FACULTY OF ECONOMICS TUL

Master Thesis

Financial Performance Evaluation of a Selected Business Entity

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Study branch:	Management of Business Processes

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Master Thesis Assignment Form

Financial Performance Evaluation of a Selected Business Entity

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2. Specification of selected methods of financial analysis.
3. Application of selected performance evaluation methods on a business entity.
4. Evaluation of results and formulation of recommendations and measures for enhancing the company's efficiency.
5. Conclusions.

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- ARNOLD, Glen and Deborah LEWIS, 2019. *Corporate Financial Management*. 6^{th} edition. London: Pearson Education. ISBN 978-1-292-140-445.
- BLOCK, Stanley, Geoffrey HIRT and Bartley DANIELSEN, 2019. *Foundations of Financial Management*.19^{th}edition. New York: McGraw-Hill. ISBN 978-1-260-290-813.
- BROOKS, Raymond M., 2015. *Financial Management Core Concepts*. Essex: Pearson. ISBN 978-1-292-101-422.
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- WAHLEN, James M., Stephen P. BAGINSKI and Mark BRADSHAW, 2017. *Financial reporting, financial statement analysis and valuation*. Mason: Cengage Learning Custom Publishing. ISBN 978-1-337-614-689.
- PROQUEST, 2022. *Multidisciplinary database of articles ProQuest* [online]. Ann Arbor, MI, USA: ProQuest. [cit. 2022-09-30]. Available from: http://knihovna.tul.cz/.

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Financial Performance Evaluation of a Selected Business Entity

Annotation

Assessing the financial performance of a chosen company is the main objective of this diploma thesis. This diploma thesis aims to assess the company Volkswagen's financial performance from 2018 to 2022 by conventional methods and, based on the findings, provide suggestions to the company. There are two sections to this diploma thesis. The theoretical foundation for the analysis is presented in the first part. Presenting the features of the chosen company as well as the findings from the analysis carried out is the second section. This diploma thesis measures Volkswagen company's financial performance. Conclusions from the practical analysis of the diploma thesis serve as the foundation for suggestions and recommendations that are presented in the end.

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List of Abbreviations

B2B	Business-to-business
Capex	Capital expenditures
DHO	Days of Inventory on Hand
DSO	Days of Sales Outstanding
EAT	Earnings After Taxes
EBIT	Earnings Before Interest and Taxes
EBT	Earnings Before Taxes
GATT	General Agreement on Tarrifs and Trade
GDP	Gross Domestic Product
HR	Human Resources
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
MNC	Multinational Company
ROA	Return on Assets
ROCE	Return on Capital Employed
ROE	Return on Equity
ROS	Return on Sales
TNC	Transnational Company
US GAAP	United States Generally Accepted Accounting Principles
WTO	World Trade Organization

Introduction

The evaluation of the financial state of an organization and its profitability over a particular time span is referred to as financial performance. It entails examining the financial records, such as the revenue statement, balance sheet, and cash flow statement, to obtain a better understanding of the company's profitability, liquidity, efficiency, and stability.

Financial success is frequently assessed by computing and analysing financial ratios and measures, which provide an overview of the company's financial situation. Some of the most frequently used financial measures are gross profit margin, net profit margin, current ratio, quick ratio, inventory turnover, accounts payable turnover, debt-to-equity ratio, and interest coverage ratio.

Investors, shareholders, creditors, and other parties who want to make educated choices about a company's financial health and prospects must evaluate its financial success. An investment in a business with good financial health is generally considered to be safer than one in a company with weak financial performance, which may be considered to be a greater risk.

Companies can find areas for development and formulate sound choices about their future financial strategy by evaluating their financial success. Companies can spot strengths and flaws in their financial situation and take action to strengthen their performance by examining their financial statistics and measurements.

Overall, evaluating a company's financial performance is important for determining the health and profitability of the business and is a crucial instrument for making wise financial choices.

This thesis may provide light on the efficacy of financial management methods, point out areas that need development, and assist in investment decisions by analysing the financial performance of a particular organization.

The following are some possible contributions of this study to the field of finance:

- **Enhanced knowledge of financial performance evaluation**: This thesis can help in the creation of measures and methodologies that are more efficient in measuring financial performance. This study can pinpoint the advantages and disadvantages of the financial measures and ratios utilized in the assessment of the chosen business entity and make suggestions for changes.

- **Better financial decision-making**: The conclusions of this thesis can help with financial decision-making by highlighting the condition and performance of the chosen company's finances. As a result, shareholders, investors, and other interested parties may be better equipped to decide whether to fund the business or invest in it.

Overall, the prospective contributions of this thesis is to have the ability to promote academic understanding, enhance techniques for evaluating financial performance, guide financial decision-making, identify best practices, and improve financial performance evaluation methodologies.

The financial analysis tries to determine the company's financial health as well as the strengths and weaknesses of the main operational processes.

Even though the terms "financial situation," "position," and "health" are frequently used interchangeably, it is important to understand the distinctions between them. Financial efficiency, which is primarily gauged by profitability metrics, affects an organization's financial status. The idea of financial health represents the company's favorable financial status. It relies on the business's long-term capacity to pay obligations on time (liquidity measures) and capacity to produce a steady profit, (profitability metrics). The capacity to satisfy financial commitments and control the sources of financing is based on the ability to assess liquidity, which is reflected in the financial risk. In other words, the capital structure decision made by the firm may be viewed as a key determinant of future success.

The primary goal of financial analysis is to gather the most significant and pertinent financial indicators to give the management of the firm an accurate, realistic, and complicated financial picture of the business. The steps in an enterprise's financial analysis process are as follows:

- establish the core concepts of business financial performance evaluation,
- specification of selected methods of financial analysis,
- application of selected performance evaluation methods on a business entity,
- evaluation of results and formulation of recommendations and measures for enhancing the company’s efficiency,
- conclusions.

1 Performance Measurement Methods

Modern performance assessment techniques are everything from strict; on the contrary, because of the fierce rivalry in global markets that are developing quickly, businesses are vying for whatever edge they can get by utilizing these techniques (Wagner, 2009). Like other management disciplines, performance measurement has a theory that corresponds to its practice. Companies must adapt their operations as economic and social conditions change over time to take advantage of newly emerging possibilities and minimize newly developing risks (Bititci, 2015).

1.1 Evolution of Performance Measurement Methods

According to Bititci (2015), double-entry bookkeeping, the first type of performance management, appeared in the late 13th century and persisted in its current form until the Industrial Revolution of the 19th century, when it started to evolve quickly. With the advent of mass production, salaries as opposed to piecework payment became more prevalent, and as industrial systems expanded, authority and control were transferred as organizational complexity increased (Bititci, 2015).

More complex methods of regulating productivity first emerged during the early phases of globalization in the 1950s, including quality control and variety reduction (Bititci, 2015). However, even with these newly developed techniques, the primary objective of measuring business success was still to maximize profits through output volume (Wagner, 2009). The emphasis on performance assessment shifted towards the side of demand after the 1960s and throughout the 1980s.

When assessing performance, quality, timeliness, adaptability, and customer happiness have become crucial considerations (Bititci, 2015). During this time, business plans underwent a change as well. Whereas before the current business strategy was prioritized, there is now a new emphasis on future development and a constant search for ways to strengthen firm competitive advantages (Wagner, 2009).

Performance management and measurement were widely used between the turn of the 20th and the beginning of the 21st centuries, with a range of businesses using different measurement models and frameworks (Bititci, 2015). Beyond the range of models applied, the idea of evaluating a corporation as a complex system spread widely. To better understand

contemporary concepts, such as the reality that elements other than only economic ones—such as social, legal, and demographic ones—have an impact on a company's success, performance management transitioned away from quantitative calculations. The idea of competitive advantage has evolved into a prized intangible asset with the development of technology and expanded access to previously inaccessible information (Wagner, 2009).

The techniques used now are the result of these historic advancements in performance measurement. Performance indicators that are not monetarily measurable are frequently used in operational performance management (Neely, 2002). Despite the popularity of these contemporary performance metrics, financial success is still a significant factor at the highest levels (Neely, 2002). In addition, Neely (2002) contends that financial performance measurements continue to be among the most significant because they fulfill three key purposes despite the fact that non-financial measures of success have advanced further over the last decades:

- Financial measurements of performance are instruments for financial management in the provision and use of financial resources to aid in the achievement of the company's overarching objectives and to enable efficient and effective operation.

- Financial measurements of performance may be employed inside an organization as methods for reinforcing incentives and exercising control. By this, it is intended that financial data may offer insight into the management of certain activities, as well as their financial inputs and outputs.

- Finally, a company's financial performance, which is used to gauge its success and meet its commitments to its shareholders, is a key goal for every commercial organization (Neely, 2002).

The public and even non-senior management personnel are rarely given comprehensive information about non-financial performance metrics; some may be disclosed in yearly reports, but their publication is in no way required. Contrarily, it is a legal requirement for every business to publish financial data. Although there is a delay between the time this information is made available internally and the time it is made public, it is still one of the most trustworthy ways to gauge how well a business is doing overall.

1.2 Fundamentals of Financial Analysis

In nations with a developed market economy, using financial analysis as a tool to assess a company's financial performance has a long history. A company's financial status and financial health are depicted in broad strokes by the financial analysis. You can think about financial analysis either narrowly or generally. Financial analysis is more widely concerned with predicting the financial future of a firm than it is with evaluating the company's past and present financial performance.

The principles of fundamental financial analysis are listed below:

- Accrual Accounting: Financial analysis is based on accrual accounting, which records revenues and expenditures as they are made rather than when money is transferred. The financial performance of a business over time may be evaluated more precisely as a result.

- Financial Statements: An organization's income statement, balance sheet, and statement of cash flows serve as the foundation for financial analysis. These statements offer a summary of the company's cash flows, financial status, and performance over a certain time period (Norton P.E, 2019).

- Comparative Analysis: Comparative analysis differentiates a company's financial performance from that of its rivals or industry averages. The financial analysis also includes comparative analysis. This makes it possible for experts to assess a company's overall performance and pinpoint its potential for growth.

- Disclosure: Companies must provide pertinent financial data in their financial statements in order to conduct financial analysis. To help stakeholders make wise decisions, the information presented must be accurate, comprehensive, and pertinent. (Gupta, 2019).

- Materiality: The importance of financial information is taken into account in financial analysis. Information that can influence a user's process of decision-making is referred to as material information.

1.2.1 Significance of Data in Financial Analysis

Analysis of financial results entails a meticulous examination of acquired financial information. The initially obtained data is chosen and pooled, the relationships between the elements are established, causation is established, and their development is defined. This is the basis for financial evaluation. By putting the aforementioned approach into practice, financial data now has more informational value. Additionally, the outcomes of evaluation, based on data from financial accounting, constitute the basis for sound decision-making procedures. Financial analysis, unlike financial accounting, is mostly based on customer requirements and is not subject to any laws or other generally accepted norms.

The financial analysis makes it possible to track the evolution of financial performance through time. Past evolution of the success of a business may be inferred using retrospective historical information gathered from financial records. Additionally, the users' understanding of historical events provides them with the basics for planning for the future and economic and financial growth projections. However, a thorough assessment of the relationships between financial indicators and pertinent pieces of information is required to conduct a competent financial analysis (Sherman, 2015).

Financial statements, comprising balance sheets, income statements, cash flow statements, and statements of shareowners' ownership, are the main sources of data for financial analysis. Notes to financial statements and internal accounting both provide pertinent details, explanations, and proof of the application of accounting principles.

