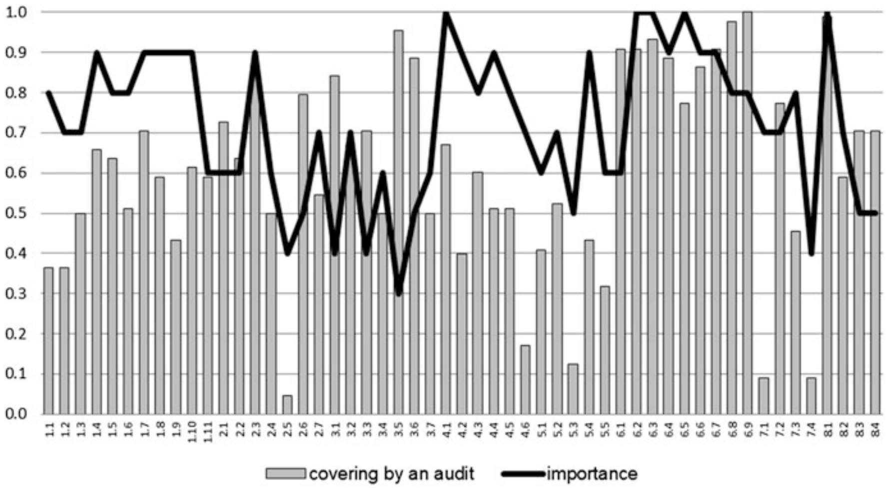
Number of the area	Name of the management system area	The average measure of importance	The average measure of covering by an audit
I	Organization management	0.81	0.54
II	Structure and internal relations	0.61	0.58
III	System of control and surveillance	0.5	0.72
IV	Customers and markets	0.85	0.48
V	Processes and investment	0.66	0.36
VI	Finance and accounting	0.88	0.91
VII	Communication with stakeholders and social relations	0.68	0.35
VIII	Corporate governance	0.68	0.75

[3]For the purpose of carrying out analysis in this respect, the following assumptions concerning the assessment were made: 1 (100 % coverage), in the case of the auditor's declaration on the completed implementation of the audit; 0.5 (50 %), for the declaration of a partial assessment; and 0 (0 %), in the absence of assessment. The author is aware of the shortcomings of the adopted scale for a partial assessment (as this assessment is blurred—can take values different from 50 %); however, it allows outlining the scale of the issues in question and makes a visual presentation. Detailed results of the research are presented in Ciechan-Kujawa (2014c).

The extent to which an audit covers the evaluations of the continuing of operation was analyzed from two different points of view: according to the highest significance of a given factor's influence on continuing an entity's operation (Graph 1) and according to the dimensions of evaluating an entity's operations, i.e., the areas of the management system (Graph 2).



Graph 1 Covering by an audit according to the highest significance of a given factor's influence on continuing an entity's operation



Graph 2 Covering by an audit according to the dimensions of evaluating an entity's operations, i.e., the areas of the management system

Graph 1 shows that the aspects which the experts had pointed to as certain to continuing operation (evaluation: 1) coincide with the auditors' assessment. The analysis of the next areas is not so positive though. 25 % of the most important aspects influencing the continuing of operation (whose range of influence was defined between 0.9 and 1) are matched during an audit at the level of 0.71. Graph 2 confirms that the area which is the most frequently studied is finances and accounting. One can also notice that the greatest discrepancies between a given aspect's influence on continuing operations and the extent to which it is studied have been noted in such areas as customers and markets (deviation 0.37), communication (deviation 0.3), processes (deviation 0.3), and organization management (deviation 0.27). Thus, it can be stated that the match in the finance-related aspects comes as no surprise; the most significant threats (which obviously influence the continuing of operation) are covered by an audit. The remaining ones (the measure of influence of 0.8–0.9) unfortunately are not, and what is especially disturbing is the limited extent of evaluation in the categories such as customers and markets and organization management, as they were the domains that the experts had pointed to as especially significant to continuing of operation.

4 The Manner of Evaluation of Continuing Operation Used in Economic Practice

In the first quarter of 2015, the author conducted survey studies in order to determine whether the discriminant models are actually used by companies and statutory auditors. An additional research objective was the evaluation of the effectiveness of these business models, made by representatives of companies, while analyzing the threat of an entity's bankruptcy, its suppliers, and key customers.

The research was conducted among companies operating on the Polish market. The questionnaire was sent out by email to representatives of financial and accounting departments. Half of the companies that participated in the survey were manufacturing companies (49 %), 31 % were companies rendering services, and were 20 % commercial ones. Companies with the prevailing Polish capital and functioning on national and international markets for at least 10 years were dominant. Most of the entities examined are commercial law companies (44 %) and medium-sized ones (58 %). The criterion for being selected for the examination was the possession by the entity of the financial statement that is subject to mandatory auditing. In all of the cases, the statutory auditor's report drawn up on the entity's financial statement for 2013 was also analyzed.

