

The Application of Financial Analysis in Business Practice

UNIWERSYTET SZCZECIŃSKI

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Introduction

Financial analysis is a key research tool for assessing the financial health of an entity, primarily through metrics and indicators. Economic analysis is used to plan, evaluate and verify the phenomena and processes in an enterprise, providing a decision-making tool for business. Economic analysis, including financial analysis, is aimed at evaluating the company's current performance, as well as evaluating its performance in the past and determining positive and negative phenomena and cause-and-effect relationships therein, analyzing the efficiency of the company's operations, and planning the processes and activities concerned with its future development. Another important element is the control of processes and activities at the enterprise in relation to the present as well as to the past, the analysis of the data required for decision-making in adjustment/restructuring and/or improvement processes at the enterprise, and its future performance.

The aim of this book is to present selected theoretical and practical issues in financial analysis. The content includes the information, tools and evaluation methods relevant for their proper interpretation. The work consists of five chapters. The subject of the study is Wawel SA, a manufacturer of confectionery products based in Krakow, Poland. The company offers several dozen types of products, including different kinds of chocolates, bars, filled chocolates, boxes of chocolates, wafers, prunes in chocolate, and candies.

The first chapter provides a theoretical introduction to the calculation. This chapter is based on the Polish version of the book *Financial Analysis in Economic Practice* by Edyta Mioduchowska-Jaroszewicz, Małgorzata Porada-Rochon, and Mirela Romanowska. However, it has been modified, supplemented with new content, enriched with examples and case studies, and additional sections have been introduced: *Stakeholders—users of economic analysis* and *Ways to present the results of economic analysis, including financial analysis*.

Along with these theoretical considerations, chapters two, three and four also include practical solutions illustrated by the example of Wawel SA's financial statement for the years 2019–2021. All the applied methods and research tools are given for specific numbers, the method of calculation is demonstrated, and research conclusions are drawn. Chapter two characterizes the scope of financial reporting and

specifically describes the four basic financial statements prepared according to the provisions of the International Financial Reporting Standards: Statement of Financial Position, Total Income Statement, Cash Flow Statement, and Statement of Changes in Equity. It discusses an important part of the financial analysis, which is called the preliminary financial analysis, and which allows the construction of initial research hypotheses on the financial situation of the entity examined, and provides clues as to which areas of the entity's activity require detailed examination. The tools used in the preliminary analysis (horizontal and vertical financial statements) are then characterized. For each of the financial statements referred to, the empirical use of the horizontal and vertical analysis tools is presented, and the principles applicable to the interpretation of the data are outlined.

The third and fourth chapters cover the second stage of the assessment of the financial situation, where indicators and models of financial analysis are described to verify the hypotheses derived from the preliminary analysis of the financial statements. Chapter three discusses the methods and research tools used in the analysis of solvency ratios and operational capability, focusing in particular on liquidity analysis: asset management, working capital and bankruptcy risk models. Chapter four is dedicated to capital structure and profitability, in particular level of debt, return on invested capital and profitability analysis and causal DuPont analysis.

The fifth chapter discusses the topical issue of CSR (Corporate Social Responsibility) and ESG (Environmental, Social, Governance) analysis for Wawel SA. The concept of Corporate Social Responsibility, which is the precursor to ESG standards, is further clarified. The chapter's content is intended to provide an insight into the specifics of the non-financial areas that allow for a more accurate determination of the company's value. The term ESG considers three key elements: environment, society, and corporate governance, which affect the value and long-term perspective of a company.

The book is an extended research study of the financial health and viability of Wawel SA. Due to its content, it should find wide application among business practitioners, MBA students and students of Economics at various levels of higher education. The insights it contains are intended to help the student acquire both knowledge and practical skills for the application of financial analysis in the study of the financial position of companies assessed through data from financial statements. The book fills a gap in the literature of subjects taught in English-language courses on the evaluation of the financial condition of enterprises.

On behalf of the Authors,
Małgorzata Porada-Rochoń

Chapter I Substantive Theoretical Financial Analysis

Introduction

This chapter gives a theoretical introduction to the empirical section, and focuses on introducing the essence of economic analysis, definitions, tasks, and divisions. The sources of information and methods used for economic analysis will be outlined. The role of the environment, including in particular the macro environment, will be highlighted, and specific aspects of individual environments will be discussed. Attention will also be paid to the company's stakeholders and their needs in terms of economic analysis information.

I.1. Significance and tasks of economic analysis, including financial analysis

According to the PWN dictionary of the Polish language, **“Analysis is a study of a problem, a phenomenon from various perspectives with the aim of understanding or explaining it, or an explanation or description resulting from such consideration, or a research method that involves separating its elements from a given whole and studying each of them separately.”** Dynus, Kołosowska & Prewysz-Kwinto (2005, 9) define analysis as “a method of cognition and evaluation of complex phenomena and processes through their division into simple elements, the study of their properties and relationships between them and the search for regularities.”

Thus, the aim of analysis is to learn, understand or explain a problem/phenomenon/process by separating its components and subjecting it to research from different perspectives, seeking to explain the mechanism of its origin, and cause-and-effect relationships. Depending on the type of problem, phenomenon or process there are different types of analysis, including medical, biochemical, mathematical, legal, historical, bookkeeping, etc. In the social sciences, a special type of analysis is economic analysis.

Analysis is both a procedure and an applied science; hence, economic analysis can be understood as the science of methods of analysis. **Economic analysis**, which is considered a scientific discipline, **“deals with the evaluation of and explanation for economic phenomena and their interrelationships and determinants by means**

of properly selected research methods” (Dynus, Kołosowska & Prewysz-Kwinto, 2005, 9). In contrast, the scope of economic analysis in terms of the research activity is very broad and multifaceted. The result of this economic analysis should be an objective assessment of, for example, an entity, through the use of appropriate research methods, which is the basis for making appropriate/rational decisions. Walczak states that economic analysis enables the most appropriate variants of economically justified action to be chosen and thus determines the possibility for the entity’s operating effectiveness to be increased (Walczak, 2007, 48). Economic analysis is a tool for achieving a company’s primary objective, i.e., maximizing value for stakeholders. In addition, economic analysis can be considered, on the one hand, as a management tool enabling the implementation of planning and control functions, and on the other hand, as a management tool (economic information system) combining available and recorded information (Jerzemowska, 2004, 14). Examples of definitions of economic analysis are given in table 1.1.1.

Table 1.1.1. Selected definitions of economic analysis

Item	Author/s	Definition
1.	M. Dynus et al.	Economic analysis deals with the evaluation of and explanation for economic phenomena and their interrelationships and conditions by means of appropriately selected research methods
2.	M. Walczak	Economic analysis facilitates the selection of the most appropriate options for economically justified action and determines the possibility for increasing an entity’s operating efficiency
3.	M. Porada-Rochoń	Economic analysis is a key research tool for assessing the financial condition of an entity, primarily using measures and indicators. Economic analysis is used to plan, evaluate and verify the phenomena and processes in the enterprise, and is a tool for decision-making
4.	J. Kowalik	Economic analysis is a system of research methods and the process of coordinating and merging the material and regulatory activities of an enterprise
5.	L. Bednarski et al.	Economic analysis in cognitive terms is a method for studying economic processes and phenomena that involves the breakdown of components or the detection of relationships that occur in the subject under study as a whole

Sources: Dynus, Kołosowska & Prewysz-Kwinto (2005), Mioduchowska-Jaroszewicz, Porada-Rochoń & Romanowska (2021), Walczak (ed.) (2007); Kowalik (2023); Bednarski, Borowiecki, Duraj, Kurtys, Waśniewski & Wersty (2001).

The approaches to defining economic analysis given in table 1.1.1 highlight their interpretative differences arising, for instance, from the point of perspective.

Having analyzed the components of the phenomena and processes, the determinants shaping them and the cause-effect relationships, conclusions for decision-making can be made regarding, e.g.:

- the day-to-day functioning of the entity,
- investment/innovation/development (e.g., entering new sales markets, extending the range/changing the business model),
- processes of adjustment in a crisis situation, or during financial disruption (deterioration of the financial state).

The nature of the subject matter and the scope of economic analysis are inconsistent and depend on (Jerzemowska, 2004, 14):

- the entity carrying out the analysis,
- the purpose of the research conducted,
- the legal status of the entity being audited,
- the accounting principles in force.

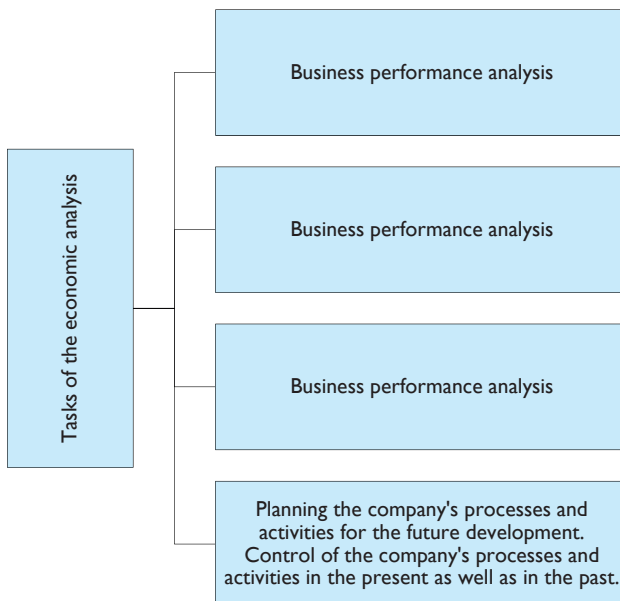


Figure 1.1.1. Tasks of economic/financial analysis

Source: own work.

The tasks of economic analysis, including financial analysis (fig. 1.1.1), involve:

1. Analysis of the company's operational efficiency.
2. Assessment of the company's day-to-day performance, along with its past performance, the identification of positive and negative developments in performance, and the cause-and-effect relationships within this.
3. Planning the company's processes and activities for its future development. Inspection of the company's processes and activities in both the present and the past.
4. Analysis of the data necessary to make decisions on adaptation/restructuring processes and/or improving the company's operations and its results in the future.

Economic analysis is a tool that supports the decision-making process. It should be remembered, though, that the majority of its tasks are carried out using current and/or past data; the future course of events is predicted much less frequently.

Economic analysis is used to evaluate a company's economic efficiency. Hence, both financial and technical-economic analysis are used to examine the effectiveness of the company's objectives, e.g.:

- financial efficiency (profitability ratios, liquidity ratios, performance ratios, capital structure ratios, creditworthiness ratios, cost of capital ratios, capital market ratios, value creation ratios),
- technical efficiency (productivity indicators, indicators of the use and availability of economic resources and others) (Jaki & Kruk, 2022, 30).

Taking decisions in a company can be both very simple and highly complex, requiring multiple analyses and the review of a wide range of factors that can influence the decision's outcome. An entrepreneur launching a new product has to carry out a number of analyses: apart from the obvious economic aspects, these include assessing whether there is a demand for the product, if the product is competitive, predicting its viability, defining the target group, determining distribution channels, identifying what problems may disrupt the production process, and evaluating the national and global economic situations.

Examples:

Examples of simple entrepreneurial decisions:

1. Bakery—whether to finance or lease a new bakery oven.
2. Restaurant—whether to buy new salt shakers and pay cash or use trade credit.

Examples of decisions requiring economic analysis:

1. How to plan the distribution process of a nationwide meal delivery service in order to rationalize costs?
2. How to increase the profitability of a crayon-making process?

Examples of decisions requiring complex analysis, where the economic aspect is only part of the analysis:

1. How to increase the efficiency of a production worker?
2. How to achieve long-term financial goals in a rapidly changing environment?

Consider and analyze:

1. What factors should be considered when deciding which university to go to?
2. Two large furniture and accessories companies have identified growing demand for their products in the past year, yet they make different decisions. The first invests in the construction of a new warehouse, while the second decides on a long-term lease of the warehouse. How do you assess these decisions from an economic and non-economic point of view?

1.2. Criteria for the division of economic analysis

Economic analysis consists of financial, and technical and economic analysis (table 1.2.1). Often the term “economic analysis” is used interchangeably with “financial analysis”, particularly when speaking, although less so in writing. Financial analysis is in fact a part of economic analysis.

Economic analysis is used to assess the company’s objectives and achievements in the past and present, as well as to help forecast future performance. The most popular classification of economic analysis is that by Sierpińska and Jachna (2007).

Table 1.2.1. Classification of economic analysis

Analysis of the company’s operational efficiency		
Economic analysis		
Technical and economic analysis	Analysis of the environment	Financial analysis
1. Production analysis 2. Socio-employee analysis 3. Analysis of the use of fixed assets 4. Analysis of material management 5. Environmental analysis 6. Management analysis (of corporate governance) 7. Analysis of technical and technological progress		I. Horizontal and vertical analysis of the 1. Balance sheet 2. Profit and loss account 3. Cash flow 4. Statements of changes in equity II. Indicative analysis 1. Liquidity and solvency 2. Debts 3. Profitability 4. Risks III. Causal analysis

Source: own work.

Considering the previous work in this field, we would like to propose a new classification of economic analysis, as shown in table 1.2.1.

Financial analysis concerns the financial aspects of the entity being audited. From the financial statements, an assessment is made of its financial health and economic efficiency. The need to link financial analysis to external information, i.e., an analysis of the environment, is stressed. For medium-sized and large enterprises in particular, an evaluation of their performance should be supplemented by sectional analyses, known as technical and economic analyses. When examining the individual sections of a company's activity, the internal and external factors determining its performance must be shown separately since, although their action is usually simultaneous, they may act in completely different directions (Sierpińska & Jachna, 1998, 14). In narrow terms, *financial analysis provides information on a company's financial position, while in broader terms it should be considered in relation to maximizing the company's value* (Pomykalska & Pomykalski, 2017, 13). Financial analysis is an information and evaluation system in terms of achieving company objectives (Walczak, 1998, 62).

Technical and economic analysis serves in a sense to detail the results of the financial analysis, as it focuses on identifying the factors influencing deviations in the financial indicators, their causes, and consequences. The depth of this analysis depends on the practical needs of the financial analysis (Borowiecki & Wysłocka, 2012, 88). It may concern, e.g., an environmental analysis which includes an evaluation of the direct and indirect impacts of water, energy and fuel, waste and waste water, atmospheric emissions and other things. Another example is the socio-employee analysis, which may include professional development and education, the level of employment, occupational health and safety, or product and consumer safety.

As a result of users' growing information needs and the areas that need to be analyzed and evaluated, the number of economic analysis metrics and indicators is increasing.

1.3. Criteria for the breakdown of economic analysis, including financial analysis

Each economic analysis is accompanied by an objective, on the basis of which can be assigned the appropriate breakdown criteria necessary to achieve that objective.

Criteria for the breakdown of economic analysis (Gabrusewicz, 2007):

Criterion: Subject of the study

- *Macroeconomic analysis*: when the entity under study is the economy.
- *Microeconomic analysis*: when the entity under study is an enterprise.

- *Mesoeconomic analysis*: when the entity under study is regional or local (e.g., local government institutions, government agencies, business support institutions).

Criterion: Time horizon

- *Strategic analysis*: focuses on the longer term, on the future, on the environment. Due to the dynamically changing environment, it is becoming increasingly important to be able to anticipate changes, gauge opportunities and threats and, consequently, be able to plan processes, including adaptations, in all areas of the company's operation.
- *Tactical analysis*: aims at a shorter time horizon of up to one year, addresses the company comprehensively and to a lesser extent the environment. It is detailed.
- *Operational analysis*: aims at the day-to-day operation (performance) of the company and the identification of any deviations.
- *Retrospective analysis (ex-post, refers to the past)*: aims at evaluating the actions and decisions taken.
- *Current state (in tempora, operative) analysis*: does an ongoing assessment of the achievement of the company's tasks/objectives.
- *Prospective analysis (ex-ante, refers to future events)*: supports future planning and decision-making, and serves to determine the results of anticipated actions.

Criterion: Frequency of the analysis

- *Ad hoc (occasional) analysis*: refers to the production of an assessment at a specific time, for a specific purpose, for a specific demand, e.g., to make a decision in a certain area.
- *Periodic analysis*: refers to the analysis of a particular area over a specific period of time, e.g., monthly, quarterly, annual.
- *Permanent analysis*: refers to the ongoing evaluation of the entity's activities (selected area) and the entire period of its operation. It provides an immediate analysis of the selected event.

Criterion: Depth of the study

- *General analysis*: includes an overall assessment of the entity's current operations or development.
- *In-depth analysis* is a more detailed investigation of the overall analysis. It aims to identify the factors (variables), their relationships and dependencies affecting the aspects under study.

Criterion: Purpose of the analyses

- *Internal analysis*: provides the information necessary for decision-making to internal stakeholders, including primarily owners, directors/managers, etc.
- *External analysis*: provides information to external stakeholders on the condition of the economic entity.

Criterion: Test methods (Bławat, 2011, 26)

- *Functional analysis*: aims to study specific aspects of economic activity by specialized individuals or organizational units which, by virtue of their powers and functions, are responsible for shaping economic issues and processes. As functional analysis is carried out simultaneously by different people, their viewpoints on the assessment of an aspect may differ, which should be considered a weakness of this analysis, just as another weakness of this analysis is the validity of both the information collected and the indicators needed to formulate conclusions (Bławat, 2011, 26).
- *Comprehensive analysis*: involves evaluating economic activity from the standpoint of the links and dependencies that exist between economic issues. It includes a comprehensive look at the business activity of the enterprise (unit). It is more time-consuming and more difficult to carry out. However, as each aspect should be considered from the point of view of the enterprise's end goal, it is an improved tool for understanding and assessing economic issues occurring in the enterprise (unit) compared to functional analysis (Gabrusewicz, 2014, 33–34).
- *Decision analysis*: addresses and evaluates important choices faced by businesses, especially decisions with a high level of risk. These decisions are attributed to economic issues in a cause/effect and chronological order. The research addresses the period starting with the first effect of a decision and lasting until a certain point or the end of the action triggered by the decision (Gabrusewicz, 2014, 33–34). It requires skills in associating technical, organizational, social and economic issues and knowledge of modern computing techniques (Gabrusewicz, 2014, 33–34).

Examples:

1. Criterion: Intended use of the analysis – internal analysis

Assuming that the company in question produces ski equipment and accessories, then an internal analysis can look at one sales profile to identify the bottom line and margin level for internal management purposes.

2. Criterion: Time horizon – prospective analysis

Assuming that the company in question is planning to develop and launch a new product, a prospective analysis can be used e.g., by an investor on the profitability of investing capital in the development of the new product.

Consider and analyze:

1. Considering the time horizon, which types of analysis are there? In what situations can they be applied?
2. If the stakeholder is a bank, what kind of analysis will it expect the company to provide?

I.4. Reference materials used for economic analysis, including financial analysis of the company

Information shapes managers' awareness of what is going on within the company and its internal and external environment. It is generated by the company's accounting system, whose primary function is informational (Sadowska, 2018, 226). According to Sadowska, "Information is a set of messages about facts, events, activities, presented in such a form that allows the decision-maker to relate to a given situation and determines the most effective and efficient management decision-making" (Sadowska, 2018, 229). The extent of information required for an economic analysis depends on the information needs, the purpose of the analysis, the depth, the analytical methods, etc. This, in turn, determines the choice and selection of the source of information.

A broad classification of information sources for economic analysis was proposed by Bławat (2011) (fig. 1.4.1).

In general, reference materials can be divided into:

1. Internal materials and
2. External materials.

Internal materials include:

1. *Registered materials:*
 - Primary documentation, which includes all documents related to the business;
 - Secondary documentation, which includes pre-processed data.
 - Entries made in analytical and synthetic recording devices (e.g., general ledger and subledger, registers, tubulograms).
 - Financial reporting, which includes statements, accounts, notes, checks, reports (Bławat, 2011, 12–14).
2. *Non-registered materials:*
 - Material and financial plans, which include e.g., business plans, calculations, cost estimates.
 - Results of previous analyses.
 - Documents from previous audits and reviews.
 - Reports and minutes from supervisory and management board meetings (Bławat, 2011, 12–14).

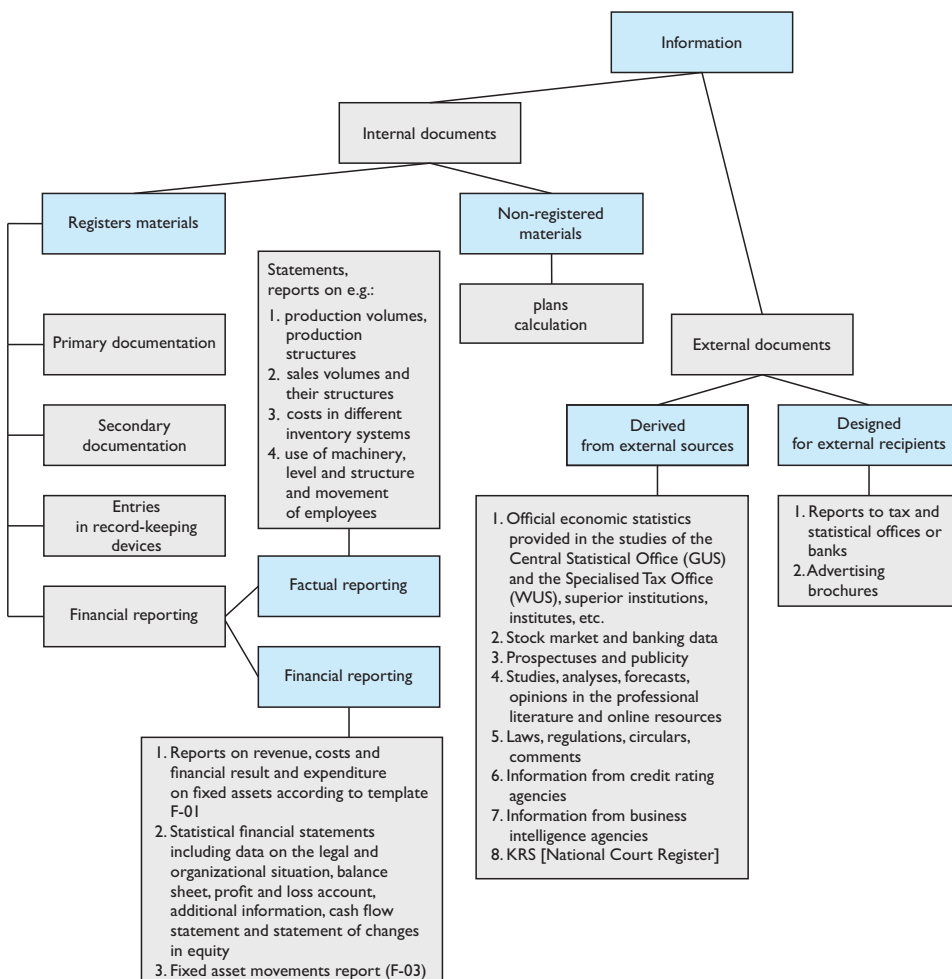


Figure 1.4.1. Classification of information resources for economic analysis

Source: Bławat (2011, 13).

External materials include (Bławat, 2011, 13):

1. *Those derived from external sources:*

- official economic statistics provided by the Central Statistical Office (GUS) and the Specialized Tax Office (WUS), superior institutions, institutes, etc.,
- stock market and banking data,
- prospectuses and publicity,
- studies, analyses, forecasts, opinions in the professional literature and online resources,

Reference materials used for economic analysis, including financial analysis of the company

- laws, regulations, circulars, comments,
 - information from credit ratings agencies,
 - information from business intelligence agencies,
 - KRS [National Court Register].
2. *Materials from internal sources for external recipients:*
- reports to tax and statistical offices or banks,
 - advertising brochures.

The key source of information on an economic entity's financial health remains financial reporting, which, Sawicki says, is a set of financial statements prepared by an economic entity according to the applicable templates and submitted within specific deadlines (Sawicki, 2009, 272). Financial reporting provides a plethora of useful information expressed in money. However, this is not a complete set of information for assessing a company's market position. Hence, there is a need to supplement this information with materials and data from the environment, including market conditions, as these have a direct impact on the company's operations. Systematic analysis of the environment provides vital information that enriches the collection of sources for economic analysis.

The information usefulness of financial statements is also an important issue. Zielińska's (2023) research indicates that there is a need to expand financial reports to include new data that consider the key information needs of managers in their decision-making process. A financial report that provides the relevant information in an easy-to-understand format can increase the efficiency of managers, reducing the time needed for data analysis and decision-making. Another advantage is the increased accuracy of the forecasts. A properly structured and tailored financial report can improve the accuracy of forecasts, which can guide managers in their planning and management.

Examples:

The balance sheet is a static statement that presents financial data as on the exact date of drafting. It is not a sufficient financial document showing financial health. Only by analyzing additional statements such as the profit and loss account and the cash flow statement and any other information does it provide a more comprehensive picture of the company's financial health and allow the financial analyses necessary for decision-making within the company to be carried out.

Consider and analyze:

1. What role do external materials play for the company and its management?
2. How do you assess the validity of financial reporting against other material?

I.5. General and specific methods used in economic analysis

According to the PWN dictionary, “method” is a term used in several different senses, the most important of which are:

- a course of action, selection of the type of action (selection and sequence of steps of a complex action) consciously applied with the possibility of repetition in all cases of a given type;
- a set of activities and measures used in a specific way to achieve a specific objective;
- a way of completing a given practical task or solving a theoretical problem;
- a set of general assumptions adopted as a framework or guideline for the study (PWN).

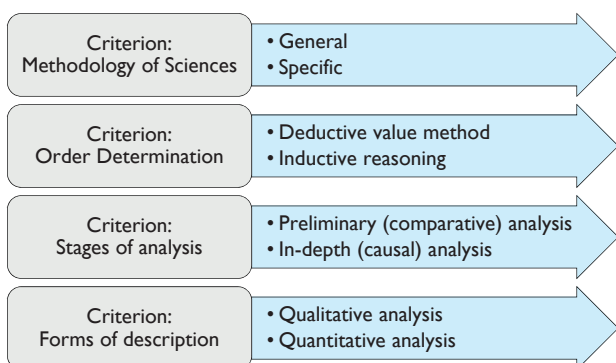


Figure I.5.1. Methods of economic analysis

Source: study based on Gabrusewicz (2019, 37).

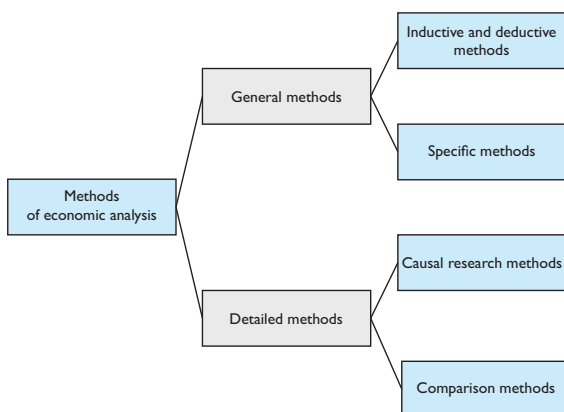


Figure I.5.2. Overview of general and specific methods

Source: own work based on the subject literature.

Methods of economic analysis can generally be divided into general and specific, but there are additional criteria for division, as shown in fig. 1.5.1.

General methods are based on logical thinking, the ability to associate facts and cause-and-effect relationships, and accurate inference. This division is shown in fig. 1.5.2. These methods are universal and can be used in scientific research.

The inductive method, also known as the method of integration, involves the study of phenomena, moving from specific observations to broader generalizations and theories, from factors to results, from causes to effects. With deductive reasoning, conclusions and generalizations are formulated on the basis of the analysis of partial, specific data.

Deductive reasoning, informally called a ‘top-down’ approach, works from the more general to the more specific, from results to factors, from effects to causes. In deductive reasoning, we start from general processes/phenomena and successively analyse the specific factors that shape the results of the general process/phenomenon.

Specific methods are general methods, also known as techniques of economic analysis, used to quantify the relationships between different economic phenomena (Kowalczyk, 2017, 38).

Moving to **detailed methods**, on the other hand, a distinction can be made between **comparison methods** and **detailed research methods**.

The comparison method is one of the most important methods used in economic analysis. It involves the comparison of at least two variables defining economic quantities, one of which is the actual state of affairs and the other the basis for comparison, also known as the reference, benchmark or base. The result of the comparison are deviations that can be expressed in absolute (positive or negative) or relative (percentage) numbers.

There are three directions:

1. **Comparison over time**—consists in assessing changes/dynamics of variables, measures, indicators of the period under consideration in relation to the previous period(s) (e.g., a month, a quarter, a year) or future periods.

Comparisons over time, depending on the adopted basics, can be divided into (Wersty, 1996, 38):

- *Ordinary time comparisons*—based on a fixed basis, i.e., on indicators from one selected period, called the base (single base indicator).
- *Chaining comparisons over time*—ascending at the base of the variable, whereby each time only indicators from the period preceding the period under study are taken as a reference basis (multiple indicators).

By comparing over time, company managers are able to assess, e.g., how the achieved sales profitability ratios have developed in recent years, whether there has been an increase/decrease in sales profitability, and whether and how big the increase/decrease is.

Example:

- Comparison of sales revenue volumes in 2023 vs. 2022 and 2021.
- Comparison of ROE in Q1 2023 vs Q1 2020.
- 2. **Comparison with normative values**—relates the achieved values of the indicators to the normative values defined for these indicators, either averages for the industry or in relation to the plan.

By comparing with normative figures, company/entity managers are able to assess, e.g., how the current liquidity ratio develops in relation to a norm based on a theoretical basis, or in relation to a plan/calculation/budget; what are the deviations?

Example:

- Comparison of the achieved level of the return on sales (ROS) indicator of the company under study to the normative figure (standard) adopted for this indicator
- 3. **Spatial comparison**—involves comparing the values of indicators of the entity under study with the values of indicators of another entity while maintaining the principles of comparability (e.g., same entity size, same sector).

In terms of **spatial comparisons**, we can distinguish between (Jerzemowska (ed.), 2018, 25):

- *Internal spatial comparisons*—these relate to the comparison of a particular company. They may concern various types of confrontation of economic indicators in the economic units that make up this enterprise. Depending on the complexity of the organizational structures in a given unit, the degree of completion of sectional production or financial tasks, workplaces, etc., may be subject to comparison.
- *External space comparisons*—these relate to the comparison of indicators characterizing the company under study to selected data for other companies and the company's environment. Comparisons can be inter-plant, regional, national, or international, but always with the principles of data comparability.

Examples:

- Comparison of the achieved level of overall debt ratio at the company surveyed with the average for this ratio in the industry in the voivodship.
- Comparison of the achieved level of overall debt ratio at the company surveyed with the average for this indicator in the industry in the whole of Poland.
- Comparison of the achieved level of inventory turnover at the company surveyed with the performance of the largest competitor.

As already highlighted, in comparative analysis it is extremely important to consider the comparability of the data, following the principle that in economics not everything can be compared with everything. Incorrect assumptions about comparisons will result in incorrect interpretations/conclusions/assessments, which in turn translates into the uselessness of the comparative analysis carried out.

In order to minimize errors that may occur in the comparison process, it is necessary to indicate the potential deviations that may occur (Jerzemowska (ed.), 2018, 28):

- **Methodological deviations** may occur, e.g., in relation to:
 - the methodology for calculating a specific indicator,
 - differences arising from the construction of the financial statements,
 - differences in accounting standards,
 - differences in the adopted methods of comparison (at the international level).
- **Financial deviations** may occur in relation to the underlying data adopted and the data to be compared, as there may be differences between them, e.g., in terms of wages, depreciation rates, taxation rates, lending rates, etc.
- **Organizational deviations** may occur through organizational and legal transformations. For example, redefinition of the business model, adjustment processes, restructuring, mergers or acquisitions.
- **Material deviations** may be the result of organizational changes. They can be linked to changes in the range of products/services offered, including the expansion or narrowing of the offer, developments in technology and techniques.

It should be remembered that some of the deviations identified may occur at company level, or regionally, while others may be at national or international level. Whatever the level of deviations, efforts should be made to eliminate them or minimize their impact on economic/financial indicators. Identifying the type of deviation and knowing the potential magnitude of its impact can also influence the effect of the comparative analysis.

Causal research methods involve looking at the relationships that exist between certain financial phenomena. These methods enable the reasons for the formation of the phenomena to be detected. Causal research establishes the direction and strength of the influence of specific factors on the course of the phenomenon under investigation, including the deviations found during the course of the research (Nowak, 2005).

In economic analysis, by adopting the criterion *of the form of description*, we can distinguish between qualitative analysis methods and quantitative analysis methods.

The qualitative method, also called the descriptive method, involves conducting a comparative analysis of time series dynamics (Bednarski & Waśniewski, 1996, 128).

This method is applicable to describe non-measurable phenomena. It can also be used for the graphic or verbal presentation of measurable phenomena. The qualitative method may complement the quantitative method. The advantage of the qualitative method is its easy application in practice, while the disadvantage is the inability to use it to investigate the relationships between the variables studied (Leszczyński & Skowronek-Mielczarek, 2000, 41).

The quantitative method is used to quantify the relationship between the variables under study. Quantitative methods include stochastic methods and deterministic methods. Stochastic methods recognize random events, while deterministic methods consider the underlying factors, but do not take into account the influence of the random component, or the extent and direction of the influence of the individual components on changes in the phenomenon (Leszczyński & Skowronek-Mielczarek, 2000, 41).

The economic analysis mainly uses (Jerzemowska, 2006, 21):

1. **As part of deterministic methods:**
 1. The method of successive substitutions;
 2. The partial differences subtraction method;
 3. The logarithm method;
 4. The functional method.
2. **As part of stochastic methods:**
 1. The statistical method;
 2. The econometric method;
 3. The taxonomic method;
 4. The discriminant method.