Conclusions regarding the overall achievement and financial status of the firm may be drawn using the information gathered through financial analysis. For managers, investors, and other consumers of financial research, it offers a starting point. Completeness, precision, and consistency in the application are crucial criteria for financial analysis. Additionally, there are a number of requirements that must be met while doing financial analysis, including application, effectiveness, and objectivity. Application refers to the use of strategies that are appropriate given the company's circumstances and available options. Additionally, the corporation carries out financial analysis effectively if only the advantages from a course of action outweigh the expenses. Finally, financial analysis needs to be impartial and connected to previously established objectives (Neely, 2002).

Financial statement analysis is a judgmental procedure that seeks to assess present and previous financial positions as well as the outcomes of an enterprise's operations, with the main

goal of coming up with the most accurate projections and forecasts for the future. It essentially entails grouping and analysing data from financial statements to establish relationships and shed light on a company's points of strengths and weaknesses. This information is then used to inform decision-making that involves comparisons with other companies' performance (cross-sectional analysis) and the performance of the company itself over time (time series analysis).

1.3 Users of Financial Analysis

The management, owners, and other external users who are connected to the business, such as suppliers, workers, rivals, the general public, international institutions, auditors, and the government, are the primary audiences for the financial analysis' findings. The findings of financial analyses are used by managers to track the company's short-term viability. Since they answer directly to the business owner for their decisions, managers are most concerned in the capital structure, profitability, liquidity, and financial independence of the organization.

The owners determine if the money they have invested is properly valuable through financial research. Maximizing the market value of the company's stock, developing market indicators and profitability indicators, and establishing a positive link between cash flows and long-term liabilities are the main objectives of the business owner. Financial analysis can be regarded from the perspective of the creditors in one of two ways. If a bank is a creditor, it primarily assesses the company's long-term profitability and liquidity.

The company's capacity to create funds and the consistency of its cash flows are both critical for banks. The viability of the business, cash flow, and the composition of current assets and current obligations are the main concerns of short-term creditors. Figure 1 shows how the financial analysis ought to be carried out and what economic entities ought to anticipate as a result of doing so.

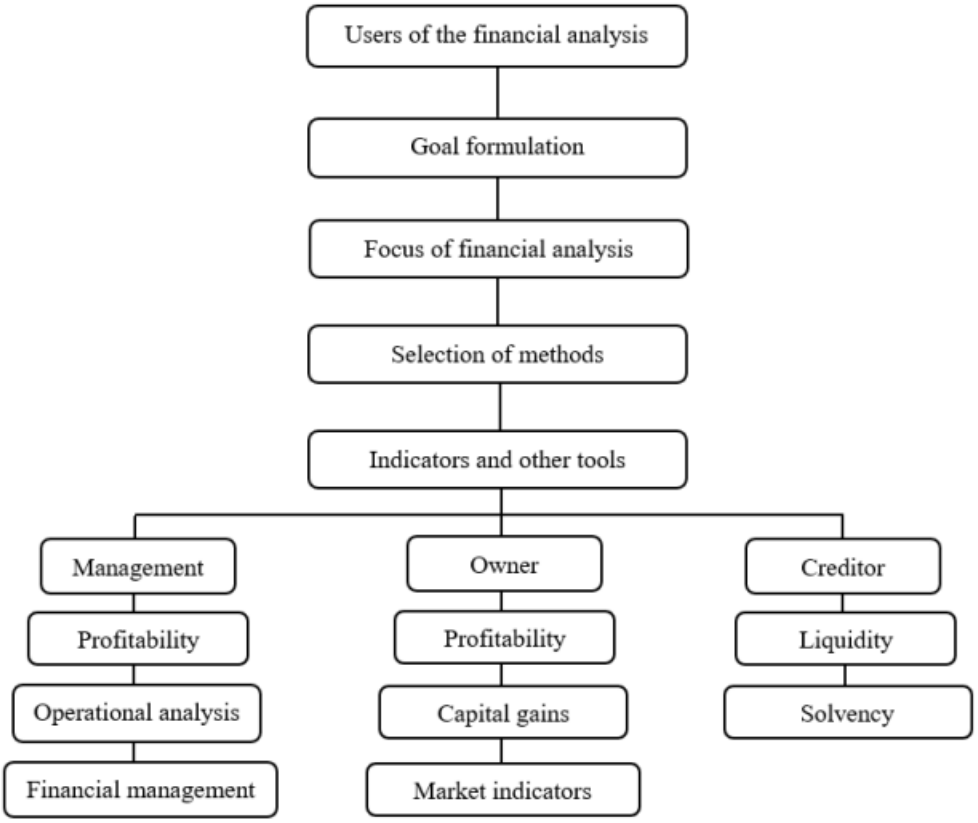

Figure 1: Users and steps of financial analysis
Source: Own creation according to Růčková (2021, p. 28)

Financial analysis is the act of correctly creating correlations between the various elements of the balance sheet and the statement of profit and loss in order to determine the firm's financial strengths and weaknesses. Management of the company may do financial analysis, or parties outside the company, such as owners, trade creditors, lenders, investors, labor unions, analysts, and others, may do so. Depending on the analyst's goal, the type of analysis will vary. Because the interests of the analysts vary, a strategy that one analyst uses regularly may not always be useful to other analysts. For many users, financial analysis is relevant and beneficial in the following ways:

- **Finance manager**: The facts and connections connected to management performance, corporate effectiveness, financial abilities and deficiencies, and the company's creditworthiness are the main subjects of financial analysis. A financial manager has to be well-versed in the various analytical tools in order to make wise judgments for the company. The analytical tools assist in examining accounting data to assess the viability of operating strategies, the investment potential of the company, credit ratings, and operational effectiveness. The procedures are similarly essential in the domain of financial control, allowing the finance manager to conduct ongoing

analyses of the firm's real financial operations to identify the root causes of significant deviations and, if appropriate, take remedial action.

- **Top management**: Financial analysis is important for all levels of management, not just the finance manager. Its extensive reach covers senior management in general as well as other managerial positions. Every part of the financial analysis would be of interest to the company's management. They have a general duty to ensure that the company's resources are utilized as effectively as possible and that its financial standing is stable. Financial analysis assists management in gauging the effectiveness of the business' operations, assessing employee performance, and assessing the system for internal control (Wagner, 2009).

- **Trade payables**: Trade payables evaluates the company's capacity to fulfill its short-term financial commitments as well as the likelihood that it will continue to be able to meet all of its financial obligations in the future through an examination of financial statements. The firm's capacity to settle claims within a very short time frame is of special significance to trade payables. Therefore, their study will assess the firm's liquidity status.

- **Lenders**: Providers of long-term financing are worried about the company's long-term viability. They evaluate the company's long-term profitability, cash flow, ability to cover interest payments and principal repayments, and the link between different funding sources (capital structure relationships). Long-term lenders examine previous financial data to evaluate the company's future profitability and solvency (Neely, 2002).

- **Investors**: Investors who have staked money in the company's shares are curious about the profits. As a result, they focus on the examination of the company's current and potential profitability. They are also curious about the capital structure of the company and how it affects risk and earnings. They also assess the management's effectiveness and decide whether or not a change is required. The shareholders' options to purchase, sell, or keep shares may be limited in some major corporations, though.

- **Labor unions**: To determine if an organization can now afford a salary rise and whether it can absorb a wage increase through greater productivity or by raising prices, labor unions examine the financial accounts.

- **Others**: The economists, researchers, etc., analyse the financial statements to study the present business and economic conditions. The government agencies need it for price regulations, taxation and other similar purposes.

1.3.1 Limitations of Financial Statement Analysis

It's crucial to understand that the constraints of financial statements might have an impact on the analysis's correctness and dependability.

The fact that financial statement analysis is reliant on historical data is one of its key drawbacks. The preparation of financial statements is dependent on previous financial transactions and events, which may not be a reliable predictor of future results. Market and economic conditions are subject to quick changes, and there may be new risks and possibilities that are not represented in prior financial statements (Bititci, 2015).

A business's accounting records from the prior year, for instance, could not have taken into account the effects of a new rival joining the market or a shift in customer preferences.

- **Limited Scope**

  Financial statements only give a limited picture of an organization's activities and don't take into account qualitative elements like managerial ability, brand recognition, customer happiness, and innovation potential. Therefore, a company's intrinsic worth could not be entirely captured by financial statement examination. For instance, a business could not have this information recorded in its financial records while having a high brand awareness and devoted clients, which might favourably affect its future profitability and cash flows (Meyer , 2015).

- **Accounting Policies**

  General accepted accounting principles (GAAP) or international financial reporting standards (IFRS), which might differ between nations and sectors, are used to compile financial statements. The ability to compare of financial statements may be

impacted by the varying treatment that accounting principles permit for issues like revenue recognition, inventory value, depreciation, and intangible assets. For instance, a business could value inventory using various techniques, which could have an impact on its estimated cost of goods sold and gross margin.

- **Manipulation**

  Financial statements can be manipulated and fraudulently obtained through techniques including window dressing, inventive accounting, and false declarations. This could result in miscalculated financial ratios and a misreading of financial performance. For instance, a business can misclassify obligations in order to overstate its debt levels or postpone recognizing costs in order to artificially inflate reported earnings (Mellvile, 2019).

- **External Factors**

  External variables that might affect financial performance include shifts in interest rates, currency rates, inflation, regulations, and geopolitical threats. These outside variables, which might impact the financial health of a business and position, could be missed by financial statement examination. For instance, a business in a highly regulated sector can have greater expenses and decreased profitability as a result of new laws, which might not be represented in its financial statements.

In a nutshell the analysis of financial statements is a valuable instrument for assessing the financial health and financial position of a firm, but it has limits that must be taken into account. Financial statement analysis should be used in addition to other sources of information, such as management reports, industry research, and expert views, to overcome these constraints and provide a thorough knowledge of a company's financial performance and situation (IFRS Foundation, 2021).

1.4 Financial Statements

The management of a firm gathers information from a variety of sources, including financial documents, to make educated choices. As a result, financial statements serve as a formal record of a person, business, or other entity's financial activity. Report on finances is another term for financial statements. The information in this report is laid out clearly and in a systematic

manner. A lot of planning goes into how a firm needs to present its accounting data and utilize this kind of data to win economic competitiveness given the significance of financial statements in investment choices (Griffin, 2015).

An organization's financial records are normally made up of five essential components: assets, liabilities, equity, income, and costs. These components, which are presented in line with accounting standards like IFRS and GAAP, are utilized to give a thorough perspective of the financial well-being and performance of a business.

An asset is defined as a resource that is controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity (IASB, 2021). An asset is simply something of value that a firm owns or controls and is anticipated to bring the company future advantages.

A liability is defined as a present obligation of the entity arising from past events, the settlement of which is expected to result in an outflow of economic resources from the entity (IASB, 2021). A liability is an expense or obligation owed by a firm to other organizations or people that will need payment, the provision of products or services in the near future.

Equity is defined as the residual interest in the assets of the entity after deducting all its liabilities. In other words, equity represents the portion of a company's assets that belong to its owners, shareholders or investors, after all debts and obligations have been paid off (IASB, 2021).

Income is defined as increases in economic benefits during the accounting period in the form of inflows or enhancements of assets or decreases of liabilities that result in increases in equity, other than those relating to contributions from equity participants (IASB, 2021). Income may also be defined as revenues, profits, or other asset or liability increases or declines that lead to a rise in a company's equity or net worth.