Out of 512 entities studied, 501 answered the question concerning the methods used for evaluation of continuing operation. Only 75 turned out to be conducting the evaluation by means of discriminant analysis. They were mostly large manufacturing companies, which had been functioning on the market for more than 10 years, their area of operation being international. As many as 92 % of the entities which did not use discriminant models declared the reason was the lack of their usefulness for making long-term decisions and evaluation of continuing operation of the entity, suppliers, or customers. About 6 % of the respondents said that the reason was the lack of staff capable of using the method. The entities which use discriminant analysis assessed on average its usefulness as 3.85 on the 5 degree Likert scale. The average evaluation from the entities which did not use discriminant analysis was 1.2.

A review of the reports by statutory auditors drafted for the same entities also points to infrequent use of discriminant models. Such an analysis was not presented in any of the reports. In six cases a statement was noted that "the analysis was conducted, and its results confirm lack of threats to continuing operation." The confirmation of this state of affairs is also reflected in other studies (e.g., Andrzejewski and Mazurczak 2011).

5 Assumptions of the Business Audit Model

The business audit is understood as an independent evaluation of the effectiveness of the mechanisms of management implemented in a company concerning the company's potential, operational risk, interactions with stakeholders in order to determine the entity's ability to continue operation, at the same time complying to the rules of sustainable development.

The following factors are evaluated: systems ensuring compliance, the degree of keeping the compliance, and the effectiveness of solutions. The result of the evaluation is the level of risk resulting from the designed solutions, business practice, and effectiveness of operation (see Fig. 2).

Similar to the assessment of credit rating, the usefulness of the model required the use of scoring, which makes it possible to make a comparison in time and space. The assessment in each of the three dimensions is based on the already established eligibility criteria for observations as strong or weak sides of the organization under scrutiny using the rule of grading the observation weight on a 1–5 scale. The basis for this qualification is the rules set out in Table 3.

The results obtained by the entity are the result of the assessments made in many areas and are presented in the form of an average. In view of this, in order to assign them to one of the five levels defined for each perspective, a conversion scale should be used. The criteria that form the basis for the interpretation of results are contained in Table 4.

The point evaluation method allows one to determine and communicate the results in different cross sections: in the form of partial indicators with varying degrees of aggregation (according to various aspects that are subject of the assessment, according to the eight areas identified in the assessment, according to the individual dimensions) and a holistic index (general, the overall result of the evaluation). This approach also gives the possibility of positioning the entity on

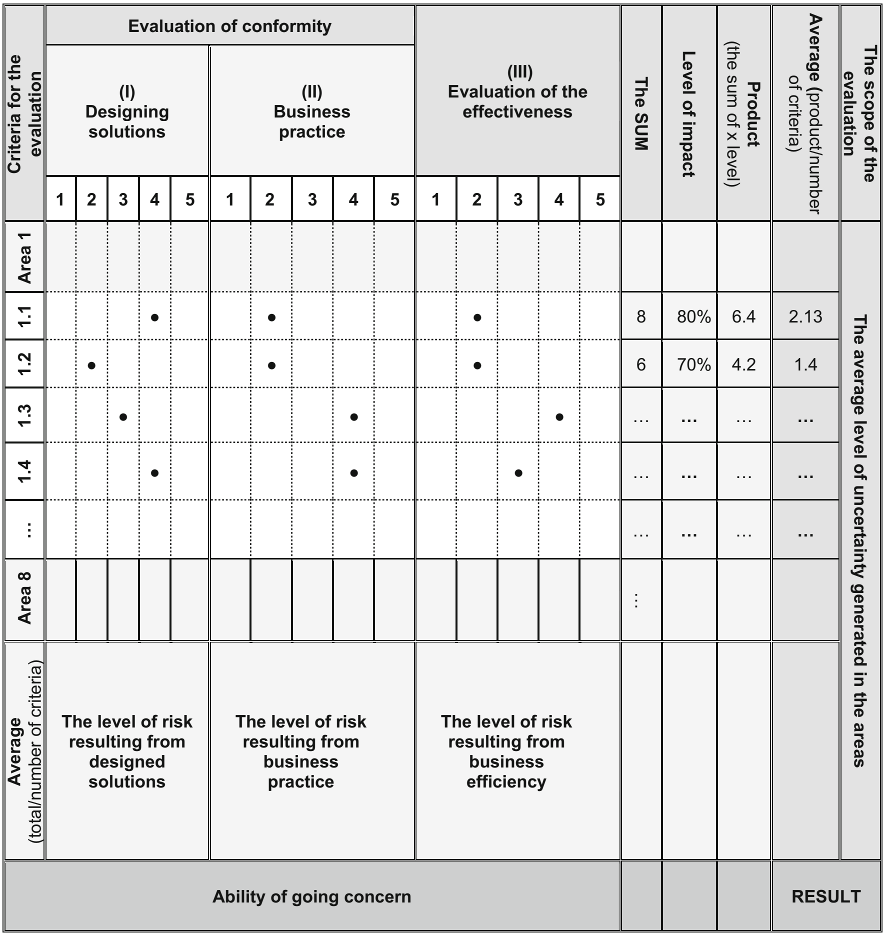


Fig. 2 Business audit model. *Source*: elaborated by the author based on Ciechan-Kujawa (2014c)

the axis of perfection. When presenting the information on the strengths and weaknesses of the solutions adopted by the entity, a platform for improvements is created, and at the same time, it allows pointing to good practice in the entity and using it to promote the organization.