A selection of methods is presented below, and on the basis of these, examples of tasks are provided throughout the book.

One of the most commonly used deterministic methods is the **method of successive substitutions**. This method may take the form of a chain substitution method or a differentiation method. It involves identifying the reasons for differences between the actual quantities of the phenomenon under study and the baseline quantities. The essence of this method is that individual factors are successively substituted for a specific phenomenon in the base period in the magnitude of the study period, maintaining the substitutions once made in all subsequent periods (Kowalczyk, 2017, 40). The following sequence of events is adopted in this method:

1. Determining the cumulative deviation between the quantity to be compared and the quantity taken as the reference (base).

2. Identifying the factors contributing to aggregate deviations and the causal relationship that exists between them.
3. Conducting subsequent substitutions for individual factors, while maintaining the mode of conduct recognized in theory and practice: first, quantitative factors are substituted, and then value factors (prices, wage rates, etc.) are taken into account, while maintaining the previously substituted quantitative factors.
4. Listing partial deviations and their interpretation (Engelhardt, 2000, 30).

As a result of the successive substitution method, the findings of the analysis provide information on the extent to which the value of the phenomenon under study has changed under the influence of a specific factor. This method is one of the relatively simple methods that require little work. In this method, the key is to correctly determine the order of substitutions, which determines the findings and its usefulness.

The iterative method tries to solve an equation by successive approximations to its solution, substituting the individual base elements with the actual data and determining the partial deviations on the basis of the so-called corrected products that emerge.

The method of successive substitutions can be used in analytical studies when there is a linear relationship between individual phenomena. The effect of changing one phenomenon by a certain amount on the change in another phenomenon can be determined when there are constant cause-and-effect relationships between them. The result of the calculation will be correct if the relationships do not depend on the mutual influences of the factors affecting the phenomenon under consideration (Jerzemowska (ed.), 2004, 32).

The logarithm method achieves accurate results. It may seem complicated, especially for business practitioners, due to the need to calculate logarithms. However, if we use a computer or calculator to do this, the degree of difficulty involved in this method is negligible (Urbańczyk et al., 2001, 95). Compared to the method of successive substitution, it produces much more precise results. In the logarithm method, the analysis of the quantitative impact of individual factors on the phenomenon under study is estimated by calculating the decimal logarithms of the factors influencing the phenomenon and the phenomenon itself (Chomać-Pierzecka, 2008, 7–28).

When considering the degree of labor intensity for the above methods, it can be concluded that the simplest calculation techniques are the chain substitution method and the residual method. Of the methods that allow the relatively accurate calculation of individual deviations, the function method is less labor-intensive than the cross-substitution method when three factors are present, while the situation is the opposite with two factors. As already pointed out, the labor intensity of the

calculations in the logarithm method (irrespective of the number of factors) is significantly reduced if, e.g., a computer program is used (Urbańczyk et al., 2001, 95).

Each of these methods has its advantages and disadvantages; none of them can be considered absolutely certain and definitively conclusive as to the contribution of individual factors to the process of change of an economic phenomenon under study, but the results obtained using these methods produce much better results than logical reasoning alone without the support of mathematical apparatus.

The discriminatory method uses discriminatory models, which combine traditional indicator analysis with discriminatory methods. Their relevance in assessing financial health to forecast bankruptcy is unquestionable. Discriminatory models are considered to be highly accurate in assessing the solvency of the entity under investigation and allow symptoms of deteriorating financial health to be identified. The literature points to a number of models, which are configurations of different indicators and metrics and their weights, subject to the specificities of the sectors.

The first multivariate **bankruptcy prediction model** was developed by E. I. Altman. He developed the Z-score, consisting of both traditional single-criteria financial analysis methods and a statistical method, i.e., multi-criteria discriminant analysis, to identify the probability of bankruptcy in a specific future. Under Polish conditions, several models have been developed that take into account the specificity and conditions. Bankruptcy forecasting models show a very high degree of usefulness in economic analysis, as their use, together with an in-depth analysis of the company's condition, provides important information not only to owners but also to investors, thus facilitating key decisions that determine the survival of the company and, if possible, its growth.

Deterministic and stochastic methods can be used together, complementarily. Deterministic methods are primarily used for retrospective, past (ex post) research while stochastic methods are used for prospective, future (ex-ante) research.

The choice of the research method is determined by the purpose as well as the available data. Following the method(s) used, the analysis is carried out and conclusions and recommendations are formulated, unless the research procedure requires other research stages to be added. The presentation of the results is also an important issue, as it can either enhance the perception of the analysis in its final form or, in the case of a form of presentation ill-suited to the data, hinder it. Whichever form of presentation of the economic analysis (i.e., numerical, graphical or descriptive form) is chosen, it needs to be, above all, transparent and readable.

I.6. Importance of environment analysis in economic analysis, including financial analysis

The analysis of a company's activities through the prism of economic analysis, including financial analysis, should be considered together with the analysis of the environment, as the environment influences the company and its operation on the market. A systematic and multifaceted analysis of the environment should be a *sine qua non* for the functioning of a modern enterprise. The results of this analysis should form the basis for decisions that stabilize, condition survival and, above all, aim to develop and create competitive advantage (Porada-Rochoń, Brojak-Trzaskowska, Kordela, & Tomczyk, 2018, 13).

Decisions made in a company are determined by a variety of factors; hence their understanding and knowledge of their potential impact is very valuable. It is important to take into account the impact of external determinants on financial decisions that depend on the broadly understood environment. Environmental analysis should be an integral part of economic analysis, as the environment affects processes and activities within the enterprise, and should be carried out systematically. The question of the rationality of decision-making is also not insignificant. As Over points out, "People, together with the mental states or processes that characterize them and the actions they take, are rational when they meet certain cognitive standards. It is an action related to reason, referring to what is correct or at least justified by reasoning" (Over, 2004). When it comes to the role of behavioral finance in decision-making, it is worth highlighting, among other things, the fact that behavioral finance assumes that individual financial decisions are influenced by emotions and mood, and can be influenced by personality, experiences, judgements and particular social relationships, which can cause biases and cognitive errors (Valaskova, Bartosova & Kubala, 2019, 73).

A company's environment includes a range of phenomena and processes within it—globalization, financialization, the phase of the business cycle, macroeconomic factors, technical and technological developments and innovations, etc. (Valaskova, Bartosova & Kubala, 2019, 11). The analysis of the environment provides a variety of external information necessary to make the right decisions (e.g., regarding the conditions for market expansion, expansion of the product/service range, upgrading of the production line) and can refer to (Sierpińska & Jachna, 1998, 12):

- evaluation of social and legal conditions,
- market analysis,
- competitor analysis.

More broadly, components of the company's **macro-environment** most commonly include the:

- **Economic environment**, referring to the health of the economy. The health of the economy is determined by macroeconomic factors such as GDP, inflation, unemployment or debt levels.

It has a very significant impact on decision-making. Example: Decisions to invest in additional machinery for the production of higher-end goods are taken differently in a downturn and consumers are less willing to buy than in an economic upturn.

- **Technological environment**, which is expressed in terms of the progress and development of technology and engineering, which is linked to the development of innovation and expenditure on research and development (R&D). It has a significant impact on the level of development and advancement of artificial intelligence, robotization and automation.

The development of artificial intelligence and robotization is affecting, e.g., employment levels in factories and warehouses, due to the greater substitutability of human labor by processes. The life cycle of many products is also shortened.

- **Demographic environment**, involving adapting production to the size and structure of the population of a given society—orientation to the demographic trends is important for producers as well as insurance institutions and banks (Kowalczyk, 2017, 29).

In the case of an ageing society—such as the one we are currently living in—there is increasing demand for e.g., care homes for the elderly, caregivers for the elderly, support products and services for the elderly. Market needs are changing, which affects consumer decisions as well as those of producers.

- **Sociocultural environment**, referring to trends and developments in changes in lifestyles, attitudes towards work, environmental protection, leisure activities, social activation processes, traditions and religions, the universalization of consumption patterns, the level of civilizational development, the shift away from the welfare state model, and changes in the social status of women (Sołek-Borkowska, 2016, 25–26).

Examples include a growing demand for ready-made lunch dishes available in supermarkets or vending machines. Another example is a decision to enter the tea market in a country where there is no such tradition, e.g., Italy.

- **Political and legal environment**, which is analyzed from the point of view of the presence of the main political forces, the stability and destabilization of power, social tensions political alliances, the position of the country and in the world; laws and regulations.

One example is a decision to open a business, e.g., by considering the lowest cost of running that business in the chosen country and the legal conditions related to it, such as building regulations.

- **International environment**, considered through the prism of international business factors, which can include: globalization and internationalization of the economy (opportunities and threats; positive and negative effects), economic and legal regulations for doing business in a given country, the country's membership of economic, political and military groupings, sanctions and restrictions applied to international trade, natural and military threats, etc.

An example is a decision to enter new markets or withdraw from a given market (e.g., due to war).

- **Ecological environment**, analyzed through the prism of climate and natural resources. Decisions are influenced by the level of public knowledge, awareness and sensitivity about climate change, ecology and environmental protection, the impact of ecology on life, countering environmental risks, as well as the increasing level of knowledge about the positive relationship between environmental management and corporate financial performance. It also includes legislation related to environmental protection, nature conservation, waste, etc.

An example is when companies decide to change raw material suppliers due to climate change (e.g., droughts). Another example is when a number of large multinational companies have decided to increase spending on campaigns to raise consumer awareness of environmental issues. A further example is companies' commitment to ESG reporting.

The consideration of external factors in the economic analysis has a significant impact on the results of the analysis carried out and determines the achievement of the company's objectives and its growth opportunities. The strength of the environment's impact on the company is such that monitoring the environment, as well as identifying and assessing the changes that occur, should be one of the company's most important activities. It is necessary to adapt the company to the changes in the environment in which it operates while identifying potential opportunities, threats and barriers as well as minimizing the risk of their occurrence. The fact that today's businesses operate in a volatile and barely predictable environment implies the need for managers to react quickly to adapt to change, often requiring a redefinition of the business model (or parts thereof). This, in turn, requires managers to have the knowledge and skills, as well as the interpersonal qualities necessary to drive effective change. In summary, today's business environment, the processes and phenomena that occur therein and the factors they create significantly influence the choice

and shape of decisions. Hence, it should be important for business managers to take a conscious approach to analyzing the environment from multiple perspectives, in a deliberate and non-incidental manner.

Example:

The COVID-19 pandemic lockdowns had a huge impact on businesses worldwide. For instance, language schools and training centers had to move their services online in a very short space of time.

Consider and analyze:

1. Give an example of a foreign company in the catering industry that was established in Poland but after some time decided to withdraw from the market. What do you think were the reasons for such a decision?
2. Why are more and more companies analyzing the environmental and socio-cultural environment? Give examples of companies that have made ecological or socio-cultural changes to their business model.

1.7. Stakeholders—users of economic analysis

Stakeholders are individuals or institutions that share a various degree of interest in the operation of an economic entity.

Examples of stakeholders are shown in fig. 1.7.1.

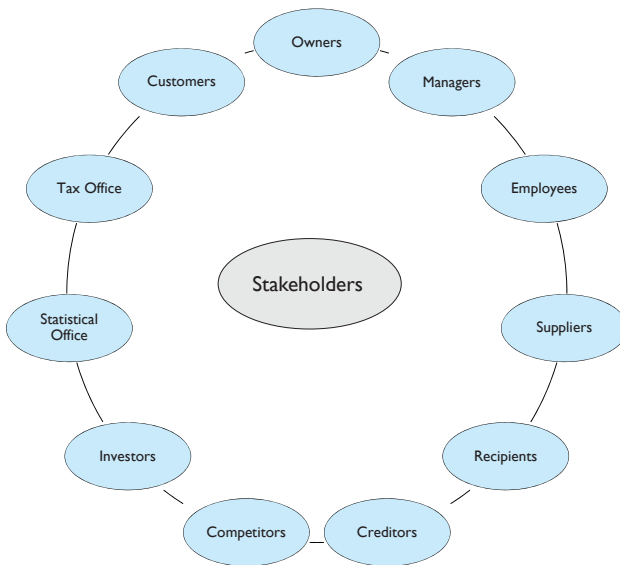


Figure 1.7.1. Examples of a company's stakeholders

Source: own work.

The results of the economic analysis are of interest to a wide range of stakeholders with differing expectations regarding the scope of information. Stakeholders' knowledge of economic analysis also varies, as do users' information needs, which will translate into differentiated decisions. At the same time, it should be emphasized that financial statements as well as economic analysis are not aimed at a specific audience—they are standard—but once the specific needs of the stakeholder have been identified, it is possible to select the data necessary to make decisions.

If there is no information, the information needs of the company and stakeholders are not fully met, limiting the ability to make sound and appropriate managerial decisions. In the context of emerging uncertainty, the information needs of the company and stakeholders rise (Daft, 1992).

The information obtained forms the basis for various decisions. Key stakeholders are owners and managers who, thanks to the results of economic analysis, can make decisions about the survival of the company and its development. Employees, shareholders, creditors, suppliers, customers, competitors, investors, statistical and tax offices, etc. are also affected by the results of the economic analysis. A manager has different information needs than a creditor (see an example below). For example, a stock market investor uses a great deal of data in the decision-making process, including financial data that affects share prices after the publication of reports, the most important events of the quarter, investment policy, significant contracts, a description of financial data and business risk (Lulek, 2018, 25).

Corporate reports are devoting more and more information to non-economic issues (see more in point five), e.g., charitable activities of the business entity, environmental/ecological issues, related to corporate social responsibility or corporate governance (CSR or ESG reports), etc.

It should be noted that the financial statements that form the basis for the economic analysis are based on historical data, which involves many risks that may lead to wrong decisions, e.g., not being able to raise additional funds for the completion or implementation of a new project, overinvestment, loss of orders due to insufficient stock levels, or holding cash in the organization instead of investing it. Hence, it is important to consider the potential risks that may jeopardize the achievement of the objectives.

Information from economic analysis should form the basis of the decision-making process, but it should undoubtedly be supported by a number of additional analyses (depending on information needs), e.g., analysis of the competition, industry, market, macroeconomic situation. A complex approach, supported by selected, differentiated information will prevent/minimize errors/risks in the decision-making process.

Examples:

1. A bank (creditor) deciding whether or not to grant a business development loan is interested in whether the company will be able to pay its debts as they fall due. It uses, among other things, a business plan for the venture, an analysis of the current health of the company (including liquidity and solvency), and a cash flow analysis.
2. Managers expect detailed data on the financial health of the company in order to make rational decisions on the survival and growth of the business.
3. The tax office will mainly be interested in the Income Statement to calculate/verify the tax due.
4. Employees expect, above all, information on the financial stability of the employer, the ability to pay salaries and potential salary rises.
5. Society: for example, students need the statements required to carry out a ratio analysis to assess the financial health of a company which is the subject of their Bachelor's dissertation.

Consider and analyze:

1. What information does the investor need? Should their decisions be based solely on financial data?
2. What information does the customer expect?
3. If you were to buy a new T-shirt, what information about the company would you want to know? What information is relevant to you in deciding whether to purchase that T-shirt?

1.8. Ways to present the results of the economic analysis, including financial analysis

Any economic/financial analysis requires bespoke presentation catering to the needs of the recipient. Most often, the results of the analysis are given in the following ways:

- numerically,
- graphically,
- descriptively.

Ways to present the results of the economic analysis, including financial analysis

The numerical form presents the results by means of data expressed in absolute and relative quantities, and using statistical measures (fig. 1.8.1).

Balance sheet item			
	2019	2020	2021
1. Fixed assets	405377	385 964	367 372
2. Current assets	389762	404 918	446 604
Asset flexibility ((1:2)x100)	104%	95%	82%

Short-term liabilities calculated/adjusted			
1. Short-term liabilities item from the balance sheet	83444	67 384	86 96
2. Trade liabilities maturing over 12 months	0	0	0
3. Short-term liabilities calculated/adjusted (5-6)	83444	67 384	86 967
Short-term inequality (4:7)	4.67	6.01	5.14

0,98<0,99>0,86<0,87<0,98

Items	Variant I	2020	2021
Net financial result	profit	+	+
Cash flow from operating activities	excess inflows (positive)	+	+

Assets	2019	2020	2021	dynamics index in %	
				2020/2019	2021/2020
	405377	385 964	367 372	95	95
Fixed assets	385396	367 898	354 122	95	96

Figure 1.8.1. Numerical presentation of results

Source: own work based on data from later chapters.

A graphical representation of the results means that not only can numerical data using various graphs illustrate the findings of the analysis, but they can also show trends in change, relationships or dependencies (fig. 1.8.2).

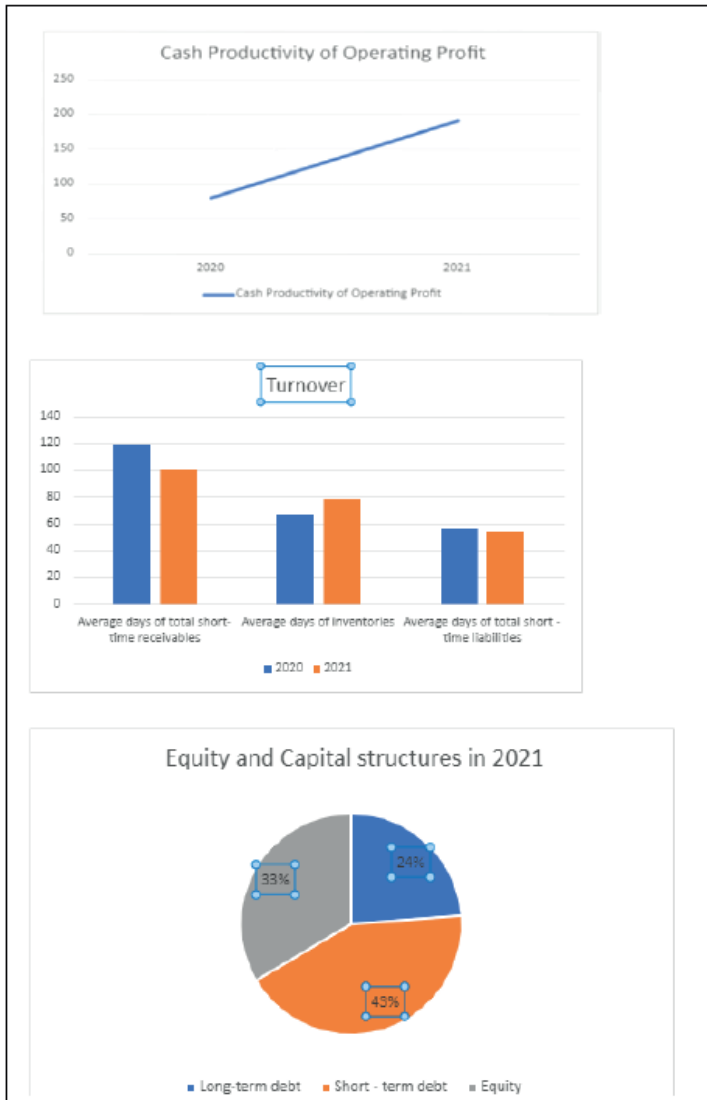


Figure 1.8.2. Graphical representation of the findings

Source: own work based on data from later chapters.

A descriptive presentation allows for a verbal interpretation of the findings and cause-and-effect relationships, if any (fig. 1.8.3).

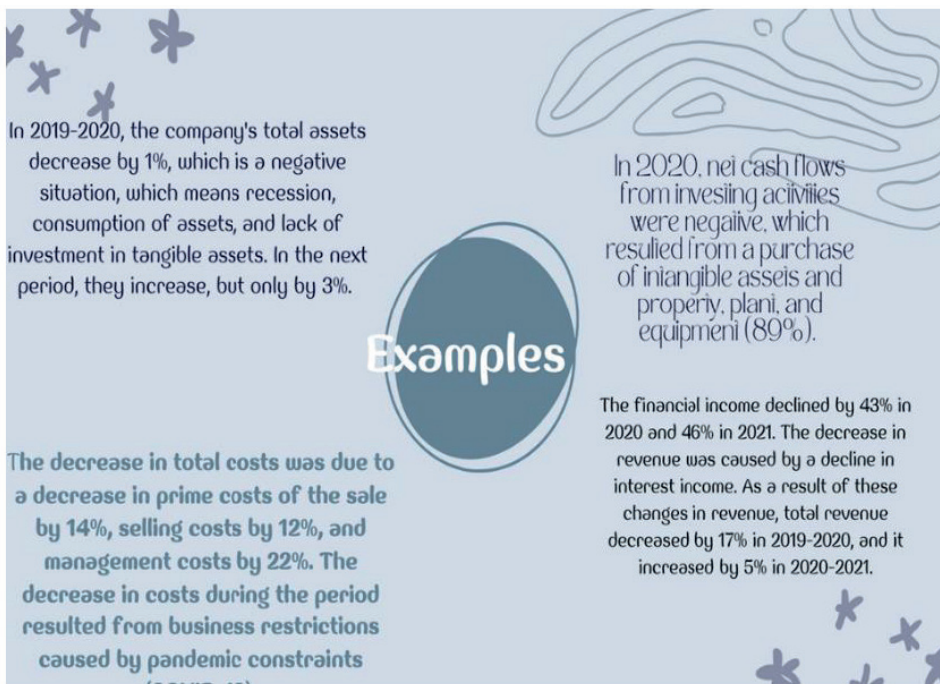


Figure 1.8.3. Descriptive presentation of the findings

Source: own work based on data from later chapters.

In practice, reports usually use all three forms of presentation for a more complete communication of the findings. The use of color is not insignificant for the audience.

Chapter II Horizontal and Vertical Analysis

Introduction

IAS 1 sets out the overall requirements for the presentation of financial statements, guidelines for their structure, and the minimum requirements for their content. It requires an entity to present a complete set of financial statements at least annually, with comparative amounts for the preceding year (including comparative amounts in the notes). A complete set of financial statements comprises:

- a statement of the financial position as at the end of the period;
- a statement of profit and loss and other comprehensive income for the period. Other comprehensive income is those items of income and expense that are not recognized in profit or loss in accordance with IFRS Standards. IAS 1 allows an entity to present a single combined statement of profit and loss and other comprehensive income or two separate statements;
- a statement of changes in equity for the period;
- a cash flow statement for the period;
- notes comprising a summary of significant accounting policies and other explanatory information; and
- a statement of the financial position as at the beginning of the preceding comparative period when an entity applies an accounting policy retrospectively or makes a retrospective restatement of items in its financial statements, or when it reclassifies items in its financial statements.

An entity whose financial statements comply with IFRS Standards must make an explicit and unreserved statement of such compliance in the notes. An entity must not describe financial statements as complying with IFRS Standards unless they comply with all the Standards requirements. The application of IFRS Standards, with additional disclosure when necessary, is presumed to result in financial statements that achieve a fair presentation. IAS 1 also deals with going concern issues, offsetting, and changes in presentation or classification.

The purpose of this chapter is to provide a preliminary assessment of the financial statements of a selected company operating on the public market in Poland.

The preliminary assessment includes vertical and horizontal analysis. Horizontal and vertical analysis is a crucial stage in the analytical study and is one of the stages of analytical work. Focusing only on indicator/ratio analysis and overlooking the first stage of the study is a methodological error made due to the illusory ease and universality of indicator analysis. Horizontal and vertical analysis of financial statements is often a prerequisite for conducting the next stage of research on analytical work. The primary stages of analytical work are as follows (Wersty, 1996):

STAGE 1—measurement and preliminary assessment:

- defining the purpose of the study;
- accurately defining the object of study to determine the appropriate scope of research;
- determining reference bases for the comparative method;
- calculation of the deviation of the quantity studied (dynamics/growth rate analysis, horizontal analysis);
- examining a given phenomenon's structure (structure analysis, vertical analysis);
- formulating preliminary research hypotheses relating to a specific research goal.

STAGE 2—causal analysis:

- forming a preliminary hypothesis;
- selecting evaluation criteria and reference bases;
- identifying the tools (indicators and/or models) required to conduct the analysis;
- conducting a study and drawing comparisons with the adopted reference bases;
- determining the causes and consequences of identified distortions;
- determining directions for the rationalization of economic activities;
- observing and evaluating the efficacy of the measures taken and modifying them.

The preliminary stage of the financial statement examination aims at:

- a) making a preliminary scrutiny of the organization's financial situation concerning the enterprise as a whole or only a specific part of it. The findings of this analysis will help draw conclusions from further investigations;
- b) examining what items in the studied financial statements are relevant to the company's financial position, to better select detailed indicators in the subsequent analysis;
- c) determining the items in the financial statements that affect the problem appearing in the extended analysis.

We shall start with a characterization of horizontal analysis. **Horizontal analysis**, also called trend analysis, refers to studying the behavior of individual financial statement items over several accounting periods. These periods may be several quarters within the same fiscal year or several different years. The analysis of a given item

may focus on trends in the absolute dollar amount of the item or trends in percentages. For example, a user may observe that the revenue increased from one period to the next by \$42 million (an absolute dollar amount) or by a percentage, such as 15 percent. The absolute amounts of particular financial statement items have many uses. Various national economic statistics, such as gross domestic product (GDP) and the amount spent to replace productive capacity, are derived by combining absolute amounts reported by businesses. Financial statement users with expertise in particular industries might evaluate amounts reported for research and development costs to judge whether a company is spending excessively or conservatively. Users are particularly concerned with how amounts change over time. For example, a user might compare a pharmaceutical company's revenue before and after the patent expires on one of its drugs. However, comparing only absolute amounts has drawbacks because materiality levels differ from company to company or even year to year for a given company. The materiality of information refers to its relative importance. An item is considered material if knowledge of it would influence the decision of a reasonably informed user. Generally accepted accounting principles permit companies to account for immaterial items in the most convenient way, regardless of technical accounting rules. For example, companies may expense, rather than capitalize and depreciate, relatively inexpensive long-term assets like pencil sharpeners or wastebaskets, even if the assets have useful lives of many years. The concept of materiality, which has both quantitative and qualitative aspects, underlies all accounting principles. Percentage analysis involves computing the percentage relationship between two amounts. In horizontal percentage analysis, a financial statement item is expressed as a percentage of the previous balance for the same item. Percentage analysis sidesteps the materiality problems of comparing differently sized companies by measuring changes in percentages rather than absolute amounts. Each change is converted to a percentage of the base year.

When financial statements for a certain number of years are examined and analyzed, the analysis is called *Horizontal Analysis*. *Horizontal analysis* is also called *Dynamics/Growth Rate Analysis*.

It is based on the data or information spread over the years rather than on one date or a period as a whole (Alamry, 2020, 13).

Horizontal (dynamic) analysis is based on computations from the dynamics index (in %) or the rate of change ratio (ROCR) when the dynamics index cannot be applied. The formula for the dynamics index is as follows:

$$\frac{\text{dynamics}}{\text{growth}} \text{ index \%}(di\%) = \frac{\text{volume of ad phenomenon(process)}t}{\text{volume of ad phenomenon(process)}t - 1} \times 100$$

Where:

a volume of a partial issue (process) **must be** greater than zero.

The dynamics index interpretation is as follows:

- $di\% > 100\%$ —an increase in the value of the issue under study in a given period compared to the base period by such percentage as the surplus above 100%;
- $di\% = 100\%$ —the issue under study remains unchanged compared to the baseline;
- $di\% < 100\%$ —a decrease in the value of the issue under study in a given period compared to the base period by such percentage as the difference between the value obtained and 100%.

When evaluating economic phenomena expressed in negative numbers, we cannot use percentage changes in the dynamics index to study dynamics, as a horizontal analysis based on such an indicator leads to misleading conclusions. Therefore, when evaluating economic phenomena expressed in negative values or when they are alternately positive or negative, we use **the rate of change (growth) ratio (ROCR)**. The formula for ROCR is g with the formula for $\Delta\%$:

$$\Delta\% = \frac{X_t - X_{t-1}}{X_{t-1}} \times 100$$

Where:

$\Delta\%$ —the rate of change (growth) ratio;

X_t —the volume of a partial issue (process) t;

X_{t-1} —the volume of a partial issue (process) t –1.

The interpretation of the rate of change (growth) ratio is as follows; when the index is:

- positive, we are dealing with an increase in the value of the issue being studied in a given period compared to the base period;
- equal to zero, the issue under study remained unchanged compared to the base period;
- negative, we are dealing with a decrease in the value of the issue being studied in a given period compared to the base period.

Note that when the value of the issue under study is negative in the base period, one must take the absolute value in the denominator of this item to avoid reaching misleading conclusions about their changes over time.

The next stage of the preliminary study is to assess the structure of the issue under study.

The word “structure” in the etymological sense means a construct or an arrangement of elements constituting a whole. In academia, it is not a new concept, and it is related to the philosophical discussion of “wholeness” and its division into elements/components and how a whole is formed from parts (Suliborski 2010, 25; Stępień 1971, 571–578).

Vertical analysis suggests examining only one period. It is useful to compare common-size income statements for several years (Alamry, 2020, 14):

1. This refers to the analysis of ratios developed for one date and one accounting period.
2. Vertical analysis is also known as static analysis.
3. Vertical analysis neither facilitates proper analysis nor the interpretation of the figures in comparison over the years.

Vertical analysis is based on:

- a statistically accurate representation of the studied sample;
- a descriptive analysis—its measures are not used for statistical testing (statistical tests) but rather for the description of the issue in the studied group;
- the characteristics of the studied group of people according to a given trait;
- comparing two groups in terms of a given trait.

In this method, an important role is played by structure indicators that inform on the share of a separate component of the process or economic issue in its global value. They are calculated according to the formula:

$$Sg = \frac{Vs}{Vo}$$

Where:

Sg —the global structure indicator expressed as a percentage;

Vs —the volume of a partial issue (process);

Vo —the global volume of the issue or process.

We begin our analysis of dynamics and structure (i.e., horizontal and vertical analysis) by assessing the rate of change of the major and dominant positions. **The principle of big numbers applies:** it involves focusing on the most dominant items and then interpreting those that have increased or decreased significantly compared to the previous year. The greatest numerical changes indicate that these items have impacted the company's changes more than others.

To conclude, we start interpreting the data from the share of changes in the largest to the smallest numbers. The preliminary assessment provides an opportunity to construct **hypotheses concerning** only the COMPANY'S FINANCIAL CONDITION, which should be evaluated in the next stage of the study.

2.1. Statement of financial position

The statement of financial position is another term for **the balance sheet**. The balance sheet reports the financial condition at a point in time, in contrast to the income statement, retained earnings statement, and cash flow statements, which report changes in financial condition for a period of time. The financial condition of a business at a point in time is measured by its total assets and claims or rights to those assets. Thus, the financial condition of a business can be represented as (Warren, 2016, 34):

$$\text{Assets} = \text{Claims (Rights to the Assets)}$$

The claims on a company's assets consist of the rights of creditors and stockholders. The rights of creditors are liabilities. The rights of stockholders are referred to as stockholders' or owners' equity. Thus, the assets and the claims on those assets can be expressed in equation form:

$$\text{Assets} = \text{Liabilities} + \text{Stockholders' Equity}$$

This equation is called the accounting equation. This equation is the foundation of accounting information systems, which are discussed in later chapters. The balance sheet, sometimes called the statement of financial condition, is drawn up using the accounting equation. The balance sheet is prepared by listing the accounting equation in vertical rather than horizontal form as follows (Warren, 2016, 34):

Step 1. Each asset is listed and added up to arrive at total assets.

Step 2. Each liability is listed and added up to arrive at total liabilities.

Step 3. Each stockholders' equity item is listed and added up to determine total stockholders' equity.

Step 4. Total liabilities and total stockholders' equity are added up to arrive at total liabilities and stockholders' equity.

Step 5. Total assets must equal total liabilities and stockholders' equity.

The assets of a business entity and how they are used profoundly impact the size, nature, and financial standing of the company. Therefore, the analysis of the asset situation is critical, and its prime purpose is to:

1. Study the size and changes of the individual components of the company's assets.
2. Analyze the structure of assets.
3. Determine the degree of asset utilization.
4. Suggest significant changes in the use of assets and investment policy to achieve better financial results.

The following principles should be kept in mind when conducting a preliminary assessment of the asset situation:

1. This analysis must not be standalone; the company's objectives and policies must be considered when conducting the analysis.
2. The analysis should be based mainly on value indicators, and to a lesser extent on the material/tangible consideration of assets.
3. This analysis should include an assessment concerning the total assets of the company as well as individual parts of the assets.

The purpose in doing the preliminary assessment of the statement of financial position assets is to:

1. Examine the changes in total assets.
2. Study the interrelationships between fixed assets and current assets.
3. Assess the structure of the individual components in both of these resource groups.
4. Analyze investment policies and operational risks.

The analysis of the size and asset changes, i.e., **horizontal analysis** over a given period, is based on numerical data in absolute values and dynamic indicators. In the first case, it is done as follows:

1. The global volume of assets shown in the balance sheet is determined.
2. It is then compared with the previous year's assets, and it is also possible to consider changes over a broader time horizon by comparing elements of the balance sheet from previous years.
3. An analysis of the size and changes in fixed and current assets and their components is carried out.
4. Global changes in the size of assets expressed in absolute values are determined by a formula that is the absolute deviation, which can be expressed in equation form:

$$\text{Absolute deviation } \Delta A = A_1 - A_0$$

A_1 — assets the analyzed period t

A_0 — assets the analyzed period $t - 1$

The second stage of preliminary balance sheet analysis—vertical analysis—is nothing more than an examination of the structure of assets. This study is essential as it provides crucial information about the company's financial situation.

The analysis of the balance sheet structure:

- uses structure indicators in the study;
- determines and evaluates individual elements of the balance sheet in the overall balance sheet total;

- is based on the fact that the structure of assets depends on several factors, such as the type of business, the degree of technical equipping, the use of assets and how they are priced;
- provides an assessment of what economic resources and in what quantities the business unit has at its disposal, and whether their structure is adequate to the specifics and scale of operations.