Expenses is defined as decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or incurrences of liabilities that result in decreases in equity, other than those relating to distributions to equity participants (IASB, 2021). A company's costs or losses incurred in order to produce income or other economic advantages, which lower the company's equity or net value, are referred to as expenses. Financial Statements are broadly categorized into 4 categories. They comprise:

- balance sheet,
- income statement,
- statement of cash flow,
- statement of changes in equity.

Accounting standards are followed in the preparation of financial statements to guarantee their accuracy, uniformity, and comparability among various businesses. Accounting regulations are a collection of guidelines that specify how to generate and report financial records.

The International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles (GAAP) used in the United States are the two accounting standards that are most commonly accepted globally.

Over 120 nations utilize IFRS, which is published by the International Accounting Standards Board. (IASB). In the income statement, balance sheet, statement of cash flows, and notes to the financial statements, it offers instructions on how to report financial activities.

The Financial Accounting Standards Board (FASB) in the United States has published a set of rules known as GAAP. Revenue recognition, inventory accounting, and lease accounting are only a few of the many accounting issues covered by GAAP.

Other regional accounting standards, such as Japanese GAAP (JGAAP) and Chinese GAAP (CGAAP), which are utilized in their respective nations, exist in addition to IFRS and GAAP.

These accounting standards must be followed by businesses in order to guarantee the consistency, openness, and comparable information of their financial statements.

1.4.1 Balance Sheet

The balance sheet, which is also sometimes referred to as the **statement of financial position**, contains information about the wealth of a company, how much wealth is held in each category, how much of the company's wealth is under its control and how much is committed to third parties, as well as the total amount of wealth in the company. The balance sheet gives a "snapshot," showing the company's situation just at that particular moment in time, unlike other financial statements which provide a summary of a period of time (IASB, 2021)

Three main areas make up a balance sheet: a company's assets, liabilities, and equity. The items that a firm possesses and may utilize to generate revenue are referred to as assets.

Liabilities represent the money owed to external parties by the business, while equity represents the worth of the remaining assets after all debts and liabilities have been settled. The crucial connection between these groups is that the assets and liabilities of the firm must always equal each other's values.

$$Assets = Liabilities + Equity \tag{1}$$

According to IAS1, the statement of financial situation is not needed to adhere to any particular format but must always balance. Additionally, it doesn't state what order the things should be shown in. However, if their size or character makes it important for understanding the company's financial status, the IAS1 contains a list of line items that should be provided individually (IASB 2022).

If any of the following conditions are met, an asset is categorized as a current asset:

- it is held primarily for trading,
- it is anticipated to be realized within a year following the reporting period,
- it is cash or cash equivalent,
- it is anticipated to be realized or is intended for sale or consumption within the normal operating cycle (IASB 2022).

XYZ plc – Statement of financial position as at 31 December 2022		
	2022	2021
ASSETS		
Non-current assets		
Property, plant, and equipment	xxx	xxx
Intangible assets	xxx	xxx
Investments	xxx	xxx
Total non-current assets	**xxx**	**xxx**
Current assets		
Inventories	xxx	xxx
Marketable securities	xxx	xxx
Account receivables	xxx	xxx
Supplies	xxx	xxx
Cash and cash equivalents	xxx	xxx
Total current assets	**xxx**	**xxx**
Total assets	**xxx**	**xxx**
EQUITY AND LIABILITIES		
Equity		
Share capital	xxx	xxx
Retained earnings	xxx	xxx
Other reserves	xxx	xxx
Total equity	**xxx**	**xxx**
Non-current liabilities		
Long-term debts	xxx	xxx
Deferred tax	xxx	xxx
Long-term provisions	xxx	xxx
Total non-current liabilities	**xxx**	**xxx**
Current liabilities		
Trade and other payables	xxx	xxx
Short-term debts	xxx	xxx
Current tax payable	xxx	xxx
Short-term provisions	xxx	xxx
Total current liabilities	**xxx**	**xxx**
Total liabilities and equity	**xxx**	**xxx**

Figure 2: Illustrative content of statement of financial position
Source: Own creation according to Melville (2019, p. 57)

The asset is deemed non-current if none of these conditions are met. Cash, marketable securities, accounts receivable, inventory, supplies, deferred costs, accrued revenues, property, plant, and equipment, investments, and intangible assets are among the assets that are frequently listed in the financial status statement. The details of these assets are provided:

- **Cash** - money, coins, and demand deposits at a bank are all examples of cash.
- **Marketable securities** - are things like bonds, notes, stocks, and bills that can be easily traded and that the business intends to sell in order to make money.
- **Account receivables -** are actionable legal claims filed against consumers, typically as a result of a credit sale.

- **Raw materials** - component parts, partially finished items, finished goods, and work in progress are all included in inventories.

- **Inventories -** are auxiliary products that are anticipated to be used up rather than sold during a reporting period, including pencils and wrapping paper.

- **Deferred Expense** - an expenditure that has already been incurred in the current accounting period but is not recognized as an expenditure until the products or services are used is known as a deferred expenditure.

- **Accrued revenue** - revenue that has been earned during the current accounting period by rendering products or services but has not yet been paid is referred to as accrued revenue.

- **Property, plant, and equipment** - are observable, long-term assets that are kept for use in the manufacture or provision of products and services, for letting out and managing space, and are anticipated to remain in use for an extended period. Depreciation is used to spread out the cost of these assets over the course of their useful life, although there are certain exceptions, such as land and artwork, which are not subject to depreciation. Investments primarily consist of stocks of another firm held for more than one accounting period (Sherman, 2015), (Corporate Financial Institute, 2022).

Liabilities are categorized as current liabilities if any of the following conditions are met:

- the liability is held primarily for trading purposes,

- the liability is expected to be settled in the course of the company's normal business operations,

- the liability is due for settlement within twelve months following the reporting period and,

- the company does not have an unconditional right to defer the fulfilment of the liability for a minimum of twelve months following its reporting period (IASB, 2022).

If none of these requirements are met, the liability is regarded as non-current, just like with assets. Long-term debts, short-term debts like accounts payable, notes payable, and other

payables, accrued expenses, and deferred revenues are some of the liabilities that are frequently shown in the statement of financial position. These liabilities can also take the form of a loan or goods or services provided to the business before payment. These liabilities are all fully explained.

- **Non-current liabilities** - Liabilities that are not expected to be paid back during the upcoming operational cycle are referred to as non-current liabilities. The maturity of a long-term liability exceeds one accounting period.

- **Current liabilities** - are debts that are due for repayment within the upcoming 12 months. Current obligations include things like accounts payable, notes outstanding, taxes due, interest due, and salaries due, among others.

- **Accrued Expenses** - expenditures that will be owed for services previously rendered for the organization are referred to as accrued expenditures.

- **Deferred revenues** - A prepayment received by the client for products and services that have not yet been provided is referred to as deferred revenue (also known as unearned income) (Sherman, 2015), (Corporate Financial Institute, 2022).

One of the most popular pieces of information used to evaluate a company's financial health is shareholder equity, which may also be thought of as the company's book value. The following components are often included under equity in the statement of financial position:

- **Share capital** is referred to as the funds that a business raises via the issuance of common or preferred stock. Common stock and extra paid-in capital are the proceeds from the sale of a security that retains a claim to the company's assets and earnings after all other claims have been satisfied. Common investors are entitled to vote on any issues pertaining to a company's general management. In the event of Preferred Stock, the Preferred Stockholders shall receive the dividends first to the Common Stockholders.

- **Retained earnings** are the earnings that have been reinvested during the course of the company's existence; they can be boosted by net income and lowered by net loss. Retained earnings are accumulated profits that are not given to shareholders but rather are kept for the company's future expansion (Griffin, 2015).

- **Other reserves** are a component of shareholders' equity that always has a credit balance and denotes money used to pay for future costs or to make up for any capital losses (Sherman, 2015).

Depending on who is reading a statement of financial condition, it might serve one of two objectives. Internal analysis of the statement of financial situation is used to determine if a corporation is prospering or failing. Based on this knowledge, policies and methods may be changed, building on successes, fixing mistakes, and turning toward new prospects. On the other side, it aims to provide details about the resources a corporation had access to and how they were financed when it is assessed externally. Based on this information, potential investors can choose whether or not to invest. External auditors might utilize the statement of financial position to check that a firm is adhering to all applicable reporting rules (Harvard Business School, 2021).

1.4.2 Income Statement

The company's income and spending for the reporting period are shown on the statement of profit or loss and other comprehensive income, a financial statement that also provides an overview of the company's performance and operational outcomes.

IAS1 states that corporations are free to use different names for their financial statements. As a result, the shorter names "statement of comprehensive income" or "income statement" are frequently employed. Additionally, the business can choose to show the statement of profit or loss and other comprehensive income for the reporting period in one statement or two statements. Figure 3 illustrates the one-statement method, which the IASB declared it favours (Alibhai et al. 2020), notwithstanding this (IASB, 2022).

When determining the company's profit or loss for the reporting period, the majority of forms of income and costs are taken into account. International standards demand, however, that specific forms of revenue or costs be recorded in the statement of comprehensive income under the heading "other comprehensive income" as opposed to being included in the calculation of profit or loss. In the event of a single comprehensive income statement, the section titled "other comprehensive income" comes after the computation of the period's profit or loss. The separate statement of profit or loss should appear before the separate statement of comprehensive income when two distinct financial statements are being created (Melville, 2019).

XYZ plc – Statement of profit or loss and other comprehensive income as at 31 December 2022		
	2022	2021
Revenue	xxx	xxx
Cost of sales	(xxx)	(xxx)
Gross profit	xxx	xxx
Other income	xxx	xxx
Operating expenses	(xxx)	(xxx)
Income before tax	xxx	xxx
Tax expense	(xxx)	(xxx)
NET INCOME FOR THE YEAR	**xxx**	**xxx**
Other comprehensive income		
Items that will not be reclassified to profit or loss:		
Gains on property revaluation	xxx	xxx
Investments in equity instruments	xxx	xxx
Tax relating to items that will not be reclassified	(xxx)	(xxx)
Other comprehensive income for the year net for tax	xxx	xxx
TOTAL COMPREHENSIVE INCOME FOR THE YEAR	**xxx**	**xxx**

Figure 3: Illustrative content of statement of profit or loss and other comprehensive income
Source: Own creation according to Melville (2019, p. 48)

The users can assess whether the company is making a profit, spending more than it makes, and having the funds to reinvest in the company from the statement of profit or loss and other comprehensive income (Harvard Business School, 2021). Since it serves to depict the firm's financial health, the statement of profit or loss and other comprehensive income has long been regarded by investors, creditors, management, and other stakeholders as the most significant section of the financial statements of the company (Alibhai et al. 2020).

The breakdown of income and costs is also included. Investors frequently have an interest in the company's historical earnings since they view this information as the most important factor for predicting the company's future earnings and cash flows. To determine whether the borrower can afford to pay interest, creditors are interested in the borrower's capacity to produce future cash flows (Alibhai et al. 2020).

The following categories are listed in the profit or loss statement:

- **Revenues** - The amount of money a firm earns over the course of a reporting period is represented by revenues. They might be divided up by firm division or product line. Operating revenues, which reflect sales from a company's primary business, and non-operating revenues, which come from outside sources, are common divisions of

revenues. When they are incurred, revenues must be reported using the accrual method.

- **Expenses** - are the sum of money spent by a business to produce revenues within a reporting period. Typically, expenses are divided into rent, salaries, depreciation, leases, procurement costs, and interest on debt. Revenues and expenses are separated into operational and non-operating costs. The accrual basis must be used to report expenses.

