

Financial Reporting and Analysis: Evaluating Property, Financial Position, and Results in Business Entities

Aneta LIPCZYŃSKA

<https://orcid.org/0000-0002-9984-3846>

State Vocational University of prof. Stanisław Tarnowski, Tarnobrzeg, Poland
a.lipczynska@op.pl

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Abstract:

Financial analysis is essential for evaluating company performance, providing insights into assets, capital, and financial health. This research highlights the importance of key indicators like profitability, efficiency, and stability in supporting strategic decisions and managing risks. The paper further examines the utility of discriminant models, such as Altman's Z-score and models tailored to Polish market conditions, for early detection of financial distress and potential bankruptcy. It provides a comparative analysis of multiple models, including those by Gajdka and Stos, Hadasik, Holda, and Sojak and Stawicki, evaluating their efficacy in forecasting financial risk.

The study applies these models to assess the financial standing of Wawel S.A., a prominent confectionery producer in Poland, exploring its financial statements, operational performance, and risk indicators. The findings reveal the nuanced applications and limitations of discriminant models, emphasizing the importance of adapting methodologies to local market conditions and the unique characteristics of individual enterprises. This research contributes to the broader discourse on financial risk management, offering practical insights for businesses, analysts, and policymakers.

Keywords: financial statements, financial analysis, performance indicators, liquidity, financial position, business sustainability.

JEL Classification: B21, B26, G00.

Introduction

Financial statements serve as a structured and systematic representation of a business entity's financial position and performance over a specific accounting period. They provide key information about the entity's assets, liabilities, and the financial outcomes of its operations, offering valuable insights into its overall financial health. The primary purpose of preparing financial statements is to furnish stakeholders with essential data regarding the entity's financial standing, enabling informed decision-making by investors, creditors, and other users (Żukowska et. al., 2016).

Financial analysis, grounded in economic analysis, is a vital tool for evaluating a business entity's financial condition. It offers a snapshot of the company's current situation while also identifying trends and patterns that may signal opportunities for growth or areas requiring attention. This process involves evaluating key performance indicators, such as profitability, solvency, and liquidity, to assess how effectively the company is utilizing its resources and managing its obligations. Through financial analysis, potential weaknesses - such as inefficiencies, high debt levels, or underperforming assets - can be uncovered, providing insight into areas that may impact the company's long-term stability and profitability.

The core objective of financial analysis is to examine the sources of an entity's financing and assess its financial liquidity. This includes analyzing both liabilities, which represent the sources of financing, and assets, to determine the company's ability to meet its short-term obligations and its overall liquidity position. Key financial indicators, such as the structure of assets and liabilities, liquidity ratios, and capital efficiency, are critical for a comprehensive understanding of the entity's financial health and operational effectiveness. These indicators offer valuable insights into the company's financial flexibility, solvency, and long-term viability.

The importance of examining the financial condition of businesses extends beyond internal management and decision-making. It holds significant relevance for external stakeholders, including investors, creditors, and regulatory authorities, who rely on such assessments to gauge the financial viability and sustainability of the company. Furthermore, understanding the financial health of businesses is crucial from a broader economic perspective. In particular, the financial stability and growth prospects of major enterprises can have profound implications for regional economies. The economic performance of business units within a specific region can influence local economic development, employment rates, and overall prosperity.

This paper hypothesizes that WAWEL S.A., a leading business entity in the food industry, maintains a solid financial position with minimal risk of bankruptcy in the foreseeable future. Through an in-depth analysis of the company's financial reporting and performance, the study evaluates its assets, financial stability, and operational outcomes, contributing to a deeper understanding of the financial dynamics within business entities.

1. Financial Statements in Business Reporting

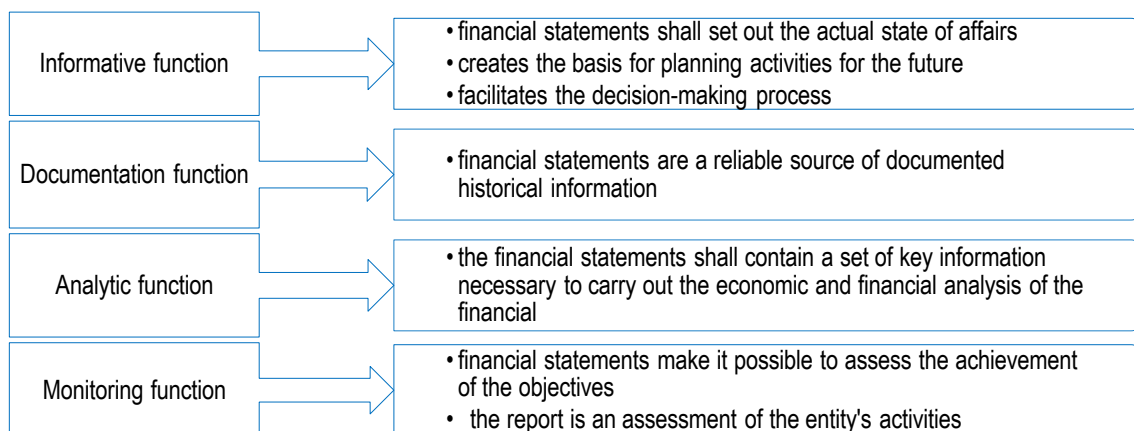
The reporting of business entities encompasses a series of reports prepared periodically, presenting numerical summaries for specific reporting intervals (Buk, 2005). These summaries summarise the resources owned and the operational outcomes of the business entity (Nowak, 2005).