The preliminary assessment of assets should be supplemented with a basic asset structure ratio (immobilization/flexibility ratio), which is the ratio of fixed assets to current assets and has the following formula:

$$A = \frac{\text{Fixed assets (non current assets)}}{\text{Current assets}} \times 100$$

The indicator is a measure of the degree of flexibility or immobilization of the enterprise. A value above 100% suggests a significant degree of immobilization, high fixed costs, and high operational risk. The opposite can be seen when the value of the ratio is less than 100%, which means high asset flexibility or low immobilization, lower fixed costs, and low operating risk (Mioduchowska-Jaroszewicz, Porada-Rachoń & Romanowska, 2021, 36–37). The structure of assets is closely related to the branch of industry in which the company operates. High immobilization or low flexibility is characteristic of capital groups with a high value of assets; this often applies to production and manufacturing companies. High flexibility is typical of service and trade companies. The conclusions that the interpretation of this indicator should reach are primarily the answers to the following questions:

1. What is flexibility or immobilization, and what does it entail?
2. What are the operational risks of the capital group under study?
3. Is the asset structure adequate for the business profile?
4. How does the asset structure change over time, and is this change positive or negative?

Then we move on to a preliminary assessment of liabilities. Liabilities are the source (the origin) of financing of economic resources (assets) at the disposal of an entity. We can divide them into:

- shareholders' equity—which represents the equivalent of funds contributed by its owners and funds obtained during its operations;
- liabilities (external capital)—understood as capital contributed to the entity for a specified period by various external parties. These are liabilities and provisions for liabilities. Liabilities are divided into long-term and short-term.

Liabilities in the balance sheet are arranged by the criterion of maturity (period of disposal), i.e., from the least mature, i.e., equity, to the most mature, i.e., short-term liabilities. These are essential issues since companies' financial decisions regarding the formation of the term structure of liabilities are closely related to the age structure of assets, which means that the maturity of financing sources must be synchronized with the useful life of the assets financed by them. An analytical statement of liabilities is used to study the structure and dynamics of liabilities. Analysis of the structure of liabilities helps to study the company's capital structure, assess its financial risks, and determine whether it is at risk of insolvency. On the other hand, the dynamics of liabilities is indispensable in studying changes in various types of capital, assessing their increases and decreases in the context of their impact on the company's financial condition.

The next stage of the preliminary study is to supplement the analytical statement of liabilities with a basic indicator of the structure of liabilities (self-financing ratio, financial independence ratio), the relationship of which in the capital group includes:

$$B = \frac{\text{Equity total}}{\text{Total liabilities}} \times 100$$

This indicator is a measure of self-financing and financial independence (Mioduchowska-Jaroszewicz et al., 2021, 41). A value greater than 100% is interpreted as a high level of liquidity, reliability, financial independence, and low financial risk in the business. A value lower than 1, on the other hand, means weak or a lack of liquidity and a high risk of losing its capacity to pay. The liabilities structure has many factors that determine its formation, but no researcher has thus far found the appropriate, optimal, normal, most efficient, and successful capital structure. Certainly, the capital structure of a capital group depends on its age, organizational and legal form, sector, and stage of development. When evaluating the basic capital structure indicator, the following questions should be answered:

1. Is the capital group characterized by high or low self-financing?
2. What does the liability structure tell us?
3. What level of financial risk characterizes the capital group?
4. How does the structure of liabilities change over time? Is this change positive or negative?

The larger the values of this indicator, the more the entity finances its operations from its own sources. When the value of this indicator is greater than unity, then financing with equity is higher than financing with external capital (Mioduchowska-Jaroszewicz et al., 2021, 41).

To demonstrate an application of the financial analysis tool in this book, we will look at the annual report of the public joint-stock company Wawel SA for the years 2019, 2020, and 2021, published on www.wawel.com.pl. This chapter shows the results of transforming the financial statement of Wawel SA into an analytical and synthetic form. Conclusions on vertical and horizontal analysis are made. But first, we will look at the entity that has become this book's case study.

Wawel SA is one of Poland's oldest and most experienced confectionery manufacturers. The company produces chocolate bars, filled chocolates, pralines, mini chocolates, marshmallows in chocolate, filled toffees, fudge, gelees, jellied candies, and sweets with no added sugar, or fruits in chocolate, and cocoa. Wawel ensures that each of its products is of the highest quality in order to please even the most demanding consumers. Its mission is to create natural and innovative sweets that are available on a daily basis. It constantly improves its products, using the knowledge and experience of its employees as well as scientific and technical know-how. Wawel also works with a Council of Experts who support its recipe development under the Good Ingredients project, advising on the use and selection of specific raw materials so that its sweets contain only the highest quality ingredients. Wawel believes that the pleasure derived from its products based on Good Ingredients can encourage people to do small, good deeds. By being socially responsible and skillfully combining tradition with modernity, Wawel sets its own path, which it consistently follows. Charity is deeply rooted in Wawel's mission. Since 2008, the Wawel with the Family Foundation, which carries out charity projects undertaken by Wawel, has been operating at the Company. Wawel produces its sweets in ultra-modern plants in Dobczyce near Krakow. Using state-of-the-art technologies, Wawel ensures the highest quality products and minimizes the environmental impact of its activities. While constantly moving forward, Wawel is mindful of its history and the traditional products for which it is famous. Wawel produces its caramels by hand, and some recipes, such as the *Danusia* mini chocolate, have remained unchanged since the 1920s (Statement on non-financial information Wawel SA from 2021, 8).

Our preliminary analysis of balance sheet assets begins with a vertical analysis, i.e., a structure analysis. For this purpose, we are using the structure ratio presented above. Table 2.1.1 shows the results from the analysis of asset dynamics.

Table 2.1.1. Horizontal analysis of assets for the Wawel SA statement of financial position, 2019–2021

Assets (thousand PLN)	2019	2020	2021	dynamics index (%)	
				2020/2019	2021/2020
Fixed assets	405 377	385 964	367 372	95	95
1. Tangible assets	385 396	367 898	354 122	95	96
2. Goodwill	2 008	2 008	2 008	100	100
3. Non-tangible assets	2 490	2 553	852	103	33
4. Long-term receivables	81	251	88	310	35
5. Long-term financial assets	1 452	210	576	14	274
5.1. Shares in associates valued by equity method	0	210	66	–	31
5.2. Other long-term financial assets	0	0	510	–	–
6. Long-term accruals	50	49	45	98	92
7. Deferred income tax	13 900	12 995	9 681	93	74
Current assets	389 762	404 918	446 604	104	110
1. Inventories	63 824	116 794	104 441	183	89
2. Short-term receivables	175 260	142 893	142 146	82	99
2.1. Short-term trade and other receivables	170 278	141 357	140 433	83	99
2.2. CIT receivables	4 982	1 536	1 713	31	112
3. Short-term accruals	383	633	625	165	99
4. Cash and cash equivalents	150 295	144 598	199 392	96	138
4.1. Cash	148 970	141 870	198 387	95	140
4.2. Cash equivalents	1 325	2 728	1 005	206	37
Assets in total	795 139	790 882	813 976	99	103

Source: own work.

Based on the data in table 2.1.1, we can see the changes in asset values using dynamics indexes. The horizontal analysis of the asset dynamics of Wawel SA in 2019–2021 leads to the following conclusions:

- in 2019–2020, the company's total assets decrease by 1%, which is a negative situation, meaning recession, consumption of assets, and a lack of investment in tangible assets. In the next period, they increase, but only by 3%. Tangible assets dominate the fixed assets, determining the decrease in total fixed assets, which decrease by 5% in 2019–2021, affecting the changes in total assets. The 3% increase in assets in 2020–2021 is due to the growth of current assets being faster than the decrease in fixed assets;

- current assets increase by 4% in the first period and 10% in the following periods; the result of their growth in 2019–2020 is an 83% increase in inventories, and in 2020–2021, it is the result of a 40% increase in cash. An increase in inventories can mean a rise in the amount of inventory in storage, less ability to sell output, or increased demand;
- short-term receivables decrease by 18% in the first period and by 1% in the following period, which may be due to operating limitations of the company or a more restrictive credit policy;
- despite the significant change in short-term accruals in the first period, this does not affect the value of assets, as they do not even account for 1% of the company's assets;
- the company fails to grow, has operational problems, accumulates cash, and may be in a declining phase of its operation.
- the next evaluation is carried out on Wawel SA's assets structure in 2019–2021, summarized in table 2.1.2.

Table 2.1.2. Vertical analysis of assets for the Wawel SA statement of financial position, 2019–2021

Assets (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)
Fixed assets	405 377	50.98	385 964	48.80	367 372	45.13
1. Tangible assets	385 396	48.47	367 898	46.52	354 122	43.51
2. Goodwill	2 008	0.25	2 008	0.25	2 008	0.25
3. Non-tangible assets	2 490	0.31	2 553	0.32	852	0.10
4. Long-term receivables	81	0.01	251	0.03	88	0.01
5. Long-term financial assets	1 452	0.18	210	0.03	576	0.07
5.1. Shares in associates valued by equity method		0.00	210	0.03	66	0.01
5.2. Other long-term financial assets		0.00	0	0.00	510	0.06
6. Long-term accruals	50	0.01	49	0.01	45	0.01
7. Deferred income tax	13 900	1.75	12 995	1.64	9 681	1.19
Current assets	389 762	49.02	404 918	51.20	446 604	54.87
1. Inventories	63 824	8.03	116 794	14.77	104 441	12.83
2. Short-term receivables	175 260	22.04	142 893	18.07	142 146	17.46
2.1. Short-term trade and other receivables	170 278	21.41	141 357	17.87	140 433	17.25
2.2. CIT receivables	4 982	0.63	1 536	0.19	1 713	0.21
3. Short-term accruals	383	0.05	633	0.08	625	0.08

Table 2.1.2 (continued).

4. Cash and cash equivalents	150 295	18.90	144 598	18.28	199 392	24.50
4.1. Cash	148 970	18.74	141 870	17.94	198 387	24.37
4.2. Cash equivalents	1 325	0.17	2 728	0.34	1 005	0.12
Assets in total	795 139	100.00	790 882	100.00	813 976	100.00

Source: own work.

Based on the data in table 2.1.2, we can draw the following conclusions about the structure of Wawel SA's assets in 2019 and 2020:

- the share of fixed assets in the period under review decreases from 50.98% to 45.13%;
- tangible assets are the dominant item, with their share dropping from 48.47% to 45.13%;
- other fixed asset items are not significant in the fixed assets, as their share is less than 1%, except for deferred income tax, whose share decreases from 1.75% to 1.19% and accounts for more than 1% of the share. However, this does not affect the operations of the company and is due to the company's credit policy;
- fixed assets are dominated by tangible and intangible assets, inherent in this type of activity, i.e., production;
- the share of current assets increases from 49.02 to 54.87%;
- current assets, typically for manufacturing companies and Polish listed companies, are dominated by short-term receivables, short-term investments, and inventories;
- the change in the asset structure to the advantage of current assets is the result of an increase in the cash share in assets from 18.47% to 24.37%;
- the dominant share of short-term receivables in the manufacturing business is related to economic activity based on trade credit, but over the study period, the share drops from 22.04% to 17.46%, which may reflect either reduced sales and declining profits or a more restrictive credit policy;
- the share of inventories in 2020 increases from 8.03% to 14.77%, and decreases to 12.83% in 2021. The decrease in inventory shares may indicate a reduction in operations in 2021 or changes in inventory level management.

Next, we will be analyzing **asset flexibility**, which is summarized in table 2.1.3, according to the formula:

$$A = \frac{\text{assets}}{\text{Current assets}} \times 100$$

Table 2.1.3. Asset flexibility at Wawel SA, 2019–2021

Balance sheet item (thousand PLN)	2019	2020	2021
Fixed assets	405 377	385 964	367 372
Current assets	389 762	404 918	446 604
Asset flexibility ((1:2) × 100)	104%	95%	82%

Source: own work.

We can see from table 2.1.3 that the asset flexibility ratio value decreases from 104% to 82%. Such a situation implies that the company's flexibility is on the rise, i.e., there is increasing potential for a possible change in the business profile. The asset flexibility indicator shows the company's flexibility in adapting to market changes. If the indicator takes on higher values and is greater than 100%, as in 2019, it shows a longer asset inflexibility period. This may indicate higher fixed costs and low flexibility at the company. This situation is not critical for the company, as the ratio falls over three years for the benefit of current assets: the operational risk level declines, and Wawel SA's flexibility in 2019 and 2021 increases.

Next, we turn to the preliminary assessment of Wawel's liabilities in 2019–2020. The company's financial situation is analyzed based on the liabilities on the balance sheet.

In the first stage, similarly to the preliminary analysis of assets, we consider the results from the analysis of the dynamics of liabilities and equity in total, tabulated in two periods: 2019–2020 and 2020–2021. The results of the study are shown in table 2.1.4.

Table 2.1.4. Horizontal analysis of equity and liabilities for the Wawel SA statement of financial position, 2019–2021

Equity and liabilities (thousand PLN)	2019	2020	2021	dynamics index (%)	dynamics index (%)
Total equity	690 602	702 443	708 526	102	101
1. Share capital	7 499	7 499	7 499	100	100
2. Share premium capital	18 146	18 146	18 146	100	100
3. Supplementary capital	607 941	621 558	585 124	102	94
4. Reserve capital		0	56 200		
5. Revaluation capital	710	710	710	100	100
6. Other capital components	–2 123	–2 549	–2 198	120	86
7. Retained earnings/loss carried forward	58 429	57 079	43 045	98	75
Total liabilities	104 537	88 439	105 450	85	119

Table 2.1.4 (continued).

Long-term liabilities and provisions for liabilities	21 093	21 055	18 483	100	88
1. Provisions for liabilities	12 240	12 835	11 202	105	87
1.1 Provisions for pensions and similar benefits	12 240	12 835	11 202	105	87
2. Long-term liabilities	8 853	8 220	7 281	93	89
Short-term liabilities	83 444	67 384	86 967	81	129
1. Short-term trade and other liabilities	67 763	52 594	71 036	78	135
2. Liabilities for other employee benefits	8 472	14 069	15 596	166	111
3. Accruals and other liabilities	7 209	721	335	10	46
Liabilities and equity in total	795 139	790 882	813 976	99	103

Source: own work.

Based on the calculated dynamics indicators for liabilities and equity in total in 2019 and 2020 in table 2.1.4 we can draw conclusions about the changes in liabilities and equity in total:

- similarly to the total assets in the first period, here we have a decrease of 1% in all liabilities and equity, while in the second period, there is a 3% increase;
- equity grows by 2% and then by 1%—the changes are insignificant;
- changes in equity are the result of a 2% increase, and then a 6% decrease in supplementary capital; a 20% increase and then a 14% decrease in other capital components; and changes in retained earnings/loss carried forward, which decreased by 2% and then increased by 25%;
- changes in liabilities are much larger, as they fall by 15% in 2019–2020 and then by 19% in 2020–2021;
- the decline in short-term liabilities in 2019–2020 results from a 19% decrease in short-term liabilities as short-term trade and other liabilities fall by 22%;
- the increase in short-term liabilities in 2020–2021 results from a 19% increase in short-term liabilities as short-term trade and other liabilities increase by 35%;
- debt increases, equity financing decreases;
- short-term liabilities increase, long-term liabilities decrease;
- a change in the structure of financing sources in favor of short-term external capital increases the financial risk of the business;
- the increase in trade liabilities may be due to a change in credit policy toward the company i.e., greater use of trade credit, which is conducive to business growth or problems with payment and negotiated contracts that make it possible to extend payment terms for trade liabilities;

- the decrease in long-term liabilities coincides with the decrease in fixed assets, which confirms the lack of investment and development plans.

Table 2.1.5. Vertical analysis of equity and liabilities for the Wawel SA statement of financial position, 2019–2021

Liabilities (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)
Total equity	690 602	86.85	702 443	88.82	708 526	87.05
1. Share capital	7 499	0.94	7 499	0.95	7 499	0.92
2. Share premium capital	18 146	2.28	18 146	2.29	18 146	2.23
3. Supplementary capital	607 941	76.46	621 558	78.59	585 124	71.88
4. Reserve capital		0.00	0	0.00	56 200	6.90
5. Revaluation capital	710	0.09	710	0.09	710	0.09
6. Other capital components	–2 123	–0.27	–2 549	–0.32	–2 198	–0.27
7. Retained earnings/loss carried forward	58 429	7.35	57 079	7.22	43 045	5.29
Total liabilities	104 537	13.15	88 439	11.18	105 450	12.95
Long-term liabilities and provisions for liabilities	21 093	2.65	21 055	2.66	18 483	2.27
1. Provisions for liabilities	12 240	1.54	12 835	1.62	11 202	1.38
1.1. Provisions for pensions and similar benefits	12 240	1.54	12 835	1.62	11 202	1.38
2. Long-term liabilities	8 853	1.11	8 220	1.04	7 281	0.89
Short-term liabilities	83 444	10.49	67 384	8.52	86 967	10.68
1. Short-term trade and other liabilities	67 763	8.52	52 594	6.65	71 036	8.73
2. Liabilities for other employee benefits	8 472	1.07	14 069	1.78	15 596	1.92
3. Accruals and other liabilities	7 209	0.91	721	0.09	335	0.04
Equity and Liabilities in total	795 139	100.00	790 882	100.00	813 976	100.00

Source: own work.

Based on the data in table 2.1.5, which lists the results of the structure of liabilities analysis, we can draw the following conclusions for 2019–2021:

- the company's capital comes from 87–89% equity—generated in the course of its operations over the years of its existence on the market (internal supply), about 80% supplementary capital, and 7–5% from retained earnings. In 2021, a reserve capital item appeared, which accounted for less than 7% of liabilities;
- external capital mainly consists of short-term liabilities, i.e., trade liabilities, the share of which ranged from 8% to 10% during the period under review; that is the riskiest type of external capital;

- long-term liabilities, which represent a negligible source of external capital accounting for about 3%, are the other major component of liabilities;
- other elements of external capital are not essential in this company's structure;
- capital structure is safe, meaning high self-financing, low financing risk, and high cost of sustaining financing sources because the cost of equity is always higher than the cost of external capital. Furthermore, it indicates the absence of development plans for the company.
- To summarize the analysis of the structure and dynamics of liabilities, the self-financing ratio should be calculated. The results are summarized in table 2.1.6.

Table 2.1.6. The self-financing ratio at Wawel SA, 2019–2021

Balance sheet item (thousand PLN)	2019	2020	2021
1. Equity in total	690 602	702 443	708 526
2. Total liabilities	104 537	88 439	105 450
Self-financing ratio (1:2)	6.61	7.94	6.72

Source: own work.

The results shown in table 2.1.6 indicate that owing to the changes in the capital structure caused by an increase in the value of equity and a decrease in the value of external capital, the self-financing ratio shows an upward trend in 2019 and 2020, rising from 6.61 to 7.94 respectively, then falling to 6.72 in 2021. The increase in the value of the self-financing ratio indicates that the company is increasingly relying on its own sources to finance its operations—self-financing increases, while debt and financial risk decrease, but the cost of external capital increases.

The next step in the preliminary assessment is to examine the accuracy of the links between assets and liabilities (see table 2.1.7). To examine the accuracy, we use the golden rule of finance, which says that a company's assets cannot be tied to a given asset component for longer than the asset's remaining life in the company. The golden rule of financing is maintained when the given conditions specified by the following formulae are met (Waśniewski & Skoczylas, 2002, 133–134):

$$\text{long-term inequality} = \frac{\text{Long-term assets}}{\text{Long-term liabilities} \wedge \text{equity}} \leq 1$$

$$\text{hort-term inequality} = \frac{\text{Short-term assets}}{\text{Short-term liabilities} \frac{\text{calculated}}{\text{adjusted}}} \geq 1$$

The items included in the formulae of the golden financial rule are defined as follows:

- long-term assets are the balance sheet total of fixed assets, increased by trade receivables maturing above 12 months;
- current assets are the balance sheet total of current assets reduced by trade receivables maturing above 12 months, plus payments due to core capital and own shares;
- long-term liabilities are the balance sheet total of equity increased by provisions for deferred income tax, other long-term provisions, long-term liabilities, trade liabilities maturing over 12 months, long-term accruals, and a negative value of the company (negative goodwill);
- short-term (current) liabilities are the balance sheet total of short-term provisions and short-term liabilities reduced by trade liabilities maturing over 12 months and increased by short-term accruals.

The first formula expresses the principle that long-term assets should be financed entirely with long-term capital. In contrast, the second formula, representing the golden financing rule, shows that short-term liabilities should be fully covered with short-term assets. Maintaining the above two relationships allows the company to maintain its ability to pay so that it can pay its liabilities on time at any given time (Engelhardt, 2012, 159–160). The accuracy of financing assets with liabilities means that the two inequalities from the golden financial rule should be met.

In order to evaluate the golden financial rule, it is necessary to assign appropriate values to the following items appearing in the **inequality formulas**. Table 2.1.7 shows the breakdown of long-term and short-term assets and long-term and short-term liabilities based on Wawel SA's statement of financial position and includes the calculation of long-term and short-term **inequality**.

Table 2.1.7. A breakdown into long-term and short-term assets and long-term and short-term liabilities based on Wawel SA's statement of financial position, 2019–2021

Balance sheet item (thousand PLN)	2019	2020	2021
Long-term assets			
1. Fixed assets	405 377	385 964	367 372
2. Trade receivables maturing above 12 months	0	0	0
3. Stocks overdue for more than 12 months	0	0	0
1. Long-term assets (1 + 2 + 3)	405 377	385 964	367 372
Long-term liabilities and equity			
1. Total equity	690 602	702 443	708 526
2. Long-term liabilities	21 093	21 055	18 483
3. Trade liabilities maturing over 12 months	0	0	0
4. Long-term liabilities and equity (5 + 6 – 7)	795 139	723 498	813 976

Table 2.1.7 (continued).

Long-term Inequality (4 : 8)	0.51	0.49	0.45
Short-term assets			
1. Current assets	389 762	404 918	446 604
2. Trade receivables with a repayment period of over 12 months	0	0	0
3. Stocks overdue for more than 12 months	0	0	0
4. Short-term assets (1 – 2 – 3)	389 762	404 918	446 604
Short-term liabilities calculated/adjusted			
1. Short-term liabilities item from the balance sheet	83 444	67 384	86 967
2. Trade liabilities maturing over 12 months	0	0	0
3. Short-term liabilities calculated/adjusted (5 – 6)	83 444	67 384	86 967
Short-term inequality (4 : 7)	4.67	6.01	5.14

Source: own work.

Based on the data and calculations in table 2.1.7, we can conclude that the golden financial rule was met in 2019–2021 as both long-term and short-term inequalities were realized. Using the golden rule means having both long-term and short-term liquidity, and it also shows the accuracy of the links between long-term and short-term assets and long-term and short-term liabilities.

Questions:

1. Characterize the statement of financial position.
2. What are the goals of the preliminary assessment of the statement of financial position?
3. What is the analysis of the size and changes in assets—that is, the horizontal analysis of the statement of financial position?
4. What is the analysis of the structure of the statement of financial position?
5. What are the characteristics of the flexibility or immobilization ratio?
6. How do we use the self-financing ratio?
7. What is the definition of the golden financial rule?
8. How do we calculate the golden financial rule?

Practice:

1. Based on a selected financial statement, do a preliminary assessment of the statement of financial position for a given period.
2. Based on a selected statement of financial position, evaluate the structure and dynamics of assets.
3. Based on a selected financial statement, evaluate the structure and dynamics of liabilities.

4. Evaluate the level of immobilization/flexibility in a model company.
5. Analyze the level of self-financing in a model company.

2.2. Total income statement

An income statement is one of the three important financial statements used for reporting a company's financial performance over a specific accounting period. The other two key statements are the balance sheet and the cash flow statement. The income statement focuses on the revenue, expenses, gains, and losses of a company during a particular period. Also known as the profit and loss (P&L) statement or the statement of revenue and expense, an income statement provides valuable insights into a company's operations, the efficiency of its management, underperforming sectors, and its performance relative to industry peers (<https://www.investopedia.com/terms/i/incomestatement.asp>).

Profit or loss is defined as "the total of income less expenses, excluding the components of other comprehensive income." Other comprehensive income is defined as comprising "items of income and expense (including reclassification adjustments) that are not recognized in profit or loss as required or permitted by other IFRSs," whilst total comprehensive income is defined as "the change in equity during a period resulting from transactions and other events, other than those changes resulting from transactions with owners in their capacity as owners." [IAS 1.7]

Comprehensive income for the period + Profit or loss = Other comprehensive income

All items of income and expense recognized in a period must be included in profit or loss unless a Standard or an Interpretation requires otherwise [IAS 1.88]. Some IFRSs require or permit some components to be excluded from profit or loss and instead be included in other comprehensive income.

An entity has a choice of presenting:

- a) a single statement of profit and loss and other comprehensive income, with profit or loss and other comprehensive income given in two sections;
- b) or two statements:
 - an income statement showing components of profit or loss and
 - a statement of comprehensive income that begins with profit or loss (bottom line of the income statement) and displays the components of other comprehensive income [IAS 1.81].

The statement(s) must present [IAS 1.81A]:

- profit or loss;
- total other comprehensive income;

- comprehensive income for the period;
- an allocation of profit or loss and comprehensive income for the period between non-controlling interests and owners of the parent company.

The following minimum line items must be presented in the profit or loss section (or separate statement of profit or loss, if presented) [IAS 1.82–82A]:

- revenue
- gains and losses from the derecognition of financial assets measured at amortized cost;
- finance costs;
- share of the profit or loss of associates and joint ventures accounted for using the equity method;
- certain gains or losses associated with the reclassification of financial assets;
- tax expense;
- a single amount for the total of discontinued items.

Table 2.2.1 below shows the statement of comprehensive income for Wawel SA in 2019–2021.

Table 2.2.1. Statement of Wawel SA's comprehensive income, 2019–2021

Items (thousand PLN)	2019	2020	2021
I. Revenues	564 440	488 621	517 949
Revenue from contracts with customers	556 764	483 049	510 512
Sales revenues	7 676	5 572	7 437
II. Costs	494 137	416 520	61 611
Prime sales costs	356 218	307 542	346 923
Other income/operation incomes	608	4 095	–186
Selling costs	62 298	54 889	56 214
Management costs	75 013	–58 184	58 288
III. Operating profit	70 303	72 101	56 338
Financial income	3 657	2 095	1 141
Financial costs	885	1 409	1 130
Share in the profits of associates	33	–1 242	–141
IV. Profit before tax	73 042	71 545	56 205
Income tax	14 432	–14 285	–12 979
V. Net profit from continuing operations	58 610	57 260	43 226
VI. Other comprehensive income	–753	–426	351
Actuarial gains and losses for retirement benefits	–908	–514	430
Income tax related to non-transferable items	155	88	–9
VII. Total comprehensive income	57 857	56 834	43 577

Source: own work.

Expenses recognized in profit or loss should be analyzed either by nature (raw materials, staffing costs, depreciation etc.) or by function (cost of sales, selling, administrative, etc.) [IAS 1.99]. If an entity categorizes by function, then additional information on the nature of expenses—at a minimum depreciation, amortization, and employee benefits expense—must be disclosed [IAS 1.104]. The other comprehensive income section is required to present line items that are classified by their nature and grouped between those items that will or will not be reclassified to profit and loss in subsequent periods [IAS 1.82A]. An entity's share of OCI of equity-accounted associates and joint ventures is presented in aggregate as single line items based on whether or not it will subsequently be reclassified to profit or loss [IAS 1.82A].

When an entity presents subtotals, those subtotals are to be comprised of line items made up of amounts recognized and measured in accordance with IFRS; be presented and labeled in a clear and understandable manner; be consistent from period to period; not be displayed with more prominence than the required subtotals and totals; and reconciled with the subtotals or totals required in IFRS [IAS 1.85A–85B]. Additional line items may be needed to fairly present the entity's results of operations [IAS 1.85]. Items cannot be presented as “extraordinary items” in the financial statements or in the notes [IAS 1.87]. Certain items must be disclosed separately either in the statement of comprehensive income or in the notes, if material, including [IAS 1.98]:

- write-downs of inventories to net realizable value or property, plant, and equipment to recoverable amount, as well as reversals of such write-downs;
- restructurings of the activities of an entity and reversals of any provisions for the costs of restructuring;
- disposals of items of property, plant, and equipment;
- disposals of investments;
- discontinuing operations;
- litigation settlements;
- other reversals of provisions.

The following evaluation steps should always be included in the preliminary analysis of a company's statement of comprehensive income:

1. the dynamics and structure of revenue based on an analytical statement of revenues;
2. the dynamics and structure of costs based on an analytical statement of costs;
3. the dynamics and structure of the financial result based on an analytical statement of the financial result;
4. the rate of change and the relationship between the basic values that characterize inputs using the management efficiency model.

The analysis of revenue dynamics and structure is mainly aimed at assessing sales revenues, as they play a major role in a company's operations and affect both internal relations within the company and relations with the business environment. Revenues are one of the important measures of a company's performance, offering the opportunity to compare the company against others in the same sector, regionally or internationally. In a free market economy based on the principles of free competition, "a company's sales are a fundamental indicator of its financial success. The size of a company's sales is one of the most important exponents of commercial and financial success." Revenue is an accounting term that denotes the obtained or receivable inflow of value, material benefits from business activities carried out personally, employment-based relationships, home-based work and cooperative employment relationships, and revenue from real estate, including its sale. Revenue is most often defined as the total value of net sales of goods and services (i.e., excluding VAT) during the accounting period (day, month, quarter, or fiscal year). Revenue is an inflow of assets or other increase in an entity's assets or decrease in its liabilities (or a combination of the above). It results from the provision or production of goods, services, or other activities that are the entity's core business. The Accounting Principles Board (APB) Statement No. 4 defines revenue as "an increase in gross assets or a decrease in gross liabilities, recognized and measured in accordance with the accepted accounting principles, that arises from profit-driven activities [...] of an enterprise that may change the value of equity."

In light of the current tax laws and accounting rules, to analyze revenue, one can distinguish:

- sales revenues;
- financial revenue;
- other operating revenue.

Income does not include loans or shareholders' contributions. The concept of revenue should not be mistaken for income, the day's earnings/takings, or profit. The revenue of an enterprise does not reflect its actual financial position. Under the accrual principle, revenue in accounting is not synonymous with cash inflow (although it can sometimes be the same, as in the case of cash sales) but primarily with the creation of receivables.

The structure and dynamics of revenues were analyzed, based on the data in table 2.2.1 (above), and the results are summarized in table 2.2.2 (below).

Table 2.2.2. Analytical summary of Wawel SA revenue, 2019–2021

Type of revenues (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)	Dynamics index (%)	
Revenue from contracts with customers	556 764	97.9	483 049	97.2	510 512	98.2	87	106
Sales revenues	7 676	1.3	5 572	1.1	7 437	1.4	73	133
Other income operations	760	0.1	6 239	1.3	735	0.1	821	12
Financial income	3 657	0.6	2 095	0.4	1 141	0.2	57	54
Total revenues	568 857	100	496 955	100	519 825	100.0	87	105

Source: own work.

The revenue figures summarized in table 2.2.2 reveal that the revenue from contracts with customers was the main source of revenue throughout the period under review, with its share ranging from 97.9% to 98.2%. The large share of revenue from contracts with customers suggests that they are the company's primary revenue generator. Sales revenues account for about 1% throughout the period under study. In 2019 and 2021, the share of other income operations accounted for less than 1%; in 2020, the value rose to 1.3%. The slight growth, however, was mainly due to grants received and, to a lesser extent, to other income and profit on the sale of non-financial fixed assets. The financial revenue was so low that its percentage share fell from 0.6% to 0.2%. It should be noted that other types of revenue had little impact on the revenues generated. The sources of revenue are correct and confirm that the company's business is manufacturing related.

When looking at dynamics, or in other words, changes in revenue, we should start by assessing any changes in major and dominant items. This is known as the rule of large numbers, which involves focusing on the most dominant items and then interpreting those that have increased or decreased the most compared to the previous year. The most significant numerical changes indicate that these are the items that affect the changes in the company the most. To summarize the interpretations of the data, we should begin with the share of changes from the highest to the lowest numbers.

As we can see from table 2.2.2, revenue value fluctuates from 2019–2021. In 2019–2020, the largest source of revenue was from contracts with customers, which went down by 13% and then, in the next period, up by 6%. The decline in revenue was caused by restrictions on the company's operations due to the COVID-19 pandemic. The situation improved in 2020–2021 but still failed to reach 2019 revenue levels (because pandemic-related restrictions were still in place). Similar trends were

observed with sales revenues, which fell by 27% in 2019–2020 and then rose by 33%, but were still below 2019 levels. Such a trend constitutes a negative situation. As a result of subsidies provided in the form of COVID-19 aid funds, other operating income increased by 721%; however, in the following year, 2021, it decreased by 88%. The financial income declined by 43% in 2020 and 46% in 2021. The decrease in revenue was caused by a decline in interest on income. As a result of these changes in revenue, total revenue decreased by 17% in 2019–2020, and increased by 5% in 2020–2021. Unfortunately, negative revenue changes in 2020, resulting from the pandemic, did not allow the company to reach 2019 revenue levels. The lower revenue level may indicate lower profits and a “melting” market share.