- **Cost of goods sold** - The entire sum that a company shelled out as a cost directly associated with the selling of goods is known as the cost of goods sold.

- **Gross Profit** - The difference between total revenues and the cost of products sold is the gross profit.

- **Operating income** - is the result of subtracting operating expenditures from gross profit.

- **Income before taxes** - Operating income less non-operating expenditures is what is meant by "income before taxes." (Harvard Business School, 2021) Income before taxes is calculated as income after taxes.

Production variables must be employed to launch business activities in order to earn profit. The income statement, a financial statement that summarizes events that have impacted a company's wealth through time, includes both revenues and costs; the difference between these two figures shows the period's profit or loss. Wealth here refers to anything that has economic worth for the business, including cash as well as assets, credit, and debt (McLaney, 2017).

1.4.3 Statement of Cash Flows

A cash flow statement details the company's operating cash inflows and outflows over the course of an accounting period and sheds light on its financial and investment operations. It displays the company's capacity to produce cash flows, which is what investors are most concerned about (Harvard Business School, 2021). The potential to create future positive cash flows, as well as the capacity to fulfill commitments and make dividend payments, is evaluated

by creditors and investors using the statement of cash flows. Additionally, it assists them in determining the causes of variations in profit or loss and cash collections and payments. The cash flow statement is created individually and is a crucial component of the financial statements in accordance with IAS7. Users may learn about the company's financial structure, including its solvency and liquidity, through the statement of cash flows. It also offers data for assessing changes in the company's assets, liabilities, and equity and acts as a predictor of the size, timing, and predictability of future cash flows. Cash flow from operating operations, cash flow from investment activities, and cash flow from financing activities are the three main divisions of the cash flow statement.

- **Operating Activities** - All transactions that are not regarded as investing or financing operations are categorized as operating activities. Cash flows from transactions and events that are utilized to calculate profit or loss are typically referred to as operating cash flows. The company's primary sources of income come from its operating operations, which also include producing and distributing things for sale as well as offering services. Revenues and costs are also included in this category.

- **Investment operations -** include cash flows from the purchase or sale of real estate, machinery, and equipment, as well as other long-term assets, as well as debt and equity instruments of other businesses that aren't kept as cash equivalents or for trading.

- **Financial operations** - include dividend payments and revenues from the sale of the company's stocks or bonds. This category also includes resources earned through short- and long-term borrowing (Alibhai et al. 2020).

Figure 3 illustrates how the direct and indirect techniques may be used to compute and produce the operational activities component of the cash flow statement. However, IFRS likes to display net cash from operational activities directly (IASB, 2022). The things that have an impact on cash flow during an accounting period are displayed using the direct approach. Cash collected from operating activities must be subtracted from cash outflows from operating activities in order to compute the operation section using the direct approach. Understanding the connections between a company's profit or loss and cash flow is a key benefit of the direct method (Alibhai et al. 2020). It starts by determining the profit or loss based on the profit and loss statement or other comprehensive income. Changes in the items of current assets and liabilities are highlighted in the statement of cash flows generated using the indirect technique (Alibhai et al. 2020).

Statement of cash flows for the year ended December 31 2022		
Direct method	2022	2021
Cash flows from operating activities		
Cash received from customers	X	X
Cash provided by operating activities	X	X
Cash paid to suppliers	(X)	(X)
Cash paid for operating expenses	(X)	(X)
Cash pad for income taxes	(X)	(X)
Cash disbursed for operating activities	(X)	(X)
Net cash flows from operating activities	X	X
Indirect method		
Cash flows from operating activities		
Profit before income taxes	X	X
Adjustoments for:		
Depreciation	X	X
Interest expense	X	X
(Increase)/decrease in accounts receivable	(X)	(X)
(Increase)/decrease in inventories	X	X
(Increase)/decrease in prepaid expenses	X	X
Increase/(decrease) in accounts payable	(X)	(X)
Increase/(decrease) in salaries and wages	(X)	(X)
Increase/(decrease) in taxes payble	X	(X)
Net cash flow from operating activities	X	X

Figure 4: Illustrative content of statement of cash flows
Source: Own creation according to Sherman (2015, p. 27)

Both direct and indirect approaches are used to display the operating activities section above. The preparation of the latter two portions (investment and finance) follows the same methodology. The fundamental reason why the IASB favours the direct technique over the indirect method is that the former makes it possible to anticipate future cash flows, whilst the latter does not (Alibhai et al. 2020), (IASB, 2022).

1.4.4 Statement of Changes in Equity

The beginning and ending balances as well as changes in the equity accounts that are indicated in the statement of financial position during an accounting period are reported in a statement of changes in equity, as illustrated in Figure 5. In other words, the statement of changes in equity indicates the changes in net assets that occurred during the accounting period for the firm.

All equity changes must be stated separately from equity changes involving non-owners in accordance with IAS1. These elements are included in the statement of changes in equity:

- the effects of retrospective application or restatement for each component of equity,

- total comprehensive income for the accounting period,
- a reconciliation between the carrying amount at the start and end of the accounting period,
- separately disclosing changes for each component of equity (Alibhai et al. 2020), (IASB, 2022).

XYZ plc – Statement of changes in equity for the year ended December 31 2022				
	Share capital	**Retained earnings**	**Other equity**	**Total**
Balance at 1 January 2021	xxx	xxx	xxx	xxx
Changes in equity for 2021				
Total comprehensive income		xxx		xxx
Dividends		(xxx)		(xxx)
Balance at 31 December 2021	**xxx**	**xxx**	**xxx**	**xxx**
Balance at 1 January 2022	xxx	xxx	xxx	xxx
Changes in equity for 2022				
Stock issuance	xxx			xxx
Total comprehensive income		xxx	xxx	xxx
Dividends		(xxx)		(xxx)
Other	xxx		xxx	
Balance at 31 December 2022	**xxx**	**xxx**	**xxx**	**xxx**

Figure 5: Illustrative content of statement of changes in equity
Source: Own creation according to Melville (2019, p. 50)

The statement of changes in equity, also known as the statement of stockholders' equity or statement of shareholders' equity, is a document that details how shareholders' equity has changed over the course of a certain time. The components of shareholders' equity, such as retained profits and share capital, are listed together with the effects that net income, dividend payments, share buybacks, capital contributions, and other comprehensive income will have (Schmidlin, 2014).

If the business has extra money at the conclusion of a fiscal quarter, it can distribute it as dividends to shareholders. However, shareholders have the choice to let the money remain in the business as an investment. Financial statements describe these amounts as retained profits. These are claims made against assets rather than actual assets. Management uses these retained revenues to upgrade facilities, buy more merchandise or equipment, and do other things (McLaney, 2017).

1.5 Data Sources for Financial Analysis

The input information has a major impact on the accuracy and expressiveness of the findings of financial analysis. For this reason, accurate information gathering and preparation are required.

Typically, the data needed to undertake financial analysis is condensed into three categories:

- Business statistics focusing on production volume, sales, employment, consumption norms, etc., are examples of quantifiable non-financial information.

- Financial information covers both external and internal quantifiable information.

- Unquantifiable information contains information that may not be measurable but is in the field of financial management's main influence.

The preceding chapter provided a thorough introduction to financial reporting as a main source of data for doing financial analysis. Depending on their intended audience, financial statements are classified as either internal or external statements. External financial statements are used as a basis for financial analysis and are a source of data for external consumers. The findings of internal financial accounts, on the other hand, are refined and financial analysis aberrations are eliminated since they are based on the internal demands of the organization (Růčková, 2021).

In addition to information from the notes and the statements of financial position, profit or loss, and other comprehensive income, cash flows, and changes in equity, an analyst can find a wealth of useful information from the following sources for conducting financial analysis:

- annual reports,
- websites and databases with official economic information,
- public registers, databases and,
- management reports are only a few examples (Knapková et al. 2017).

2 Methods of Financial Analysis

Because there are so many different reasons to undertake financial analysis, so many different methods are accessible, and there is such a large amount of data, it is essential to adapt the analytical approach to the particular circumstance (Robinson et al. 2015). The most popular techniques for assessing a firm's financial performance are those of fundamental and technical analysis, which assess a corporation based on a thorough examination and analysis of its financial statements. The foundation of financial analysis techniques are financial indicators, which are characterized by numbers and represent the economic activities of the organization.

Indicators are given in monetary terms and are obtained straight from the financial accounts. However, answers can also be derived in other units using mathematical operations, such as percentages or temporal units. Financial indicators can be categorized according to a number of factors, such as the purpose, target audience, and objectives of the financial study. Absolute, differential, and ratio indicators are the three main categories that the indicators fall under (Růčková, 2021).

Processing financial analysis entails a number of core tasks, including:

- the characteristics of the company,
- the industry in which the company operates,
- the analysis of absolute indicators,
- the analysis of differential indicators,
- the analysis of ratio indicators,
- the analysis of cumulative indicators,
- the identification of the diagnosis and,
- the formulation of suggestions and recommendations for improvement (Knápková et al. 2017).

2.1 Analysis of Absolute Indicators

The first stage of basic financial analysis, which directly evaluates the values of various components of the financial statements, is the study of absolute indicators.

Data that is stated in absolute terms is referred to as an absolute indicator. Vertical and horizontal analyses are also produced using this data (Čižinská, 2018).

2.1.1 Horizontal Analysis

When doing a horizontal analysis, also known as a comparative financial statement analysis, balance sheets, cash flow statements, and income statements are examined in succession from one year or period to the next.

Horizontal analysis, sometimes referred to as trend analysis, examines the evolution of absolute indicators through time in order to show users how a certain item has changed from one accounting period to the next. When performing a horizontal analysis, a long time 48 series must be created in order to get accurate findings. The horizontal examination reveals structural modifications to the company activities (Robinson et al. 2015).

During the horizontal analysis, the absolute and percentage change of each financial statement item is calculated, and the financial statement items are then further compared with one another line by line (Růčková, 2021). The following formulae can be used to determine both the absolute change and the percentage change:

$$Absolute\ Change = Amount\ in\ Comparison\ Year - Amount\ in\ Base\ Year \quad (2)$$

$$\%Change = \frac{Amount\ in\ Comparison\ Year - Amount\ in\ Base\ Year}{Amount\ in\ Base\ Year} * 100 \quad (3)$$

(Corporate Financial Institute, 2022)

This is true for both the company's general financial situation and specific entries on financial records. Year-to-year change analysis and index analysis are two widely used methods for doing a horizontal study (Subramanyam, 2014).

2.1.2 Year-to-Year Change Analysis

Year-to-year change analysis may be used to compare financial statements over shorter time periods, such as two to three years, as the data are easier to handle and comprehend.

Year-to-year change analysis has the benefit of presenting results in both absolute values and percentages, which is a welcome feature because percentage changes don't always accurately reflect their significance. For example, a 50% change in a base amount of 10,000 Czech Crowns (CZK) will typically be less significant than a change of the same percentage in a base amount of 1,000,000 CZK (Subramanyam, 2014).

While simple, year-to-year analytical computation issues might arise. No useful percentage can be derived when a negative quantity emerges in the base period and a positive amount in the next period, or the opposite is true. In a similar vein, no percentage change may be calculated when there is no quantity in the base period. Additionally, care should be used when interpreting significant percentage changes that might result from tiny base period amounts or when an item is present in the base period but missing in the succeeding period, in which case the percentage change would indicate a 100% drop (Subramanyam, 2014).