Financial statements, as one of the primary sources of information about a business entity, provide synthetic data that facilitate efficient communication between entities engaged in international transactions. This is often referred to as the "language of business" and operates effectively on both micro and macro scales (Świdarska, 2006). Financial reporting supports decision-making processes in economic activities and ensures equitable settlements between parties to transactions (Wójtowicz, 2006). This functionality arises from the internationalization of accounting principles within individual countries, achieved through the harmonization of accounting practices via International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) (Sokół et al., 2018).

The primary objective of financial statement preparation is to present a reliable and transparent depiction of a company's financial and asset position, alongside its financial performance. These statements aim to deliver essential information to external users, such as investors, transaction participants, and credit decision-makers (Olchowicz, 2002). Additionally, financial statements serve as the principal source of knowledge about a company's operations and activities. They also provide a historical perspective on managerial decisions, which are reflected in the elements of the management report.

The following Figure 1 presents four key functions of financial statements: informational, documentation, analytical, and monitoring. Each of these functions serves a distinct yet mutually complementary role in business management processes. The informational function aims to present the actual financial condition of the company, forming the basis for future action planning and supporting decision-making. The documentation function ensures reliability by providing documented historical information. In turn, the analytical function facilitates detailed analysis of the company's economic and financial situation based on key data. Finally, the monitoring function allows for evaluating the achievement of set goals and preparing reports on the company's activities. All these functions are closely interconnected - the information collected during the documentation process serves as the foundation for analyses, which in turn support monitoring and strategic decision-making processes.

Figure 1. Functions of financial statements



Source: Author's own elaboration.

The functions performed by financial statements are primarily determined by several critical factors. These include the purpose for which the financial statements are prepared, the role of the commissioning entity in the preparation process, the scope of the information being utilized, the manner in which this information is applied, and the areas identified during the audit process (Lobos, 2014). These factors influence the relevance, accuracy, and usability of the financial statements, ensuring that they fulfill their intended purpose of supporting informed decision-making by stakeholders, including investors, creditors, and regulatory bodies.

Financial statements serve as tool for assessing the financial health and operational outcomes of an entity. They facilitate transparency, accountability, and compliance with legal and regulatory requirements while also providing a comprehensive view of the organization's assets, liabilities, revenue, and expenses. In addition, financial statements enable comparative analysis across reporting periods, enhancing the decision-making processes related to investments, financing, and operational strategies.

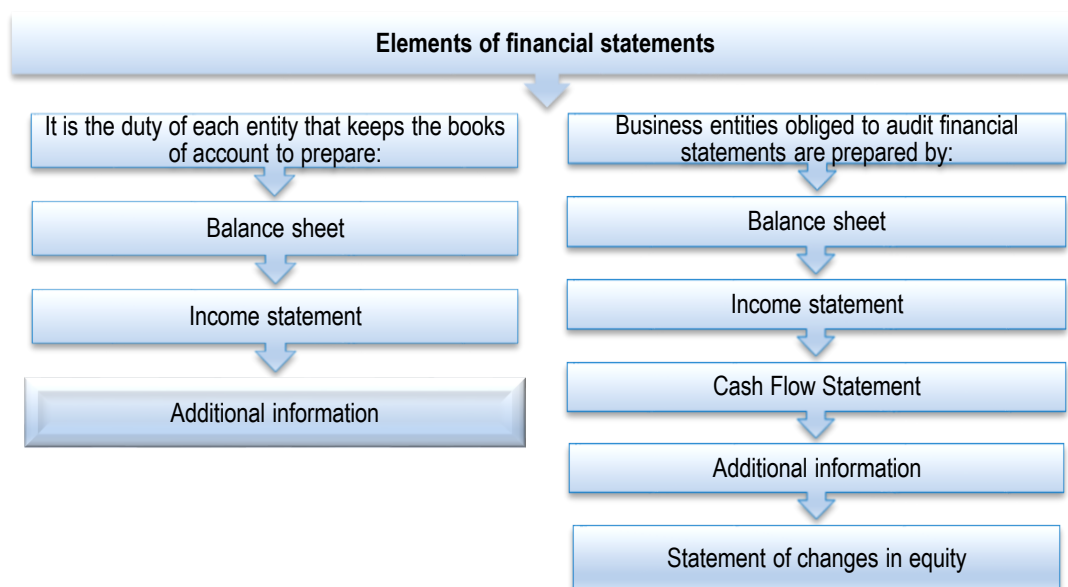
In accordance with Article 45(2) of the Accounting Act of 29 September 1994 (Dz.U. 2023, poz. 120, with amendments), financial statements comprise the following components: a balance sheet, a profit and loss account, and accompanying notes. These notes include an introduction to the financial statements as well as additional information and explanatory details.