The cost aspect is another element of the evaluation. Cost is the natural basis for a competitive strategy called cost leadership. **The cost leadership strategy** is aimed at gaining a cost leadership position in the sector. Since the subject of the analysis covers the results of a Polish-listed company, to analyze the cost it is necessary to define them according to Polish financial reporting regulations, i.e., the Accounting Act (1994). The **Accounting Act** includes the requirements of the IAS regulations. According to this Act, a cost is an expected decrease in economic benefits of a reliably determined value during the reporting period in the form of a decrease in the value of assets or an increase in the value of liabilities and provisions, which will lead to a decrease in equity or an increase in its deficiency by means other than withdrawal of funds by shareholders or owners. Also according to these regulations, it means the consumption, expressed in monetary terms, of an economic entity’s own factors of production, third-party services, and human labor at a specified time. The generally defined cost in the Accounting Act is only a preliminary step towards distinguishing cost categories for accounting purposes. Cost classifications are related to the basic task of accounting, i.e., gathering information that enables an up-to-date assessment of the financial situation. They allow comparisons to be made with previous years’ results and with the results achieved by other business entities.

To analyze costs, we need to consider three groups of costs:

- operating activities,
- other operating activities,
- financial.

Operating costs are associated with an entity’s core business. These are both costs that create the value of products and costs of day-to-day operations. The classification of operating costs differs depending on the variant the company chooses for its statement of comprehensive income, considering the requirements of the Accounting

Act (1994). There are two systems of cost classification: 1/ **multiple-step system (by place)** and 2/ **comparative system (by type)**.

1/ In relation to the places where they arise, costs are based on **the multiple-step system (by place)**. In this system, we distinguish the following accounts:

- the primary production account—which records costs directly related to the production process;
- the factory burden account—which records indirect production costs (i.e., costs incurred in production departments that cannot be directly related to manufactured goods);
- auxiliary production—the part of the production activity essential to the servicing of the main production and the ensuring of the uninterrupted manufacture and output of its product, e.g., packaging, repairing and maintaining, transport;
- the general and administrative expenses account—this illustrates the costs associated with the company's management and administration operations (i.e., in accounting, general and administrative expenses represent the necessary costs to maintain a company's daily operations and administer its business, but these costs are not directly attributable to the production of goods and services);
- the costs of sales account—related to the costs accompanying the sale of products e.g., distribution, transportation, etc.

In the multiple-step system, manufacturing costs are determined based on the cost of products sold, adding sales costs and general and administrative expenses.

2/ Operating costs according to **the comparative system (by type)** include:

- costs of material and energy consumption (electricity, heat, gas, water, fuel);
- outside services (rent, repairs, transportation, banking, cleaning, property protection, consulting);
- taxes and fees of a “cost” nature (excise tax, real estate tax, input VAT not deductible from output VAT, VAT on imported services, VAT on material consumption for promotion and advertising, stamp duty, court fees, notary fees),
- remuneration (resulting from employment contracts, fee-for-task agreements, contracts for a specific task and others);
- employee benefits (contributions to social insurance, the Labor Fund and Guaranteed Employee Benefits Fund, write-offs for the company social fund, employee training costs, costs related to occupational health and safety);
- depreciation;
- the value of goods and materials sold.

On the other hand, regardless of whether we use the classification of costs by place (the multiple-step system) or by type (the comparative system), we are concerned

with other operating costs and financial costs. **Other operating costs** are expenses that are not directly linked to the business because they are not related to the core business activities. They arise most often due to the decisions made and are of various natures.

According to Article 3, paragraph 1, item 32 of the Accounting Act, other operating costs are expenses indirectly related to the operating activities of the entity, in particular, those related to:

- the company's activities in terms of employee benefits;
- the disposal of fixed assets, fixed assets under construction, intangible assets, and real estate and intangible assets that have been classified as investments;
- the maintenance of the real estate and intangible assets included in investments, and revaluation of these investments, reclassification from fixed assets and intangible assets, if the market price or otherwise determined fair value was used to value the investment;
- write-offs of time-barred, uncollectible receivables (except for receivables of a public law nature not charged to expenses);
- the creation and release of provisions, excluding provisions related to financial operations;
- asset write-offs and their adjustments, except for write-offs charged to financial costs;
- damages and penalties;
- gratuitous transfers of assets (also applies to donations), including cash that is not intended to be used to subsidize selling prices, acquisition or production of fixed assets, fixed assets under construction or intangible assets;
- fortuitous events.

Financial costs are costs incurred by an enterprise that are not directly related to the production volume. According to Article 42(3) of the Accounting Act, these are costs (and losses) arising directly from transactions related to the entity's various investment or financial activities. These costs are primarily:

- interest;
- losses on disposal of investments (other than investments in real estate and rights);
- the revaluation of investments (other than investments in real estate and rights);
- a surplus of negative exchange rate differences over positive exchange rate differences. The only exceptions to this are interest, commissions, and positive or negative exchange rate differences on liabilities affecting:
 - the purchase price or production price of fixed assets or fixed assets under construction and intangible assets (investment), as costs incurred when they

have not yet been made available for use will affect the initial value of such assets;

- the value of the product (only if the launch of the product is preceded by a long period of preparation for sale or the manufacturing period is very long).

The financial costs most commonly incurred by companies include, in particular:

- the value of sold investments in financial assets;
- paid and accrued interest and bank fees and commissions on bank loans and borrowings if they do not serve to finance the acquisition or manufacture of fixed assets and intangible assets, as well as the manufacture of products or preparation of goods for sale—in cases justified by the long-term period of manufacture or preparation;
- paid and accrued interest on overdue civil-law liabilities and on budget receivables;
- paid and accrued interest and discount on debt securities and on promissory notes;
- surplus of negative exchange differences over positive ones from the valuation of financial assets in foreign currencies;
- costs from revaluation of investments in financial assets;
- bank fees and commissions;
- stamp duties on loan agreements;
- negative result of the revaluation of investments;
- losses resulting from the disposal of investments;
- discount on promissory notes and on the sale of notes and third-party checks.

Table 2.2.3 summarizes analytical costs according to the *multiple-step system* for 2019–2021.

Table 2.2.3. Analytical summary of costs at Wawel SA, 2019–2021

Type of costs (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)	Dynamics index (%)	
Prime sales costs	356 218	71.7	307 542	72.4	346 923	74.8	86	113
Selling costs	62 298	12.6	54 889	12.9	56 214	12.1	88	102
Management costs	75 013	15.1	58 184	13.7	58 288	12.6	78	100
Other operation costs	1 368	0.3	2 144	0.5	921	0.2	157	43
Financial costs	885	0.2	1 409	0.3	1 130	0.2	159	80
a) interest	406	0.1	730	0.2	470	0.1	180	64
Total costs	495 782	100.0	424 168	100.0	463 476	100.0	86	109

Source: own work.

The costs analysis was made based on table 2.2.3. The total costs for the entire period under review come from prime sales costs, in 2019—71.8%, in 2020—72.4%, and in 2021—74.8%. The second item was management costs, whose value varies from 15.1% to 12.6% during this period. Selling costs were the third-largest cost category in terms of share in 2019, accounting for 12.6% of total costs. Their share increased slightly to 12.9% in 2020 but in 2021 dropped to 12.1%. The structure of this company operating in the manufacturing sector is adequate. The propriety of the costs structure is determined by the dominant share of prime sales costs, selling costs, and management costs. A large proportion of the selling costs are due to the nature of the business, as the company produces confectionery, which means that the company incurs significant costs related to the product's packaging. Other operating and financial costs make up an insignificant share of total costs (less than 0.5% of other operating and financial costs), implying that they do not impact the overall development of total costs. Such a situation is appropriate because, in typical such enterprises (manufacturing, trade, and services), operating costs should dominate. In 2019–2020, the total cost dynamics showed a decline in the scope of operations (dynamics/growth indicators are below 100%), with costs falling by 14%. It would appear that the goal of every company is to reduce costs; however, costs are closely linked to revenues, so a decrease in the most important types of costs is never positive. Costs should increase at a lower rate than revenues to ensure that the company operates efficiently. The decrease in total costs was due to a decrease in prime sales costs by 14%, selling costs by 12%, and management costs by 22%. The decrease in costs during the period resulted from business restrictions caused by pandemic constraints (COVID-19). The bans and orders caused by the pandemic, which began on March 11, 2020, negatively affected both demand (limited access to stores) and reduced production capacity due to human resource shortages (lack of employees due to sick leave). In 2020–2021, total costs increased by 9%. The increase in costs in 2020–2021 was due to an increase in prime sales costs, which increased by 12%, and an increase in selling costs, which increased by 2%. Management costs, which remained at their level from the 2020 period, behaved correctly for this period; management costs are considered to be fixed costs. The increase in costs resulting primarily from the increase in prime sales costs is considered correct, as those costs create sales revenues. We will evaluate whether this cost increase was appropriate for the increase in revenues with another research tool—the management efficiency model.

The management efficiency model is a synthetic study of the efficiency of an economic entity's operations. The model uses systems of inequalities called series

$$iE < iA < iC < iR < iP \dots\dots\dots (1)$$

i—index	C—cost
E—total employment	R—revenue
A—total assets	P—net profit

- when there is a relative decrease in own costs, i.e., when the dynamics of total revenues is ahead of the dynamics of total costs, faster growth in net profit than in total revenues occurs;
- higher net profit dynamics than total revenue dynamics may be because sales margins are higher;
- the essence of the model for faster growth of assets than employment in the economic unit is intensive management, aimed at increasing revenue and profit through technical and technological progress, which seeks to substitute living labor for objectified labor;
- when the $iA < iC$ inequality is satisfied, it shows a better use of the expenditures incurred, which are the basis for assessing economic development;
- furthermore, if total income grows faster than total assets, it means that there is asset productivity, which is achieved through an increase in labor productivity $iA < i$.

Table 2.2.4. Summary of the financial data for Wawel SA, 2019–2021, for calculating the management efficiency model for net profit, 2019–2021

Items (thousand PLN)	2019	2020	2021	Dynamics index	
				2020/2019	2021/2020
total employment (E)	1 118	1 097	1 036	0.98	0.94
total assets (A)	795 139	790 882	813 976	0.99	1.03

Table 2.2.4 (continued).

total costs (C)	495 782	424 168	463 476	0.86	1.09
total revenues (R)	568 857	496 955	519 825	0.87	1.05
net profit (P)	57 857	56 834	43 577	0.98	0.77

Source: own work.

Based on the data for 2019–2021 in table 2.2.4 (data on costs and revenues come from tables 2.2.2 and 2.2.3, on assets from table 2.1.3), the dynamics indicators were substituted under the model formula (1).

The management efficiency model for net profit in 2019–2020 is as follows:

$$0.98 < 0.99 > 0.86 < 0.87 < 0.98$$

As we can see, all the dynamics indicators are below unity, which means that the management efficiency model at the level of net profit has not been met. The dynamics indicators below unity imply that all categories surveyed have fallen. The greatest decreases were seen in total cost, followed by total revenue, total employment, and net profit. The slowest rate of decrease was seen in total assets. The part of the model reflecting these effects is shaped accordingly in terms of the rate of decline of the cost, revenue, and net profit indicators. Despite all the declines, the company under study made a profit. The part of the model reflecting inputs, i.e., employment and assets, shows that they behave correctly in relation to each other, which implies that the relationship between these categories is correct. However, the decreasing trend for these categories is not satisfactory.

The management efficiency model for net profit in 2020–2021 is as follows:

$$0.94 < 1.03 < 1.09 > 1.05 > 0.77$$

The management efficiency model for net profit in 2020 and 2021 shows anomalies, and therefore it means that it was not met. During the period under review, employment decreased, while assets grew at a slower rate than total costs and total revenues. Total costs went up faster than total revenues, which resulted in a decrease in net profit.

Management efficiency models for net profit for each period under review were not met. The employment-to-asset relationship indicates that the correct proprietary equipment was available to each employee. Furthermore, the incorrect asset-to-cost relationship implies an inefficient use of assets. There are slight differences in the rate of change between costs and revenues, which indicates that the trend that guarantees profit is maintained.

Wawel's 2021 financial statements give a summary of the impact of the COVID-19 pandemic on its financial performance and will serve as an explanation for the changes in revenue, expenses, and financial results:

Impact of the COVID-19 pandemic on the achieved financial results The coronavirus threat that we continue to face is certainly affecting consumer behavior on the one hand, and on the other is determining the increase in the level of prices of goods and services, which has ultimately influenced and continues to influence the level of sales and results achieved by the Company, the impact of which however, cannot be reliably estimated. The main factor negatively affecting the financial results and the margin level is the dynamic increase in production costs related to the increasing prices of purchased materials, energy and services. However, it is difficult to offset this dynamic increase in production costs with an increase in the prices of the products offered by the Company, as a result of which the Company recorded a lower profit margin on sales in 2021 than in 2020. However, in the context of the supply of raw materials and packaging, it should be emphasized that the structure of purchases—excluding cocoa pulp—remains diversified, and as of today, the company has not identified any risk of disruption to supply chains. Nevertheless, in the case of cocoa pulp, which is the main raw material for the production process, preventive measures have been taken to ensure the continuous availability of this raw material, so that the production process and the related order fulfillment can proceed without disruption, which has resulted in an increase in inventory in the balance sheet from 2020. The Company generally did not feel the impact of the pandemic on its financial liquidity, as it received receivables and settled its liabilities without major delays. All major expenses planned for 2021, including the dividend payment, were carried out smoothly. Considering the above, the Issuer believes the Company's operations have not been permanently or significantly disrupted. In the current reporting period, both production and sales are in line with orders. (<https://relacjeinwestorskie.wawel.com.pl/raporty/raporty-okresowe?year=2021>, financial reports 2021, 54/55)

Questions:

1. Describe the specific features of the statement of comprehensive income according to international regulations.
2. Indicate the ways a preliminary evaluation of the statement of comprehensive income can be made.
3. Describe what the vertical and horizontal preliminary assessment of the statement of comprehensive income consists of.
4. How do we use the analytical statement of income, costs, and financial results?
5. Indicate the essence of the management efficiency model.

Practice:

Based on the selected financial statement, prepare a preliminary evaluation of a company of your choice using the comprehensive income statement for the two-year period.

Include:

- an analytical statement of revenues;
- an analytical statement of costs;
- a management efficiency model.

2.3. Cash flow statement

The **cash flow statement** is the missing link that reflects the changes in the financial condition of a company over a certain period, resulting from the management of the company's financial resources (funds). The **balance sheet** reflects the financial and asset structure of an entity at a given time. It is a “snapshot” of the company as of a certain date. The **profit and loss account** is a representation of the company's performance over a given period.

In international regulations, Cash flow Statements are regulated by **International Accounting Standards 7 (IAS 7)**. According to IAS 7, a Cash flow Statement requires an entity to present a statement of cash flows as an integral part of its primary financial statements. Cash flows are classified and presented into operating activities (either using the “direct” or “indirect” method), investing activities, or financing activities, with the latter two categories generally presented on a gross basis. IAS 7 was reissued in December 1992, retitled in September 2007, and is operative for financial statements covering periods beginning on or after 1 January 1994. All entities that prepare financial statements in conformity with IFRSs are required to present a statement of cash flows.

According to IAS 7.7–8, the statement of cash flows analyzes changes in cash and cash equivalents during a period. **Cash and cash equivalents** comprise cash in hand and demand deposits, together with short-term, highly liquid investments that are readily convertible to a known amount of cash, and that are subject to an insignificant risk of changes in value. Guidance notes indicate that an investment normally meets the definition of a cash equivalent when it has a maturity of three months or shorter from the date of acquisition. Equity investments are normally excluded, unless they are in substance a cash equivalent (e.g., preferred shares acquired within three months of their specified redemption date). Bank overdrafts which are repayable on demand, and which form an integral part of an entity's cash management, are

also included as a component of cash and cash equivalents. According to IAS 7.10, presentation of the Statement of Cash Flows, then cash flows must be analyzed between operating, investing, and financing activities. Key principles specified by IAS 7 for the preparation of a statement of cash flows are as follows:

1. **Operating activities** are the main revenue-producing activities of the entity that are not investing or financing activities, so operating cash flows include cash received from customers and cash paid to suppliers and employees (IAS 7.14).
2. **Investing activities** are the acquisition and disposal of long-term assets and other investments that are not considered to be cash equivalents (IAS 7.6).
3. **Financing activities** are activities that alter the equity capital and borrowing structure of the entity (IAS 7.6); interest and dividends received and paid may be classified as operating, investing, or financing cash flows, provided that they are classified consistently from period to period (IAS 7.31); cash flows arising from taxes on income are normally classified as operating, unless they can be specifically identified with financing or investing activities (IAS 7.35); for operating cash flows, the direct method of presentation is encouraged, but the indirect method is acceptable (IAS 7.18).

The direct method shows each major class of gross cash receipts and gross cash payments. The operating cash flows section of the statement of cash flows under the direct method would appear something like this:

- cash receipts from customers;
- cash paid to suppliers;
- cash paid to employees;
- cash paid for other operating expenses;
- interest paid;
- income taxes paid;
- net cash from operating activities.

The indirect method adjusts accrual basis net profit or loss for the effects of non-cash transactions. The operating cash flows section of the statement of cash flows under the indirect method would appear something like this:

- profit before interest and income taxes;
- add back depreciation;
- add back impairment of assets;
- increase in receivables;
- decrease in inventories;
- increase in trade payables;
- interest expense;
- less interest accrued but not yet paid;

- interest paid;
- income taxes paid.

Net cash from operating activities, i.e., the exchange rate used for the translation of transactions denominated in a foreign currency should be the rate in effect at the date of the cash flows (IAS 7.25); cash flows of foreign subsidiaries should be translated at the exchange rates prevailing when the cash flows took place (IAS 7.26); as regards the cash flows of associates, joint ventures, and subsidiaries, where the equity or cost method is used, the statement of cash flows should report only cash flows between the investor and the investee; where proportionate consolidation is used, the cash flow statement should include the venturer's share of the cash flows of the investee (IAS 7.37); aggregate cash flows relating to acquisitions and disposals of subsidiaries and other business units should be presented separately and classified as investing activities, with specified additional disclosures (IAS 7.39). The aggregate cash paid or received as consideration should be reported net of cash and cash equivalents acquired or disposed of (IAS 7.42); cash flows from investing and financing activities should be reported gross by major class of cash receipts and major class of cash payments except for the following cases, which may be reported on a net basis (IAS 7.22–24):

- cash receipts and payments on behalf of customers (for example, receipt and repayment of demand deposits by banks, and receipts collected on behalf of and paid over to the owner of a property);
- cash receipts and payments for items in which the turnover is quick, the amounts are large, and the maturities are short, generally less than three months (for example, charges and collections from credit card customers, and purchase and sale of investments);
- cash receipts and payments relating to deposits by financial institutions;
- cash advances and loans made to customers and repayments thereof.

Investing and financing transactions which do not require the use of cash should be excluded from the statement of cash flows, but they should be separately disclosed elsewhere in the financial statements (IAS 7.22–24). Entities should provide disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities (IAS 7.44A–44E).

The components of cash and cash equivalents should be disclosed, and a reconciliation presented to amounts reported in the statement of financial position (IAS 7.45); the amount of cash and cash equivalents held by the entity that is not available for use by the group should be disclosed, together with a commentary by management (IAS 7.48).

Four evaluation steps are included in the **preliminary analysis of the statement of cash flows**:

- the relationships between the result and operating cash flows;
- “fourteen” cases;
- horizontal analysis;
- vertical analysis.

The first step (1) in evaluating external cash flows is to evaluate the relationships between the financial result and operating cash flows. The relationships between operating cash flow and the financial result distinguish four variants (table 2.3.1).

Table 2.3.1. Relationships between the financial result and operating cash flows

Items	Variant			
	I	II	III	IV
Net financial result	profit	profit	loss	loss
Cash flow from operating activities	excess inflows (positive)	cash shortage inflows (negative)	excess inflows (positive)	cash shortage inflows (negative)

Source: own work.

Variant I (despite the unknown value of profits and excess inflows) is the best, while Variant IV is the worst. This is because, with Variant I, the entity makes an accrual and cash profit, as it generates excess inflows over expenses. However, with Variant IV, both “on paper” and “in cash” losses occur. In business practice, it is shown that Variant III is superior to II. This is because it is always better to have cash “available” than profit “on paper”. From the short-term perspective, Variant III is better for the company’s operations. Businesses do not go bankrupt for lack of profit. Despite substantial amounts of cash frozen in accounts receivable, inventories, or bad investments, companies often fail not because of a lack of profits but because of a lack of cash to pay their current obligations. Table 2.3.2 shows the results of the analysis of the relationships between the financial result and cash flows for Wawel SA in 2020–2021.

Table 2.3.2. Relationships between the financial result and cash flows for Wawel SA, 2019–2021

Items	Variant I	2019	2020	2021
Net financial result	profit	+	+	+
Cash flow from operating activities	excess inflows (positive)	+	+	+

Source: own work.

Wawel SA in 2019–2021 is characterized by the best type of Variant. During the study period, the company generated accrual and cash profits, which indicates that the company was in good financial condition.

The next step (2) in the preliminary analysis of the statement of cash flows is based on an assessment of the state of cash (cash excess or cash shortage) of the various types of flows coming from three areas: operating, investing, and financing activities. The three areas of activities and two directions of flows (positive or negative) make it possible to distinguish eight possible cases, and by adding the evaluation of the change in cash, there are 14 cases (table 2.3.3).

Table 2.3.3. Analysis of 14 cases

Type of net cash flows from	Cases													
	Mature phase							Transitional phase				Danger phase		
	I	2	3	4	5	6	7	8	9	10	11	12	13	14
A. operating activities	+	+	+	+	+	+	+	–	–	–	–	–	–	–
B. investing activities	+	–	–	+	+	–	–	+	+	–	–	+	+	–
C. financing activities	+	–	–	–	–	+	+	+	+	+	+	–	–	–
D. in total (A.III+/-B.III+/-C.III)	>	>	<	>	<	>	<	>	<	>	<	>	<	<

Source: own work.

+ positive cash > increase in cash

– negative cash < decrease in cash

In the mature phase, cash flows from operating activities are positive and high enough to inject cash into other activities.

In the transitional phase, operating flows are negative, but at the same time, financial flows are positive. Such a situation characterizes entities which can be both dynamically developing, relatively young companies operating in sectors with good development prospects and companies that are poorly managed in the operational sphere. A transitional phase is one in which an enterprise can transition to a better or worse phase. When enterprises move to the mature phase, it is a sign of a better financial situation. A shift to the danger phase reveals a deteriorating financial situation.

The danger phase is characterized by negative operating and financial flows at an enterprise. Such a situation may indicate that the enterprise is at risk of bankruptcy.

The “fourteen” cases occurring in the company are described below:

Case 1	+	+	+	+
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Case 1 is characteristic of companies with good liquidity. The surplus of cash flows from any type of activity, resulting in an increase in liquid cash, most often indicates that the entity is geared up to undertake new ventures, mergers, acquisitions, restructuring, or building a holding structure (acquiring shares in other companies). In business practice, the case is rarely encountered, but it does occur.

Case 1 was recorded by Seko SA (<https://sekosa.pl/>) in 2020 due to the government’s decision to subsidize companies to compensate for the damage resulting from the COVID-19 pandemic restrictions, a lack of investments, and tranches of loans.

Cases 2 and 3	+	–	–	+/-
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Cases 2 and 3 occur in mature companies whose operations are highly profitable. The profit generated from operating activities allows them to engage in investing and pay their liabilities to owners (dividends) and creditors (repayment of loans, credits). Then the total cash flow is positive. On the other hand, when there is a negative value (deficit) of cash flow from overall operations, it signals that the company is in financial difficulties in a given period. New investments—perhaps—are a means to survive and improve the financial situation. Mature units, with highly profitable operations, undergo a temporary crisis of liquidity and solvency.

Case 3 was recorded in 2020–2022 at Dino SA (<https://grupadino.pl/>). The company financed its expansive growth (fig. 2.3.1) with loans. Beginning in 2020, it began repaying loans in previous periods, changing its method of development from loans to issuing debt securities. Unfortunately, the change in cash was negative, indicating that funds generated from operations were not sufficient to make the situation positive.

Cases 4 and 5	+	+	–	+/-
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Cases 4 and 5 are characteristic of companies facing a situation of organizational or operating changes, ongoing restructuring, and modernization of assets, or when the state of funds from operating activities is not sufficient to cover expenses for financing activities; therefore, they support themselves with inflows from investing activities. Positive investment flows may also indicate that past investments have not had the expected effect of enabling repayment of financing solely from operating cash flows. Ideally, it would be better to have positive cash flows at the end than negative cash flows from overall operations.

Cases 6 and 7	+	–	+	+/-
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Cases 6 and 7 describe companies that achieve a net surplus of cash flows from operations, but the scale of their investments results in them having to use external sources of financing. This situation is typical of young, developing companies whose financial situation is favorable enough to obtain new loans and credits or funds. This financial situation is the most desirable scenario for the company. Total cash flows additionally strengthen the positive assessment of the financial situation at the end of the period under review.

Case 6 was recorded between 2014 and 2019 at Dino SA (<https://grupadino.pl/>). This company has financed its expansive growth (construction of new stores, the number of which is increasing year by year—fig 2.3.1) mainly with bank loans.

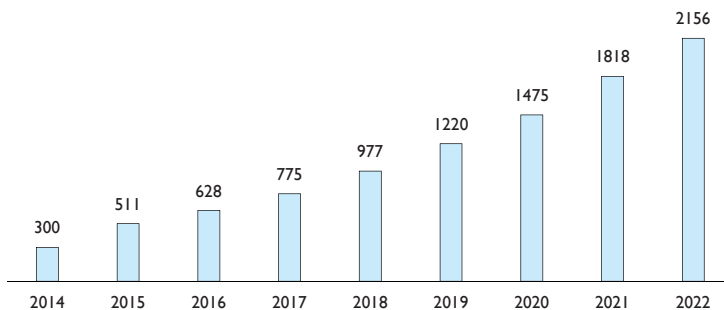


Figure 2.3.1. Number of Dino SA stores, 2015–2022

Source: own work.

Cases 8 and 9	–	+	+	+/-
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Cases 8 and 9 describe companies that are experiencing temporary difficulties. Entities try to cover the shortfall in operating funds from the sale of assets and from the inflows from financing activities. The situation is good enough and the financial difficulties are temporary enough for lenders to grant loans or for investors to contribute additional funds to the company, thereby generating surplus inflows from financing activities. An additional advantage in the assessment would be positive total cash flows.

Cases 10 and 11	–	–	+	+/-
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Cases 10 and 11 show a situation where the two negative streams, operating and investment, are financed from external sources (loans or owners' capital). This is a typical situation for young, developing companies. The prospects for this company must be sound enough since both owners of capital and creditors are not afraid to invest in it.

Cases 12 and 13	–	+	–	+/-
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Cases 12 and 13 occur in companies facing financial difficulties. They attempt to cover the resulting losses and liabilities by selling the company's most valuable assets. The company is trying to cover the shortfall in operating funds and the repayment of its loan obligations (financing activities) with funds obtained from the disposal of assets. There is no indication that the hardships are temporary. Obtaining a positive cash flow at the end of the period will not improve the company's unfavorable situation.

Case 13 appears in companies whose financial situation is difficult and may end in bankruptcy. This was the case for ABM SOLID SA (<http://www.abmsolid.eu/>), which operated on the Warsaw Stock Exchange until 2019. The company had had negative operating and financial flows since 2011 (excluding 2012 and 2013). It tried to cover the deficit from these two activities with cash from investing activities. This cash came from the sale of fixed and financial assets. Except for 2013 (case 14), the cash from all the operations was negative. The company is currently in bankruptcy proceedings.

Case 14	–	+	–	+/-
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Case 14 characterizes companies that may experience a shortage of cash from operating activities but continue to pay off debts and make investments, which implies an incomplete investment cycle. Since all activities require cash, a company will operate as long as it has enough accumulated cash from previous periods. If they do not prevent the “flight” of cash, they will collapse. A longer period of the prevalence of shortages indicates a high likelihood of bankruptcy. This is a case that rarely occurs in economic practice.

Case 14 arises when the downside occurs in three types of activities. While this is uncommon in business practice, it does occur.

An example in point is Szczecińskie Przedsiębiorstwo Budownictwa Przemysłowego Espebe SA). The now-defunct Szczecin-based company, engaged in industrial construction, recorded Case 14 in 2001 and 2002. It ceased to exist in 2003.

Table 2.3.4 shows an analysis of the 14 cases at Wawel SA from 2019–2021.

Table 2.3.4. Analysis of the 14 cases at Wawel SA, 2019–2021

Type of net cash flows from	2019	2020	2021
operating activities	+	+	+
investing activities	–	–	–
financing activities	–	–	–
in total (A.III+/-B.III+/-C.III)	–	–	+

Source: own work.

During the period under study, Wawel SA was characterized by Cases 2 and 3. Such a situation mainly occurs in mature companies with high profitability. The positive cash flows generated from its operating activities allowed the company to carry out investments and fulfill its obligations to owners through the payment of dividends and to creditors through the repayment of loan installments and interest. In the years 2019–2020, total cash flow was negative. This indicates that the company faced financial difficulties during the study period due to a shortage of cash flow from overall activity. New investments may have been a means to survive and improve the financial situation. Mature units, with highly profitable operations, sometimes face

a temporary crisis of liquidity and solvency. As we can see, in the next period, the situation improved because total cash flows were positive.

The next step of the evaluation is a vertical (4) and horizontal analysis (3) of cash flows. This evaluation uses the structure and dynamics/growth ratios (ROCR) described in the introduction to the chapter. The results of the horizontal and vertical analysis for individual operating, investment, and financing activities are shown in tables 2.3.5–2.3.7.

Table 2.3.5. Vertical and horizontal analysis of operating cash flows, 2019–2021

Description note no. (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)	ROCR (%)	
							2020/2019	2021/2020
A. Net cash flows from operating activities								
I. Gross profit (loss)	73 042	88	71 545	129	56 562	53	-2	-21
II. Adjustments in total	10 082	12	-16 044	-29	51 460	48	16	421
Depreciation	29 521	36	29 743	54	29,723	28	1	0
Currency exchange profits (losses)	9	0.0	-105	0	-80	0	109	24
Income tax paid	-15 998	-19	-9 846	-18	-9 921	-95	-62	-1
Interest and dividends	371	0.4	437	1	361	0	1	-17
Investment profit (loss)	383	0.5	2 604	5	146	0	85	-94
Changes in reserves	914	1.1	81	0	-1 204	-1	-1 028	-1 586
Changes in inventories	-2 348	-2.8	-8 751	-52	12 533	12	92	144
Changes in receivables	7 467	9.0	751	1	1 086	1	-894	45
Changes in short-term liabilities (except for loans and credits)	-3 148	-3.8	-4 951	-27	19 431	18	79	230
Changes in accruals	-7 089	-8.5	392	1	-615	-1	1 908	-257
III. Net cash flows from operating activities	83 124	100	55 501	100	107 665	100	-50	94

Source: own work.

Based on the data in table 2.3.5 it is possible to draw conclusions that will answer the following questions:

1. Where did the funds from operating activities come from (vertical analysis)?
2. What is the reason for changes in operating flows (horizontal analysis)?

In 2019, cash flows from operating activities were positive and came from:

- gross profit (88%);
- depreciation (36%).

Items decreasing the level of 2019 operating flows were:

- income tax paid (19%).

In 2020, cash flows from operating activities were positive and came from:

- gross profit (38%);
- depreciation (57%).

Items decreasing the level of 2020 operating flows were:

- income tax paid (18%);
- changes in inventories (52%);
- changes in short-term liabilities, except for loans and credits (27%).

In 2021, cash flows from operating activities were positive and came from:

- gross profit (53%);
- depreciation (28%);
- changes in short-term liabilities, except for loans and credits (18%);
- changes in inventories (12%).

The item decreasing the level of 2021 operating cash flows was income tax paid (95%), and in 2019 about 62%.

The smaller decrease in operating cash flow from 2019 to 2020 was the result of:

- changes in inventories by approx. 92%.

From 2020 to 2021, operating cash flows increased by 94% due to growth in the following items:

- changes in inventories by approx. 144%;
- changes in short-term liabilities, except for loans and credits, by approx. 230%.

The increase in operating cash flow would have been higher had it not been for a 21% decrease in gross profit. The structure and dynamics of operating cash flows appear to be correct.

Table 2.3.6 shows the results of the vertical and horizontal analysis of cash flows from investing activities in 2020 and 2021.

Table 2.3.6. Vertical and horizontal analysis of cash flows from investing activities at Wawel SA, 2019–2021

Description note no. (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)	ROCR (%)	
							2020/2019	2021/2020
B. Net cash flows from investing activities								
Sale of intangible assets and property, plant, and equipment	218	-1	120	-1	193	-2	-82	61
Purchase of intangible assets and property, plant, and equipment	-25 082	101	-14 059	89	-13 700	114	-78	3
Paid loans	16	-0.1	6	0	2 010	-17	-167	33 400
Expenditure on financial assets	0	0.0	-1 893	12	-500	4	100	74
Other investment expenditure	-16	0.1	-6	0	0	0	-167	100
IV. Net cash flows from investing activities	-4 864	100	-5 832	100	-1 997	76	-57	24

Source: own work.

Based on table 2.3.6, conclusions can be drawn as to **where the investment flow amounts came from and why the amount changed**.

In 2019–2020, net cash flows from investing activities were negative, which resulted from a purchase of intangible assets and property, plant, and equipment (101% and 89%). In 2021, the value of net cash flows from investing activities was above the purchase of intangible assets and property, plant, and equipment, at 114% of net cash flows from investing activities. In 2020, the negative value was expenditure on financial assets, at 12% of net cash flows from investing activities. In 2021, the second negative position, which influenced at 17% the increase in the negative value of net cash flows from investing activities, was the inflow from paid loans.