2.1.3 Index Analysis

Since utilizing the year-to-year change analysis for durations longer than two to three years may become cumbersome, index analysis, or index-number trend analysis, can be used to span longer periods of time. A base period must be specified for all items, with a preselected index number commonly set to 100, in order to conduct an index analysis. It is essential to select a base period in which business conditions are as near to normal as feasible since this base period will serve as a frame of reference for subsequent comparisons. Certain shifts, such those from negative to positive amounts, cannot be adequately described using index numbers, much like year-to-year comparisons. This method may be used to determine percentage changes using an index number of 100 (Subramanyam, 2014).

$$\frac{Current\ Year\ Balance}{Base\ Year\ Balance} * 100 \quad (4)$$

Only key financial statement items need to be studied using index analysis, but care should be taken to assess how external influences, such as economic or industry conditions, may affect the data utilized in the study. Wherever feasible, these discrepancies ought to be taken into account. Additionally, a distorted image on any changes in price level may be produced the longer the comparison period is. On the plus side, one result of this research would be to shed light on managers' strategies and their capacity to cope with challenges and seize opportunities during these times (Subramanyam, 2014).

2.1.4 Vertical Analysis

The balance sheet might possibly be understood better via the vertical analysis. By presenting the percentage of an account inside a certain group or subgroup, vertical analysis—also known as common-size financial statement analysis—seeks to produce common-size financial

statements. The aggregate of the accounts within these groups on a balance sheet can be stated as 100%, with the accounts within these groups being expressed as percentages of the total. The sales are frequently set at 100% for the income statement, and the remaining accounts are reported as a percentage of the sales (Subramanyam, 2014).

Vertical analysis places emphasis on two elements when assessing a balance sheet: the sources of funding and the allocation of funding between liabilities and equity, as well as the makeup of assets. Vertical examination of an income statement is as significant, even though it is better suited for examining the balance sheet. Due to the relationships between the specific things contained inside each statement, both lend themselves to this study. Knowing how much of the inventories are made up of current assets, for instance, might help with the balance sheet's estimate of asset liquidity. Since sales affect practically all costs, the income statement lends itself to vertical analysis, making it possible to determine what proportion of sales each item represents (Subramanyam, 2014).

2.2 Analysis of Differential Indicators

Differential indicators are typically used to analyse a company's financial status with a focus on liquidity. The difference between two absolute indicators is used to compute them. As indicated in Figure 6, the most popular differential indicator is net working capital, which is calculated as the difference between current assets and current liabilities. The company's liquidity is significantly impacted by its net working capital (Knápková et al. 2017).

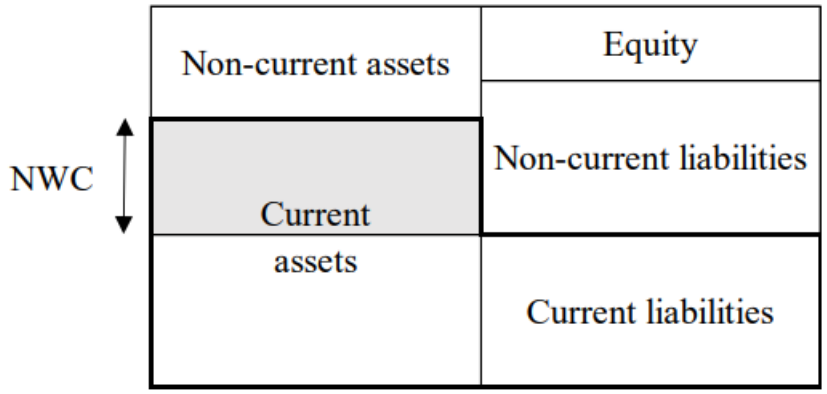

Figure 6: Net working capital
Source: Own processing according to Knápková et al. (2017, p. 355)

Therefore, a portion of current assets that are financed by long-term capital is represented by net working capital. A net working capital value that is positive is the optimum scenario (Knápková et al. 2017).

2.3 Analysis of Ratio Indicators

Due to the ease of computation, useful information about the company's financial features, and representation of major links between various elements in the financial statements, ratios are thought to be the most widely used method of financial analysis (Sedláek, 2001). One financial statement item is divided by another item to generate a financial ratio. Numerous ratios can be divided into the following groups:

- Activity ratios quantify how well a business completes routine activities.
- Liquidity ratios gauge a company's capacity to pay its immediate debts.
- Profitability ratios gauge a business's capacity to make money off its assets.
- Leverage ratios assess a company's capacity to fulfill long-term commitments (Robinson et al. 2015).

2.3.1 Activity Ratios

Activity ratios gauge a company's ability to successfully handle diverse tasks and make use of its resources. When a business has more assets than is necessary, it faces needless expenses and low profitability. On the other side, the corporation loses potential profits if its assets are below their ideal level (Synek, 2011). Activity ratios may serve as gauges of continuing operational success. They typically mix data from the numerator of the statement of profit or loss and other comprehensive income with data **from** the denominator of the statement of financial position.

Total asset turnover reveals how well a firm uses all of its assets to generate sales. Total net sales are divided by total assets to calculate total assets turnover (Weygandt et al. 2010). The total assets turnover values mostly rely on the nature of the company activity. Higher total asset turnover values than the industry average indicate inefficient asset use by the firm and poor or declining production capacity utilization. On the other hand, management should focus on growing sales or selling inefficiently used assets if the company's turnover is lower than the industry average (Sedláček, 2001). The following is the total asset turnover calculation formula:

$$Total\ Assets\ Turnover\ = \frac{Net\ Sales}{Average\ Total\ Assets} \quad (5)$$

Inventory turnover, which is used to calculate inventory liquidity, indicates the typical frequency with which inventory is handed over or sold during a specific time period. The inventory turnover ratio, which measures management effectiveness, is determined as sales divided by stocks (Weygandt et al. 2010). Generally speaking, the likelihood of larger earnings increases with the inventory turnover rate. By dividing inventory turnover by the number of days in the accounting period, days of inventory on hand (hereafter "DOH") may also be calculated (usually 365 days). The inventory turnover and DOH are frequently calculated using the following formulas:

$$Inventory\ Turnover = \frac{Net\ Sales}{DOH} \quad (6)$$

$$DOH = \frac{Inventory}{\frac{Total\ Sales}{365}} = \frac{Number\ of\ Days\ in\ Period\ (365)}{Inventory\ Turnover} \quad (7)$$

Receivables turnover gauges the company's accounts receivable's liquidity. Total sales divided by accounts receivable is how it is calculated. The ratio calculates the typical number of times the business collects accounts receivable over the accounting period.

Days of sales outstanding (hereinafter "DSO") is another way that the receivables turnover ratio might be translated. The amount of DSO indicates the average amount of time it takes to collect receivables. The invoice due date is the suggested figure for the receivable's turnover ratio. The size of the firm must be taken into account by the financial analyst. The DSO and receivables turnover are calculated using the following formulas:

$$Receivables\ Turnover = \frac{Total\ Sales}{DOS} \quad (8)$$

$$DOS = \frac{Receivables}{\frac{Total\ Sales}{365}} = \frac{Number\ of\ Days\ in\ Period\ (365)}{Receivables\ Turnover} \quad (9)$$

As DOS shows a rise in the creditor's payment discipline, it ought to be declining with time. The amount of money the firm receives from receivables increases with the receivable's turnover ratio. On the other hand, a low percentage of turnover of receivables raises concerns over the effectiveness of the company's credit policies (Robinson et al. 2015), (Weygandt et al. 2010).

The number of times the corporation hypothetically pays out all of its debtors each year is measured by **the payable's turnover**. The company's total sales divided by its payables is used to compute this ratio. When there is a decrease in the number of days for payables and an increase in payables turnover, the situation is ideal. The firm may be having problems making timely payments or abusing the conditions of its suppliers if its payables turnover is abnormally low and its days payable are high. The number of payables days is also calculated to show how soon the company's payables are settled. To avoid upsetting the company's financial balance, the days of payables should typically be more than the days of outstanding sales. Both ratios are crucial because they show how the firm conforms to its business credit strategy for potential creditors. The number of days of payables and the payables turnover are determined using the calculations below:

$$Payables\ Turnover = \frac{Cost\ of\ Goods\ Sold}{Average\ Accounts\ \ Payables} \tag{10}$$

$$Number\ of\ Days\ of\ Payables = \frac{Payables}{\frac{Total\ Sales}{365}} = \frac{Number\ of\ Days\ in\ Period\ (365)}{Payables\ Turnover} \tag{11}$$

When there is a decrease in the number of days for payables and an increase in payables turnover, the situation is ideal. The firm may be having problems making timely payments or abusing the conditions of its suppliers if its payables turnover is abnormally low and its days payable are high.

2.3.2 Liquidity Ratios

The capacity of a particular asset to be turned into cash with little loss of value is referred to as liquidity, and it is seen as an essential precondition for the company's solvency. The capacity of the business to meet its debt obligations on time is then expressed by the word "solvency," which is supported by all of the company's assets. Lack of liquidity prevents a firm from taking advantage of lucrative business prospects and may potentially lead to the company's insolvency or bankruptcy. Contrarily, excessive liquidity is a sign of inadequate growth in current assets (Čižinská, 2018).

Depending on the industry, different amounts of liquidity are required. The volume and makeup of their obligations are frequently better managed by larger organizations than by smaller ones. Because of this, managers of smaller businesses must to be concerned not just with increasing

profits but also with preserving the viability of their organizations. The liquidity ratios, which typically employ data from the balance sheet date, only indicate the status of a corporation at a specific point in time. The current, quick, and cash ratios make up the liquidity ratios. As explained below, each ratio employs an increasingly tighter definition of liquid assets (Robinson et al. 2015).

A common metric for assessing a company's liquidity and capacity to settle short-term debt is its **current ratio**. The ratio displays the amount of current assets that exceed current liabilities for the business. In other words, it illustrates the company's capacity to pay off its debts if it liquidates all of its present assets. Due to its disregard for the liquidity and maturity structures of current assets and liabilities as well as their affectability at the balance sheet date by deferring some purchases, the current ratio has low explanatory power (Růčková, 2021). Weygandt et al. (2010) state that the formula for calculating current ratio is as follows:

$$Current\ ratio = \frac{Current\ Assets}{Current\ Liabilities} \tag{12}$$

The current ratio should be between 1.5 and 2.5. However, the precise amount is highly influenced by the business sector, financial management approach, and current market circumstances (Kubíčková, 2015).

The **quick ratio**, commonly referred to as the acid test, measures a company's capacity to pay creditors without liquidating its inventory since such assets could not be promptly and readily convertible to cash. Due to the fast ratio's inclusion of only the current assets that are more liquid in comparison to current liabilities, it is thought to be more conservative than the current ratio. (Robinson et al. 2015). Quick ratios are highly industry-specific. But the numerator must be equal to the 53 denominators. (1:1). In this situation, the business shouldn't need to sell any inventory in order to cover its present obligations (Růčková, 2021). The quick ratio is frequently calculated using the following formulas:

$$Quick\ ratio = \frac{(Current\ assets - Inventory)}{Current\ Liabilities} \tag{13}$$

$$Quick\ ratio = \frac{Cash + Short\text{-}Term\ Investments + Receivable}{Current\ Liabilities} \tag{14}$$

According to Scholleová (2017), the quick ratio should be between 1.0 and 1.5.

