ASSESSING THE COMPANY'S STRATEGIC DECISIONS IN THE CONTEXT OF ITS ABILITY TO CONTINUE BUSINESS AS A GOING CONCERN – THE CASE OF X COMPANY

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Purpose: The objective of the study is to determine the degree of prediction of the discriminant function on the example of a household appliance company.

Design/methodology/approach: The objective of the study is to be achieved by verifying the discriminant function as an instrument for assessing the company's strategic decisions in terms of its ability to continue business as a going concern.

Findings: Discriminant models in terms of their application in the household appliance company are presented in the theoretical part whereas the company's ability to continue operations is analyzed in the empirical part. Based on the prepared scientific material, the following research question was formulated: Is it possible to determine the degree of prediction of the discriminant function on the example of a household appliance company.

Originality/value: The problem of assessing the company's ability to continue business as a going concern is not new. However, it is still very important and up-to-date with regard to the impact on making strategic decisions in enterprise management.

Keywords: decision-making, ability to continue business as a going concern, discriminant models.

Category of the paper: literature review and case study.

1. Introduction

The development of business management processes has created the need for the continuous updating of information about the endogenous and exogenous environment of the enterprise (Lichtarski, 2007; Skowron-Grabowska, 2015). Providing reliable information forces managers to search for new (Stabryła, 2010), effective solutions and instruments that will allow them to make the right decisions in the enterprise. Effective assessment of the company's strategic decisions in terms of its ability to continue business as a going concern provides an opportunity to stay on the competitive market (Chan Kim, Mauborgne, 2007). The application of

discriminant models is an effective instrument for identifying the symptoms of risk of corporate bankruptcy (Dudycz, Osbert-Pociecha, 2012). It should be emphasized that discriminant models are a valuable instrument for assessing the financial condition of enterprises, and additionally they are characterized by the ease of use due to computer programs (Mosionek-Schweda, 2014). The objective of the study is to determine the degree of prediction of the discriminant function on the example of a household appliance company. Based on the prepared scientific material, the following research question was formulated: Is it possible to determine the degree of prediction of the discriminant function on the example of a household appliance company.

2. Instruments for assessing the ability to continue business as a going concern and decision-making

An effective instrument facilitating managerial decision-making is the Altman model. Altman's concept belongs to the group of multi-factor discriminant methods indicating the signs of corporate bankruptcy. The concept consists in examining the information contained in the financial statements of the entities under study using specific indicators. E.I. Altman proposed several versions of the so-called Z function. Altman's original concept was created in 1968 and had the following form (Altman, 1968):

Formula 1.

The first formula of the Altman model

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5 \tag{1}$$

Source: Own study based on: Altman, 2007, pp. 229-239.

where:

X_1 – working capital/total assets,

X_2 – retained earnings/total assets,

X_3 – earnings before interest and tax/total assets,

X_4 – market value of equity/book value of foreign capital,

X_5 – net sales/total assets.

When carrying out the empirical study using the Altman index, the information is obtained indicating companies at risk of bankruptcy and solvent ones in the research group. The research result refers to the adopted boundaries of enterprise classification and to individual groups of categorization (Table 1).

Table 1.

Classification of risk of bankruptcy according to E.I. Altman

Z-score value	Bankruptcy risk level
1.8 or less	Very high
1.81 – 2.99	Unspecified
3.0 and more	Low

Source: Stabryła, 2002, p. 359.

Table 1 shows that enterprises for which the value of the Z index exceeds 2.9 are characterized by a low risk of bankruptcy, thus their financial situation is good. On the other hand, when the value of the Z index is below 1.8, there is a high level of risk of bankruptcy. Another concept used in this study was created in 1983 and comes down to the following form:

Formula 2.

The second formula of the Altman model

$$Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5 \qquad (2)$$

Source: Own study based on: Altman, 1984, pp. 171 et seq.