During 2019–2020, investment flows decreased by 57% while during 2020–2021, investment flows increased by 24% (a smaller minus, i.e., a 24% decrease in quota). The reason for the decrease was a 78% drop in spending on purchases of operating fixed assets. In 2020–2021 cash flow went up as a result of a 33,400% increase in larger inflows from the repayment of loans granted (for the company Wawel SA).

Table 2.3.7 gives data on the vertical and horizontal analysis of cash flows from financing activities for 2019 to 2021.

Table 2.3.7. Vertical and horizontal analysis of cash flows from financing activities at Wawel SA, 2019–2021

Description note no. (thousand PLN)	2019	Structure (%)	2020	Structure (%)	2021	Structure (%)	ROCR (%)	
							2020/ 2019	2021/ 2020
C. Net cash flows from financing activities								
Dividends and other payments to owners	-37 494	95	-44 993	96	-37 494	96	17	17
Payment of liabilities under financial lease agreements	-1 580	4	-1 306	3	-1 240	3	-21	5
Interest on financial lease agreements	-401	1	-470	1	-417	1	15	11
V. Net cash flows from financing activities	-9 475	100	-6 769	100	-9 151	100	16	16
D. Net cash flows in total	18 785		-7 100	15	56 517	-144	365	896

Source: own work.

The data in table 2.3.7 allow us to draw **conclusions on the origin of inflows and outflows from financial flows**. Expenditures on financing activities accounted for 100% of cash flows from financing activities. The structure of financial expenses in 2019 and 2021 was identical: 95–96% were dividends and other payments to owners, 3–4% the repayment of liabilities under financial lease agreements, and 1% was interest on financial lease agreements. All negative figures decreased, as reflected by the rate of change indicators which inform on the increase in negative amounts. In 2019–2020 there was an increase of 16%, as a result of a 17% increase in expenditure dividends and other payments to owners. The opposite situation occurred in 2020–2021. In 2020–2021, the cash deficit from financing activities decreased as a result of a 17% decrease in the payment of dividends and other payments to owners, leading to a “lesser minus” increase in flows by 16%. Net cash flows in total increased from a negative amount of -7,100 to a positive amount of 56,517, i.e., by 896%.

The preliminary vertical and horizontal analysis of cash flows provided only initial hypotheses regarding the company’s liquidity and solvency. For the period in question, i.e., 2020 and 2021, we can draw the synthetic conclusion that the company under study was liquid and solvent. Gross profit generated by the company provided the basis for creating positive operating cash flows. The company also made

development investments (expenses for the purchase of intangible assets and property, plant, and equipment), repaid borrowings (expenses for liabilities under financial lease agreements and expenses for interest on financial lease agreements), and remunerated its owners (expenses for dividends and other payments to owners). Net cash flows in total at the end of the 2021 period were positive.

Questions:

1. What are the stages of the preliminary evaluation of cash flows?
2. What is the evaluation of the relation between financial result and cash flows?
3. What is the analysis of fourteen cases based on?
4. What are the main determinants of the vertical analysis of cash flows?
5. What are the features of the horizontal analysis of cash flows?

Practice:

Perform a preliminary evaluation of cash flows using a sample financial statement from a company operating in the international market.

2.4. Statement of changes in equity

IAS 1 requires an entity to present a separate statement of changes in equity. The statement must show (IAS 1.106):

1. Total comprehensive income for the period.
2. The effects of any retrospective application of accounting policies or restatements made, as separate amounts attributable to the owners of the parent and to non-controlling interests, in accordance with IAS 8.
3. Separately, for each component of other comprehensive income, reconciliations between the carrying amounts at the beginning and the end of the period for each component of equity, separately disclosing:
 - a) profit or loss other comprehensive income transactions with the owners;
 - b) contributions by and distributions to owners, and changes in ownership interests in subsidiaries that do not result in a loss of control, shown separately.

An analysis of other comprehensive income by item is required to be given either in the statement or in the notes (IAS 1.106A). The following amounts may also be shown on the face of the statement of changes in equity, or the amount of dividends recognized as distributions and the related amount per share may be given in the notes (IAS 1.107).

The notes must (IAS 1.112) give information on the basis of preparation of the financial statements and the specific accounting policies used, disclose any information required by IFRSs that is not given elsewhere in the financial statements, and provide additional information that is not given elsewhere in the financial statements but is relevant to an understanding of any of them. Notes are written in a systematic manner and cross-referenced from the face of the financial statements to the relevant note (IAS 1.113).

IAS 1.114 suggests that the notes should normally be presented in the following order:

1. A statement of compliance with IFRSs and a summary of significant accounting policies applied, including (IAS 1.117):
 - a) the measurement basis (or bases) used in preparing the financial statements, and the other accounting policies used that are relevant to an understanding of the financial statement;
 - b) supporting information for items presented on the face of the statement of financial position (balance sheet), statement(s) of profit or loss and other comprehensive income, statement of changes in equity and statement of cash flows, in the order in which each statement and each line item is presented,

and other disclosures, including:

- c) contingent liabilities (see IAS 37) and unrecognized contractual commitments, and non-financial disclosures, such as the entity's financial risk management objectives and policies (see IFRS 7 Financial Instruments: Disclosures).

Disclosure Initiative (Amendments to IAS 1), effective 1 January 2016, clarifies this order to demonstrate how notes can be ordered and adds additional examples of possible ways of ordering the notes to clarify that comprehensibility and comparability should be considered when determining the order of the notes.

An entity must disclose, in the summary of significant accounting policies or other notes, the judgements, apart from those involving estimations, that management has made in the process of applying the entity's accounting policies that have the most significant effect on the amounts recognized in the financial statements (IAS 1.122).

Examples cited in IAS 1.123 include management's judgements in determining: when substantially all the significant risks and rewards of ownership of financial assets and lease assets are transferred to other entities, and whether, in substance, particular sales of goods are financing arrangements and therefore do not give rise to revenue.

An entity must also disclose, in the notes, information on the key assumptions concerning the future, and other key sources of estimating uncertainty at the end of the reporting period that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year (IAS 1.125). These disclosures do not involve disclosing budgets or forecasts (IAS 1.130).

In addition to the distributions information in the statement of changes in equity (see above), the following must be disclosed in the notes (IAS 1.137): the number of dividends proposed or declared before the financial statements were authorized for issue but which were not recognized as a distribution to owners during the period, and the related amount per share, and the amount of any cumulative preference dividends not recognized.

An entity discloses information about its objectives, policies, and processes for managing capital (IAS 1.134). To comply with this, the disclosures include (IAS 1.135): qualitative information about the entity's objectives, policies and processes for managing capital, including a description of capital it manages; the nature of external capital requirements, if any; how it is meeting its objectives; quantitative data about what the entity regards as capital; changes from one period to another; whether the entity has complied with any external capital requirements; and if it has not complied, the consequences of such non-compliance.

IAS 1.136A requires the following additional disclosures if an entity has a puttable instrument that is classified as an equity instrument: summary quantitative data about the amount classified as equity; the entity's objectives, policies and processes for managing its obligation to repurchase or redeem the instruments when required to do so by the instrument holders, including any changes from the previous period; the expected cash outflow on redemption or repurchase of that class of financial instruments; and information about how the expected cash outflow on redemption or repurchase was determined.

The following other note disclosures are required by IAS 1 if not disclosed elsewhere in information published with the financial statements (IAS 1.138): domicile and legal form of the entity; country of incorporation; address of registered office or principal place of business; description of the entity's operations and principal activities; if it is part of a group, the name of its parent and the ultimate parent of the group; if it is a limited life entity, information regarding the length of the life.

A sample statement of changes in equity at Wawel SA in 2019 and 2021 is shown in table 2.4.1.

Table 2.4.1. Statements of changes in equity at Wawel SA, 2019–2021

Description (thousand PLN)	Share capital	Share premium capital	Supplementary capital	Reserve capital	Revaluation capital	Other capital components	Earnings/ losses from previous years	Total equity
As of 1st January 2021 (as of 2020)	7 499	18 146	621 558	0	710	–2 549	57 079	702 443
a) net value	0	0	0	0	0	0	43 226	43 226
b) other total income	0	0	0	0	0	351	0	351
a) total income in total	0	0	0	0	0	351	43 226	43 577
b) transfer of undistributed profit acc. to the resolution of the General Meeting of Shareholders	0	0	19 766	0	0	0	–19 766	0
c) dividends paid	0	0	0	0	0	0	–37 494	–37 494

Table 2.4.1 (continued).

d) transfer of revaluation capital to supplementary	0	0	–56 200	0	0	56 200	0	0
As of 31st December 2021	7 499	18 146	585 124	56 200	710	–2 198	43 045	708 526
As of 1st January 2020 (as of 2019)	7 499	18 146	607 941	0	710	–2 123	58 429	690 602
1) net value	0	0	0	0	0	0	57 260	57 260
2) other total income	0	0	0	0	0	–426	0	–426
a) total income in total	0	0	0	0	0	–426	57 260	56 834
b) transfer of undistributed profit acc. to the resolution of the General Meeting of Shareholders	0	0	13 617	0	0	0	–13 617	0
c) dividends paid	0	0	0	0	0	0	–44 993	–44 993
As of 31st December 2020 (as of 2020)	7 499	18 146	621 558	0	710	–2 549	702 443	57 079

Source: own work.

In accordance with resolution no. 4 of the Extraordinary General Meeting of Shareholders of January 12, 2021 (as of 2020), reserve capital was created to finance the purchase of its own shares in the amount of PLN 56,200,000. The maximum number of own shares that may be acquired by the Company is 100,000, with a total nominal value of PLN 500,000 and which constitute 6.6678% of the share capital. The total maximum payment for the Company's own shares to be acquired under this authorization will not exceed PLN 56,200,000, with the proviso that this amount includes both the price for the Company's own shares to be acquired, as well as the costs of their acquisition. The Company's shares will be purchased for write-off (Financial statement 2021, Wawel SA, 6).

In order to make a preliminary assessment of the statement of changes in equity (funding), it is necessary to analyze it using structure and dynamics indicators.

Structure analysis involves differentiating the individual components of equity in terms of their nature. When assessing the structure of equity (funding) and its changes during the reporting period, it is also necessary to consider the sustainability

of its various components as sources of financing for the company's net assets. The most stable source of financing for a company is core capital, which is derived from the company's contracts or articles of association, while the way in which capital is formed and the purpose of using reserve or supplementary capital determine the degree of stability of these sources of corporate financing differently. A higher proportion of changes that reduce the level of capital than the proportion of changes that increase it indicates low sustainability of these capitals. Of a completely different nature is revalued capital (funding), which is not formed from contributions by the owners or from profits earned, but results only from changes in the value of assets, and is thus only an item that adjusts the state of the company's financing sources. It cannot be distributed by the owners in any way. Not insignificant for the assessment of the structure of equity is the share of retained earnings from previous years and the net result of the current period. On the one hand, as a profit, it is a potential source of increase in the capital and the owner's benefit from distributed profits; on the other hand, in the case of loss, it is a source of capital decrease, which is often burdensome when the loss accumulates in the following years (Zbroja, 2004).

Based on the statement of changes in equity in table 2.4.1, the structure indicators were calculated, as shown in table 2.4.2.

Table 2.4.2. Vertical analysis of the statement of changes in equity, 2019–2021

Type of capital (thousand PLN)	Value (thousand PLN)			Structure (%)		
	2019	2020	2021	2021	2019	2020
Share capital	7 499	7 499	7 499	1.1	1.1	1.1
Share premium capital	18 146	18 146	18 146	2.6	2.6	2.6
Supplementary capital	607 941	621 558	585 124	84.7	88.0	88.5
Reserve capital	0	0	56 200	8.1	0.0	0.0
Revaluation capital	710	710	710	0.1	0.1	0.1
Other capital components	–2 123	–2 549	–2 123	–0.3	–0.3	–0.4
Earnings/losses from previous years	58 429	57 079	58 429	8.5	8.5	8.1
Total equity	690 602	702 443	690 602	100	100	100

Source: own work.

Based on the data in table 2.4.2, the following conclusions can be drawn about the equity structure of Wawel SA for 2019–2021, considering the beginning and end of the year. In all four points in time:

- the largest share was supplementary capital, which accounted for between 88% and 84.7%;
- the second most important component of equity was earnings from previous years, which accounted for 8.5% to 8.1%;
- at the end of 2021, reserve capital appeared, with a share of 8.1%;
- a stable share was share premium capital, which accounted for 2.6%;
- share capital accounted for 1.1%.

Based on the statement of changes in equity in table 2.4.1, dynamics indicators were calculated, which are summarized in table 2.4.3.

Table 2.4.3. Horizontal analysis of the statement of changes in equity, 2019–2021

Type of capital (thousand PLN)	Value (thousand PLN)			Dynamics (%)	
	2019	2020	2021	2020/2019	2021/2020
Share capital	7 499	7 499	7 499	100	100
Share premium capital	18 146	18 146	18 146	100	100
Supplementary capital	607 941	621 558	585 124	102	94
Reserve capital	0	0	56 200	–	–
Revaluation capital	710	710	710	100	100
Other capital components	–2 123	–2 549	–2 123	120	83
Earnings/losses from previous years	58 429	57 079	58 429	98	102
Total equity	690 602	702 443	690 602	102	98

Source: own work.

The horizontal analysis of the changes in equity in 2019–2021 shows that the increase in equity by 2% and the decrease by 2% were caused by:

- the changes in supplementary capital (which makes up the largest part of equity); it increased by 2% from January 2020 to January 2021 and decreased by 6% from December 2020 to December 2021;
- revaluation capital grew much faster, increasing by 20% from January 2020 to January 2021 and decreasing by 17% from December 2020 to December 2021, and has a negligible value in equity (less than 1%).

In conclusion, the preliminary analysis of the financial position based on the statement of changes in equity forms the basis for deriving preliminary theses on the situation of Wawel SA in 2019–2021:

- no new shares were issued;
- the profit generated was allocated to supplementary capital and reserve capital;
- the owners were rewarded by the distribution of dividends.

Questions:

1. What are the regulations for preparing a statement of changes in equity?
2. What information should the statement of changes in equity contain? Describe.
3. Describe the importance of information that, when analyzed, provides valuable information about the financial condition of companies.

Practice:

Evaluate the statement of changes in equity of an example company for at least two years, using vertical and horizontal analysis.

Chapter III An Analysis of Solvency Ratios and Operational Capability

Introduction

We begin the third chapter with the second stage in evaluating a company's financial position, by cause and effect analysis. In this stage, financial ratios, causal models of financial analysis, and discriminatory methods of financial analysis become the main tools of evaluation. First, we will consider theories on indicators/ratios. The definition of an indicator, the role of ratio analysis, and its advantages and limitations will be discussed. We will also describe how we evaluate and interpret changes.

We start with **the concept of a ratio/indicator**. Table 3.1 gives a definition (Alamry, 2020).

Table 3.1. The concept of a ratio

1. A ratio can be defined as a numerical or arithmetical relationship between two figures.
2. A ratio is expressed when one figure is divided by the other.
3. A ratio is one figure expressed in terms of another figure.
4. For example, if 4,000 is divided by 10,000, the ratio can be expressed as 0.4 or 2:5 or 40%.
5. Absolute figures alone do not convey any meaning unless they are compared with each other.
6. Accounting ratios show an inter-relationship that exists among various figures shown in financial statements.

Source: own work, based on Alamry, 2020.

Below, we can find **a definition of the ratio analysis** and its main points (Alamry, 2020):

1. Financial analysts always need certain yardsticks to evaluate the efficiency and performance of any business unit. One of the most frequently used yardsticks is ratio analysis.
2. Ratio analysis is an attempt to derive quantitative measures or guides concerning the financial health and profitability of a business enterprise.
3. Ratio analysis involves the use of various methods for calculating and interpreting financial ratios to assess the performance and status of the business unit.

4. Ratio analysis is a tool of financial analysis that studies the numerical or quantitative relationship between two variables or items.
5. Ratio analysis is the method or process by which the relationship of items or groups of items in the financial statements are computed, determined, and presented.

The important point is also the description of **the role of ratio**. The main points are as follows (Alamry, 2020):

1. The ratio shows the financial position of a business:
 - a. Accounting ratios reveal the financial position of a business;
 - b. Accounting ratios help banks, insurance companies and other financial institutions assess a firm before sanctioning any loan to them.
 - c. Similarly, the ratios are also helpful to investors in finding out a business's profitability.
2. The ratio is useful in inter-firm and intra-firm comparisons:
 - a. Inter-firm comparison is necessary to find out the exact position of a business as compared to other businesses in the same industry.
 - b. Intra-firm comparison is also necessary to compare the performance of a business of the current year with that of previous years.
3. The ratio is calculated for a number of years:
 - a. If accounting ratios are calculated for a number of years, a trend can be established. This trend helps in setting plans and forecasting. For example, net profit expressed as a percentage of sales can be forecast based on past percentages.
4. The ratio shows the weak points in the business:
 - a. Accounting ratios are of great assistance in finding the weak spots in the business;
 - b. This weakness may exist in a business despite satisfactory performance;

For example, if a company finds that the increase in sales and distribution costs is disproportionate to the expected or achieved results, remedial steps can be taken to improve the situation.

The advantages of ratio analysis are shown below (Alamry, 2020):

1. Ratio analysis reflects the working efficiency of a business.
2. Ratio analysis facilitates comparison between one company and another in the same sector over several years to determine profitability.
3. Because ratio analysis reflects a company's financial performance, banks, insurance companies, and other financial institutions rely on it when evaluating loan applications and making important investment decisions.

4. Ratio analysis helps to identify the trend as the results are analyzed over several years.
5. Ratio analysis helps forecast likely events in the future.

Besides the above-mentioned advantages, **ratio analysis** also has certain **limitations**, which are listed below (Alamry, 2020):

1. **Absence of an Explicit Theoretical Structure**

The striking aspect of ratio analysis is the absence of an explicit theoretical structure and the fact that different calculation methods are adopted by different companies.

2. **Full adjustments**

For proper analysis, the analyst must be aware of inside information, as most companies paint a rosy picture of financial results. For example, a company may draft its balance sheet when its inventory level is low to reflect better liquidity, etc. Thus, to come to correct conclusions, ratios must be calculated after full adjustments are made.

3. **Changes in the Basis of Accounting**

Changes in the basis of accounting introduced between the analyzed periods may pose difficulty in analyzing ratios between one period and another period.

4. **Inability to provide full information**

There may be some peculiar circumstances that may not be reflected in ratio analysis. For example, a company's debentures may be due for redemption.

In such a situation, although the current ratio may appear favorable, there may be a shortage of funds due to payment requirements.

Interpretation of ratios (Alamry, 2020)

Ratios may be interpreted in different ways, as follows:

- a. **Pure/Simple Ratios**—this is merely a quotient arrived by simple division of one number by another.

Example: When the current assets of a business organization are 40,000 and current liabilities are 10,000, then the ratio is derived as follows:

$$40\,000/10\,000 = 4$$

or as 4 : 1

- b. **Percentages**—ratios are expressed as percentage relations when the simple or pure ratios are multiplied by 100.

Example: The current ratio in the above example (a) can be expressed as a percentage by multiplying 4 by 100. The ratio will be expressed as 400% as shown below:

$$40\,000/10\,000 \times 100 = 400\%$$

c. **Rate**—sometimes ratios are expressed as rates which refer to ratios over a period of time.

Example: Stock has turned over “6 times a year.”

Figure 3.1 concludes the discussion of financial indicators. In it, we can see the role of financial indicators in the improvement of a company's performance indicators and how an organization can improve its financial results and capacity by having consecutive steps in a closed cycle.

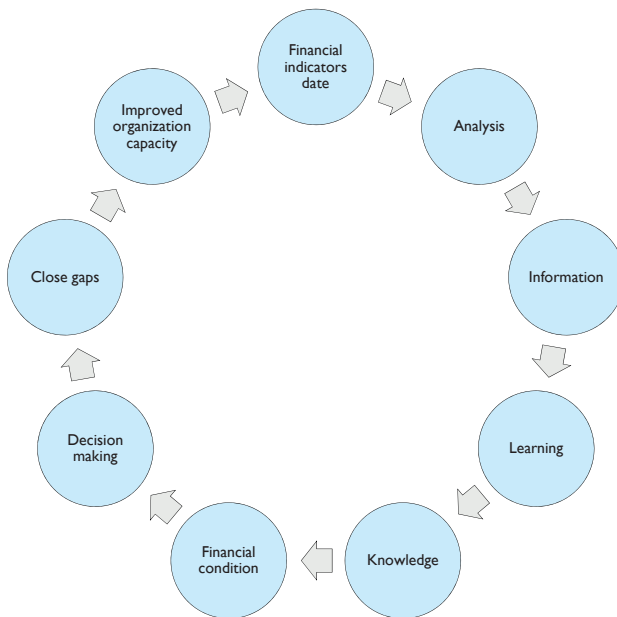


Figure 3.1. Use of financial indicators

Source: own work based on Suarez et al., 2011.

Figure 3.1 shows the importance of ratio analysis in evaluating the financial activity of companies. Analysis of financial ratios provides an opportunity to gain additional information and insight into a company's financial condition. Companies should use the insights gained from financial ratios in decision-making and also in remedying deficiencies, thus creating the conditions for improving their performance.

3.1. Liquidity

Liquidity is the ability of a company to pay short-term liabilities and other necessary payments on time, and it determines whether the company will survive in the market or not. In highly developed countries, the main reason for the bankruptcy of small and medium enterprises is a lack of liquidity. **Lack of liquidity** leads to a decline in the confidence of financial institutions, resulting in lower creditworthiness or a complete absence of it. A loss of liquidity is also accompanied by a loss of reputation, which negatively affects profitability and reduces the company's market value. Critical situations caused by a long-term lack of liquidity lead to the bankruptcy of the company. Not only is a lack of liquidity a real risk to the company, but financial **“over-liquidity”** is also a threat. It limits the company's development potential as it reduces the profit that normally finances the company's development (Wędzki, 2002). Over-liquidity is observed when a company reaches a certain level of liquidity and/or when the cash inflows expected in the not-too-distant future exceed the expenses required for the timely settlement of liabilities to other companies and for purchases (Michalski, 2013). Thus, effective liquidity management is very important because it is the only way for a company to survive in the market.

Liquidity can be presented in various ways. Definitions in economics and financial publications show different approaches to liquidity. The following aspects can be distinguished:

a. Assets

Assets characterized by low liquidity include, among other things, goodwill, know-how, or human capital, i.e., intangible assets. The disposal of intangible assets is generally considered difficult for the company and entails high costs for the valuation of these assets. The situation is different for the valuation of current assets, which generally have a high level of liquidity due to their 12-month disposal period. These may include e.g., finished goods, the sale of which generates cash that can then be used to purchase short-term securities or materials needed for the production of new finished goods. Cash is the most liquid asset, and it is a necessary means of exchange with other business entities in the market. The greater the ability to convert assets into cash, the greater the possibility of maintaining liquidity in the company (Cicirko et al., 2010).

b. Asset-capital

Liquidity, in the context of the asset-capital approach, is the two-way relationship between the external capital that finances the asset and the asset that guarantees the timely payment of liabilities (Wędzki, 2002). It means that the company can meet

its current obligations on time. Liquidity depends on the convertibility of assets into cash. The greater the proportion of a company's assets that are highly liquid relative to its total assets, the better its liquidity. The asset-capital approach not only draws attention to the high liquidity of assets but also emphasizes the high maturity of current liabilities.

c. **Cash flow**

This is based on cash inflows and outflows, which show the economic entity's financial activities. Such liquidity exists when the financial resources flowing into the entity on an ongoing basis are sufficient to pay current expenses and future obligations. Cash flow is determined by the difference between inflows and outflows. A **positive cash flow** appears when cash inflows are greater than cash outflows. However, if outflows are greater than inflows, there is a **negative cash flow**. In this case, it is worth having cash at the beginning of the next period to maintain liquidity, i.e., reserves from the previous year(s). Having liquidity means that a company can buy goods and services when they are needed to meet production or consumption needs. In addition, the company can pay any kind of financial liabilities on time and in the total amount. However, it is not only a lack of liquidity that is dangerous for a company. As mentioned before, too much liquidity or over-liquidity is also undesirable, as it means that the company uses its potential inefficiently, is passive, does not take any risk to invest the accumulated funds, and part of the working capital is frozen (Cicirko et al., 2010).

d. **Static and dynamic**

Assets and asset-capital are considered in a static sense, since the values that enter into the construction of the indicators are contained in the balance sheet, i.e., in a report prepared at a precisely defined time called the balance sheet moment. The level of liquidity is determined based on the actual level of current assets, which will be liquidated within one year at the latest, and based on the level of current liabilities, the repayment period of which is less than one year. This aspect does not consider inflows and outflows expected in the near future, the time structure of the repayment of liabilities, and the liquidation of assets. We use the balance sheet and income statement to assess static liquidity.

On the other hand, the dynamic aspect of liquidity includes all phenomena that generate inflows and outflows at a given point in time. The cash-effective results from already existing assets and liabilities as well as the results that will arise from the company's ongoing business activities are considered. The time structure of the cash flows, which shows the time divergence of inflows and outflows, is of significance.

The data contained in the cash flow statement are used to assess dynamic liquidity and the ability to generate cash inflows determines liquidity (Cicirko et al., 2010).

Static liquidity

Two liquidity ratios are used to assess static liquidity (Fridson, 1995):

- a. Current Ratio (CR);
- b. Quick Ratio (QR).

The current ratio (CR) provides information on the company's ability to pay its liabilities with its current assets. There is no common consensus in the subject literature on the normative value of this indicator. It is assumed that the ratio's value should be between 1.2 and 2.0, and if this is the case, it means that the company can pay its short-term liabilities on time and thus has sufficient liquidity. If the ratio exceeds 2.0, it can be assumed that the company is over-liquid due to inefficient use or management of funds, and, ultimately, this may lead to a deterioration in profitability. This indicator is calculated as follows:

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Short-term liabilities}}$$

Table 3.1.1. Current Ratio, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Current assets	389 762	404 918	446 604
2. Short-term liabilities	83 444	67 384	86 967
3. Current Ratio	4.67	6.01	5.13

Source: own work.

As we can see from the calculations above, the current ratio reached very high values, well above the targeted values—more than two times higher in 2019, at 4.67; three times higher in 2020, at 6.01; and two and a half times higher in 2021, at 5.13 (see table 3.1.1, item 3). This means that Wawel SA had an excessive value of current assets, including cash and short-term receivables, proving passivity and/or prudence in the management of the assets. Noteworthy, however, is the specific period in which the assessment was made, i.e., during the COVID-19 pandemic, which disrupted the “normal” cycle of businesses and the economy as a whole. The current ratio is one of the most important ratios for calculating a company's liquidity. However, its disadvantage is that current assets include inventories and accruals, which are relatively illiquid and provide poor protection for a company's liquidity. Therefore, the liquidity analysis should be accompanied by a quick ratio.

The value of the **quick ratio (QR)**, which allows liabilities to be repaid on time, is usually determined in the range of 1.0–1.2. A value below 1.0 means that current liabilities are greater than liquid current assets, i.e., the company may have temporary difficulties in paying due short-term liabilities on time. The quick ratio eliminates illiquid inventories and short-term accruals from current assets. Its value is determined using the following formula:

$$\text{Quick Ratio} = \frac{\text{Current assets} - \text{Inventories} - \text{Short-term accruals}}{\text{Short-term liabilities}}$$

Table 3.1.2. Quick Ratio (version I), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Current assets	389 762	404 918	446 604
2. Inventories	63 824	116 796	104 441
3. Short-term accruals	383	453	625
4. Short-term liabilities	83 444	67 384	86 967
5. Quick Ratio ((1-2-3):4)	3.90	4.27	3.93

Source: own work.

The quick ratio can also be calculated according to the shorter formula below:

$$\text{Quick Ratio} = \frac{\text{Cash and cash equivalents} + \text{Short-term receivables}}{\text{Short-term liabilities}}$$

Table 3.1.3. Quick Ratio (version II), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Cash and cash equivalents	150 295	598	199 392
2. Short-term receivables	175 260	142 893	142 146
3. Short-term liabilities	83 444	67 384	86 967
4. Quick Ratio ((1+2):3)	3.90	4.27	3.93

Source: own work.

Throughout the period under review, there were slight changes in the value of the quick ratio (from 3.90 in 2019 to 4.27 in 2020, and then back to 3.93; see table 3.1.2, item 5 and table 3.1.3, item 4), indicating that the company's liquidity was too high. This means that Wawel SA was able to cover its maturing liabilities with current assets by almost four times. Previous conclusions regarding the high level of cash and cash equivalents and short-term receivables were confirmed. A similar situation was observed in many companies operating in the market during the COVID-19 pandemic; as a result, the managers at Wawel SA were cautious about making decisions,

and their potential passive attitude could have been caused by a careful attitude in conditions of high risk and uncertainty. Whatever the reason, the excessively high liquidity observed at Wawel SA led to a decline in profitability due to a decrease in the efficiency of assets, in this case, current assets.

Dynamic liquidity

The indicator analysis of dynamic liquidity is performed by applying the metrics used to assess

- cash flow structure;
- cash sufficiency;
- cash productivity.

The structure of cash flow is examined by determining the share of profit and depreciation in net cash flow from operating activities. These figures can be used to determine the quality of this cash flow. The greater the share of gross profit in these flows, the higher the quality of the cash flow since gross profit reflects the efficiency of the company (profitability).

$$\text{Share ratio of gross profit in net cash flows from operating activities} = \frac{\text{Gross profit}}{\text{Net cash flows from operating activities}}$$

Table 3.1.4. The share ratio of gross profit in net cash flows from operating activities, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Gross profit	73 042	71 545	56 562
2. Net cash flows from operating activities	83 124	55 501	107 665
3. Share ratio of gross profit in net cash flows from operating activities (1:2)	0.88	1.29	0.53

Source: own work.

From the point of view of the company's condition, the best indicator value is 1. In 2019 and 2020, the gross profit value exceeded operating cash flow by 0.29 (see table 3.1.4, item 3), meaning that the profit generated by the company made it possible for the company to finance its development. In 2021, the value of 0.53 and in 2019, the value of 0.88 meant that part of the profit was not covered by cash generated from operating activities, i.e., gross profit significantly financed operating activities, namely the company's current expenses, instead of financing its growth, i.e., investment activities.

Share ratio of depreciation in net cash flows from operating activities

$$= \frac{\text{Depreciation}}{\text{Net cash flows from operating activities}}$$

Table 3.1.5. The share ratio of depreciation in net cash flows from operating activities, 2019–2020

Items (thousand PLN)	2019	2020	2021
1. Depreciation	29 521	29 743	29 723
2. Net cash flows from operating activities	83 124	55 501	107 665
3. Share ratio of depreciation in net cash flows from operating activities (1:2)	0.36	0.54	0.28

Source: own work.

Depreciation, as a non-expense cost, is an integral part of cash flows, but it should not be dominant in their structure. On the other hand, its high level allows the company to take additional advantage of the obvious income tax savings and to use otherwise unspent cash. A high level of this indicator or its upward trend is a negative phenomenon in the long term. This is because depreciation is used to restore the worn-out assets of the company. If they are used to repay liabilities or to pay dividends, this may jeopardize the long-term existence of the company. A high share of depreciation in operating cash may mean that the company does not have sufficient profitability to finance its operations or that too much cash is frozen in inventories or receivables. In the company under study, the value of this indicator was changeable. In 2019 the share of depreciation was 0.36. In 2020 the value of this ratio increased by 0.18. In addition, in 2021, the share of depreciation decreased significantly by 0.26, from 0.54 to 0.28, compared to 2020 (see table 3.1.5, item 3). This shows a marked improvement in the quality of net cash flows from operating activities. Comparing the share of gross profit and depreciation in net operating cash flow, it can be seen that the quality of the flow of these funds was good, as depreciation accounted for a smaller share than gross profit (see table 3.1.4, item 3 and table 3.1.5, item 3), i.e., funds came from the gross profit rather than from wear and tear on assets.

Ratio of financing investment activity =

negative net cash flow from investment activities

Net cash flow from operating activities + Net cash flow from financial activities

The ratio of financing investment activities is analyzed only when the investment flows have a negative value—in Wawel SA's case, in both years. The ratio of financing investment activities is calculated when expenses exceed inflows from investment activities (hence the need to use an absolute value in the numerator). It shows that the

company can cover this difference with the surplus it can generate from other fields of activities. The ratio below unity indicates that the investments are fully covered by income from other sources.

Table 3.1.6. The ratio of financing investment activities, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from investment activities	– 24 864	–15 832	–11 997
2. Net cash flow from operating activities	83 124	55 501	107 665
3. Net cash flow from financial activities	–39 475	–46 769	– 39 151
4. Ratio of financing investment activities should be negative (negative numerator) ((1:(2+3))	0.57	1.81	0.17

Source: own work.

A company with a long-term ratio below unity is considered reliable and promising. Unfortunately, in the company studied, the value in 2020 was greater than 1. The result in 2019 and 2021 was favorable for Wawel SA, indicating an improvement in the financial situation compared to the previous period (2020) (see table 3.1.6, item 4). A value above 1 means that the current investments were covered by the previously accumulated funds.

Cash sufficiency ratios

Cash sufficiency ratios provide information on the relationship between cash generated from operating activities and debt repayments, dividend payments to owners, and investments in property, plant and equipment (tangible assets) and intangible assets (operating investments, i.e., those related to the company's core business). Usually, however, only **operating cash sufficiency ratio (OCS)** is calculated, which includes in the denominator the total expenses incurred for debt repayments, dividend payments and investments. In Poland, for example, this indicator at 0.4 means that the company is positively valued; at best, its value is 1. It reflects the ability of the company to pay expenses related to the repayment of debts (understood as repayment of loans, the redemption of securities, other financial obligations, leases, and interest), investments related to operating assets, and payments to owners with the funds generated from operating activities.

$$OCS = \frac{\text{Net cash flows from operating activities}}{\text{Purchase of tangible and intangible assets} + \text{dividends payments} + \text{payment of liabilities} + \text{payment of interest}}$$

Table 3.1.7. Operating Cash Sufficiency Ratio (OCS), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from operating activities	83 124	55 501	107 665
2. Purchase of intangible assets and property plant and equipment	25 082	14 059	13 700
3. Dividends payments	37 494	44 993	37 494
4. Payment of liabilities (only loans and credits from investment activities)	1 580	1 306	1 240
5. Payment of interest	401	470	417
6. Operating Cash Sufficiency Ratio (1:(2+3+4+5))	1.29	0.91	2.04

Source: own work.