In addition, entities specified in the Act which are obliged to audit financial statements are also required to present a cash flow statement and a statement of changes in net assets. The objects from the mentioned above Act are as following: banking institutions and their branches; domestic payment institutions and electronic money institutions; joint-stock companies (with the exception of companies in the process of being established); entities operating under the regulations in the organization and operation of pension funds and entities operating under the provisions on securities trading and on the basis of the regulations on investment funds and management of alternative investment funds; as well as entities that have met 2 of the 3 conditions set out in Article 64(1)(4) of the Act of 29 September 1994, which provides that in the preceding financial year for which the financial statements were prepared, the given entities fulfilled at least two of the following conditions:

- a) the average annual full-time equivalent employment was at least 50 persons,
- b) the total assets of the balance sheet at the end of the financial year were the equivalent of at least EUR 2,500,000 in Polish currency,
- c) net revenues from the sale of goods and products as well as financial operations for the financial year amounted to the equivalent of at least EUR 5,000,000 in Polish currency.

Figure 2 shows the components of financial statements, distinguishing between the requirements for entities keeping books of account and those obligated to audit financial statements. Entities that maintain accounts must prepare three primary elements: the balance sheet, income statement, and additional information. In contrast, business entities subject to audit are required to prepare a more comprehensive set of documents, including balance sheet, income statement, cash flow statement, additional information, and statement of changes in equity.

Figure 2. Elements of financial statements



Source: Author's own elaboration.

These elements are interconnected and collectively provide a holistic view of an entity's financial position. The balance sheet offers a snapshot of assets, liabilities, and equity at a given moment, while the income statement details financial performance over a period. The cash flow statement reveals the liquidity and cash movements, and the statement of changes in equity tracks variations in the company's equity. The additional information provides supplementary data to support and explain the figures presented in the core financial statements. Together, these components form an integrated framework essential for financial analysis and decision-making.

The financial statements, as described by Kata and Rogowski (2008), consist of essential components that provide a critical foundation for informed decision-making by internal and external stakeholders, promoting transparency and accountability in financial reporting, as follows:

- **Balance Sheet:** This provides detailed information about the size, structure, and changes in a company's economic resources (assets) and their financing sources at a specific date. It includes a statement of assets (fixed and current) available to the entity and their financing, divided into equity and borrowed capital (long- and short-term). The balance sheet offers insights into the property and capital structure of the enterprise, serving as a snapshot of its financial position.
- **Profit and Loss Statement:** As a core element of the financial statements, this dynamic report presents the revenues earned and associated costs incurred during the reporting period. It highlights the structure of the financial result, with the financial outcome serving as a comprehensive measure of the company's operational performance. The primary objective of the profit and loss statement is to assess the economic results of the enterprise's activities over a defined period.
- **Cash Flow Statement:** This component delivers information on the sources, amounts, and utilization of cash and its equivalents during the entity's operations. It categorizes cash flows into operating, investing, and financing activities, allowing stakeholders to evaluate the liquidity and cash management practices of the business (Śnieżek & Wiatr, 2012).
- **Statement of Changes in Equity:** This statement provides details on variations in the entity's equity components over the reporting period. It illustrates the contributions, distributions, and adjustments affecting equity, offering a comprehensive understanding of its evolution.
- **Explanatory Notes:** These include an introduction to the financial statements and provide supplementary details and clarifications. They expand upon the data presented in the balance sheet and profit and loss statement, offering context and explanations that enhance the interpretability of the financial reports.