The presented model is called the *Zeta* function or the *Z-Score* model and is based on the parameters of Altman's original concept, except for the X_4 variable, which took the following form (Altman, p. 171 et seq.; Altman, Hotchkiss, 2007, pp. 229-239):

Formula 3.

The formula of the X_4 variable in the Altman model

$$X_4 - \text{balance sheet (book) value of equity/book value of foreign capital} \qquad (3)$$

Source: Own study based on: Altman, Hotchkiss, 2007, pp. 229-239.

Redefining the *Zeta* function brought about that more companies could benefit from Altman's concept. Its original version required the knowledge of the market value of the equity of the company under investigation (Gnysińska, 2013). The Z-Score model, based on the balance sheet (book) value of equity, was addressed to enterprises that could not determine the market value of equity.

Another version of the *Z-Score* model consists in eliminating the last variable of the Z' function, which is the X_5 parameter. Such a change is dictated by the fact that the X_5 asset turnover ratio strongly depends on the market in which the surveyed company operates. Eliminating the X_5 variable made the Z' function a universal and cross-sectoral method of early warning of bankruptcy in the surveyed enterprise, and the Z" function took the following form:

Formula 4.

The third formula of the Altman model

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \qquad (4)$$

Source: Own study based on: Altman, Hotchkiss, 2007, pp. 229-239.

The presented concepts of E.I. Altman illustrate only a selected excerpt of the scientist's research and are to present exemplary concepts of forecasting bankruptcy of enterprises.

Formula 5.

The fourth formula of the Altman model

$$Z''' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 + 3.25 \tag{5}$$

Source: Own study based on: Altman, Hotchkiss, 2007, pp. 229-239.

The fourth formula of the Altman model, referred to as the EM Score, was created in 1990 and was to serve as an instrument for assessing the risk of bankruptcy for investors and lenders operating in much less stable markets than in the US. In this formula, the return on assets ratio was omitted and the intercept of 3.25 was added. The result of this formula is interpreted as follows (Table 2):

Table 2.

Classification of risk of bankruptcy according to the EM Score formula by E.I. Altman

EM Score value	Bankruptcy risk level
(0-5.5>	High
(5.5-∞)	Low

Source: Stabryła, 2002, p. 359.

An important instrument for evaluating the alternatives of choice to make a specific decision is the model by A. Hołda. It is a correction of Altman's model adapted to Polish conditions. Hołda's model is used to forecast the bankruptcy of enterprises (Malinowska, 2001, p. 46; Nita, 2007, p. 23; Maćkowiak, 2009, pp. 24-25). A linear discriminant function was applied in the model. The concept of the Hołda model is presented in the form of the following formula (Hołda, pp. 306-310):

Formula 6.

The formula of the Hołda model (ZH)

$$ZH = 0.605 + 0.681X_1 - 0.0196X_2 + 0.00969X_3 + 0.000672X_4 + 0.157X_5 \tag{6}$$

Source: Own study based on: Hołda, 2001, pp. 306-310.

where:

X_1 – current assets/current liabilities,

X_2 – total liabilities/balance sheet total,

X_3 – net profit (loss)/average annual total assets,

X_4 – average annual current liabilities/cost of products, goods and materials sold,

X_5 – total revenue/average annual total assets.

When using Hołda's model as an assessment instrument being part of decision-making models, one obtains the concise description of the company's operations. In addition to numerous advantages of the implementation of the ZH function in decision-making models, its application also brings the following disadvantages:

- "no possibility of substantive interpretation of the value of the discriminant function,
- not considering qualitative factors affecting the financial situation of entities,
- a high degree of generalization and synthesis, which is not always sufficient to diagnose the financial situation, which is a multi-faceted category,
- problems with the comparability of empirical data concerning various entities which have some freedom as to the methods of accounting and preparing financial statements,
- difficult access to empirical data, especially in relation to those entities which are at risk of bankruptcy,
- problems with estimating the discriminant model based on empirical data concerning one specific economic entity (relationship between the number of financial ratios and the number of observations)" (Nowak, 2005, p. 255).