The operating cash sufficiency ratio was characterized by very high volatility, as in 2019 Wawel SA financed the entire expenditure with net cash from operating activities but in 2020 the company was able to finance 0.91 (i.e., 91%) of its expenses with funds generated from operating activities, while in 2021 these funds were more than double the expenses incurred during the period (see table 3.1.7, item 6). Such a situation is considered beneficial for the company, as the surplus funds can be used to finance investments in future periods. Considering the COVID-19 pandemic in 2020 and 2021 and the cautious attitude of the company's management, the market situation seems to be improving significantly after the exceptional pandemic situation. This is due to the greater activity of buyers and sellers, which, in turn, will result in greater investment activity, for example, in the area of purchasing. As can be seen from the above analysis, the company under study will be able to cope easily with the resulting challenges due to the amount of accumulated cash and the financial potential for—broadly understood—investments.

Cash productivity ratios

Cash productivity ratios show the relationship between cash generated from operating activities and sales revenue, operating profit and assets. In this section, we will analyze Cash Productivity of Sales (CPS), Cash Productivity of Assets (CPA), Cash Productivity of Operating Profit (CPOP) and Operating Cash Flow Ratio.

The first of the ratios is **Cash Productivity of Sales (CPS)** calculated according to the formula:

$$CPS = \frac{\text{Net cash flow from operating activities}}{\text{Revenue}} \times 100$$

Table 3.1.8. Cash Productivity of Sales (CPS), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from operating activities	83 124	55 501	107 665
2. Revenues	564 440	488 621	517 949
3. Cash Productivity of Sales ((1:2) x 100)	14.73	11.36	20.79

Source: own work.

The higher the indicator value, the better the condition of the company. The company usually receives a positive rating with a value between 15–20%. Our analysis shows that cash productivity of sales decreased from 14.73% to 11.36% in 2020 and then increased from 11.36% to 20.79%, i.e., by 19.43%, which corresponds to a growth rate of 183% (see table 3.1.8, item 3). The results thus indicate a significant increase in sales revenues, i.e., the degree of their realization in cash.

The next ratio is **Cash Productivity of Assets (CPA)** whose formula is as follows:

$$CPA = \frac{\text{Net cash flow from operating activities}}{\text{Average assets in total}} \times 100$$

Table 3.1.9. Cash Productivity of Assets (CPA), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from operating activities	83 124	55 501	107 665
2. Assets in total	795 139	790 882	813 976
3. Average assets in total $(200_t + 200_{t-1}) : 2$	no data	793 010.5	802 429
4. Cash Productivity of Assets ((1:3) x 100)	no data	7.00	13.42

Source: own work.

The ratio determines the potential of assets to generate revenue from operating activities. Its desired value is between 30 and 35%. During the period under review, asset productivity increased from 7% to 13.42% (see table 3.1.9, item 4), which means that the company's ability to generate positive operating cash flow from its assets almost doubled. This indicates a significant improvement in the company's asset productivity; however, the improvement was not satisfactory.

Cash Productivity of Operating Profit (CPOP) is calculated according to the following formula:

$$CPOP = \frac{\text{Net cash flow from operating activities}}{\text{Operating profit}} \times 100$$

Table 3.1.10. Cash Productivity of Operating Profit (CPOP), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from operating activities	83 124	55 501	107 665
2. Operating profit	70 303	72 101	56 338
3. Cash Productivity of Operating Profit $((1:2) \times 100)$	118.24	76.98	191.10

Source: own work.

The acceptable value of CPOP should fall within the range of 40–60%, but the satisfactory level is 100%. As we can see above, profit productivity decreased from 118.24% to 76.98% in 2019–2020 and then increased from 79.98% to 191.10% in 2020–2021 (see table 3.1.10, item 3), which means that profit poorly reflected the company's economic potential. In 2021, operating cash flow exceeded operating profit by 91.10%. However, the ratio value was not satisfactory in 2020, as it was below 100%.

The last of the ratios we use to analyze dynamic liquidity is **Operating Cash Flow Ratio**, which is calculated as follows:

$$\text{Operating Cash Flow Ratio} = \frac{\text{Net cash flow from operating activities}}{\text{Average current liabilities}}$$

Table 3.1.11. Operating Cash Flow Ratio, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Net cash flow from operating activities	83 124	55 501	107 665
2. Current liabilities (Short-term liabilities)	83 444	67 384	86 967
3. Average current liabilities $(200_t + 200_{t-1}) : 2$	no data	75 414	77 175.5
4. Operating cash flow ratio (1:3)	no data	0.74	1.39

Source: own work.

The operating cash flow ratio of 0.74 in 2020 proves that the company did not have sufficient funds to pay its current liabilities with the funds generated from operating activities. In 2021, the situation improved significantly, as the net cash generated from operating activities made it possible to fully cover the liabilities (the value of the ratio was above 1) and there was still something left to finance other activities such as investments (development) (see table 3.1.11, item 4).

To summarize ratio analysis, a company should decide which of the above ratios is of the greatest cognitive value. The literature emphasizes that cash flow analysis is a “powerful analytical tool” because it most accurately describes the aspects that determine the company's continued operations (Olzacka & Pałczyńska-Gościński, 2003; Sierpińska & Jachna, 2004; Walczak, 2003, and Fridson, 1995).

Questions

1. What is the difference between the Quick and Current Ratio formulas?
2. What may the phenomenon of over-liquidity be indicative of?
3. What is evidenced by a high share of depreciation in the creation of net cash flow from operating activities?
4. What expenses in a well-functioning company should net cash flow from operating activities be sufficient for?

Practice

Based on a selected statement of financial position, evaluate the following:

- current ratio (CR);
- quick ratio (QR);
- selected indicators of dynamic liquidity based on information from the cash flow statement.

3.2.Asset management

Assessing a company's liquidity is extremely important because, as mentioned in Section 3.1, too much liquidity can adversely affect a company's profitability, while too little liquidity can lead to payment difficulties. The loss of liquidity has a number of negative economic consequences for the company. Therefore, it is also important to examine how efficiently the company manages its assets to generate and maximize sales revenues. For this purpose, we use a group of metrics called **asset management ratios**, or **activity ratios**. These metrics provide information about a company's ability to generate sales revenues using its resources. We use them to measure the company's efficiency and effectiveness in managing receivables, inventories and total assets. In other words, they describe the relationship between net sales and assets and provide information on the efficiency of their use. This group of ratios includes:

1. Total Asset Turnover.
2. Average Days of Receivables.
3. Average Days of Trade Liabilities (Payables).
4. Average Days of Inventory Turnover.
5. Working Capital Ratio (see chapter 3, section 3.3 and table 3.3.3, item 3).

Total asset turnover (1) shows how efficiently the company uses its assets to generate sales revenue. It provides information on how many times asset turnover has taken place in the study period. The higher the value of the asset turnover ratio, the more efficiently the company uses its assets. In other words, the higher the ratio,

the shorter the production cycle. The assessment of the value of the ratio should also depend on the industry in which the company operates.

$$\text{Total asset turnover} = \frac{\text{Revenues}}{\text{Average total assets}}$$

Table 3.2.1. Total asset turnover, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Assets in total	795 139	790 882	813 976
2. Average total assets (200 _t +200 _{t-1}):2	no data	793 010.5	802 429
3. Revenues	556 764	488 621	517 949
4. Total asset turnover (3:2)	no data	0.62	0.65

Source: own work.

In the company under study, the use of total assets improved, which was reflected in an increase in the productivity of total assets. The increase was insignificant: by 0.03, from 0.62 in 2020 to 0.65 in 2021 (see table 3.2.1, item 4). Thus, the values in both years were very similar, which indicates that the total assets (capital disbursed/ invested in the purchase) made a little more than 0.6 turnover (cycle) over one year.

Average days of receivables (2), also known as accounts receivable days, indicates how long a company waits to receive cash for products sold. The accounts receivable collection cycle in days is influenced by market factors or internal conditions resulting from the efficiency of the company's management. The value of the indicator should be as low as possible. An increase in the ratio negatively affects the company's payment liquidity, as it reduces the ability to pay current obligations on time due to the delayed collection of receivables.

The assessment carried out below uses the annual financial statements of Wawel SA, which is why the number of days used to calculate the ratios is 365. The number of days used to calculate turnover ratios is determined by the period for which the income statement was prepared, i.e., the number of days over which revenue was generated.

$$\text{Average days of receivables} = \frac{\text{Average short-term trade receivables}}{\text{Revenues}} \times 365$$

Table 3.2.2. Average days of receivables, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Short-term trade receivables*	170 278	141 357	140 433
2. Average short-term trade receivables $(200_t + 200_{t-1}) : 2$	no data	155 817.5	140 895
3. Revenues	556 764	488 621	517 949
4. Average days of receivables $((2:3) \times 365)$	no data	116.39	99.29

Source: own work.

*In Wawel SA's statement of financial position, short-term trade receivables are shown together with other short-term receivables.

At Wawel SA, trade receivables were collected at an increasing rate. In 2020, the average time from issuance of an invoice to receipt of funds was about 117 days, while in 2021, this went down to about 100 days (see table 3.2.2, item 4). 100 days is the period for which the company gave credit to its customers. This does not mean that all partners of the company in question pay their debts at the same time. However, it is always positive if the waiting time for funds is reduced by about 17 days, as the company can reinvest the funds in its operations more quickly and reap financial benefits, and thus it is a sign of an improvement in the efficiency of the accounts receivable management. This improvement generally may be due to, among other things, the company's strengthened position in the market or its cooperation with companies that have better liquidity or with existing customers whose liquidity has improved.

In business practice, companies that have worked together over a longer period of time can negotiate relatively longer payment terms because of the lower risk involved in collecting receivables. The key here is to evaluate this indicator by comparing its value in different periods. It is expected that the value of this indicator is low in a developing company and tends to decrease with time.

The **average days of trade liabilities ratio (3)** reflects the company's efficiency in negotiating with suppliers. It provides information on the number of days after which payables/liabilities are settled. The indicator should assume the highest possible values, as it indicates the time during which the company uses interest-free external capital (trade credit). It is calculated according to the following formula:

$$\text{Average days of trade liabilities} = \frac{\text{Average short-term trade liabilities}}{\text{Revenues}} \times 365$$

Table 3.2.3. Average days of trade liabilities, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Short-term trade liabilities*	67 763	52 594	71 036
2. Average short-term trade liabilities $(200_t + 200_{t-1}) : 2$	no data	60 178.5	61 815
3. Revenues	556 764	488 621	517 949
4. Average days of trade liabilities $((2:3) \times 365)$	no data	44.95	43.56

Source: own work.

*In the statement of financial position of the company under study, short-term trade liabilities are shown together with other short-term liabilities.

The liability repayment period was shortened by about 1 day in 2021 compared to 2020 (see table 3.2.3, item 4). From the company's point of view, its situation worsened due to the use of increasingly shorter trade credit. In 2020, an average of 45 days (44.95) elapsed between the receipt of the invoice and goods and the date of payment, meaning that the company disposed of external capital for that many days without incurring additional costs ("no-fee loan"). The reduction of this period by an average of 1 day in 2021 (average days of trade liabilities was 43.56 days) may indicate a weaker negotiating position of the company in the market or timely settlement of payables as a result of improved liquidity (fulfillment of contracts with suppliers). In summary, this situation means that the company credits itself with interest-free external capital over a shorter period.

If we compare the period of collection of receivables with the period of liabilities payment (this is what we call the operating cycle), we can see that the situation was not favorable for the company, as the funds from sales (receivables) in 2020 were collected after about 117 days, while the company paid its liabilities after about 45 days. In 2021, receivables were collected after about 100 days and liabilities were paid after about 44 days. However, from year to year, the period in which the company collected receivables and paid payables shortened. In 2020, this difference was about 72 days (117–45 days), while in 2021 it was 56 days (100–44 days). Nevertheless, the company was more of a "capital provider" than a "capital taker."

The answer to the question of whether such a situation is due to the company's relatively weak position in the market and its low bargaining power or to its liquidity problems should be sought, among other things, in the comparison of the results achieved with the terms of the contracts concluded with suppliers.

Average days of inventory turnover (4) indicates the number of days in which a company rebuilds its inventories to generate sales revenue. This indicator determines the efficiency of inventory usage, as it provides information on how many days the funds are frozen in inventory. The smaller the volume and with a decreasing

tendency, the better the inventory usage is. It is calculated according to the following formula:

$$\text{Average days of inventory turnover} = \frac{\text{Average inventories}}{\text{Revenues}} \times 365$$

Table 3.2.4. Average days of inventory turnover, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Inventories	63 824	116 794	104 441
2. Average inventories $(200_t + 200_{t-1}) : 2$	no data	90 309	110 617.5
3. Revenues	556 764	488 621	517 949
4. Average days of inventories $((2:3) \times 365)$	no data	67.46	77.95

Source: own work.

The inventory turnover ratio in days shows an increasing trend from about 68 days (67.46) to 78 days (77.95), i.e., an increase of 10 days (see table 3.2.4, item 4). This situation indicates a worse efficiency in the use of inventories, i.e., a longer period of “freezing” of funds in this asset. As we can see from the table above, in 2020 inventories took about 68 days to complete a full turnover cycle, measured from the purchase of inventories through the processing phase to the sale and receipt of money in the account. Then in 2021, it went up to about 78 days (77.95 days), which extended the time to reinvest capital and increase its efficiency.

In summary, the decrease in the duration of turnover is a favorable phenomenon. By reducing inventory, the company reduces storage costs and debt service costs when purchases are made using a working capital loan.

The next thing to look at is the **cash conversion cycle (CCC)**. The term was introduced by Richards and Laughlin (Richards & Laughlin, 1980) who proposed it as a dynamic indicator in liquidity analysis. The authors propose the cash conversion cycle as a measurement for the flow concept of liquidity. The cash conversion cycle reflects “the net time interval between actual cash expenditures on a firm’s purchase of productive resources and the ultimate recovery of cash receipts from product sales” (Richards & Laughlin 1980). In particular, the authors specify that the cash conversion cycle is equal to the sum of the inventory conversion period and receivables conversion period subtracted by the payables deferral period. Technically a cash conversion cycle can be traced for each item from the sourcing of raw materials to work-in-progress, the sale and payments for finished goods and payment for the purchases needed for production. In reality, it is difficult to track a large number of individual transactions taking place on an ongoing basis. Therefore, the cash conversion cycle is typically calculated using firm-wide accounting data. In particular, the cash

conversion cycle is derived from three components: inventory conversion period, receivable conversion period, and payable deferral period (Nowak, 2008).

In other words, the cash conversion cycle indicates the time that elapses from the disbursement of cash (i.e., payment of liabilities) to the receipt of receivables. It is, therefore, the number of days between the spending of cash to pay for the materials purchased for production and the time cash is received from the sale of products manufactured by the company (Tan, 2019). In accordance with this definition, it is calculated as follows:

$$\begin{aligned} \text{Cash conversion cycle} = & \\ & \text{Average days of total short-term receivables} \\ (+) & \text{Average days of inventories} \\ (-) & \text{Days in accounts payable (total short-term)} \end{aligned}$$

The shorter the cash conversion cycle and the lower its value over time, the more favorable the situation is for the company, as this means a shorter period during which cash is “frozen” in inventories and receivables, which is due to improved operational efficiency.

$$\text{Average days of total short-term receivables} = \frac{\text{Average total short-term receivables}}{\text{Revenues}} \times 365$$

Table 3.2.5. Average days of total short-term receivables, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Total short-term receivables	175 260	142 893	1 426
2. Average total short-term receivables (200t + 200t-1): 2	no data	159 076.5	149 519.5
3. Revenues	556 764	488 621	517 949
4. Average days of short-term receivables ((2:3) × 365)	no data	118.83	100.43

Source: own work.

The next indicator, **average days in accounts payable**, considers the short-term liabilities reported on the balance sheet, as opposed to the average days of liabilities ratio where ONLY short-term trade liabilities are included.

$$\text{Average days in accounts payable} = \frac{\text{Average total short-term liabilities}}{\text{Revenues}} \times 365$$

Table 3.2.6. Average days in accounts payable, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Total short-term liabilities	83 444	67 384	86 967
2. Average total short-term liabilities $(200_t + 200_{t-1}) : 2$	no data	75 414	77 175.5
3. Revenues	556 764	488 621	517 949
4. Average days in accounts payable $((2:3) \times 365)$	no data	56.33	54.39

Source: own work.

Table 3.2.7. Cash conversion cycle (CCC) (in days)

Ratios	2020	2021
1. Average days of total short-term receivables	118.83	100.43
2. Average days of inventories	67.48	77.95
3. Average days of total short-term liabilities	56.33	54.39
4. CCC $(1+2-3)$	129.98	123.99

Source: own work.

At Wawel SA, the cash conversion cycle was reduced by 6 days from 130 days in 2020 to 124 days in 2021 (see table 3.2.7, item 4). This means that the company improved the efficiency of its cash management, so that it was no longer forced to use more and more capital to finance its activities, as the company had less capital in circulation, and the opportunities to reinvest it were faster. However, there is no doubt that the cash conversion cycle was still very long, with a period of about 4 months (130 days: 30 days per month) elapsing between the commitment of funds to the business and the receipt of these funds in the form of cash.

Comparing the working capital ratio, whose value in 2020 was 252.14 (approx. 253 days) (see table 3.3.3, item 3), with the cash conversion cycle of 129.98 (approx. 130 days) at that time, one should conclude that the company's financial situation (especially liquidity) was stable and secure, as the company had enough working capital to finance its operations for about 253 days in case it did not generate revenues, and the cash conversion cycle shows that the funds were engaged in turnover for about 130 days. Thus, it is obvious that the company has a "large" and secure financial cushion (a buffer) that fully covers and even exceeds its capital needs. This is not a phenomenon that has a positive impact on profitability (Shin & Soenen, 1998, and Gill, Biger & Mathur, 2010), because the capital is not used efficiently. In 2021, the situation was even worse in terms of capital efficiency, as the company's working capital was sufficient to finance operations for about 254 days without sales revenues, and cash conversion cycles showed that in that year, the period between "cash spent" and "cash

received” was about 124 days. This means that although the company had to wait more than four months to receive the funds, it did not have to take out additional loans to finance its operations because it had its own surplus funds.

Many authors point out that choosing values for constructing indicators to determine the CCC depends on many factors, such as the size of the company or the type of financial information. A summary of the different concepts along with the results of their research is given by Xin Tan (2019, 67). Moreover, as pointed out by Cagle (Cagle, Campbell & Jones, 2013) the cash conversion cycle is a method incorporating time that remedies many of the disadvantages from using the static measures of liquidity, such as current ratio. Recognizing the growing demand for help in managing the cash flow cycle, Hutchison (Hutchison, Farris II & Anders, 2007) propose to use the cash conversion cycle as a benchmark to investigate improvement opportunities and a tool in negotiations with suppliers and customers.

3.3. Working capital

A supplement to the preliminary balance sheet analysis is the analysis of working capital, also known as net working capital (NWC). In companies, net working capital is primarily used to finance current assets. Its increase is therefore considered positive, while a decrease may indicate financial difficulties and the need for greater recourse to external sources of financing, such as bank loans (Ek & Guerin, 2011). Many authors believe that working capital determines a company’s liquidity, short-term financial health, and value growth (Kieschnick, Laplante & Moussawi, 2013; Ben-Nasr, 2016).

1. In balance sheet terms, net working capital is the difference between current assets and current liabilities (the so-called asset approach):

$$\text{Working capital} = \text{Current assets} - \text{Short-term liabilities}$$

Table 3.3.1. Working capital (asset approach), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Current assets	389 762	404 918	446 604
2. Short-term liabilities	83 444	67 384	86 967
3. Working capital (1–2)	306 318	337 534	359 637

Source: own work.

2. Difference between fixed capital and fixed assets, the so-called capital approach (Subramanyam, 2014):

$$\text{Working capital} = \text{Long-term capital in total} - \text{Fixed assets}$$

Table 3.3.2. Working capital (capital approach), 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Equity in total	690 602	702 443	708 526
2. Long-term liabilities and provisions for liabilities	21 093	21 055	18 483
3. Fixed assets	405 377	385 964	367 372
4. Long-term capital in total (1+2)	711 695	723 498	727 009
5. Working capital (4–3)	306 318	337 534	359 637

Source: own work.

In all years, working capital is positive (see table 3.3.1, item 3 and table 3.3.2, item 5). This situation is the result of the golden balance sheet rule and the golden financial rule. This means that the company adequately finances the assets at its disposal, and has liquidity and a certain value of capital as a safety buffer for its business operations. The surplus can be used in the future to finance the company's further development.

Proper working capital management contributes to improving the efficiency of business operations and to an increase in the profitability and competitiveness of a given company (Deloof, 2003). It is considered that if working capital has a value greater than zero, the company does not have a high risk of liquidity breaches and is able to meet its current obligations. On the other hand, if the value of the indicator is negative, its solvency is at risk and its liquidity is assessed negatively (Gołębiowski & Tłaczala, 2009).

The assessment of working capital can be extended to include the working capital ratio, which provides information on how many operating days the company would have sufficient funds for if it did not generate any sales revenue.

Table 3.3.3. Working capital ratio

Items (thousand PLN)	2019	2020	2021
Working capital	306 318	337 534	359 637
Revenues	564 440	488 621	517 949
Working capital ratio (days), $((1:2) \times 365)$	198.08	252.14	253.44

Source: own work.

The working capital ratio, expressed in days, shows a year-on-year increase for the entire period under study. However, in 2019, after rounding up to full days, the value is already 199, which means that the company had sufficient capital to operate for more than six months (199 days/30 days, the average number of days in a month) even if it did not generate any revenue during that period. This is a very long time, which means that the capital is too high, which proves that managers do not effectively use the capital at their disposal. The consequence of such behavior may be a decrease in profitability. In 2020 and 2021, the figures increased and amounted to 253 and 254 days, respectively (rounded up to full days), indicating that working capital would be sufficient to finance the company's operations if no revenues were generated for more than eight months (235 days/30 days).

The above results show the passive attitude of managers, perhaps due to market uncertainty (the unfriendly micro- and macroeconomic environments) or a lack of appetite for risk.

3.4. Bankruptcy risk models

Bankruptcy risk models arose from the need to forecast a company's risk of bankruptcy. Owners and investors use them to predict what the future holds for a given company. When examining the financial situation, it is important to use the experience of other companies threatened with collapse or already bankrupt. It is also helpful in recognizing the symptoms that herald a financial crisis, which in turn helps to not only anticipate the impending collapse but also counteract it. Since the late 1960s, the problem of predicting corporate bankruptcy has been well-known in the international finance literature. Bankruptcy forecasting essentially comes down to classifying any business entity into one of two distinct groups: (1) the group of "healthy" i.e., financially sound companies, and the group of "sick" i.e., bankruptcy-prone companies (Korol & Prusak, 2014). The main advantage of discriminant analysis is that it makes it possible to create an early warning system, which is a combination of ratio analysis and econometrics (Kaczmarek, 2010). The most popular model for the discriminant analysis of a company is Altman's method. In 1968, he published his discriminant model in *The Journal of Finance*. Altman is considered a representative of methods that can be used to predict the bankruptcy and insolvency of a given company. His method is a simple tool that is still used today to help identify solvent and insolvent companies. Altman's model is based on conservative ratio analysis and multivariate discriminant analysis (Siegel, Shim & Hartman, 1999).

His model is often called **Altman's Z-score**. Altman's Z-score formula is written as follows (Siegel, Shim & Hartman, 1999):

$$Z(\zeta) = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + 1.0x_5$$

The model can be used by an analyst who has financial ratios with conflicting information about a company's financial condition (Zepek, 2000). The Z-score model is based on five key financial ratios (Kaczmarek, 2010, 108).

Zeta (ζ)—Altman's Z-score

- the working capital/total assets ratio;
- the retained earnings/total assets ratio;
- the earnings before interest and tax (EBIT)/total assets ratio;
- the market value of equity/total liabilities ratio (i.e., the book value of total debt);
- the total sales/total assets ratio.

Figure 3.4.1 shows an interpretation of Altman's Z-score.

Altman's Z-score Model		
<1.8 Distress Zone	<1.8:3.0> Grey Zone	>3.0 Safe Zone

Figure 3.4.1. Interpretation of Altman's Z-Score

Source: own based on the research study.

As a rule, the lower the Z-score, the greater the likelihood that a company is at risk of bankruptcy. If the Z-score is less than 1.8, it indicates that the company is in financial distress and is very likely to go bankrupt. A score of 3 and above, on the other hand, shows that the company is in the safe zone and is not at risk of bankruptcy. A score of between 1.8 and 3 means that the company is in the grey zone and there is a medium probability of bankruptcy. Altman's model has proved to be an accurate method for predicting bankruptcy. Studies show that the model has an accuracy of 95% in predicting bankruptcy one year before it occurred, 72% two years before, and 48% accuracy three years before bankruptcy occurred (Mioduchowska-Jaroszewicz, 2005).

There is also a modification of Altman's Z-score model applicable to the analysis of non-public entities (without the market value of equity), which takes the following form:

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

$Z < 1.23$ —high risk of bankruptcy;

$1.23 \leq Z \leq 2.90$ —gray zone (no clear classification);

$Z > 2.90$ —no risk of bankruptcy.

The Altman model and other bankruptcy risk prediction models can be used to study a single company or a group of companies. They are used to determine whether one or more companies are in the bankruptcy zone or in a position to threaten another company. In this analysis, it is critical for an owner or shareholder of a particular business to be able to get an accurate view of the financial situation before a particular business gets into financial trouble (Kaczmarek, 2010, 109).

Another model based on the same ratios as Altman's and further expanded to include a cash ratio (i.e., based on cash flow items) operating cash flow/total liabilities (J6) takes the following form **operational cash flow/total liabilities (J6)** (Almamy, Aston & Ngwa, 2016):

$$J - UK = 1.484J1 + 0.043J2 + 0.390J3 + 0.004J4 - 0.424J5 + 0.75J6$$

As mentioned above, the Z-score model is based on five key financial ratios. Below, you can find a breakdown and description of these five financial ratios and the additional ratio incorporated by Almamy as described by Leo Nelissen in his (2018) article titled "Predicting Bankruptcy Among U.S. Companies: A Study Based on Altman's Z-score and Almamy's JUK Model."

(=J1) **working capital/total assets**—this ratio is a measure of liquidity where working capital is the difference between current assets and current liabilities. Altman found this to be the most efficient liquidity ratio given that companies that lose money on a frequent basis tend to have declining net assets. The other two liquidity ratios he examined were the current ratio and the quick ratio, which were less important in Altman's earlier studies.

(=J2) **retained earnings/total assets**—retained earnings display a company's cumulative profitability. This ratio contains two aspects that are extremely interesting and well thought out. The first is the incorporation of age. Bankruptcy models, like the one from Taylor Shumway in 2001, added age as an extra variable, as measured by the number of calendar years a company has been active. Altman's model, on the other hand, assumes that companies with a long history have higher returned earnings, simply because they have been in business for a longer period. This also means that newer companies are discriminated against, given that they have a lower ratio and therefore a higher bankruptcy probability, according to Altman. However, he argues

that this is a good representation of the real economy where newer companies, often in early business stages, have a lower chance of survival. Later research from Canada found that an early age indeed caused a higher bankruptcy risk because it takes time to create value-adding capabilities (Thornhill & Amit, 2003).

(=J3) **EBIT/total assets**—the purpose of this ratio is to look at the true earnings power of a company's assets. In this case, Altman looked at earnings abstracting taxes and the influence of leverage.

(=J4) **the market value of equity/total liabilities ratio (i.e., the book value of total debt)**—not all companies have available operating cash flow data, whereas some companies miss even more variables. Market value is defined as the total market value of all preferred and common shares. Total debt is the sum of both short-term and long-term debt or total current liabilities plus total long-term debt. The purpose of this ratio is to see how much a given firm's assets can decline before liabilities exceed assets. In the case of a stock-listed company, there is another aspect that plays a role. Investors and traders who often incorporate many other indicators in addition to the ones discussed in this paper, tend to sell companies when they expect financial turmoil to happen in the future (Shumway, 2001). This gives the Z-score a predictive aspect.

(=J5) **the total sales/total assets ratio**—total sales as a part of total assets indicate management's ability to generate top-line growth in different situations.

(J6) **Operational cash flow/total liabilities**—the variable added by Almamy et al. (Nelissen, 2018).

Another discriminant model is the Ohlson O-score for predicting bankruptcy (Ohlson, 1980), which is an extension of Altman's Z-score model. Ohlson added four more indicators to this model, giving the model an accuracy of 92.5%. The model was based on a study of 105 bankrupt and 2,058 financially sound companies. Ohlson's O-score model first appeared in 1980 in *The Journal of Accounting Research*. The goal of the model is to predict whether or not a company is likely to go bankrupt in the near future. Ohlson's model is based on nine business indicators that can be taken from companies' financial statements. Once you have a set of the relevant indicators, you can calculate the value using the following formula (Alam, 2022):

$$O\text{-score} = -0.407x_1 + 6.03x_2 - 1.43x_3 + 0.757x_4 - 2.37x_5 - 1.83x_6 + 0.285x_7 - 1.72x_8 - 0.521x_9 - 1.32$$

Another way to calculate the O-score is to convert it into a **probability default** based on the following:

$$P = \frac{1}{1 + e^{-0-SCORE}}$$

where:

e—Euler's number $\approx$;

0—limit value.

$P > 0.5$ —the enterprise is at risk of bankruptcy;

$P \leq 0.5$ —the company is not at risk of bankruptcy.

The score obtained provides information on the condition of a company—the higher the score, the better the company's condition. According to the literature, all scores above 0.5 indicate that a given company will fail within the next two years (Lichota, Rabiej & Pitera, 2021).

The calculations based on Ohlson's model for Wawel SA are shown in table 3.4.1.

Table 3.4.1. Calculations based on Ohlson's model for Wawel SA, 2020–2021

Items (thousand PLN)	2020	2021
X1 = assets in total/inflation rate	–1.58	–1.58
X2 = total liabilities/assets in total	0.67	0.13
X3 = (current assets – short-term liabilities)/current assets	–1.19	–0.19
X4 = total liabilities/current assets	–0.01	0.06
X5 = 1 if liabilities exceed assets; 0 otherwise	–2.37	0.46
X6 = total comprehensive income/total assets	–0.13	–0.10
X7 = net cash flows from operating activities/total liabilities	0.18	0.29
X8 = 1 if there has been a net loss in the last two years, 0 otherwise	–0.12	–1.72
X9 = (total income from the previous year – total income from the base year)/(total income from the previous year + total income from the base year)	0.08	0.07
Ohlson's model score	–4.22	–2.31
P value	0.01	0.09

Source: own work.

The analysis of the results from table 3.4.1 based on Ohlson's model for Wawel SA in 2020–2021 leads to the following conclusions regarding the financial situation:

- the P value derived from Ohlson's model is below 0.5, which means that the company is not at risk of collapse;
- the value of the model in 2020–2021 has increased, indicating an improvement in the financial situation of the company.

In Poland, one of the best-evaluated discriminatory models in terms of applicability, the unambiguity of the answer (fulfillment of the discriminatory function),

and effectiveness appears to be the model by D. Stos and J. Gajdka (1998). Their discriminatory model adapted to Polish conditions has the following formula:

$$Z(\zeta) = -0.0005A + 2.0552B + 1.726C + 0.1155D - 0.3342$$

where:

A—average value of current liabilities/cost of production sold,

B—net profit/average value of net assets,

C—gross profit/sales revenue,

D—total assets/total liabilities

The limit value for Z is 0. This value separates insolvent from solvent companies. Companies whose value is greater than or equal to 0 are defined as solvent, the rest as insolvent. Taking into account an area of ignorance, defined as the “uncertain zone,” a closed range from -0.49 to 0.49 was calculated, which can include both solvent and insolvent companies (Stos & Gajdka, 2003). The results of Stos and Gajdka’s discriminatory model for Wawel SA are given in table 3.4.2.

Table 3.4.2. Calculations and explanations of the model by D. Stos and J. Gajdka, adapted to the new legal accounting requirements for Wawel SA

Ratios from the model	2020	2021
A—average value of current liabilities/cost of production sold	0.25	0.22
B—net profit/average value of net assets	0.07	0.05
C—gross profit/sales revenue	0.15	0.11
D—total assets/total liabilities	8.94	7.72
Z—score based on Stos & Gajdka’s model	0.25	0.22

Wawel SA was studied using the Stos and Gajdka model for the years 2020 and 2021, and the results show that it was characterized by a state of uncertainty, as the model’s value during the period studied falls within the range defined as the “uncertain zone” from -0.49 to 0.49 .

Another Polish **bankruptcy prediction model (Z7)** was devised by a team led by E. Mączyńska from the Institute of Economic Sciences at the Polish Academy of Sciences (2014). The model has the following form:

$$Z7 = -1,498 + 9.498x_1 + 3.566x_2 + 2.903x_3 + 0.452x_4$$

where:

x_1 – operating profit/total assets

x_2 – equity in total/total assets

x_3 – (total income+ depreciation)/total liabilities

x_4 – total assets/short-term liabilities.