6 Conclusion

Despite the fact that the ability to continue operation is influenced by both financial and nonfinancial factors, under currently used methodological solutions, it is the financial factors that are mostly assessed. It concerns both the use of the

Table 3 Criteria for assessing compliance in the concept of multidimensional business audit

Level	Perspective of compliance		Perspective of effectiveness
	(I) Designing solutions	(II) Business practice	(III.1) Assessment relative to plans (III.2) Assessment of trends (III.3) Assessment in space
1	Lack of established rules. No evidence (0 % occurrence)	Lack of evidence for implementation; it does not occur in practice (0 % compliance)	Failure to meet expectations—unrealized requested values to any extent (0 % of the plan); decrease in the level and dynamics of indicators; definitely below the average or pattern
2	The process is marginally documented. There is limited evidence (25 % occurrence)	Practice occurs only in selected areas of activity; there is little evidence of implementation (25 % compliance)	Definitely below expectations—the lack of implementation of the requested values in most of the planned areas (less than 50 % of the realized values); maintenance of the level, but decline in the dynamics of indicators; slightly below the industry average or pattern
3	Partially developed solutions. There is evidence (50 % occurrence)	The practice commonly known, but not everywhere used; the results and evidence of improvements are visible (50 % compliance)	Below expectations—implementation in most of the planned areas (over 50 % of the realized value); maintaining the level and dynamics of indicators; at the level of the average for the industry or pattern
4	In most cases the developed solutions are confirmed by clear and unambiguous evidence (75 % occurrence)	The practice often used with some exceptions, visible continuous improvement. Clear and unambiguous evidence. (75 % compliance)	Slightly below expectations—implementation in most of the planned areas (over 80 % of the realized value); an increase in the level but the maintained dynamics of indicators; slightly above the average for the industry or pattern
5	Comprehensive guidance on every aspect confirmed by comprehensive evidence (100 % occurrence)	The practice applied to a full extent without any exceptions. Comprehensive evidence. Visible and supported by the evidence systematic improvement of results in the long term (100 % compliance)	At or above expectations—the implementation in any scope (100 % of plan); an increase in the level and dynamics of indicators, definitely above the average or pattern

Source: elaborated by the author based on Ciechan-Kujawa (2014c)

Table 4 Eligibility criteria for entities according to the risk level of activity in the concept of multidimensional business audit

Level	Average	Risk Level
1	1.0–1.5	The level of uncertainty—low ability to continue operations (lack of supervision, negative trends, unfavorable comparisons, unattained objectives, evidence showing that continued operations may be threatened)
2	1.0–1.5	The level of relative uncertainty—decreasing ability to continue operations, unclear trends, unfavorable comparisons, objectives mostly not reached, evidence of the deteriorating situation of the entity
3	1.0–1.5	Neutral level—the average capacity to continue operations—goals achieved at the level of the industry, the lack of significant grounds for threatening the operation
4	1.0–1.5	The relative level of certainty—growing ability to continue operations—positive trends, objectives achieved, in most comparisons favorable conditions for improving the situation of the entity
5	1.0–1.5	Full ability to continue operations—the objectives achieved, positive and lasting trends, favorable comparisons—the entity's functioning is not threatened

Source: elaborated by the author based on Ciechan-Kujawa (2014c)

discriminant analysis and other methods used by auditors. In order to evaluate the threat to continuing an entity's operation in advance, it is essential to evaluate not only the trends in shaping the level of rates or financial quantities, but first of all the mechanisms which cause the existence of those particular trends.

New solutions should be oriented not as much toward assessment of threats to continuing operation, but rather toward the evaluation of a company's ability to continue operation. The effectiveness of tools for early identification of risks is a prerequisite for rapid response (Ciechan-Kujawa 2014b). Alternative or complementary solutions could not only affect the rationalization of business management and control (by supervisory boards, statutory auditors, business courts, and other) but also increase macroeconomic efficiency.

The method of risk assessment of going concern presented in this article is one of the three perspectives of assessment realized within the designed business audit model. In addition to the risk assessment, the model allows the assessment of the effectiveness of building value for the organization (its weaknesses, strengths, and as a result the potential of improvement) and the effectiveness of creating value for stakeholders (the level of assurance and implementation of business practice based on the consideration of the interests of all stakeholders, leading to building relationships based on a spiral value). The model is described in more detail by Ciechan-Kujawa (2014c). Assessing organizations in all dimensions included in the model should provide an answer to the question whether the organization is managing risk effectively and allocates resources to ensure the survival and sustainable development.

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