The financial statements serve as sources of historical data, providing a structured compilation of financial information that enables stakeholders to perform detailed economic and financial analyses. They support the evaluation of an organization's performance against planned objectives and offer insights into the overall effectiveness and efficiency of its operations (Sawicki, 2012). Prepared at specific reporting intervals, financial statements typically reflect the company's status as of the balance sheet date - commonly December 31 - or at the time of closing the accounting books. These reports are essential for monitoring financial health, assessing operational results, and ensuring compliance with regulatory requirements. According to Walczak (2007) and Prewysz-Kwinto & Voss (2015), financial statements are prepared in the following circumstances:

- At the close of the financial year, providing an annual summary of the company's financial performance and position.
- When the entity ceases operations, including events such as its sale, liquidation, or the conclusion of bankruptcy proceedings, the financial statements document the company's final transactions and financial standing.
- Before transitioning to a new legal form, financial statements are prepared to reflect the financial implications of the structural transformation.
- When one entity acquires another, financial statements are critical in evaluating the financial impact on both the acquiring and acquired entities, ensuring transparency in the integration process.
- In cases of division or merger, financial statements capture the financial results leading up to these significant organizational changes and facilitate the creation of consolidated or new financial reports for the resulting entity.
- At the commencement of liquidation or bankruptcy, financial statements serve as a baseline for managing the entity's remaining resources and obligations.
- In situations governed by specific regulations, financial statements may be required within a set period—typically no later than three months after such events—to meet compliance standards and provide stakeholders with relevant information.

Moreover, the preparation of financial statements under diverse circumstances ensures that all significant events affecting an entity's financial status are transparently recorded and communicated. This transparency fosters trust and accountability, which are essential for maintaining robust relationships with internal and external stakeholders.

2. Financial Analysis for Assessing Business Performance

Financial analysis is a tool that allows you to prepare documents and present a reliable assessment of a business entity. Interdependencies between the various elements of the report can help to make very important decisions and assess the effects achieved by the entity. The financial analysis allows to assess the situation of a company and present the results achieved so that the company can function well and be profitable.

Financial analysis deals with the assessment of a company's activity from its financial point of view in relation to past periods, planned assumptions as well as results achieved by other enterprises. Financial analysis is strongly related to accounting and to the economic information system, which uses processed accounting and statistical data (Dynus et. al., 2005).

The content of the financial analysis consists of economic values concerning the audited company, such as:

- assets and capital,
- financial results,
- the financial situation of the company.

The subject of a company's financial analysis is its business activity based on two types of resources: one is connected with capital and property, the second is personal (Bednarski, 2000). The subject of financial analysis of a company includes: financial condition, financial results being the consequences of the company's financial processes. The financial status is set as of a specific date. It includes an analysis of the balance sheet, sources of financing and working capital of the company. A company's financial performance is its net or gross profit or loss. The financial result represents the financial condition of the company and also illustrates the company's revenues and expenses. The financial result of a company is influenced by many factors, including: sales revenues, other operating income, financial income, incidental costs of sales, extraordinary gains and losses.

Analysis is a tool used in business management because processing and analyzing information is helpful in decision-making. Economic analysis can be referred to as a management function or a management instrument (Dynus et. al., 2005).

Financial analysis is an instrument used to evaluate and present a reliable assessment of a business entity's performance, examining the interdependencies between various components of financial reports, decision-makers can make informed strategic choices and assess the outcomes achieved by the organization. Financial analysis provides insights into a company's financial health, enabling it to operate effectively and maintain profitability. This analytical process involves evaluating a company's financial activities over past periods, comparing these against planned objectives, and benchmarking results against other enterprises. Financial analysis is deeply intertwined with accounting and the broader economic information system, which relies on processed accounting and statistical data (Dynus et al., 2005).

The scope of financial analysis covers important economic elements of the analyzed entity, including: assets and capital, financial results and the overall financial situation of the enterprise. The subject of financial analysis centers on the company's business activities, which depend on two key resources: capital and property on one hand, and human resources on the other (Bednarski, 2000). It specifically addresses two dimensions:

- Financial condition: This involves assessing the company's status at a specific point in time, including an analysis of the balance sheet, funding sources, and working capital.
- Financial performance: This pertains to the company's net or gross profit or loss, reflecting its revenues and expenses. The financial result serves as a comprehensive measure of the company's financial standing and is shaped by factors such as:
 - Sales revenues,
 - Other operating income,
 - Financial income,
 - Incidental costs of sales,
 - Extraordinary gains and losses.