The limit value for $Z7=0$

From the analysis of the above, the following conclusions can be drawn:

1. Large enterprises are more resistant to a crisis than the collective of Polish enterprises as a whole.
2. Obstacles to the development of Polish enterprises include a high tax burden, insufficient domestic demand, regulatory instability, strategy, and adaptation to changes in the business environment, which have proven to be the most important success factors.

Bankruptcy risk is not affected by ownership type, corporate structure, or the age of the enterprise. Table 3.4.3 shows the formulas for the indicators adapted to the current reporting requirements and the results of the calculations.

Table 3.4.3. Calculations based on the Z7 model for Wawel SA, 2020–2021

Ratio	2020	2021
x_1 —operating profit/total assets	0.09	0.07
x_2 —equity in total/total assets	0.89	0.87
x_3 —(total income+ depreciation)/total liabilities	1.27	1.43
x_4 —total assets/short-term liabilities	8.94	9.36
Z7	39.64	86.30

The application of the Z7 discriminatory model to the financial situation of Wawel SA in 2020 and 2021 shows that the company was in very good financial condition. However, analysis of the results from the discriminatory models above does not provide a clear assessment of the financial situation at Wawel SA for the years 2020–2021. Thus, the number of indicators used to assess the financial situation of the company justifies the search for a single measure that would provide a synthetic answer to the performance of the company's management.

Polish economic literature often uses discriminatory models that were devised and tested much earlier in Western countries (Mioduchowska-Jaroszewicz, Porada-Rochoń & Romanowska, 2021, 112–113). However, this should NOT be done, as

confirmed by E. I. Altman in his research. In 1984, Altman showed that the published models were used to predict the bankruptcy of companies in the country where the data used to develop the models were collected (Stasiewski, 1996, 19).

To study the financial situation of companies, we should use discriminatory and logit models of bankruptcy risk, which are created in the country of an analyzed company.

Questions:

1. Explain the concept of the ratio.
2. What is ratio analysis?
3. How do we interpret the ratios?
4. What is the classification of ratios?
5. What is the role of the ratio?
6. What are the advantages of ratio analysis?
7. What are the limitations of ratio analysis?
8. What do asset management indicators indicate?
9. What components make up the cash conversion cycle (CCC)?
10. What does the positive value of the CCC indicate?
11. What does the negative value of the CCC indicate?
12. What should be the relationship between average days of trade receivables and average days of trade liabilities so that the company does not have liquidity problems?
13. How do we calculate the value of working capital?
14. What does negative working capital mean?
15. Is positive working capital always a sign of a good financial position and efficient management?
16. Is there a relationship between working capital and liquidity?
17. What is the use of discriminatory models for assessing the financial condition of companies?
18. What is Ohlson's model?

Practice:

1. Based on the financial statements of a selected company, calculate and interpret the CCC.
2. Determine the efficiency of asset usage.

3. Based on a financial statement, evaluate the bankruptcy risk of a selected company using the Polish discriminatory model (if you are evaluating a Polish company) or the Altman and Almany model (if you are evaluating a foreign company).
4. Analyze bankruptcy risk with Ohlson's model using financial data from the financial statements of a Polish or a foreign company.

Chapter IV Capital Structure and Profitability

Introduction

The selection of an appropriate capital structure is of critical importance for a company, as it directly impacts the profitability and financial performance of the organization. The effective selection and use of capital are the key elements of a company's financial strategy. The efficient performance of an enterprise entails its development, which is mainly interpreted as an increase in sales. If the projected sales exceed the company's current capacity, there arises a need for physical investment. Therefore, as a consequence of a defined decision-making process (involving the selection and implementation of the most favorable option), there is a growth in the value of (fixed) capital, consequently boosting the assets of the organization. This is achieved through the careful selection of suitable financing sources, such as an augmentation in the balances of equity and debt, which collectively constitute the capital structure of the company. A change in the size of capital generally corresponds to a change in its structure. The structure and cost of capital acquired are the primary determinants of an enterprise's value growth. Hence, a crucial concern is to secure capital in the most favorable manner, which necessitates identifying the factors and patterns that currently exist or should exist. The lack of a unified capital structure theory can be attributed to the various factors influencing its formation. The establishment of a rational capital structure, encompassing equity and debt, should be based on three key areas:

- minimizing the cost of capital,
- maximizing the rate of return,
- and maximizing the value of the enterprise.

The capital structure should maximize the company's market value, which is equivalent to minimizing the weighted average total cost of capital.

The correlation between capital structure and profitability has garnered significant interest in the existing literature. An analysis of the influence of capital structure on profitability can provide insights into potential issues with capital performance and structure. Contemporary businesses are navigating a remarkably intricate and competitive corporate landscape. Consequently, it is crucial to assess the extent and

quality of debt in order to select the most advantageous capital structure capable of enabling the company to attain a heightened level of profitability.

Chapter four concentrates on evaluating the debt level, profitability, and the influence of the selected capital structure on the profitability of the examined entity, culminating with an overview of discriminatory models.

4.1. Level of debt

A company's level of debt significantly affects its financial stability, and an analysis of a company's degree of debt provides an opportunity to evaluate its financial policies in terms of capital structure and the extent to which it uses financial leverage. Low-risk companies with relatively stable cash flows may use external capital more extensively than high-risk companies. These, in turn, should be characterized by a low level of debt to manage their debt in a downturn phase (Sierpińska & Jachna, 2004). Debt analysis is therefore concerned with determining the extent to which a company uses external capital to finance its operations and whether it can cover its debts within the specified periods. To evaluate debt, we use indicators constructed based on balance sheet items (see Chapter 2, section 2.1). To further expand the description of debt analysis, we should remember that leverage ratios are financial ratios that specify the level of debt incurred by a business relative to other accounting heads on its balance sheet. For example, the debt-to-equity ratio is a leverage ratio that displays the total amount of debt to its stockholder equity. Although leverage ratios were originally designed to evaluate companies in the stock market, they have become essential tools after the 2008 financial crisis to prevent systemically-important financial institutions from defaulting or going bankrupt. Leverage ratios are different from liquidity ratios, which are primarily used to measure the amount of liquidity available to a company to fund its operations and debt obligations.

An important indicator for a company is its debt ratio (DR), also known as the **debt-to-asset ratio**. This ratio is calculated as external capital i.e., total liabilities to total assets, as shown in the following formula (Fridson, 1995, 162, and Helfert, 2004, 180):

$$\text{Debt-to-Assets Ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

This indicator gives the most general picture of the asset financing structure. The higher the indicator's value, the higher the credit risk of the company. Therefore, it should not exceed 0.67 (Gołębiowski & Tłaczała, 2009).

Table 4.1.1. Debt-to-Assets Ratio, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Long-term liabilities and provisions for liabilities	21 093	21 055	18 483
2. Short-term liabilities	83 444	67 384	86 967
3. Total liabilities	104 537	88 439	105 450
4. Total assets	795 139	790 882	813 976
5. Debt-to-Assets Ratio (3:4)	0.13	0.11	0.13

Source: own work.

The financing of assets with external capital followed a similar pattern over the three years under review. To a small extent, as the highest values occurred in 2019 and 2021 and amounted to 13% (see table 4.1.1, item 5), Wawel SA used external capital to finance its assets. This situation was very safe for the company and implied low financial risk.

Another indicator, the **debt-to-equity ratio (D/E)**, determines the level of debt to equity and the ratio of external capital to equity. The value of this ratio should not exceed 1.0 for large and medium-sized companies and 3.0 for small companies. Wawel SA is a large company, employing 1,118, 1,097, and 1,036 people in 2019, 2020, and 2021, respectively. The D/E ratio is calculated according to the following formula:

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total liabilities}}{\text{Equity}}$$

The larger the values of the above indicator, the more the company finances its activities with external capital. If the size of the indicator is greater than unity, debt financing outweighs equity financing (Nowak, 2008).

Table 4.1.2. Debt-to-Equity Ratio, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Long-term liabilities and provisions for liabilities	21 093	21 055	18 483
2. Short-term liabilities	83 444	67 384	86 967
3. Total liabilities	104 537	88 439	105 450
4. Equity in total	690 602	702 443	708 526
5. Debt-to-Equity Ratio (3:4)	0.15	0.13	0.15

Source: own work.

Wawel SA financed its operations to a greater extent with equity, which is confirmed by the fact that the financial leverage ratio reached values well below 1. A slight decrease was observed in 2020 compared to 2019, with an increase in the value of the

ratio in 2021 compared to 2020. In 2020, the ratio reached 0.13; in 2021, it increased by 0.02 points and amounted to 0.15; in 2019, it remained unchanged (see table 4.1.2, item 5). As can be seen from the above data, Wawel SA had a sustainable and stable financial position throughout the period under review.

The last of the most commonly used indicators is **the asset-to-equity ratio**, which measures the stability of a company's finances by dividing its total assets by its total equity and is calculated as follows:

$$\text{Asset-to-Equity Ratio} = \frac{\text{Total assets}}{\text{Total Equity}}$$

A low asset-to-equity ratio indicates that the company is financed rather conservatively, with a large share of investors' money and a small share of debt. A low ratio should be targeted when cash flows fluctuate significantly as debt repayment is relatively difficult in such a situation. A higher ratio is tolerated if the company has had steady cash flows for a long time and when a comparable level of cash flows is also expected in the future. A high asset-to-equity ratio may indicate that a company no longer has access to additional debt financing due to lenders who are unlikely to extend further credit to a company in this position. In addition, a company with a high equity ratio is more vulnerable to price attacks from competitors, as it needs to maintain high prices to generate the cash flow to pay off its debt.

Table 4.1.3. Asset-to-Equity Ratio, 2019–2021

Items (thousand PLN)	2019	2020	2021
1. Total assets	795 139	790 882	813 976
2. Total Equity	690 602	702 443	708 526
3. Asset-to-Equity Ratio (1:2)	1.15	1.13	1.15

Source: own work.

At Wawel SA, the value of the indicator remained at the same level of 1.15 in 2019 and 2021. In 2020, compared to 2019, the value decreased by 0.02 to increase again by 0.2 in the following year (2021) and reach the level of 2019 (see table 4.1.3, item 3). This means that the value of the ratio was low because Wawel SA financed the assets mostly with equity. Further details on the capital structure can be found in section 2.1.

4.2. Return on Invested Capital and Profitability analysis

Profitability is the ability of a business to earn a profit. A profit is what is left of the revenue a business generates after it has paid all expenses directly related to the

generation of the revenue, such as producing a product, and other expenses related to the conduct of its business activities. Profitability is the measure of the difference between the purchase price and the costs of bringing to market i.e., the revenue a company derives from its operations, less all explicit costs. The two key aspects of profitability are revenues and expenses. Revenues are the business income. This is the amount of money earned from customers by selling products or providing services. Generating income is not free, however. Businesses must use their resources in order to produce these products and provide these services. Resources, like cash, are used to pay for expenses like employee payroll, rent, utilities, and other necessities in the production process. Profitability looks at the relationship between revenues and expenses to see how well a company is performing and the future potential growth a company might have.

Profitability refers to a company's ability to generate earnings. Both management and external users employ **profitability ratios** to assess a company's success in generating profits and how these profits are used to reward investors. Some of the many ratios available to measure different aspects of profitability are discussed in the following two sections (Financial Statement Analysis, 687). The most common ratios used to evaluate managerial effectiveness measure what percentage of sales results in earnings and how productive assets are in generating those sales. As mentioned earlier, the *absolute amount* of sales or earnings means little without also considering company size (Financial Statement Analysis, 687).

Profitability ratios show the cumulative impact of liquidity, asset management, and debt management on a company's performance. Profitability is the end result of the various decisions and actions taken in a business. There are two groups of indicators used for profitability analysis:

1. Capital Profitability Ratios
 - a. Return On Assets—ROA;
 - b. Return On Equity—ROE;
 - c. Return on Invested Capital—ROIC;
 - d. Leverage Effect—LE.
2. Sales Profitability Ratios
 - a. Gross Profit Margin;
 - b. Return on Sales (or Net Margin).

First, we want to look at the most commonly used profitability ratios from the first group (1).

Return on assets (ROA) (a) expresses the efficiency of asset management and makes it possible to determine the profitability of investments generated by the

resources of a given company. The level of the indicator is intended to inform about the efficiency of the use of tangible and intangible resources as a specific combination of components involved in the activities of the company. The evaluation of return on assets considers not only the components reported on the balance sheet, but also intangible components not included in the financial statements, such as the quality of management, the level of knowledge of managers and employees, the environment, the sector in which the company operates, and so on. Therefore, the indicator is only comparable with its direct counterparts within a narrow range. When the indicator's value increases over time, is higher than assumed, and is higher than that of competitors, then we can say that the company has a more favorable financial situation. Moreover, ROA illustrates how well management employs the company's total assets to make a profit. The higher the return, the more efficient management is in utilizing its asset base. The ROA ratio is calculated by dividing net income by average total assets and is expressed as a percentage. The formula is as follows (Brigham & Houston, 2011):

Table 4.2.1. ROA, 2019–2021

Items (thousand PLN)	2019	2020	2021
ROA	no data	7.17%	5.43%
net profit (total comprehensive income)	57 857	56 834	43 577
average total assets	no data	793 011	802 429

Source: own work.

During the reporting period, the company recorded a decline in ROA from 7.17% to 5.43%, i.e., a decrease of approximately two percentage points. In 2020, the company generated 7.17 zlotys per 100 zlotys of assets, and 5.43 zlotys in 2021. The decrease in the value of the ratio over time indicates a deterioration in the efficiency of the company's use of fixed and current assets, due to a decrease in profit and an increase in average assets. The decrease in the efficiency of asset management expressed by this indicator points to poor management of Wawel SA's resources. In 2020–2021, the decrease in profitability may have been explained by the macroeconomic situation that affected the world market due to the COVID-19 pandemic. The pandemic curtailed business activity and had a significant impact on consumer behavior and the world-wide economy, which also affected the financial performance of companies.

Another important indicator is the **return on equity (ROE) (b)**, which expresses the efficiency of the use of equity, i.e., the return on investment from the capital directly employed in the company. The value of this indicator is a gauge for evaluating

the company's performance, as it illustrates the company's ability to make a profit on each zloty (PLN) of equity. ROE is an indicator that provides investors with insight into how efficiently a company (or, more precisely, its management team) manages the money that shareholders have contributed to it; for this reason, the value of this indicator is of primary interest to shareholders and stakeholders (Korol, 2013, 18–20). The desirable tendency of the indicator is to grow over time, with a higher value than the average in the sector and higher than that of competitors. The indicator determines the investment attractiveness and shows the profitability of employing external capital as a source of financing. This indicator is most commonly used in financial analysis because it provides the opportunity to compare the return on any investment, whether it is the interest rate on a bank deposit, the return on an investment fund, the return on a real estate investment, or the purchase of a work of art. A minimum return on equity of a company is otherwise also the expected minimum return or the cost of equity. In other words, return on equity (ROE) is often used to measure the profitability of the stockholders' investment. ROE is usually higher than ROI because of financial leverage. Financial leverage refers to using debt financing to increase the assets available to a business beyond the number financed by owners. As long as a company's ROI exceeds its cost of borrowing (interest expense), the owners will earn a higher return on their investment in the company by using borrowed money. For example, if a company borrows money at 8 percent and invests it at 10 percent, the owners will enjoy a return that is higher than 10 percent. ROE is computed as follows (Financial Statement Analysis, 689):

$$ROE = \frac{\text{Net profit}}{\text{Average total stockholders}} \times 100$$

If the amount of stockholders' equity changes significantly during the year, it is desirable to use average equity rather than year-end equity in the denominator. The ROE figures for Wawel SA are shown in table 4.2.2.

Table 4.2.2. ROE, 2019–2021

Items (thousand PLN)	2019	2020	2021
ROE	no data	8.16%	6.18%
net profit (total comprehensive income)	57 857	56 834	43 577
average total equity (average total stockholders)	no data	696 522.5	705 484.5

Source: own work.

The company recorded its best efficiency in 2020 when the return on equity amounted to 8.16%; in the following year (2021), it decreased to 6.18%. As for investment

attractiveness, the company met the minimum requirements for investing funds, as the return was higher than the interest rate on bank deposits at that time. The reason for the weakening of the return was certainly, as in the case of ROA, pandemic restrictions that, to a certain extent, limited business activity.

Return on invested capital (ROIC) (c) reflects the return to the company's shareholders and is calculated after deducting the returns paid to creditors (interest) and other equity investors (preferred shareholders) (White, Sondhi & Fried, 2003). The formula for calculating the return on invested capital is as follows:

$$ROIC = \frac{EBIT(1 - T)}{\text{Average INVESTORS' CAPITAL}} \times 100$$

In the numerator:

EBIT—earnings before deducting interest and taxes

T—income tax rate

(1-T)—tax shield

The pattern of ROIC construction is shown in fig. 4.2.1.

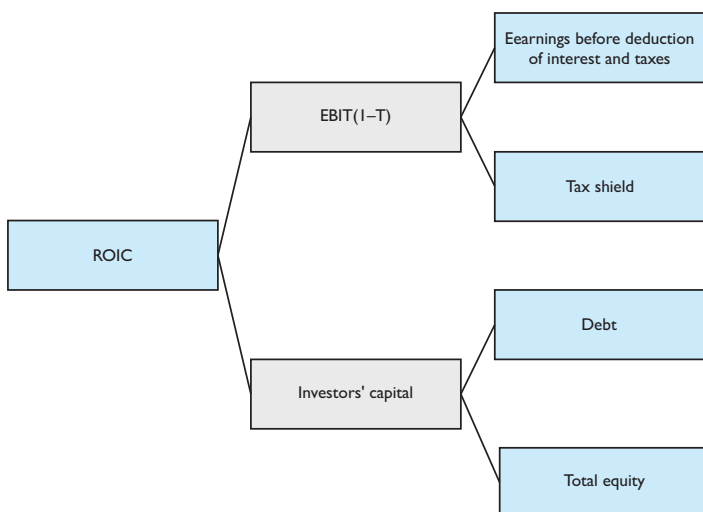


Figure 4.2.1. ROIC of construction

Source: own work.

The numerator comprises the after-tax operating profit generated by the company for its investors; thus, it consists of EBIT and the tax shield. EBIT is the profit generated from operations, and the tax shield offsets the tax benefit arising from the principle that interest on debt reduces the tax base. In other words, a company that uses less external capital will generate a lower return on invested capital than a company

that uses more debt, which is why we include the tax shield $(1-T)$ in the calculation of ROIC. The denominator, on the other hand, shows the funds that investors must contribute. In this way, ROIC indicates the value of the return on the total capital contributed by investors (Brigham & Huston, 2015, 127). ROIC can be summarized by four statements shown in fig. 4.2.2.

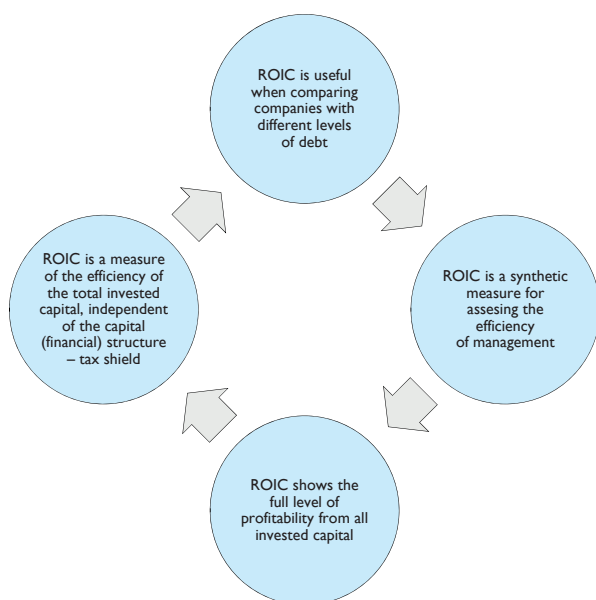


Figure 4.2.2. ROIC features

Source: own work.

Table 4.2.3. ROIC (Wawel SA), 2019–2021

Items (thousand PLN)	2019	2020	2021
ROIC	no data	7.36%	5.69%
EBIT (operating profit)	70 303	72 101	56 338
$(1-T)$, when $T=19\%$	$(1-0.19)$	$(1-0.19)$	$(1-0.19)$
EBIT $(1-T)$	56 945	58 402	45 634
Average investors' capital=	no data	793 011	802 429

Source: own work.

In 2020, Wawel SA's ROIC was 7.36%, while in the following year, it decreased by about 2 (a difference of between 5.69% and 7.36%). The reason for the decrease in the value of the ratio was a 22% decrease in EBIT (dynamics index/growth index $56338/72101 \cdot 100 = 122\%$) with a simultaneous decrease in invested capital

02429/793011*100=101%. A decrease in the ROIC value in 2021 was negative for the company, as it meant a decrease in the efficiency of the management of invested capital.

Titman and Wessels (1988) explain that a company with a high rate of return on investment uses relatively small debt. Companies with high profitability tend to use a portion of the profits earned for investment and financing operations (Brigham & Huston, 2011). A higher rate of return allows the finance of funding needs with internally generated funds. In the pecking order theory, the profitability of the company and the amount of income available for retention is an important determinant of debt policy, because the company that has had the ability to generate high earnings in the past usually has high retained earnings. If the company has had a good investment opportunity, the company will use retained earnings as a source of funding for investment, so the company does not need debt. Research conducted by Khan (2010) found that there is a positive relationship between profitability with leverage (total debt ratio) (Margaretha, 2014). Companies that use debt pay less tax than companies that do not use debt, so companies that use debt can save tax. Tax is known as one of the factors that affect capital structure. This opinion arose because companies with higher tax rates tend to benefit when using debt rather than using equity. Companies that use debt will pay less tax than companies with no debt. This is because the companies that use debt can save on taxes paid. In the end, the company is able to increase its value and increase shareholder wealth (Brigham & Huston, 2011).

Having evaluated ROIC and ROE, we can measure the value of the **leverage effect (LE)** (e), i.e., the use of debt to finance operations. For this purpose, we use the following formula:

$$LE = \frac{ROE}{ROIC} \times 100 - 100\%$$

The interpretation of the leverage effect (LE) is shown in fig. 4.2.3.

As a result of external capital involvement in the capital structure, ROE increased by% (when LE >0).

As a result of external capital involvement in the capital structure, ROE decreased by% (when LE <0).

The efficiency of external capital increased/decreased because the leverage effect increased/decreased.

Figure 4.2.3. How do we interpret the leverage effect?

Source: own work.

The LE figures for Wawel SA are shown in table 4.2.4.

Table 4.2.4. Leverage effect (Wawel SA), 2020–2021

Items	2020	2021
ROE	8.16%	6.18%
ROIC	7.36%	5.69%
LE	10.87%	8.61%

Source: own work.

In 2020, the use of external capital resulted in an increase in ROE by 10.87%, and in 2021 by 8.61%. During the study period, the efficiency of the use of external capital declined because the leverage effect decreased from 10.87% to 8.61%, by about 2%. Nevertheless, Wawel SA should continue to use external sources of financing, such as loans and credits, as this always increases the efficiency of equity and generates additional profit units.

We now turn to an analysis of the second group of indicators (2), which include:

- a. Gross Profit Margin;
- b. Return on Sales (or Net Margin).

The **gross profit margin (a)** is used to analyze how efficiently a company is using its raw materials, labor and manufacturing-related fixed assets to generate profits. A higher margin percentage is a favorable profit indicator. A company's cost of sales, or cost of goods sold, represents the expense related to labor, raw materials and manufacturing overhead involved in its production process. This expense is deducted from the company's net sales/revenue, which results in a company's first level of profit, or gross profit.

$$\text{Gross profit} = \frac{\text{Gross Profit}}{\text{Net Sales (Revenue)}} \times 100$$

Gross margin and gross profit are alternate terms for the amount remaining after subtracting the expense cost of goods sold from sales.

The **return on sales ratio (b)**, sometimes called operating margin, profit margin, or net margin describes the percent remaining of each sales dollar after subtracting other expenses as well as the cost of goods sold. Net margin can be calculated in several ways; some of the more common methods only subtract normal operating expenses or all expenses other than income tax expenses. For simplicity, our calculation uses net income (we subtract all expenses). Net income divided by net sales expresses net income (earnings) as a percentage of sales, as follows (Financial Statement Analysis, 687):

$$\text{Return on Sales} = \frac{\text{Net Income}}{\text{Net Sales (Revenue)}} \times 100$$

In table 4.2.5 below, we find the calculations for the gross profit margin and the return of sales.

Table 4.2.5. Gross Profit and Return of Sales, 2019–2021

Items (thousand PLN)	2019	2020	2021
Gross profit	12.94%	14.64%	10.85%
gross profit (profit before tax)	73 042	71 545	56 205
net sales (revenues)	564 440	488 621	517 949
ROS	10.25%	11.63%	8.41%
net profit (total comprehensive income)	57 857	56 834	43 577
net sales (revenues)	564 440	488 621	517 949

Source: own work.

As shown in the table above, in 2019–2020 gross profit increased from 12.94% to 14.64% and in 2021 it decreased from 14.64% to 10.85%. This decrease was due to a 6% increase in net sales (growth index $517\,949/488\,621 = 1.06$), with a simultaneous gross profit decrease of 21% (growth index $56\,205/71\,545 = 1.21$). The efficiency of business operations increased and then decreased, and as far as ROS is concerned, the increased from 10.25% to 11.63% (2019–2020) and the decrease in the value of this indicator from 11.63% to 8.41% (2020–2021) provides information on the decrease in the profitability of Wawel SA's business activity. The decrease in ROS was due to a 28% decrease in net profit (growth index $43\,577/56\,834 = 0.72$). Gross profit and ROS values were slightly different, as both other operating income and financial income reached marginal values and had little impact on the company's operations. Despite the decline in the values of gross profit and ROS, the company made profits in each year studied and profits remained at a safe level compared to the industry average. The decrease, as in the case of the previously analyzed indicators, was caused by the COVID-19 pandemic and the resulting restrictions that made normal business operations impossible.

4.3. DuPont analysis

The DuPont system of analysis is a synthetic and comprehensive framework for analyzing a company's performance using data from the balance sheet and income statement. The analysis provides a more in-depth understanding of a company's profitability structure than is possible with standard ratio analysis. The DuPont model shows the elements that affect the company's generated return on equity (ROE). The result of a DuPont analysis is significant for the company's owners as it shows how effectively the funds that they invested have been used. The DuPont model is named after the DuPont Corporation, an American company that manufactured gunpowder and dynamite. The company chose engineer F. D. Brown to design modern methods for planning and analyzing the return on investment. The first formula devised for this analysis was as follows (Kłosowska, Hoss & Hunterska, 2018):

$$\frac{\text{profit}}{\text{assets}} = \frac{\text{profit}}{\text{income}} \times \frac{\text{income}}{\text{assets}} = \text{ROS} \times \frac{\text{income}}{\text{assets}}$$

This equation measured profitability based on the return on assets, and was represented by two factors: net return on sales (ROS) and asset productivity (AP). Over time, the goals of companies changed. Greater importance began to be attached to the enrichment of the owners. The DuPont model was extended to include the *equity multiplier* (EM). The extended model is as follows:

$$\text{ROE} = \text{ROS} \times \text{AP} \times \text{EM}$$

i.e.,

$$\frac{\text{net profit}}{\text{average total stockholders}} = \frac{\text{net profit}}{\text{net sales (revenue)}} \times \frac{\text{net sales (revenue)}}{\text{average assets}} \times \frac{\text{average assets}}{\text{average total stockholders}}$$

The DuPont model is an essential part of business management. It is widely used to understand the profitability of a business and its sources, and to compare different investments. The model is used as a teaching tool and is also valuable in studying changes over time, especially the structure of ROE, as it aims to identify and eliminate adverse trends (White et al., 2003, 232–236; Fridson & Alvarez, 2011, 215–217). Table 4.3.1 shows the data used to calculate the values of the DuPont model in 2020 and 2021.

Table 4.3.1. DuPont model calculation (Wawel SA), 2020–2021 by logarithm method

Items	2020	2021	growth index	LOG of growth index
ROE	8.16%	6.18%	0.7570	−0.1209
ROS	11.63%	8.41%	0.7233	−0.1407
net sales (revenue)	488 621	517 949	1.0600	0.0253
average assets	793 011	802 429	1.0119	0.0051
AP = (net sales): average assets)	0.6162	0.6455	1.0476	0.0202
average total stockholders	696 522.5	705 484.5	1.0129	0.0056
EM = (average total stockholders: average total stockholders)	1.1385	1.1374	0.9990	−0.0004

Source: own work.

Below we can see the substitution of the data from table 4.3.1 to the DuPont model.

$$ROE = ROS \times AP \times EM$$

$$\text{in 2020} \quad 8.16\% = 11.36\% \times 0.6162 \times 1.1385$$

$$\text{in 2021} \quad 6.18\% = 8.41\% \times 0.6455 \times 1.1374$$

Analyzing the significance of the factors that make up the DuPont model and affect the change in ROE requires the use of a method known in the Polish financial analysis literature as the deterministic method. The following is a procedure for one of the deterministic methods, the logarithm method (the most accurate method). Similarly, an analysis of the DuPont model factors is given in an article by Saus-Sala et al. (2021).

Growth index equation:

$$iROE = iROS \times iPM \times iMK$$

$$0.7570 = 0.7233 \times 1.0476 \times 0.9990$$

By calculating the logarithm for the growth indices, we get the form of the logarithmic equation:

$$\log 0.7570 = \log 0.7233 + \log 1.0476 + \log 0.9990$$

We get an equation with logarithmic results:

$$-0.1209 = -0.1407 + 0.0202 - 0.0004$$

Then we divide each factor by the left side of the equation (the value of the logarithm of the index). In this way, we obtain the shares of the distribution of the total deviation:

$$1 = 1.1635 - 0.167 + 0.0035$$

The change (difference) of ROE between 2020 and 2021 was -1.98% ($6.18\% - 8.16\%$). The next step in the study of the factors is to calculate the product of the change in ROE and the shares in the distribution of the total deviation. The change in the ROE was influenced by the following indicators:

$$ROS \text{ change impact } (-1.98\%) \times 1.1635 = -2.31 \text{ p.p.}$$

$$AP \text{ change impact } (-1.98\%) \times (-0.167) = 0.33 \text{ p.p.}$$

$$EM \text{ change impact } (-1.98\%) \times 0.0035 = -0.01 \text{ p.p.}$$

Causal analysis of ROE shows that ROE decreased by 1.98 percentage points (-1.98) due to the following factors:

- ROS caused a decline of 2.31 percentage points (negative partial deviation) due to a decline in the indicator of about 28% (growth index 0.7233);
- AP caused a smaller decrease in ROE (growth) of 0.33 percentage points (positive partial deviation) due to a 4.76% increase in the ratio (growth index 1.0476);
- EM resulted in a decrease of 0.01 percentage points (negative partial deviation) due to a decrease in the index (decrease in debt) of less than 1% (growth index 0.99).

In addition to the logarithm method, the successive substitution method can be used in the causal analysis of profitability. The method provides an opportunity to evaluate the factors affecting the change in the profitability of equity, even if the indicators have negative values. The flowchart for this method is shown below and the data for the calculations in table 4.3.2.

Table 4.3.2. DuPont model calculation (Wawel SA), 2020–2021 by successive substitutions method

Items	2020	2021	absolute deviation (difference 2021–2020)
ROE	8.16%	6.18%	-1.98%
ROS	11.63%	8.41%	-3.22%
net sales (revenue)	488 621	517 949	29 328
average assets	793 011	802 429	9 418
AP = (net sales: average assets)	0.6162	0.6455	0.03
average total stockholders	696 522.5	705 484.5	8 962
EM = (average total stockholders: average total stockholders)	1.1385	1.1374	-0.001

Source: own work.

Below we can see the substitution of the data from Table 4.3.2 to the DuPont model.

Step 1: Equation expressing dependance:

$$ROE = ROS \times AP \times EM$$

$$\text{in 2020} \quad 8.16\% = 11.36\% \times 0.6162 \times 1.1385$$

$$\text{in 2021} \quad 6.18\% = 8.41\% \times 0.6455 \times 1.1374$$

Step 2: Total deviation (R)

$$R = ROE_{2021} - ROE_{2020} = -1.98\%$$

Step 3: Partial deviation:

$$ROE = ROS \times AP \times EM$$

$$ROS \text{ change impact } (-3.22\%) \times 0.6162 \times 1.1385 = -2.26 \text{ p.p.}$$

$$AP \text{ change impact } 0.03 \times 8.41\% \times 1.1385 = 0.28 \text{ p.p.}$$

$$EM \text{ change impact } (-0.001) \times 8.41\% \times 0.6455 = -0.01 \text{ p.p.}$$

Step 4: Conclusions

The reason for the decrease in the ROE ratio in 2020–2021 was:

- the decrease in the ROS ratio by -3.22 p.p. with the AP of 0.6162 , and the EM of 1.1385 , which resulted in a decline in ROE by 2.26 p.p.
- the increase in the AP ratio by 0.03 with the ROS of 8.41% and the ratio EM of 1.1385 , which increased ROE by 0.28 p.p.
- the decrease in the EM ratio by 0.001 with the ROS of 8.41% and the ratio AP of 0.6455 , which decreased ROE by 0.01 p.p.

The most significant impact on the change of ROE was the decrease in return on sales (ROS), showing the decline in business efficiency. Asset productivity (AP) had a much smaller impact, offsetting the decline in ROE as asset utilization efficiency increased. The equity multiplier, which reflects the change in capital structure, had the least impact on ROE. A decrease in the equity multiplier means that external capital financing was reduced, which, with positive leverage ($ROE > ROIC$), means that there was a real benefit from using external capital.