Since only the most liquid assets are taken into account in the computation, the **cash ratio** reflects the most limited definition of liquidity. It measures the company's capacity to pay off its

current liabilities immediately by expressing the connection between cash (and cash equivalents) and current liabilities (Martinovičová et al. 2019). The cash ratio may be calculated using the formula below:

$$Cash\ Ratio = \frac{Cash + Cash\ Equivalents}{Current\ Liabilities} \quad (15)$$

According to Scholleová (2017), the cash ratio should be between 0,2 and 0,5. Although corporations frequently employ accounting overloads that may not be obvious from the information in the statement of financial condition, non-compliance with these values does not always indicate that the company has financial problems (Růčková, 2021).

2.3.3 Profitability Ratios

A well completed profitability analysis collects data on the profitability of sales, assets, and equity, which is particularly useful for internal and external users to make specific decisions. The ratios might aid management in accurately assessing prospective hazards and opportunities in addition to forecasting the company's profitability. Profitability ratios show how well a firm can turn a profit and utilise the cash that has been invested. Additionally, the profitability analysis supports effective resource management, smart financial and investment choices, and business solvency assurance (Tamulevičiené, 2016).

Comparing the profitability ratios of the current financial year to those of the preceding financial years, other firms that are comparable to it, and the average profitability rates of the industrial sector yields a wealth of useful information (Tamulevičiené, 2016). The statements of financial condition, profit or loss, and other comprehensive income frequently serve as the foundation for the ratios. The chosen type of income, such as earnings before interest and taxes (hereinafter "EBIT"), earnings before taxes (hereafter "EBT"), and earnings after taxes (hereafter "EAT"), generates the numerator of the profitability ratio, whilst the denominator comprises capital or revenues. Typically, the findings of a profitability study are expressed as a percentage. Profitability is often assessed using return on assets, return on equity, and return on sales (Čižinská, 2018).

Return on assets is a financial ratio that assesses the performance and health of a firm's finances by measuring the return a company has generated on its assets over a certain time period. Managers generally utilize return on assets (hereinafter "ROA") to assess how well a business uses its resources to create profit (Robinson et al. 2015). The ROA numerator is not set and may

change depending on the goal of the analysis being done. On the other hand, total assets are always included in the ROA denominator (Čižinská, 2018). The following formula is used to accomplish the calculation:

$$Return\ on\ Assets = \frac{EBIT}{Total\ Assets} * 100 \quad (16)$$

In general, a corporation is more effective at earning profits from its assets if its return on assets ratio is higher.

The company's shareholders' or owners' return on capital invested in the business is expressed as **return on equity**. The statement of profit or loss and other comprehensive income as well as the statement of financial position are the sources of data used in the calculations. (Birken, 2022). In order to determine if the firm is doing better or worse than in the past at generating profits, it is also necessary to compare ROE with earlier data. Similar to ROA, which is frequently used to assess a company's financial performance, the ratio is determined by dividing net profit (EAT) by shareholder equity and reported as a percentage. Because of this, the company's owners are primarily interested in this ratio. (Robinson et al. 2015).

The return on equity is calculated using the calculation shown below:

$$Return\ on\ Equity = \frac{EAT}{Equity} * 100 \quad (17)$$

The return on equity (ROE) should exceed the return on assets (ROA), or vice versa. A corporation is adept at making money off of its equity if its ROE is consistently rising. These businesses typically rely less on debt finance. On the other side, if the ROE declines over time, management is obviously having trouble making the appropriate choices (Corporate Financial Institute, 2022).

Return on sales, which assesses how well a company converts revenues into profits, is used to assess the operational effectiveness of a business. In other words, it displays the amount of profit generated per dollar of sales. It also serves as a means of expressing the profit margin. The return on sales (hereinafter "ROS") numerator might change depending on the analysis's goal and can include different types of revenue. On the other hand, total net sales or total revenues make up the ROS denominator. The ratio may be compared to the company's historical data as well as data from comparable businesses engaged in the same industry (Hayes, 2021), (Růčková, 2021). The following formula is used to accomplish the calculation:

$$Return\ on\ Equity = \frac{EBIT, EBT, EAT}{Net\ Sales} * 100 \quad (18)$$

While a declining ROS portends impending financial difficulties, which may be brought on by production issues, an increasing ROS shows that the business is expanding well.

Return on capital employed, or "ROCE," is a crucial metric that conveys the company's capital efficiency. In other words, it shows how well a business produces a profit from the capital it uses. EBIT is divided by long-term capital utilized to determine ROCE. The elements of long-term liabilities and the company's equity are what the statement of financial condition uses to calculate long-term capital employed. As it takes into account both debt and equity financing, the return on capital employed is often a ratio that investors and creditors prefer above the returns on equity and assets. When comparing businesses in the same industry, the ratio is particularly helpful (Hayes, 2021), (Maverick, 2022).

The return on capital invested is calculated using the calculation shown below:

$$Return\ on\ Capital\ Employed = \frac{EBIT}{Capital\ Employed} * 100 \quad (19)$$

$$Total\ Assets - Current\ Liabilities = Capital\ Employed \quad (20)$$

A corporation that is more efficient at generating profit from capital employed has a greater return on capital employed. The corporation wants to consistently produce a ROCE that is higher than its weighted average cost of capital (Maverick, 2022).

2.3.4 Leverage Ratios

They are used to assess a company's solvency, which is seen as its capacity to pay off long-term debt. Leverage ratios, which concentrate on the statement of financial position and gauge the degree to which a company uses liabilities rather than equity to finance its assets, can be useful in determining the relative amount of debt in a company's capital structure when assessing its solvency. Additionally, these ratios may be used to compare a company's performance over time to that of other firms. (Robinson et al. 2015). It is important to note that the firm can benefit from using a specific level of debt financing since it can raise equity's profitability. The outcomes of the leverage analysis are particularly crucial for the creditors. The danger of default for the creditors increases with the amount of foreign capital used by the firm. The debt-to-equity ratio,

equity ratio, and debt ratio are some of the most well-known ratios used in leverage research (Růčková, 2021).

The **debt ratio**, which is computed as total liabilities divided by total assets, is regarded as a crucial metric that assesses the degree of a company's indebtedness. The ratio has to be compared to the company's overall profitability and its foreign capital structure. Creditors frequently use the debt ratio to assess a company's capacity to pay back its obligations and make sure it is financially sound. The following is an equation for calculating the debt ratio:

$$Debt\ Ratio = \frac{Total\ Liabilities}{Total\ Assets} * 100 \tag{21}$$

Companies with a larger debt ratio are more leveraged and, as a result, present a greater risk to creditors and investors. Due to the reduced danger of insolvency, a smaller ratio is preferred by the company's creditors. The ideal range for the ratio is between 30% and 60%. Respecting the standards of the industry is also vital (Knápková et al. 2017).

In addition to the debt ratio, the **equity ratio** measures the amount that owners' ownership contributes to the financing of the company's assets. The debt-to-equity ratio should be about equal to one. Its main purpose is to evaluate the company's overall financial status. The ratio should, however, be compared to the profitability ratios (Růčková, 2021). The following equation may be used to get the equity ratio:

$$Equity\ Ratio = \frac{Total\ Equity}{Total\ Assets} * 100 \tag{22}$$

A larger equity ratio is typically better for businesses for a number of reasons. Potential shareholders can see from the increasing investment levels that the firm is solvent and a good investment. The industry in which the firm works affects the equity ratio just like it does other ratios.

The two leverage ratios described above are combined in the **debt-to-equity ratio**. It calculates the ratio of shareholder equity to loan capital. When a bank applies for a loan, the ratio and its temporal development are crucial because they show how much the claims of creditors might be compromised. Total equity is used as the denominator for the debt-to-equity ratio rather than total assets. The following equation may be used to get the debt-to-equity ratio:

$$Debt\text{-}to\text{-}Equity\ Ratio = \frac{Total\ Liabilities}{Total\ Equity} * 100 \tag{23}$$

Since the corporation uses debt to finance its expansion, a high debt-to-equity ratio is typically correlated with a higher level of financial risk. Industry-specific optimum values range greatly, but they shouldn't exceed 200% (Munichiello, 2022).

2.4 Analysis of Cumulative Indicators

Since some of the aforementioned ratios have limited explanatory power due to too many indicators making orientation difficult and thus distorting the analyst's perception of the company, analysis of cumulative indicators aims to express the overall financial and economic performance of a company by connecting multiple ratios and analysing the existing interconnections among them. Cumulative indicator analysis' main objectives are to make the evolution of financial performance more transparent, to demonstrate the influence of certain ratios on the company's overall performance, and to serve as a basis for future decision-making. Pyramid decomposition and credibility and bankruptcy models are the two primary categories of methods used to develop a collection of cumulative indicators.

A thorough dissection of the top indication into partial components based on mathematical correlations is the essence of the pyramid decomposition. To assess the company's financial status and foresee its future financial development is the essence of credibility and bankruptcy models (Růčková, 2021). In the text that follows, the credibility and bankruptcy models are given particular focus.

2.5 Bankruptcy and Credibility Models

The examination of the company's overall financial health frequently employs bankruptcy and credibility models. Despite the fact that both models' goals are identical, they differ in terms of why they were developed. Since bankruptcy models are well-known metrics of the firm's financial hardship, they are made to tell consumers whether there is a likelihood that a company will go bankrupt in the near future.

These models are founded on the idea that any firm that is declaring bankruptcy has previously displayed the typical indicators of bankruptcy prior to the actual occurrence. Lack of liquidity, insufficient net working capital, and problems with the return on equity ratio are the most prevalent symptoms (Růčková, 2021).

For instance, the Altman Z-score, the Taffler model, and the IN model are bankruptcy models.

2.5.1 Altman Z-Score

Based on the computation of global indexes, or overall assessment indexes, the Altman Z-score model is regarded as a financial bankruptcy model. Professor E.I. Altman developed the idea for the model in 1968. In order to forecast the likelihood of bankruptcy, Altman employed the statistic discrimination analysis, which included estimating the weighted coefficients of a linear combination of the different business ratios. Financial measures including activity, profitability, liquidity, and solvency are included in Altman's model. Additionally, Altman chose the weights for each ratio, which reflects its significance for the company's financial health. The model now contains three unique formulae, created for firms publicly traded on a stock exchange market, non-traded companies, and companies operating in emerging nations, based on the changing economic condition in particular companies and countries. Only the weights of the individual ratios alter, not their values. The equation appropriate for publicly listed corporations is offered since the company under analysis in the master's thesis is one that is traded.

Z is defined as

$$Z = 1{,}2X1 + 1{,}4X2 + 3{,}3X3 + 0{,}6X4 + 1X5 \quad (24)$$

where

X1 = net working capital/total assets,
X2 = retained earnings/total assets,
X3 = EBIT/total assets,
X4 = equity/total liabilities and,
X5 = sales/total assets (Kislingerová, 2001).
If the Z-score number is more than 2,99 (the safe zone), the business is regarded as financially solid. The range between 1,81-2,98 is referred to as a "grey area," in which the company's financial soundness cannot be properly determined. Values below 1,81 (the "distress zone") indicate substantial financial problems and a considerable risk of bankruptcy (Růčková, 2021).