Economic analysis is an instrument of management. It is used to determine the factors that have the greatest impact on the implementation of the decisions made. Economic analysis makes it easier to make strategic decisions that affect the efficiency of the company's operations. Thanks to the use of the analysis, it is possible to verify the decisions made, and the methods of analysis facilitate future actions and the formulation of strategies (Leszczyński & Skowronek-Mielczarek, 2004). Economic analysis examines the effectiveness of a company's operations by:

- study of phenomena occurring in the company, their size and changes occurring over time,
- examination of deviations of the analyzed phenomena and explanation of the reasons for the occurrence of these deviations,
- determination of cause-and-effect relationships between the studied phenomena or processes,
- examination of the economic condition of the factors of production, as well as the methods of management of the examined company (Gabrusewicz, 2014).

Each business activity requires a periodic analysis in order to determine whether the activities carried out so far have brought the intended results as well as to identify and indicate ways and directions of improvement of this activity. Financial analysis is also used to explain and formulate conclusions on how to change the reality. It can be divided into (Wędzki, 2015):

- macroeconomic – examining the economic situation and the industry in which a company operates, i.e., the phases of the business cycle, the level of inflation, demand, GDP;
- microeconomic – focusing on the company itself. Market analysis focuses on customer expectations and perception of the products offered by the company. Competitive analysis allows you to determine the strengths and weaknesses of competitors and the possibilities of achieving a competitive advantage of the company;
- technical and economic – assessing work efficiency, material management, production capacity in terms of the technology used in the enterprise;
- financial – measuring the effects of the company's financial activity to a wide extent, i.e., financing structure and investments. Its part is the analysis of the financial statements.

The assessment of the entity's financial standing is based on financial ratios, which are a tool for aggregating dispersed financial information contained in the financial statements. Individual indicators differ from each other, i.e., in terms of design or capacity of influence of factors (Grzenkowicz et. al., 2017).

The most popular method of measuring and assessing the economic and financial situation of a company is ratio analysis, which is an extension, deepening and detailing of the preliminary analysis of financial statements. Ratio analysis makes it possible to assess the financial condition of an economic entity in a relatively short period of time, as well as to predict whether its financial condition allows for long-term development (Poniatowska & Maruszewska, 2013). The analysis consists in calculating the relevant financial ratios on the basis of the values included in the financial statements. They are then referenced against normative values and interpreted. Each company can create indicators depending on its own needs, their form has no legal condition (Podstawka, 2017).

Ratio methods allow one to assess the success of the company's management and assess the ability to generate profit in the future. When assessing risk using the benchmarking method, it is necessary to find a benchmark that will be the basis for comparison and inference. The calculated ratios should be compared with the calculations for previous periods, with the results of other companies and the industry as a whole, and with the limit values. However, there is no obligation to adhere uncritically to previous calculations, the industry average or indicators of competition. If the deviation is too large in relation to the adopted criterion, it is necessary to deepen the analysis and determine the reasons for such a situation (Korzeniowski, 2019).

3. Discriminant Models in Financial Risk Assessment and Bankruptcy Prediction

The discriminant model is a synthetic tool used to assess a company's financial risk. Its primary purpose is to evaluate management efficiency and detect, at an early stage, any potential risks associated with the company's inability to pay its debts. Early warning systems, therefore, play a crucial role in assessing the financial condition of a business entity, serving as an analytical tool that requires in-depth evaluation of the company's overall situation. However, discriminant models have certain limitations. One notable limitation is their specificity, as they are constructed for particular groups or types of enterprises operating within specific markets.

The natural stages in a company's life cycle - growth, stabilization, and liquidation - often lead to bankruptcy. While no entrepreneur desires to face such a situation, bankruptcy risk assessment models have been developed worldwide to identify potential threats. These models do not aim to predict bankruptcy directly, but rather to highlight early warning signs of potential financial distress (Kotowska & Uziębło, 2018).

A discriminant model serves as a synthetic measure of financial risk assessment (Gołębiowski & Tłaczała, 2005). The construction of such a model involves several stages (Kotowska & Uziębło, 2018):

- Stage I – selection of an appropriate sample, consisting of both bankrupt and non-bankrupt enterprises.
- Stage II – selection of indicators and gauges to be used in the model. Typically, out of an initial set of 20-30 indicators, about five are chosen for the model.
- Stage III – determination of the cut-off point (critical value) that divides the results of the assessment. Values above this point suggest that the company is not at risk of bankruptcy, while values below indicate potential bankruptcy risk.
- Stage IV – testing the estimated model using data from non-sampled companies.

The first research on bankruptcy risk prediction was conducted in the early 20th century, with most studies originating in the United States before spreading to other countries (Kotowska & Uziębło, 2018). Forecasting models developed by economists in the USA, as well as by Polish researchers focusing on corporate bankruptcy threats, are presented below. Discriminant analysis, in the context of assessing an entity's ability to continue as a going concern, is classified as a taxonomic method. This approach is aligned with one of the fundamental principles of accounting.