The study conducted using the *ZH* function is an objective way to assess the actual financial situation of the studied entity (Siemińska, 2002; Kędzierska, 2012). The difference between Altman's and Hołda's models consists in using the constant value in the *ZH* function, which is independent of values of the other parameters of the Hołda model (Jerzemowska, 2006; Nowak, 2013). The interpretation of the results obtained in Hołda's model is presented in Table 3.

Table 3.
Classification of risk of bankruptcy according to A. Hołda

ZH value	Bankruptcy risk level
$(-\infty; -0.3)$	Very high
$(-0.3; -0.1)$	"Grey area"
$(-0.1; \infty)$	Low

Source: Hołda, 2001, p. 306.

In conclusion, it should be noted that Hołda's model is based on the discriminant function and requires more research work than Altman's model developed in the conditions of a mature economy. Scoring models make it possible to predict bankruptcy of enterprises. The main difficulty in the course of the development of scoring models is the lack of appropriate economic and financial documentation that would allow comparing companies, the short period of occurrence of given economic conditions and the quality of empirical materials from the conducted bankruptcy procedures. It is worth emphasizing, however, that the use of discriminant models should enable the analysis and assessment of the decision-making situation.

3. Research methodology

The research tool used to accomplish the objective of this study is a case study, which allows the presentation of an accurate and in-depth image of the phenomena and relationships under study (Gibbert et al., 2008). According to W. Czakon, the case study, as a research method, has a probabilistic possibility of scientific cognition, and its limitations include high time consumption, intuitiveness, subjectivity of judgments and high costs of research, as well as low representativeness of results (Czakon, 2015). However, the attention is drawn to the fact that the empirical verification carried out based on the case study method makes it possible to find answers to questions of an original nature, which enables more thorough explanation of the studied phenomenon (Yin, 2009; Eisenhardt, Graebner, 2007).

For the purposes of assessment of the ability to continue business as a going concern a Polish household appliance company, which has been operating on the international market for many years, was selected. The surveyed company was chosen based on purposeful sampling according to the following selection criteria: empirical data were available in the Notoria database, surveyed entities were listed on the Warsaw Stock Exchange (WSE) throughout the research period, surveyed entities could be assigned based on the Polish Classification of Activities: PKD-47.54.Z - Retail sale of electronic household appliances, individual financial statements were available on an annual basis, allowing for the calculation of discriminant models, Polish manufacturer of household appliances. Such assumptions brough about that only one household appliance company met all the criteria. The research period was the years 2017-2021. The choice of the Altman and Hołda models to assess the ability to continue business as a going concern was dictated by the information capacity of these parameters (Stachowicz, Machulik, 2002), as they characterize organizational and financial phenomena (Kościelniak, 2008; Bednarski, 2005) and constitute an effective research instrument enabling parameterization of information channels. The presented models of Altman or Hołda are not models of the latest generation, however, they are characterized by simplicity and speed of measurement as well as practical applicability, which shortens the time of decision-making.

4. Verification of the discriminant function in the assessment of the ability to continue business as a going concern - the case of the X company

The assessment of the ability to continue business as a going concern of the X enterprise was carried out in two stages, i.e., all four formulas by Altman were analyzed first, and then those by Hołda. The results of the analysis of Altman's formulas are presented in Table 4.

When analyzing the results obtained using the Altman model for the Z, Z' and Z" formulas in the years 2017-2021 for the surveyed household appliance company, it is noted that the entity only in 2020 indicated the level of bankruptcy risk, referred to as "unspecified" for the Z formula. In all the other periods examined, the Z, Z' and Z" formulas indicated values below 1.8, which means that the risk of bankruptcy was very high. Similar results were obtained on the basis of the latest version of the Altman model, EM Score. Here, also the highest score was obtained in 2020. In the remaining years under study, the values of the discriminant function indicate a high risk of bankruptcy. When analyzing the ratios in 2020, it is noted that EBIT recorded a high value in contrast to other periods. The conclusion is that 2020, when the Covid-19 pandemic began in Europe, brought much better financial results to the household appliance industry. The period of the pandemic was associated with forced isolation, during which many people focused on renovations related to the replacement of household appliances. Nevertheless, the results of all four examined formulas of the Altman model show that the strategic decisions of the surveyed household appliance company may be wrong since the level of bankruptcy risk was very high almost throughout the entire research period. In terms of the company's ability to continue business as a going concern, it is recommended to conduct a detailed analysis aimed at indicating what factors cause such low financial results. Failure to implement strategic recovery decisions in the studied enterprise may contribute to its bankruptcy.