Profitability is a very important aspect of assessing the financial position of any business entity. Without it, the company has no chance of achieving its long-term goals and profitability is the main goal of all businesses. Accordingly, it is very important to measure current and past profitability and forecast future profitability.

Questions:

1. What does it mean for a company to be in debt?
2. How can the level of debt be measured?
3. Should all companies have similar levels of debt, and if so, why?
4. What are the profitability indicators and their formulas? Describe.
5. What indicators do we use when studying the benefits to owners?
6. What are the indicators that provide information on business efficiency? Describe.
7. How does the leverage effect work? Describe.

Practice:

1. Using the financial statements of companies from different industries, evaluate their debt levels by selecting the appropriate indicators for comparison.
2. Using a selected company's financial statements, analyze profitability using profitability ratios.
3. Analyze the leverage effect (LE) of the selected company.
4. Analyze the impact of the DuPont model factors on the change of ROE of the chosen company.

Chapter V CSR and financial analysis—case study

Introduction

This chapter describes the essence and concept of CSR (corporate social responsibility). The concept of CSR was the precursor to ESG (Environmental, Social, and Corporate Governance) standards, which are based on three dimensions. In addition, operational issues relating to Wawel SA in ESG during 2021 are discussed.

5.1. CSR reporting

Corporate social responsibility (CSR) is a widely recognized and significant concept in the literature, as it plays a vital role in promoting socio-economic development. Corporate social responsibility has its roots in the earliest businesses that provided products or services. Although it gained momentum in the 1990s, the notion of CSR was first defined in the 1950s (Stecko, 2012, 119–121). Over the years, there have been numerous definitions of CSR, each with its own unique perspective. There have also been many entrepreneurs who demonstrated impressive social responsibility long before it became a mainstream concept. One such entrepreneur was Jan Wedel, a confectioner who prioritized the well-being of his employees and their families (Panek-Owsiańska, 2014). It is evident from the above instance that the notion of a company's sustainable growth considering its stakeholders dates back to the distant past, even before the widespread use of corporate social responsibility. The ISO 26000 standard contains the most widely accepted definition. According to this definition, CSR is the responsibility of an organization in relation to the impact of its decisions and activities on society and the environment, through transparent and ethical behavior that contribute to sustainable development; including the health and well-being of society; takes into account the expectations of stakeholders; complies with applicable law while being consistent with international standards of behavior; and is integrated throughout the organization and implemented in its relationships (ISO 26000, 2023). The International Organization for Standardization (ISO) created ISO 26000 back in 2010 to provide organizations with a set of guidelines to follow to incorporate social and environmental responsibility principles into their operations

(Encyklopedia CSR, 2023). Table 5.1.1 shows the key categories covered by the corporate social responsibility (CSR) concept outlined by ISO 26000.

Table 5.1.1. The seven categories of CSR

Item	Category	Description
1.	Corporate governance	This category refers to the standards and principles that focus on company management. It aims to improve the efficiency of the management at the entire organization while respecting social and environmental issues, the needs of stakeholders, and the code of ethics.
2.	Human rights	All organizations must uphold and protect the dignity and rights of every individual, emphasizing their civil, social, cultural, political, and economic rights.
3.	Labor practices	This category includes employment and working conditions, employee development and workplace training, social protection, and social dialogue.
4.	Environment (environmental protection)	This category pertains to raising environmental awareness, specifically considering ecological concerns in corporate operations, the rational use of natural resources, minimizing the discharge of harmful substances into the atmosphere, and adjusting to the effects of climate change.
5.	Fair market practices	These involve countering unfair competition, respecting property rights, and setting appropriate, transparent, and relevant rules for cooperation and promoting CSR.
6.	Consumer issues (consumer relations)	This category encompasses a range of aspects related to transparent and ethical marketing practices, open lines of communication with consumers, maintaining high standards of product and service quality, ensuring consumer safety and health, dispute resolution services to consumers, promoting education and environmental awareness, and ensuring access to essential services.
7.	Social engagement and community development	The last category pertains to engaging with communities to address issues that impact workers, contractors, customers, and other stakeholders. It centers on initiatives promoting job growth, skill enhancement, well-being, education, digitalization, and cultural development. Undertakings in this domain involve actively joining in social discussions and collaborating with non-governmental organizations to execute social initiatives.

Source: own work based on ISO 26000 (<https://www.iso.org/pl>).

The ISO 26000 standard can be used in public policy activities, as it is intended to provide organizations with guidelines focusing on social responsibility. However, the standard does not provide a basis for legal action (complaints, claims) in national, international, or other proceedings.

5.2. Environmental, Social, and Corporate Governance (ESG)

CSR was the precursor to ESG (<https://www.pb.pl>, accessed January 25, 2023). Although they share some similarities, ESG and CSR have different focuses. ESG covers a broader range of non-financial areas, which provides a more precise evaluation of a company's worth. Conversely, CSR centers on corporate responsibility and utilizes marketing tactics to shape a company's image. ESG methodology, in contrast, aims to evaluate standards and goals in a more quantifiable manner. ESG concerns can be categorized into three dimensions: environmental, social, and governance (ESG Reporting Guidelines, 2021, 13). Investors can assess various valuable aspects through each of the three dimensions of ESG, as shown in table 5.2.2.

Table 5.2.2. The three dimensions of ESG

Environmental (E)	– land use; – pollution and waste; – climate change; – drought and water scarcity (water management); – raw materials management; – biodiversity; – energy consumption.
Social (S)	– relations with the community; – human rights; – labor issues; – product safety; – occupational health and safety.
Governance (G)	– ethics standards, – privacy protection and data security, – corporate governance, – anti-corruption measures.

Source: own work based on Warsaw Stock Exchange, May 2021, 13.

The first dimension of ESG, as shown in table 5.2.2, centers on safeguarding the environment and preventing further degradation. Responsible corporations should establish environmental policies that can be measured and evaluated based on specific plans. A significant component of this principle involves recognizing potential risks to the company's operations that may arise from the effects of climate change. In this area, the standard assessment also pertains to the management of the ecosystem, attentiveness toward the environment, and the observance of the principles of environmental accountability. The second dimension of ESG is centered on societal concerns, specifically social responsibility and human rights. The objectives aimed for here should not only benefit the company but also extend to the external environment. Various measures can be taken to benefit the company, including advocating

for human rights by combating inequality, implementing supplier policies, and guaranteeing equal pay for all employees irrespective of their gender (<https://www.pb.pl/>, accessed February 11, 2023). Factors that affect the relationship with stakeholders in the market (partners, customers, suppliers) are also considered. The final, third dimension of the ESG concept is corporate governance. It is crucial, especially for long-term investors, as it significantly affects the conduct of the business itself and builds trust in the company. In terms of analysis, such elements should be considered as the remuneration of executives (with regard to their experience and knowledge), supervision exercised over the company, the structure of the company's board of directors, tax transparency, and the prevention of corruption and bribery, respect for shareholders' rights, and respect for disclosure obligations to shareholders (<https://www.pb.pl/>, accessed February 11, 2023).

It is essential to emphasize the growing trend of expectations of mainly public company and business entities' stakeholders for environmental, social, and corporate governance (ESG) disclosures worldwide (Dziadkowiec & Daszyńska-Żygadło, 2021, 95–97). To date, ESG reports have taken a variety of forms, such as environmental reports, social reports, social responsibility reports, and sustainable development reports, and have been prepared in compliance with various regulations and guidelines (GRI standards, integrated reporting, reporting in accordance with UN guidelines, Carbon Disclosure Project, Model Guidance on Reporting ESG Information to Investors, the OECD Guidelines for Multinational Enterprises, EMAS principles, ISO 26000, Non-Financial Information Standard, the SASB standards (Zyznarska-Dworczak, 2019). In Poland, the normative act that currently regulates the disclosure of non-financial information is Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014, amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups (Directive 2014/95/EU (OJ L 330, pp. 1–9)). Starting from 2024, companies will have to comply with the Corporate Sustainability Reporting Directive (CSRD) instead of Directive 2014/95/EU. This new directive is still in development but will make reporting under the EU taxonomy compulsory (<https://www2.deloitte.com/>, accessed March 2, 2023). Therefore, ESG reports will be standardized, as the European Commission has already started work on unifying standards for reporting on environmental, social, and corporate governance issues (Forbes, 264). This is primarily intended to facilitate data comparison across different companies while encouraging strategic changes. Particular attention should be paid to the fact that companies, investors, auditors, or financial institutions currently face challenges in sustainability reporting due to the lack of consistent standards for preparing,

monitoring, and evaluating these reports. Investment comparisons cannot be made, and credit or investment risks cannot be fully calculated because the available literature on the subject has yet to provide a cohesive set of indicators.

Furthermore, even though the non-financial reporting directive has required companies listed on the WSE and with more than 500 employees to report ESG data since 2018, many companies have done so without a clear framework (Forbes, 264). Up to this point, businesses have been sharing information based on their perceptions of favorable aspects and contents deemed secure and advantageous for their organization. With regard to non-monetary data, companies can voluntarily adhere to both sets of regulations and standards. It is also noteworthy that non-financial data are not externally verified, as is the case with financial data. Therefore, in practice, the auditor's role is to confirm that the company has complied with its obligation under the normative act. The new Corporate Sustainability Reporting Directive (CSRD) is expected to expand the database of companies required to prepare such reports and introduce unified standards. ESG reporting standards should provide a means of comparing companies across sectors. The Polish Accounting Act will adopt the Directive, and the standards will be binding in the form issued by the European Commission (Forbes, 265). The first set of basic 13 standards, to be issued by the end of June 2023, has already passed the public consultation stage. The standards will be mandatory for all companies subject to sustainability reporting according to the CSRD. The basic rules for navigating the entire system are referred to as cross-cutting standards. In the initial stage, in 2024, the implementation of ESG reporting under the new CSRD will likely impact companies. It is anticipated that in the year following the changes, companies will have to comply with all 13 standards and at least one (out of 40) sectoral standards if they generate a minimum of 10% of their revenues from operations in a particular sector (Forbes, 265). Polish companies will face a significant challenge to implement the new standards, which entail major changes such as drafting plans for transitioning to a low- or zero-carbon economy, reporting on greenhouse gas emissions, and adapting to climate change. Certain industries will also be challenged by the need to report their impact on biodiversity and ecosystems, indicators of which will be included in sector standards.

5.3. Wawel SA and ESG

The information in this chapter is described in detail according to the three dimensions of the ESG concept. This information is based on Wawel SA's report on non-financial information prepared in accordance with the Non-Financial Information Standard—Polish Environmental Regulation—which was drawn up by the Association of Stock Exchange Issuers. It covers the period from January 1, 2021, to December 31, 2021 (<http://relacjinwestorskie.wawel.com.pl>, accessed February 25, 2023).

The business strategy adopted by Wawel SA addresses ESG issues, encompassing non-financial aspects such as the environment, its employees' well-being, and effective management practices. This approach enables a more comprehensive analysis of the company's financial standing.

ESG reporting is a non-financial report enabling a business to showcase its activities, initiatives, or events that do not pertain to financial indicators. A company's non-financial report presents information and the necessary data to enable investors, managers, or other stakeholders to make well-informed decisions. Nowadays, it is apparent that such decisions depend on the mere fact that a company is operating sustainably.

5.3.1. Environmental (E)

We will begin the analysis of Wawel SA with the environmental aspect, which is the first dimension of ESG. The company has developed an environmental policy centered around direct and indirect environmental impacts such as materials, raw materials, energy, fuel, water, atmospheric emissions, waste, and wastewater. A comprehensive overview of the environmental aspect of ESG introduced by Wawel SA can be found in table 5.3.1.

Table 5.3.1. The first dimension Of ESG

Direct and indirect impacts: materials and raw materials	
Suppliers	A decisive issue for the company is selecting the right supplier to comply with food safety regulations. Therefore, the company only cooperates with entities that meet high quality management standards recognized or approved by the Global Food Safety Initiative, which includes Safe Quality Food, International Featured Standards (IFS), the FSSC 22000 Food Safety Systems Certification, and the BRC Global Standard for Food Safety.
Purchase of raw materials and packaging	The company maintains a high quality standard for its confectionery by implementing strict purchasing criteria. The purchasing process is carried out using an interdisciplinary approach, with a team of qualified staff responsible for the monitoring and laboratory testing of all raw materials and standards developed by technologists.

Table 5.3.1 (continued).

Direct and indirect impacts: energy and fuels	
High-efficiency installations	The company uses state-of-the-art technologies in its production facilities to ensure the lowest possible consumption of water, electricity, and gas. The boiler plants are now equipped with high-efficiency steam boilers with economizers. These boilers are fueled by blue gas with low natural gas emissions. One of Wawel's production plants has been using solar energy to heat water since 2017. Moreover, they have applied solutions that involve the secondary recovery of thermal energy through condensate expansion, flue gas from steam boilers, and a thermal deaerator. Various measures have been brought in to decrease the amount of primary energy consumption in addition to the above installations. These include maintaining equipment and installations and recovering heat from the air in air handling and air conditioning units. The company has changed its lighting system, opting for modern LED lights to reduce electricity consumption and save money.
Carpooling	The company has organized special bus lines for employees who commute to far-off production facilities, in order to reduce environmental emissions. This initiative aims to minimize the use of personal cars for transportation. The company has implemented a carpooling system for its employees to enhance efficiency and reduce potential transportation-related inconveniences. This system facilitates transportation to and from work by allowing employees to reserve seats in a car that travels along their route. Moreover, the company rewards the most helpful driver with a monthly prize to incentivize carpooling.
Direct and indirect impacts: water	
Tap water is the primary water source utilized in production facilities, while groundwater remains unused.	The company safeguards the aquatic environment by maintaining the current sewage system, including the rainwater discharge outlet and site drainage. They also regularly clean the sewers that drain rainwater and remove sludge from the settling pits in the rainwater drainage line.
Direct and indirect impacts: atmospheric emissions	
Measures to reduce atmospheric emissions that result from the company's production activities	The company avoids using halogens as refrigerants to minimize the impact on ozone layer depletion. Its production facilities have a state-of-the-art air-conditioning system that runs on zero ODP refrigerant and use high-efficiency heating boilers and dust collectors to reduce atmospheric emissions and environmental impact.
Direct and indirect impacts: waste and wastewater	
Waste	The company's production facilities engage in ongoing efforts to prevent or minimize waste and its detrimental effects on the environment. The above includes economical material management, systematic technical inspections, maintenance of machinery, segregation of waste produced and its selective collection, and collecting waste in designated containers.
Wastewater	Sanitary wastewater is discharged to the wastewater treatment facility via the municipal sewer system. Industrial wastewater from sewer grates, sink drains, and bathtub drains is discharged into the plant's technological sewer system.

Table 5.3.1 (continued).

Other aspects of direct and indirect environmental impact	
Noise	Noise reduction is achieved by, among other things, periodic inspections of installations, low-noise ventilation, refrigeration and air-conditioning equipment, proper placement of ventilation equipment, and organization of raw material transportation to ensure immediate unloading of the car.
Electromagnetic radiation	The transformer station, located on the premises of the production facilities, does not increase the risk of electromagnetic radiation in the environment since its maximum voltage is 15 kV. Furthermore, the station building is closed to ensure protection and prevent the limit value from being exceeded.
Odors	Airtight equipment and sealed waste containers have been introduced to eliminate unwanted smells.

Source: own work based on <https://www.iso.org.pl>.

As can be seen from table 5.3.1, Wawel SA deals with environmental issues very well. It is worth noting that the company follows the principles of responsibility and environmental conservation by investing in cutting-edge technologies for its production facilities. These measures have significantly reduced water, electricity, and gas consumption. In addition, the company has begun carpooling for employees to reduce harmful emissions into the atmosphere. The company also undertakes several measures to protect the water environment, such as maintaining the sewage system. The company places great importance on the environment, as it sources high-quality raw materials and is therefore susceptible to the effects of climate change. It also puts effort into packaging and waste management and designates suitable waste disposal sites.

5.3.2. Social (S)

One of the dimensions of ESG is social responsibility, which encompasses state aid, employment opportunities, fair remuneration for staff, healthy relationships between white and blue-collar staff, personal growth, and respect for community and human rights. As part of social responsibility, it is important to consider factors that affect relationships with partners, customers, and shareholders. Wawel SA's top priority is supporting employee rights and ensuring fair working conditions. Table 5.3.2 provides a detailed overview of the second dimension of the ESG concept, social responsibility.

Table 5.3.2. The second dimension of ESG

State aid and public orders	
State aid	In 2021, Wawel SA received state aid exempting the company from corporate income tax on income earned in the special economic zone as specified in permit no. 86/2010 of October 7, 2010. The value of state aid for 2021 amounted to PLN 2,651,853.
Employment level	
Employment	The company employs techniques to reach a vast pool of potential candidates when seeking new staff. The selection process is based on evaluating candidates' intellectual and social potential through various diagnostic methods. Moreover, in 2021, the company employed a reliable method of remote communication with candidates that is still effective. During the initial phase of the pandemic in 2020, the company implemented efficient workflow procedures to create a safe working environment. As a result, it could allocate funds toward purchasing more air sterilizers for conference rooms. In addition, in 2021, the company assisted in organizing staff vaccinations (COVID-19) to comply with the existing restrictions adopted in the company and the public space. Staff have access to various workplace benefits, which include competitions, collaborations with educational institutions, lunch provisions, carpooling, internal communication channels, skills development opportunities, specialized training courses, and a project that links salaries to the regular performance evaluations of the employees.
Remuneration system	The company's base pay is determined by a monthly rate. In addition to base pay, employees are also awarded a bonus, which depends on the bonus fund available to the immediate supervisor for the unit. Night workers receive a salary supplement for each hour worked. In exceptional situations, employees are also given awards. Beginning in 2021, staff can benefit from extra medical care and convenient and safe on-the-job meals; the company also subsidizes a sandwich a day for each employee. Additional employee benefits include sweet treat parcels, cinema tickets, physiotherapy and holiday subsidies for the staff and their children, and MultiSport cards.
Relations with employees and freedom of association	
Relations with employees	Management and the company's board of directors regularly communicate with their staff to provide the entire Wawel SA community with information on various events. The company employs various methods including surveys, posters, face-to-face or online meetings using modern communication technology, and email newsletters. Furthermore, in 2021, the company provided ample chances for its staff to participate in entertaining activities via multiple contests. The purpose behind events such as May Day with Wawel, Summer with Wawel, and Chocolate Day was to exchange fresh ideas about leisure activities that can contribute to relaxation.
Occupational health and safety	
Safe work organization for staff and the external entities responsible for maintenance and service repairs.	Ensuring the safety and well-being of its employees is of utmost importance to the company. The employer takes necessary precautions to prevent any mishaps or unforeseen incidents at the workplace. The company offers medical care to its workers through initial, periodic, and specialized examinations; employees also have direct access to occupational physicians. The employer provides regular and specialized training opportunities to enhance its staff's health and safety qualifications, whether initial or job-specific.

Table 5.3.2 (continued).

Development and education	
Training management and staff development	The employer implements an annual training plan for employees as part of its annual training budget. Training is provided to all organizational units of the company. As part of its yearly agenda, the company provides targeted employee training programs to enhance competencies, acquire new knowledge, and cultivate positive mindsets about the organization's operations; in-person training has also been implemented. In 2021, the company organized free remote language courses for the staff. Wawel SA also supports its employees by subsidizing higher education and postgraduate studies.
Diversity management	
Diversity policy	In hiring employees, Wawel is guided by the principles of equal treatment and counteracting all forms of discrimination. The employer values the positive impact of such activities on the company's growth and innovation. The company ensures equal employment opportunities by facilitating access to professional development and individual promotions. Wawel SA strengthens the company's value by relying on the diversity of employees in terms of their knowledge, education, experience, and skills.
Human rights	
Human rights policy	Respect for human rights is also vital for the company. To this end, the company applies laws, as well as internal regulations, which include: The International Charter on Human Rights, the company's Code of Ethics, the company's labor regulations, procedures against discrimination and bullying, the International Covenant on Civil and Political Rights, and the International Covenant on Social, Cultural, and Economic Rights.
Procedures for the protection of human rights	The company is not indifferent to human rights violations and ensures that individuals involved in any violation of human rights are held accountable. Wawel has a strict confidentiality policy for anyone who reports such violations.
Child labor and forced labor	
Children's rights and the prohibition of forced labor	The company objects to forced labor and slave labor. Nor are any forms of child labor accepted at the company.
Local communities and community engagement	
Wawel SA's impact on local communities	By generating new employment opportunities and hiring locals, the company has established a positive reputation in the community.
Social commitment	The company has been actively involved in corporate social responsibility and charitable initiatives, having set up the Wawel with the Family Foundation in June 2008. The foundation's primary goal is to offer educational and social aid while supporting Polish families and institutions that cater to children. Additionally, the foundation endeavors to promote positive change in various social environments, particularly those vulnerable to exclusion. The company assists individuals and families facing challenging living and financial situations by offering subsidies for school trips and meals. Furthermore, the company supports educational, sports, or artistic events to promote children's emotional and social well-being. The organization arranges talks and instructional sessions to aid youngsters from orphanages and foster families facing challenging life circumstances. The aim is to assist them in attaining self-sufficiency and acquiring an education.

Table 5.3.2 (continued).

Countering corruption	
Policy against corruption and bribery	The company upholds a zero-tolerance policy towards corruption and bribery, including active and passive forms. Wawel promotes fair and honest practices throughout all aspects of its business operations. Moreover, the company is committed to providing equal treatment to all entities, including those with whom it cooperates and those within the same market.
Product and consumer safety	
Policy of compliance of products and services with applicable standards and guarantee of customer safety	The company's priority is to ensure the safety of its manufactured products. The company attends to protecting consumers with care, due to adopting a policy to ensure that products and services comply with the applicable standards. The company purchases from qualified suppliers with sustainability certifications or laboratory quality control. The HACCP quality safety system introduced at the company ensures health safety in compliance with the current standards.
Marketing communications	
Quality and ethics of marketing communications	The company's code of ethics encompasses rules regarding external communication. Prior to disclosing information to the media, the accuracy of the content is thoroughly screened.
Chain of company stores	The company utilizes its stores and cafes to communicate all information about its products and offerings to consumers through direct contact.
Wawel Truck	This is a mobile confectionery zone and a place containing interactive applications. The event truck project was created in 2018 to invite people into the world of the brand. The Wawel Truck offers arcade games, reveals the secrets of chocolate production, and provides the opportunity to do a good deed.
Awards and distinctions	The company has won many awards and distinctions from industry experts and consumer groups, including Best Product at the Consumer's Choice Awards (2021), Superbrands (2021), Golden Innovations of FMCG & Retail (2021), and <i>Polityka's</i> White Leaf Awards (2020).
Privacy protection	
Privacy policy, security policy, personal data policy	The company has introduced solutions to ensure the application of privacy policies, security policies, and personal data policies. The main focus is on physical protection of paper records and increased security measures for electronically processed resources to safeguard against unauthorized access.

Source: own work based on <http://relacjeinwestorskie.wawel.com.pl>.

Table 5.3.2 shows information related to the analysis of the social and employee area of Wawel SA regarding staffing levels, relations with employees, health and safety compliance, development, community, marketing communications, and privacy policies. During the pandemic in 2020, the management and board of directors implemented new work organization and communication methods that are still used today, including online meetings and training, thus increasing flexibility for both employers and employees. Additionally, Wawel provides a comprehensive remuneration system

with benefits for employees and their families. The company provides funding for staff training to encourage individual development. As the company expands, new job opportunities arise, providing the chance to hire individuals from neighboring towns. Moreover, the company operates cafes and stores, which facilitate direct communication with customers, allowing for the introduction of new products based on their feedback. Wawel organizes events to unite local communities through a mobile confectionery zone (Wawel Truck). The company ensures occupational health and safety, human capital development, supply chain, privacy, access to health care, and financial security.

5.3.3. Governance (G)

The third and final component of the ESG framework involves analyzing corporate governance. At Wawel SA, governance matters pertain to the approach for enhancing environmental and social aspects (including customers and suppliers), the management structure, internal control mechanisms, and the code of ethics. Table 5.3.3 outlines the management activities carried out by Wawel SA.

Table 5.3.3. The third dimension of ESG

Development strategy with social and environmental aspects	
Recipients	The products are sold through two distribution channels: independent (traditional) and modern. The independent channel is based on the distribution of products according to a logistics chain (manufacturer→distributor→store and manufacturer→central warehouse→chain of company stores). In the Polish market, the modern channel manages a network of supermarkets, hypermarkets, and discount stores to make sales. They directly reach consumers through their company-owned stores for product distribution. Wawel SA has stores in key Polish cities, including Krakow, Lodz, Warsaw, Zakopane, Katowice, Bydgoszcz, Dobczyce, and Jelenia Gora. Additionally, their products are gaining popularity in foreign markets such as Hungary, the USA, Germany, the UK, and Saudi Arabia.
Suppliers	Most of the company's suppliers are domestic, making up 84% of the supplier portfolio. The primary factor for selecting suppliers is the quality of their raw materials, ensuring they meet both the company's and customers' expectations.
Governance	
Management structure concerning managing non-financial aspects	The management structure conforms with generally applicable laws that apply to a joint-stock company. It aims at effective corporate governance and efficient management. Documents that affect the company's day-to-day management, supervision, and control include Regulations of the Supervisory Board, Regulations of the General Meeting, Regulations of the Audit Committee, and Regulations of the Board of Directors. The regulations that pertain to the structure of operations are included in the company's Organizational Regulations, designed to promote effective management. This document is an act that is regularly amended as it is adapted to the company's needs. The company has implemented an internal control system comprising various internal regulations and procedures. These guidelines specify the responsibilities of employees and individual units, along with ordinances, internal regulations, and instructions that form a part of the company's integrated quality management system. This system includes several certifications, such as ISO 9001, HACCP, IFS, BRC, UTZ, and RSPO.

Table 5.3.3 (continued).

Control system	The company conducts internal audits to ensure its procedures are well-managed. These audits are cross-checked and carried out by experts not involved in audited activities. The internal audit department is responsible for conducting planned and systematic compliance tests to meet the standards of ISO 9001:2015, IFS, BRC, UTZ, and RSPO. The company's management is actively engaged in regulating the control system's proper functioning and continuously monitors its performance. In addition to financial considerations, the management and board of directors consider non-financial factors when making important decisions. They focus on promoting a welcoming atmosphere and positively influencing Polish society. The company's management and board of directors prioritize employee rights and development, environmental sustainability, and community well-being as their core values.
List of certifications	Wawel SA applies a quality management system that complies with ISO 9001:2015 in the production, sales, and development of confectionery products and the principles of HACCP—Hazard Analysis and Critical Control Points. By utilizing the ISO standard, the company displays its dedication to enhancing the quality of its work and delivering products that satisfy customer expectations. Furthermore, obtaining the HACCP certificate ensures the company's compliance with health and safety regulations pertaining to their food production, a top priority for the management team. Moreover, the HACCP system ensures that the highest standards are upheld. IFS and BRC are globally recognized standards for ensuring the safety and quality of food products. UTZ is a certification system that operates internationally and establishes regulations for sustainable agricultural production of various products, including coffee, cocoa, tea, and hazelnuts. The main objective of UTZ is to develop a sustainable supply chain within the company and ensure that consumers have access to food that has been responsibly produced without causing any harm to the environment or the people involved in the production and cultivation processes. The RSPO, which stands for the Association for Sustainable Processing of Palm Oil, is a group that comprises growers, sellers, and manufacturers of palm oil products. Its primary objective is to promote using and producing raw materials through environmentally friendly methods.
Social and environmental risk management	
Monitoring of the company's internal processes and procedures related to risk management	The company consistently monitors its potential environmental impact by internally controlling the environmental aspects of its operations, including measuring noise levels, controlling wastewater parameters, measuring pollutants released into the atmosphere, managing the waste generation and hazardous substances, monitoring water consumption, and keeping records of accidents and the amount of packaging introduced into the market with products. The company did not violate any environmental standard in 2021.
Ethics management	
Code of ethics	This system aims to encourage lawful and morally upright conduct, encompassing a range of ethical principles within the organization. It aids in comprehending and implementing the specified ethical standards and principles. One of the key concerns for the company is maintaining effective communication with external parties, such as the media, and ensuring clear internal communication. The company operates under a set of core values that include professionalism, safety, respect, cooperation, responsibility, honesty, and commitment in all business dealings.

Source: own work based on <http://relacjainwestorskie.wawel.com.pl>.

Corporate governance, the last aspect in the ESG framework, is crucial as it encompasses management expertise, decision-making autonomy, compliance with commitments, and practices that foster confidence in the organization. Additionally, it is

important to address any relevant social and market concerns. Wawel SA has a proven track record of establishing enduring partnerships with suppliers and fulfilling its financial obligations to them in a just and equitable manner. The company did not face any criminal charges in 2021. Moreover, they have implemented a labeling procedure for their product design that adheres to important legal guidelines in food law.

Due to the implementation of new European regulations, there will be an increase in support for non-financial reporting. The non-financial aspects of the Wawel SA business are crucial pieces of management information that hold value for business partners, investors, analysts, customers, and potential employees. A non-financial report entails presenting a diverse set of data regarding the three dimensions of the concept: social, environmental, and corporate governance. This report provides detailed non-financial information that extends beyond the economic aspect covered in the economic-financial analysis. Creating a non-financial report can provide numerous advantages for anyone interested in Wawel SA's operations and performance. This report encompasses a comprehensive long-term strategy highlighting the company's development plans and accomplishments in a particular area. For investors, potential employees, or customers, the non-financial report serves as an additional source of information to aid in decision-making regarding collaboration with the company. Investors increasingly focus on non-financial data to evaluate a company's ESG (Environmental, Social, and Governance) factors, allowing them to analyze investment opportunities in three different directions, making non-financial evaluation an important aspect of their investment decisions.

Questions:

1. What is ESG?
2. Who does ESG impact?
3. Which entities are required to disclose non-financial data?
4. What makes ESG significant?

Practice:

With the knowledge you have acquired, prepare a sample non-financial report for an internationally-operating business.

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Streszczenie

Zastosowanie analizy finansowej w praktyce gospodarczej

Celem książki jest przedstawienie wybranych zagadnień teoretycznych i praktycznych z zakresu analizy finansowej. Monografia ma charakter teoretyczno- praktyczny i składa się ze wstępu oraz pięciu rozdziałów. Podmiotem badania jest przedsiębiorstwo WAWEL S.A, producent wyrobów cukierniczych. Całość pracy zamykają bibliografia i spis tabel, stanowiące rozwinięcie analiz i zestawień dokonanych na potrzeby książki.

W pierwszym rozdziale: „Substantive Theoretical Financial Analysis” zostało przedstawione znaczenie, istota, zadania oraz kryteria podziału analizy ekonomicznej, w tym finansowej. Przedstawiono także ogólne i szczegółowe metody stosowane w analizie ekonomicznej, interesariuszy, jako użytkowników analizy ekonomicznej oraz znaczenie analizy otoczenia w analizie ekonomicznej, w tym finansowej. Ten rozdział stanowi teoretyczne wprowadzenie do części obliczeniowej.

Celem drugiego rozdziału: „Horizontal and Vertical Analysis” było przedstawienie analizy wstępnej sprawozdań finansowych analizowanego przedsiębiorstwa w latach 2018–2021. Ten rozdział dotyczy rozważań teoretycznych oraz praktycznych rozwiązań przedstawionych na przykładzie sprawozdania finansowego przedsiębiorstwa Wawel SA.

W trzecim rozdziale: „An Analysis of Solvency Ratios and Operational Capability” oraz czwartym rozdziale: „Capital Structure and Profitability” przedstawiono teoretyczne i metodyczne aspekty analizy finansowej. Zaprezentowane wskaźniki pozwoliły na dokonanie kluczowej analizy badanego przedsiębiorstwa. Te rozdziały stanowią praktyczne rozwiązania przedstawione na przykładzie sprawozdania finansowego przedsiębiorstwa Wawel SA.

W rozdziale piątym: „CSR and Financial Analysis – Case Study” zaprezentowano koncepcję CSR. Przedstawiono analizę ESG w odniesieniu do badanego przedsiębiorstwa, skupiając uwagę na trzech kluczowych elementach: środowisko, społeczeństwo, ład korporacyjny.

Słowa kluczowe: analiza finansowa, płynność, rentowność, zadłużenie, modele dyskryminacyjne, ESG

Summary

Application of Financial Analysis in Business Practice

The aim of this book is to outline selected theoretical and practical issues in financial analysis. The book is of a theoretical and practical nature and consists of an introduction and five chapters. The subject of the study is Wawel SA, a manufacturer of confectionery products. The entire work concludes with a bibliography and a list of tables, which expand on the analyzes and comparisons made for the book.

The first chapter, *Substantive Theoretical Financial Analysis*, introduces the meaning, essence, tasks and criteria for dividing economic analysis, including financial analysis. Also outlined are the general and specific methods used in economic analysis, stakeholders as users of economic analysis and the importance of environmental analysis in economic analysis, including financial analysis. This chapter gives a theoretical introduction to the calculation section.

The aim of the second chapter, *Horizontal And Vertical Analysis*, is to give a preliminary analysis of the financial statements for Wawel SA from 2018–2021. This chapter deals with theoretical considerations and practical solutions based on Wawel SA's financial statements.

The third chapter, *An Analysis of Solvency Ratios and Operational Capability*, and the fourth chapter, *Capital Structure and Profitability*, feature theoretical and methodological aspects of financial analysis. The figures provided allow for a key analysis of the company under study. These chapters provide practical solutions based on Wawel SA's financial statements.

Chapter five, *CSR and Financial Analysis—Case Study*, outlines the concept of CSR. An ESG analysis is made of the company under study, focusing on three key elements: environment, society, and corporate governance.

Keywords: financial analysis, liquidity, profitability, debt, discrimination models, ESG