Altman's model, introduced in 1968 by Edward Altman in the *Journal of Finance* article *Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy*, was the first to combine traditional ratio analysis with multivariate discriminant analysis. Altman's study used a sample of 66 companies, divided into two groups of 33. The first group consisted of companies that went bankrupt within the following year, while the second group included financially sound companies from the same industry. From an initial set of 22 indicators, Altman (2013) selected five that demonstrated the best discriminatory ability. The result was an optimal discriminant function, which is presented below:

$$Z = 1,2X_1 + 1,4X_2 + 3,3X_3 + 0,6X_4 + 1X_5$$

where: X_1 – working capital/total assets, X_2 - retained earnings¹/total assets, X_3 - earnings before interest and taxes (EBIT)/total assets, X_4 - market value of equity/value of borrowed capital, X_5 - net sales/total assets.

Thus, the criteria:

$Z < 1.81$ zone of insolvent enterprises, "bankrupt",

$1.81 < Z < 2.99$ "grey economy", "zone of ignorance", due to the tendency to misclassification,

$Z > 2.99$ zone of solvent "non-bankrupt" enterprises.

The critical Z-score is in the range of 2.67-2.68 and reaches the level of 2.675. This value is the best distinction between bankrupt and "non-bankrupt" companies, separating these two groups.

Attempts were made to use models developed in other countries, mainly the Altman model, in the conditions of the Polish economy. However, it soon turned out that this was not possible. Therefore, more and more researchers have tried and are still trying to develop their own models of bankruptcy forecasting, which can be used in Polish conditions (Kotowska & Uziębło, 2018).

Model by Gajdka and Stos

One of the first models for forecasting the bankruptcy of Polish enterprises was developed by J. Gajdka and D. Stos (Gajdka & Stos, 1996). The study was conducted in the years 1994-1995 on a group of 40 enterprises, 20 of which were classified as bankrupt enterprises and 20 were not threatened with bankruptcy. This group includes companies from the industrial, construction and commercial sectors, listed on the stock exchange. Out of the original group of 20 indicators, five of them were selected to create the final model.

Using discriminant analysis, the following model was developed:

$$Z = 0,7732059 - 0,0856425X_1 + 0,000774X_2 + 0,9220985X_3 + 0,6535995X_4 - 0,594687X_5$$

where: X_1 = Sales revenues/Average value of total assets, X_2 = Average value of current liabilities x 360 days/Cost of production of sold production, X_3 = Net profit/Average value of total assets, X_4 = Gross profit/Sales revenue, X_5 = Total Liabilities/Total Assets.

¹ In the United States, in the "Equity" item group there is an item called "Retained earnings."

Thus, the criteria:

$Z > 0,45$, the company is not at risk of bankruptcy

$Z < 0,45$ company at risk of bankruptcy

The efficiency of the model in the correctness of qualification was 92.50.

Model D. Hadasik

The sample in D. Hadasik's (Kotowska & Uziębło, 2018) research included 78 enterprises. The first group included 39 companies that filed bankruptcy petitions with financial statements in the years 1991-1997 in the provincial courts in Poznań, Piła and Leszno. This group includes state-owned enterprises, limited liability companies, joint-stock companies and cooperatives. The second group was created on the basis of a pair, i.e., a bankrupt enterprise corresponds to an enterprise with a good financial condition with the same form of ownership and a similar size to the bankrupt enterprise.

Hadasik created nine models based on linear discriminant analysis. After conducting the research, one of them was selected, which is characterized by a very high qualification accuracy of as much as 95.08%:

$$D(W) = 0,365425 X_1 - 0,765526 X_2 - 2,40435 X_3 + 1,59079 X_4 + 0,00230258 X_5 - 0,0127826 X_6 + 2,36261$$

where: X_1 = Current assets/Current liabilities, X_2 = (Current Assets – Inventories)/Current Liabilities, X_3 = Total Liabilities/Total Assets, X_4 = Net Working Capital/Total Liabilities, X_5 = Receivables x 365 days/Net sales revenue, X_6 = Inventory x 365 days/Net sales revenue.

Thus, the criteria:

$D(W) > 0$ enterprise not threatened with bankruptcy,

$D(W) < 0$ company threatened with bankruptcy, bankrupt.