Table 4.
Results of the Altman model for the household appliance company

The Altman models					
	2017	**2018**	**2019**	**2020**	**2021**
x1	0.10	0.12	0.13	0.19	0.17
x2	0.11	0.09	0.07	0.08	0.05
x3	0.07	0.10	0.09	0.09	0.06
x4	0.02	0.03	0.03	0.03	0.02
x5	1.12	1.08	1.12	1.09	1.15
Z	**1.65**	**1.68**	**1.69**	**1.74**	**1.63**
Z'	**1.52**	**1.54**	**1.56**	**1.58**	**1.51**
Z"	**1.52**	**1.75**	**1.75**	**2.13**	**1.70**
EMS	**4.77**	**5.00**	**5.00**	**5.38**	**4.95**

Source: Own calculations.

The assessment of the household appliance company's ability to continue business as a going concern based on Altman's four formulas showed that the level of bankruptcy risk in the years 2017-2021 was very high. Therefore, in the second stage of the research, it was decided to conduct an additional analysis regarding the identification of symptoms of risk of bankruptcy of the examined enterprise, using the Hołda discriminant model, and the results of this analysis are presented in Table 5.

The results obtained based on the Hołda model provide information about the situation of the surveyed household appliance company in a much better light compared to Altman's models. In the enterprise under study, in all the surveyed years, the value of the ZH index reached a level above zero. The values are also not in the range (-0.3;0.1), i.e., the company does not belong to the "grey area". This means that the company is not at risk of bankruptcy.

Table 5.
Results of the Hołda model for the household appliance company

	2017	2018	2019	2020	2021
x1	1.28	1.38	1.45	1.64	1.52
x2	47.12	41.39	37.41	36.17	39.35
x3	10.56	8.92	7.42	7.99	5.23
x4	117.31	112.20	101.73	103.64	104.98
x5	1.12	1.08	1.12	1.09	1.15
ZH	0.91	1.07	1.18	1.33	1.17

Source: Own calculations.

When referring to the individual factors affecting the value of the discriminant function of the Hołda model, it is noted that the X1 index, reflecting the level of liquidity, was steadily increasing until 2021, when it decreased, and thus the positive trend was stopped. In turn, the X2 index, reflecting the company's debt level, was systematically decreasing until 2021, when it increased again, which also confirms the stopping of the positive trend for the X2 index. The situation was slightly different with the X3 index, reflecting the company's effectiveness in generating revenue from its operations, which initially decreased, then increased in 2020, and then significantly decreased in the following year, which indicates that the company's situation in this area was deteriorating. The X4 index, reflecting the period of rotation of short-term liabilities, was decreasing for the two examined years, then it started to increase. The last X5 indicator, reflecting the company's ability to generate profit based on its resources, alternately decreased and increased, which indicates the lack of stability of the company in this respect.

The above analysis indicates that despite the good results of the Hołda model, a certain breakdown of the indicators affecting the discriminant function is noticeable in 2021. In addition, the trend changes and unstable results of individual indicators should be a warning signal for managers making strategic decisions.