2.5.2 Index IN

A Czech version of the financial distress prediction model that accurately depicts the state of Czech enterprises is known as Index IN. The bankruptcy IN indicators were developed and evaluated by Ivan and Inka Neumaier using information gathered from about 2,000 60 Czech enterprises. The IN Index, which was developed via discriminating analysis, has estimated financial ratios and weighted coefficients, just like previous bankruptcy models. The IN index also considers the particulars of the sector. The IN95 creditor variation, the IN99 proprietary variant, the IN01 complicated variant, and the IN05 modified complex variant are four indices that Ivan and Inka Neumaier developed over time. The IN05 will be used for this master's thesis. According to Inka and Ivan Neumaier (2008), the IN05 Index has the following benefits:

- the calculation is fairly straightforward,
- financial ratio algorithms are transparent,
- IN05 uses publicly available financial data about the company and can be used for both publicly traded and non-traded companies,
- IN05 provides clear results and has high explanatory power for medium-sized and large companies and,
- IN05 is an update of the IN01 Index, although the weights of individual ratios and the boundaries for business classification have changed.

The following equation is appropriate for IN05:

$$IN05 = 0.13 * \frac{Assets}{Liabilities} + 0.04 * \frac{EBIT}{Interest\ Expense} + 3.97 * \frac{EBIT}{Assets} + 0.21 * \frac{Revenues}{Assets} + 0.09 * \frac{Current\ Assets}{Current\ Liabilities} \quad (25)$$

It is possible to forecast if the firm will file for bankruptcy or have difficulty repaying its debts based on the estimated figures. Table 1 lists the timeframes for the company's review.

Result	Evaluation
IN > 1,6	A company creates value
0,9 < IN ≤ 1,6	A company does not create value, but it is also not bankrupt
IN ≤ 0,9	A company goes bankrupt due to serious financial issues

Figure 7: Index IN05 evaluation
Source: Own processing according to Bochenková (2011, p. 24)

With a likelihood of 67%, the firm is deemed to be financially stable if the value of IN05 is more than 1.6. The term "grey zone" refers to the range from 0.9 to 1.6. There is an 86% chance that the firm will fail if the IN05 number is less than 0.9 (Růčková, 2021).

2.5.3 Credibility Models

By allocating financial point criteria, credibility models may diagnose the company's financial health. A corporation might be put into a certain category based on the points they have earned. However, while using these models, details of a certain industry and a nation's economic situation should be considered. Tamari's Index, the Credibility Index, and the Kralicek Quick Test are a few examples of credibility models (Kuběnka, 2015).

2.5.4 Kralicek Quick Test

Since its creation in 1990 by Austrian economist Peter Kralicek, the Kralicek Quick Test has gained widespread recognition throughout Central Europe, particularly in the Czech Republic, Austria, and Germany. By examining four financial indicators, it assesses the company's financial standing. The remaining two elements assess the earnings condition while the final two factors analyse the company's financial soundness.

The model does not, however, give various weights as in the case of earlier models. Because it displays accurate market data, the Kralicek Quick Test employs data from the statement of cash flows. The equity ratio *(R1)* and the time it takes for debt to be repaid from CF are two metrics that are set for the area of financial stability. *(R2)*.

R1 = (Equity/Total Assets) x 100 (%),

R2 = (Liabilities – Cash)/Operating CF (years) ,

R3 = (Operating CF/Sales) x 100 (%),

R4 = (EBIT/Total Assets) x 100 (%).

The scale that is used to assess the company's financial health and profitability is shown in Figure 8. Each of the four outcomes is rated on a scale of 1 to 5.

Additionally, the mathematical average of the two sectors, financial security, and profit condition, are computed. The sum of these values is then divided by two to determine the final grade. If the final result falls between 1 and 2, the firm is regarded as financially stable. The range from two to three is known as the "grey zone." Companies with a score below 3 may be experiencing major financial problems (Polo and Caca, 2014).

Kralicek Quick Test		**Rating scale**				
Evaluation	An indicator	1 Very good	2 Good	3 Middle	4 Poor	5 Insolvency
Financial stability	R1	> 30 %	> 20 %	> 10 %	> 0 %	Negative
	R2	< 3 years	< 5 years	< 12 years	< 30 years	> 30 years
Profit situation	R3	> 10 %	> 8 %	> 5 %	> 0 %	Negative
	R4	>15 %	>12 %	> 8 %	> 0 %	Negative

Figure 8: The evaluation scale of the Kralicek Quick Test
Source: Own processing according to Kralicek (2006, p. 7)

3 Measurement of Financial Performance of the Volkswagen Group Company

German carmaker Volkswagen, frequently referred to as VW, was established in 1937. German meaning "people's car," the company's name Volkswagen reflects its initial goal to create an economical vehicle that would be available to the whole public.

Volkswagen is one of the leading automakers in the world today, selling a variety of automobiles in markets all over the world. In addition to other brands, the firm manufactures automobiles, trucks, and commercial vehicles under the names of Volkswagen, Audi, Porsche, Lamborghini, Bentley, and Skoda.

Volkswagen has developed a reputation for having excellent engineering and cutting-edge designs throughout time. The business has also been a pioneer in the creation of hybrid and electric automobiles, and it has a growing array of environmentally friendly vehicles that are both effective and stylish.

3.1 Volkswagen Group Brands

Volkswagen Group is one of the world's largest automobile manufacturers, with a wide range of brands under its umbrella. It is known for producing cars, vans, trucks, and motorcycles that cater to various segments of the automotive market. The company has a diverse range of brands that offer different styles, features, and price points, making it a popular choice among consumers worldwide. With a focus on innovation, sustainability, and high-quality products, the Volkswagen Group continues to push the boundaries of automotive technology and design. In this context, Volkswagen Group owns several well-known brands that are recognized globally, including Volkswagen, Audi, Porsche, Bentley, Lamborghini, Bugatti, ŠKODA, SEAT, Ducati, and Volkswagen Commercial Vehicles.

- **Volume brands** with ŠKODA, SEAT/CUPRA, Volkswagen Passenger Cars, and Volkswagen Commercial Vehicles,
- **Premium brands** with Audi, Lamborghini, Bentley, and Ducati,
- **Sport & Luxury brands** with Porsche (Volkswagen AG, 2022).

The Volkswagen Group now has 120 factories in 29 nations. According to Figure 8, the majority of them are spread over 19 European nations and an additional 10 countries in America, Asia, and Africa.

Figure 9: Volkswagen Group production plants
Source: Volkswagen AG (2022)

More than 662,575 people worldwide are employed by the Volkswagen Group to manufacture and market automobiles or provide automotive-related services. Vehicles from the Volkswagen Group were sold in 153 nations in 2021 (Volkswagen AG, 2022).

3.2 Financial Characteristics of the Volkswagen Group

Deliveries to customers, sales revenues, operating result, operating return on sales, research and development ratio, capex to sales revenue ratio, net cash flow, net liquidity, and return on investment are the nine key performance indicators that the Volkswagen Group focuses on the most in the Automotive Division (Volkswagen Group, 2021).

In the fiscal year 2021, the Volkswagen Group delivered 8,881,957 automobiles to consumers globally, a 4.5% decline from the previous year. As seen in Table 3, sales numbers for the Commercial Vehicles Business Area increased in comparison to the prior-year figure while those for the Passenger Cars Business Area decreased.

Table 1: VW Group deliveries worldwide in units

Division	2021	2020	%
Passenger Cars	8,610,747	9,114,804	-5.5%
Commercial Vehicles	271,210	190,187	42.6%
Total	8,881,957	9,304,991	-4.5%

Source: Volkswagen Group (2021)

Because of a lack of semiconductors, there was a decline in the number of passenger car deliveries. However, compared to the prior year, when demand was impacted by a dip in important markets brought on by the uncertainty surrounding the Covid-19 epidemic, commercial vehicle deliveries grew dra

The Volkswagen Group reports its financial results in line with IFRS. A component of the Volkswagen Group, the TRATON GROUP, purchased the US commercial vehicle maker Navistar International Corporation at the beginning of July 2021. As of December 31, 2021, the acquisition increased the Volkswagen Group's sales revenue by €3.5 billion. In 2021, the Volkswagen Group produced sales revenue of €250.2 billion, an increase of 12.3% over the previous year, mostly as a result of improved pricing positioning and the outstanding financial services division and commercial vehicles business area performance. Figure 11 shows the sales revenue for the Volkswagen Group from 2016 to 2021.

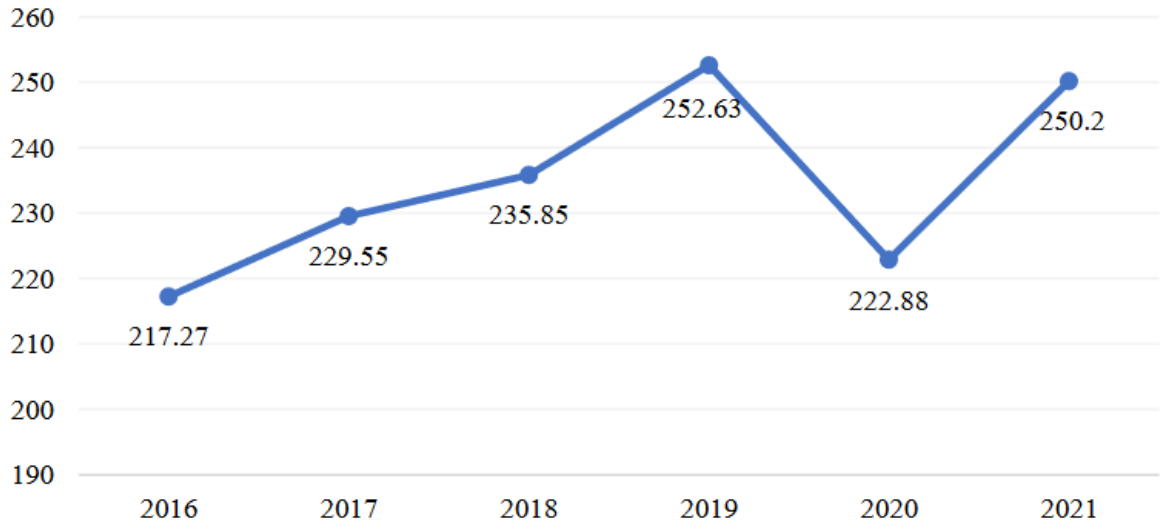

Figure 10: Volkswagen Group's sales revenue from FY 2016 to FY 2021 (€ billion)
Source: Own processing according to Volkswagen Group (2016-2021)

The sales income for the Volkswagen Group has been gradually increasing since 2016. The sales revenue peaked in 2019 with a total of €252.63 billion. Due to the effects of the UK's exit from the European Union and the Covid-19 epidemic, which drastically decreased the likelihood of selling cars due to contact limitations, the Volkswagen Group had a severe downturn in 2020. The lack of semiconductors in 2021 caused persistent supply constraints in the automobile sector. Nevertheless, sales revenue for the Volkswagen Group increased to €250.2 billion.

The ratio of capex to sales revenue in the Automotive Division dropped from 6.1% to 5.1% as a result of rising sales revenue and declining capital expenditure. Additionally, the profit margin for the Volkswagen Group increased by €8.3 billion to €47.2 billion. The operational result for the Automotive Division quadrupled to €13.2 billion in 2021. Additionally, the Automotive Division's operational return on sales rose from 3.7% to 6.4%. Positive price positioning and the fair value evaluation of derivatives are the causes of these rises. The Automotive Division's research and development ratio remained constant from the previous year at 7.6%. At the moment, contemporary platforms, electrification, digitalization, new technologies, and new models are the key areas of research and development (Volkswagen Group, 2021).