Model A. Hołdy

Hołda (2001) in conducting his research, he based his research on a sample of 80 companies, in which 40 were declared bankrupt and 40 were not threatened with bankruptcy. The analysis was carried out in the years 1993-1996 on a group of companies selected by industry, according to the European Classification of Activities (from the group 4500 to 7400). Of the 28 indicators selected at the outset, the model included five of them:

$$Z_H = 0,605 + 0,681X_1 - 0,0196X_2 + 0,00969X_3 + 0,000672X_4 + 0,157X_5$$

where: X_1 = Current assets/Current liabilities, X_2 = Total liabilities x 100/ Balance sheet total, X_3 = Profit/Net loss x 100/Total average annual assets, X_4 = Average annual current liabilities x 360/Cost of products, goods and materials sold, X_5 = Revenues from total activities/Average annual total assets.

Thus, the criteria:

$Z_H \leq - 0.3$ High chance of bankruptcy,

$-0.3 < Z_H < +0.1$ "Grey market", unspecified chance of bankruptcy,

$Z_H > +0.1$ Low chance of bankruptcy

The efficiency of the model in the correctness of qualification was 92,50%.

Model by S. Sojak and J. Stawicki

The research conducted by Sojak & Stawicki in Kotowska & Uziębło (2018) was based on a group of 58 companies for the year 1998. The research sample was divided into three groups: good, medium and bad enterprises. Out of the initial number of indicators – 20 – 7 were finally selected, which were then included in three classification functions:

▪ Bad Company:

$$0,1144X_1 + 0,5178 X_2 - 20,4475 X_3 - 0,0661 X_4 + 0,0663 X_5 - 50,461X_6 + 1,8358 X_7 - 11,6499$$

▪ Medium enterprise:

$$-0,0586X_1 - 3,3608 X_2 + 10,7088 X_3 + 0,01455X_4 - 0,066X_5 - 4,5837X_6 + 0,24329 X_7 - 2,3393$$

- Company good:

$$-0,0153X_1 + 2,0482 X_2 + 9,637 X_3 + 0,1714 X_4 - 0,0091 X_5 - 15,78X_6 - 0,0018 X_7 - 5,992$$

where: X_1 = Net result x 100/Average value of current assets, X_2 = (Current Assets – Inventories – Active Accruals)/Current Liabilities, X_3 = Average working capital/ Average balance sheet total, X_4 = Net Profit x 100/Average Equity, X_5 = Net profit x 100/Average value of non-current assets, X_6 = (Net profit + Interest on borrowed capital – Income tax)/Average value of balance sheet total, X_7 = Current Assets/Current Liabilities.

The highest positive value indicates the type of company in the analysis of a given year. The efficiency of the model in the correctness of qualification was 93.10%.

4. Assessment of Wawel S.A.'s Activities Using Discriminative Models

The application of discriminative models to assess the activities of Wawel S.A. provides valuable insights into the financial health and risk profile of the company. These models, which analyze various financial indicators and ratios, can be used to evaluate the likelihood of financial distress or bankruptcy, thereby allowing for proactive management of potential risks. Given Wawel S.A.'s extensive presence in the domestic market and its significant shareholder structure, understanding its financial stability is crucial for both investors and managers.

Characteristics of Wawel S.A.'s activities

In 1992, as part of the privatization process, Zakłady Przemysłu Cukierniczego Wawel was transformed into a joint-stock company and later became a public entity. In September 1997, the company's shares were admitted to public trading by the Securities and Exchange Commission, and on March 11, 1998, ZPC Wawel S.A. debuted on the main market of the Warsaw Stock Exchange. In 2005, the company changed its name to Wawel S.A.

Wawel offers a wide range of products, including chocolates, bars, stuffed chocolates, chocolate boxes, wafers, jellies, and chocolate-covered plums or candies. The majority of the company's sales (approximately 95%) occur in the domestic market. The largest shareholder of Wawel S.A. is Hosta International AG, based in Stimpfach-Randenweiler, Germany, which holds 52.13% of the company's share capital.

The flagship products of the Wawel brand include: Danusia mini chocolate, Malaga, Tiki Taki, and Kasztanki stuffed chocolates, handmade Peanut, Raczki, Kukułka, Refreshing chocolate caramels, and Mieszanka Krakowska chocolate-covered jellies (Wawel, 2024).

Using Discriminative Models

The issues of accounting, economics and public finance are extremely complex in the conditions of a market economy. Therefore, in economic and financial analysis, it is important to have professional preparation and knowledge of the analyst's tools and methods. Methods and techniques of analytical work are important and constitute a significant factor in the correctness and usefulness of financial analysis (Sasin, 2003).

The results of the discriminatory analysis of Wawel S.A. were presented. The assessment was carried out taking into account measures of financial risk regarding management efficiency and the related loss of payment capacity. In order to assess the financial condition of Wawel S.A. was used to examine the economic and financial situation using: Altman model, model by J. Gajdka and D. Stos, model D. Hadasik, model A. Holda.