5. Discussion

When considering the discriminant function in terms of its verification as an instrument for assessing the household appliance company' ability to continue business as a going concern, it is noted that various discriminant models provide different information about the ability to continue business as a going concern. When verifying the discriminant function based on the

Altman models, one may observe the occurrence of symptoms of a threat to the continuity of operations of the examined entity. The verification of the discriminant function using the Hołda model does not indicate the risk of bankruptcy. The results of the analyzes carried out using the Altman and Hołda models presented above prove that when assessing the risk of bankruptcy of enterprises, one cannot rely on the results of only one model. When referring to the results obtained in this study, one can therefore adopt the position presented by the authors of other studies, who indicate that the application of the Hołda model is adequate to Polish conditions, and the use of the Altman models is inadequate to these conditions (Kitowski, 2018; Micherda, 2006; Hamrol, 2013; Iwanowicz, 2018).

The conducted analyzes show that the Hołda model reflects the studied company's ability to continue business as a going concern better compared to the results obtained using the Altman model. However, when considering the financial results published on the WSE website for 2022, it is noted that the company under study had problems with both profitability and liquidity, which may suggest that its ability to continue business as a going concern is at risk. This may mean that Altman's models are more sensitive to the effectiveness of strategic decision-making in the surveyed enterprise, whereas Hołda's model is focused on assessing the results of the analyzed period. In this context, it is worth emphasizing that the task of discriminant functions as an instrument for assessing the company's strategic decisions is not only to analyze the results of the current period, but also to signal about the deteriorating financial condition (Wojnar, 2015, p. 209), which is a contribution to the research on the assessment of the company's strategic decisions in terms of its ability to continue business as a going concern.

When considering the results obtained on the basis of the analysis of the discriminant function conducted based on the Altman and Hołda models in the surveyed household appliance company, the conclusion arises that the mechanisms protecting this company against internal threats resulting from the low quality of management should be looked into (Obłój, 2002). The future direction of research should focus on examining the decision-making process which, in the surveyed enterprise, may lead to the destruction of value created by improper configuration of resources, which does not contribute to their optimal use.

6. Conclusions

The conducted case study allows for verifying the discriminant function as an instrument for assessing the company's strategic decisions in terms of the ability of the surveyed household appliance company to continue business as a going concern. To sum up, the results of the research conducted using the Altman and Hołda models to determine the degree of prediction of the discriminant function on the example of a household appliance company indicated that

the financial condition of the surveyed entity is largely determined by the effectiveness of managers' strategic decision-making. The assessment of the entity's ability to continue business as a going concern using the multidimensional discriminant analysis provides information on retrospective decisions taken in the enterprise. The empirical studies conducted in the field of verification of the discriminant function using the Altman model show the symptoms of a threat to the continuity of operations in the future despite the fact that, in the analyzed period, the enterprise was not at risk of bankruptcy in the Hołda model.

The main contribution of the article is an in-depth explanation of the possibility of using the Altman model to assess the company's strategic decisions in the context of the occurrence of signals about the deterioration of the financial condition. It is worth emphasizing that the financial results of the studied enterprise obtained in 2022 show the presence of symptoms of a threat to the continuity of operations as a result of not taking into account risk factors in future periods when making strategic decisions.

It is worth noting that the use of discriminant functions is an important instrument for assessing strategic decisions of the enterprise. Discriminant models make it possible to assess the ability to continue business as a going concern, but they should also enable signaling about the deteriorating financial condition.

It should be remembered that the use of discriminant models has both advantages and disadvantages. The advantage of scoring models is the ease of understanding and simplicity of application as well as high accuracy of classification in terms of analyzes of risk of bankruptcy of enterprises. The main disadvantage of discriminant models is their rapid obsolescence, which is the result of changes in the economic conditions of enterprises.

A clear implication from the theoretical and empirical assumptions of the conducted study is that several discriminant models should be considered when conducting the discriminant analysis of the enterprise. These results confirm that it was Altman's models that turned out to be more effective, as they earlier detected symptoms of threats to the continuity of operations, which the Hołda model did not capture.

The further direction of research will be aimed at testing discriminant models in early detection of symptoms of a threat to business continuity. On the other hand, the recommendation for managers making strategic decisions in enterprises is to monitor the enterprise and its results on an ongoing basis, especially in the face of competition on the international household appliance market.

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