The Table 1 presents the results of research on the use of discriminatory models. In accordance with the indicators adopted for a given research period over the three years, from 2020 to 2023. Based on the data contained in individual financial statements of Wawel S.A. The analysis was performed separately for each year over the years 2020-2023 and the following were used: Altman's model and Hadasik's model.

Table 1. Discriminant functions

Period of years	Altman's model	Hadasik's model
2020	7,3002	0,8062
2021	6,5334	0,9073
2022	6,3944	1,1456

Source: Own study based on financial data of Wawel S.A. for the years 2020-2023.

Table 2. Comparison of the functions of discriminatory models in the Wawel S.A. company

Period of years	Altman's model	Hadasik's model
2020	NO	YES
2021	NO	YES
2022	NO	NO

Source: Own study based on financial data of Wawel S.A. for the years 2020-2023.

Therefore:

NO – means an enterprise not at risk of bankruptcy

YES – means that the company is at risk of bankruptcy.

The analysis was performed for three years 2020-2023 collectively in connection with the presentation of average indicators and the average value of the presented financial data. Discriminant models were used for the analysis: the model of J. Gajdka and D. Stos, the model of A. Holda and the model of Sojak and Stawicki.

Table 3. Comparison of the functions of discriminatory models in the Wawel S.A. company

Period of years 2020-2023	Z-score value	Meaning
Model of Gajdki and Stosa	0,7716	NO
Model of Holdy	3,5211	NO
Model of Sojaka and Stawickiego		
Bad company	-13,0793	YES
Medium-sized enterprise	-11,0998	YES
Good company	5,0798	NO

Source: Own study based on Wawel (2024)

The values of the Z-score indicators of the discriminant function according to the model of Gajdek and Stos and the model of Holda are significantly above zero, so the company is not at risk of bankruptcy in the context of these models.

The obtained value according to the model of Sojak and Stawicki for "Good Enterprise" means that in this case there is no risk of bankruptcy for this indicator, while in the case of indicators for "Bad Enterprise" and for "Medium Enterprise" these values are below zero. Therefore, it is difficult to clearly determine whether a company is or is not at risk of bankruptcy. 2020 and 2021, due to the pandemic, was the most difficult period in terms of finances for Wawel S.A. while in 2022 the situation was stabilized and, according to selected models, the company was not threatened with bankruptcy at that time.

According to the models of Altman and Hadasik, enterprises not threatened with bankruptcy are those in the case of which the value of the discriminant function is positive and higher than the indicator of 1.0. This condition is met for the company, according to the Altman model, in all the years studied. When it comes to the Hadasik model, the condition mentioned above was met in the last examined year 2022. Therefore, according to these concepts, there was no risk of bankruptcy in the last research year 2022.

Conclusion

This paper examined the use of discriminant models for assessing the financial health and bankruptcy risk of companies, specifically focusing on Wawel S.A. The discriminant models, including those developed by Altman, Gajdka & Stos, Hadasik, Holda, and Sojak & Stawicki, serve as vital tools for early detection of financial distress. They provide a synthetic measure of financial risk, allowing analysts to evaluate the efficiency of management and anticipate potential liquidity issues that may threaten a company's ability to continue as a going concern.

The models analyzed in this study demonstrated their effectiveness in evaluating Wawel S.A.'s financial condition over the period 2020-2023. The results indicated that, despite challenges during the pandemic years of 2020 and 2021, the company's financial stability was largely preserved, with no significant risk of bankruptcy identified by the discriminant functions of Altman and Hadasik in the years examined. The Z-scores calculated for Wawel S.A. across multiple models confirmed that the company maintained a strong financial position in the most recent year, 2022.

However, the study also revealed that certain models, such as the one by Sojak & Stawicki, showed mixed results, with both "Bad" and "Medium" enterprise classifications indicating some risk of bankruptcy, while the "Good" enterprise classification indicated financial stability. This discrepancy highlights the limitations of discriminant models, particularly in their ability to classify companies in uncertain or transitional states. Therefore, while these models serve as valuable tools for early warning, they should be complemented with in-depth qualitative assessments to provide a more comprehensive evaluation of a company's financial health.

In conclusion, discriminant models remain a powerful method for forecasting bankruptcy risk, but their application should be cautious, considering their limitations and the need for sector-specific adjustments. Regular use of these models, in conjunction with other financial analysis tools, can greatly aid in identifying financial vulnerabilities and enhancing the decision-making process for businesses and investors.

Credit Authorship Contribution Statement

Aneta Lipczyńska is the sole author of this paper and was responsible for all aspects of the research, including conceptualization, data collection, analysis, interpretation, and manuscript preparation.

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