Despite the investment in Navistar, net cash flow increased by €2.3 billion from the previous year to €8.6 billion in 2021. On the other side, the net liquidity declined by €0.1 billion as a result of the purchase of Navistar and was €26.7 billion at the end of 2021. The net liquidity amount, however, was more than previously anticipated.

By the end of 2021, the Automotive Division's ROI had increased by 3.9% from the prior year to 10.4%, above the minimum needed rate of 9% due to stronger operating results and earnings-related variables (Volkswagen Group, 2021).

The Volkswagen Group anticipates that sales revenue after the fiscal year 2021 will be between 8% and 13% higher in 2022. The operational return on sales for the Group is anticipated to be between 7% and 8.5% in 2022. In the Automotive Division, it is anticipated that by 2022, the research and development ratio will have stabilized at around 7% and the capex-to-sales revenue ratio would have reached about 5.5%. The VW Group also wants its net liquidity to increase by up to 15% from the previous year's level. And finally, in 2022, the ROI is anticipated to reach between 12% and 15%. (Volkswagen Group, 2021).

3.3 Analysis of Financial Indicators

This chapter discusses the study of absolute indicators using the statement of financial position, statement of profit or loss, and statement of other comprehensive income as the basis for horizontal and vertical studies. It will be determined how the structure of the assets, liabilities, income, and costs has changed. The statistics are based on the financial statements of the firm for the most recent five accounting periods (2018–2022).

3.3.1 Horizontal Analysis of Assets, Equity, and Liabilities

Table 1 was made to reflect the chosen assets from 2018 to 2022 to execute the horizontal analysis of assets. The completed horizontal analysis is then shown in Table 2 along with the absolute and percentage changes for these assets.

Table 2: Financial expression of assets (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Current Assets					
Cash and cash equivalents	28,938	25,923	33,910	39,724	29,172
Short-term investments	21,106	20,724	24,698	27,155	41,614
Accounts receivable	54,440	57,900	55,744	52,750	60,249
Inventory	45,577	46,519	43,535	43,380	51,109
Other Current Assets	33,475	36,397	37,057	37,338	42,165
Total current assets	183,536	187,463	194,944	200,347	224,309
Non Current Assets					
property, plant and equipment	101,177	115,091	114,569	123,394	123,271
Intangibles	64,613	66,214	67,968	77,689	83,241
Deferred Income Taxes	10,131	13,106	13,486	13,393	12,921
Other Long-Term Assets	98,699	106,197	106,147	113,785	121,031
Total non-current assets	274,620	300,608	302,170	328,261	340,464
Total Assets	458,156	488,071	497,114	528,609	564,772

Source: Own processing according to Volkswagen (2018-2022)

Table 3: Horizontal analysis of assets (€ million)

Items	2019/2018		2020/2019		2021/2020		2022/2021	
	ABS	%	ABS	%	ABS	%	ABS	%
Current Assets								
Cash and cash equivalents	-3,015	-10.42%	7,987	30.81%	5,814	17.15%	-10,552	-26.56%
Short-term investments	-382	-1.81%	3,974	19.18%	2,457	9.95%	14,459	53.24%
Accounts receivable	3,460	6.36%	-2,156	-3.72%	-2,994	-5.37%	7,499	14.22%
Inventory	942	2.06%	-2,984	-6.41%	-155	-0.35%	7,729	17.82%
Other Current Assets	2,922	8.73%	660	1.81%	281	0.76%	4,827	12.92%
Total current assets	3,927	2.14%	7,481	4%	5,403	2.77%	23,962	11.96%
Non Current Assets								
property, plant and equipment	13,914	13.75%	-522	-0.45%	8,825	7.70%	-123	-0.10%
Intangibles	1,601	2.47%	1,754	2.65%	9,721	14.30%	5,552	7.14%
Deferred Income Taxes	2,975	29.37%	380	2.90%	-93	-0.69%	-472	-3.52%
Other Long-Term Assets	7,498	7.60%	-50	-0.047%	7,638	7.20%	7,246	6.37%
Total non-current assets	25,988	9.46%	1,562	0.52%	26,091	8.63%	12,203	3.72%
Total Assets	29,915	6.53%	9,043	1.85%	31,495	6.33%	36,163	6.84%

Source: Own processing according to Volkswagen (2018-2022)

The company's financial situation changed dramatically from 2018 and 2022, and total assets was a good indicator of how fast it was growing. Every year saw a different set of variables influencing the asset mix of the organization. During the first year, which ran from 2018 to 2019, there was a significant growth, as seen by a 29,915€ (6.53%) increase in total assets. Notable rises in a number of asset classes, such as cash and cash equivalents, short-term investments,

and accounts receivable, supported this surge, suggesting buoyant liquidity and expanding revenue streams.

Then, from 2019 to 2020, the company's asset growth slowed, although overall assets increased by 9,043€ (1.85%) as it maintained its positive trajectory. During this time, a variety of factors were at play. While some current asset categories, such as cash and cash equivalents, saw slight declines, perhaps indicating a strategic reallocation of resources, others, like short-term investments and other current assets, saw expansions, potentially indicating operational optimization and investment diversification.

Between 2020 and 2021, the momentum increased once more, as seen by a significant €31,495 (6.33%) increase in total assets. The company's strong financial standing and strategic acumen were highlighted at this time, as evidenced by the large increases in current assets that were seen in cash reserves, short-term investments, and inventory levels. Such expansion suggests taking preemptive action to increase liquidity and seize new possibilities in the context of shifting market dynamics.

Ultimately, the business maintained its growth trend in 2022–2021, as its total assets increased by €36,163 (6.84%). But throughout this time, the picture became more complex, with a range of successes and losses in different asset classes. While some components of current assets, such as cash and cash equivalents, showed sharp losses, other components, including inventories and accounts receivable, witnessed sharp increases, indicating strong operational activity and confidence in future revenue streams. Furthermore, non-current assets continued to be a major factor in the increase of total assets. Investments in intangibles and property, plant, and equipment demonstrate the company's long-term commitment to strengthening its operating capabilities and gaining a competitive advantage.

In general, the company's resilience, adaptability, and strategic skill in navigating a volatile business landscape are reflected in the trajectory of total assets during the five-year period. Its capacity to seize opportunities, manage risks, and solidify its position as a major player in its sector is demonstrated by the steady rising trend, which puts it in a position for long-term success and value creation.

Table 4 illustrates the performed horizontal analysis of the statement of financial position, including absolute and percentage changes of the equity and liabilities.

Table 4: Financial expression of equity and liabilities (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Current Liabilities					
Financial liabilities	89,757	87,912	88,648	78,584	91,733
Trade payables	23,607	22,745	22,677	23,624	28,748
Tax payables	456	408	340	614	813
Other financial liabilities	11,269	10,858	10,590	13,002	13,519
Other liabilities	9,416	19,320	17,979	19,890	22,542
Provisions for taxes	17,593	1,876	2,213	2,863	3,459
Other provisions	1,412	24,434	22,963	25,578	22,178
Liabilities associated with assets held for sale	23,874	370	-	238	-
Total Current liabilities	167,968	167,924	165,410	164,393	182,992
Non-current liabilities					
Financial liabilities	101,126	113,556	114,809	131,618	113,812
Other financial liabilities	3,219	4,499	4,257	4,466	4,849
Other liabilities	6,448	7,271	7,905	8,430	8,940
Deferred tax liabilities	5,030	5,007	4,890	5,132	5,589
Provisions for pensions	33,097	41,389	45,080	41,550	52,903
Provisions for taxes	3,047	2,991	3,292	3,392	4,684
Other provisions	20,879	21,783	22,688	23,474	25,625
Total Non-current liabilities	172,846	196,497	202,921	218,062	216,402
Equity					
Subscribed capital	1,283	1,283	1,283	1,283	1,283
Capital reserve	14,551	14,551	14,551	14,551	14,551
Retained earnings	91,105	96,929	100,772	117,342	137,267
Other reserves	-2,417	-3,646	-5,270	-3,167	-1,845
Equity attributable to Volkswagen AG hybrid capital investors	12,596	12,663	15,713	14,439	12,950
Equity attributable to Volkswagen AG shareholders and hybrid capital investors	117,117	121,781	127,049	144,449	164,206
Noncontrolling interests	225	1,870	1,734	1,705	1,172
Total Equity	117,342	123,651	128,783	146,154	165,378
Total equity and liabilities	458,156	488,071	497,114	528,609	564,772

Source: Own processing according to Volkswagen (2018-2022)

Table 5: Horizontal analysis of equity and liabilities (€ million)

Item	2019/2018		2020/2019		2021/2020		2022/2021	
	ABS	%	ABS	%	ABS	%	ABS	%
Current Liabilities								
Financial liabilities	-1845	-2.06%	736	0.84%	-10064	-11.35%	13149	16.73%
Trade payables	-862	-3.65%	-68	-0.3%	947	4.18%	5124	21.69%
Tax payables	-48	-10.53%	-68	-16.67%	274	80.59%	199	32.41%
Other financial liabilities	-411	-3.65%	-268	-2.47%	2412	22.78%	517	3.98%
Other liabilities	9904	105.18%	-1341	-6.94%	1911	10.63%	2652	13.33%
Provisions for taxes	-15717	-89.34%	337	17.96%	650	29.37%	596	20.82%
Other provisions	23022	1630.45%	-1471	-6.02%	2615	11.39%	-3400	-13.29%
Liabilities associated with assets held for sale	-23504	-98.45%	-370	-100%	238	-	-238	-100%
Total Current liabilities	-44	-0.026%	-2514	-1.5%	-1017	-0.61%	18599	11.31%
Non-current liabilities								
Financial liabilities	12430	12.29%	1253	1.10%	16809	14.64%	-17806	-13.53%
Other financial liabilities	1280	39.76%	-242	-5.38%	209	4.68%	383	8.58%
Other liabilities	823	12.76%	634	8.72%	525	3%	510	6.05%
Deferred tax liabilities	-23	-0.46%	-117	-2.34%	242	4.72%	457	8.90%
Provisions for pensions	8292	25.05%	3691	8.92%	-3530	-7.83%	11353	27.32%
Provisions for taxes	-56	-1.84%	301	10.06%	100	3.04%	1292	38.09%
Other provisions	904	4.33%	905	4.15%	786	3.46%	2151	9.16%
Total Non-current liabilities	23651	13.68%	6424	3.27%	15141	7.49%	-1660	-0.76%
Equity								
Subscribed capital	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Capital reserve	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Retained earnings	5824	6.39%	3843	3.96%	16570	16.44%	19925	16.98%
Other reserves	-1229	50.85%	-1624	44.54%	2103	-39.91%	1322	-41.74%
Equity attributable to Volkswagen AG hybrid capital investors	67	0.53%	3050	24.09%	-1274	-8.11%	-1489	-10.31%
Equity attributable to Volkswagen AG shareholders and hybrid capital investors	4664	3.98%	5268	4.33%	17400	13.70%	19757	13.68%
Noncontrolling interests	1645	731.11%	-136	-7.27%	-29	-1.67%	-533	-31.26
Total Equity	6309	5.38%	5132	4.15%	17371	13.49%	19224	13.15%
Total equity and liabilities	29,915	6.53%	9,043	1.85%	31,495	6.34%	36,163	6.84%

Source: Own processing according to Volkswagen (2018-2022)

The corporation had significant modifications to its financial structure in 2018. Financial obligations dropped by €1,845 million (-2.06%), which can be the result of refinancing or effective debt management initiatives. Trade payables also dropped by €862 million (-3.65%), which may indicate better terms for payments or more effective supply chain management. On the other hand, other liabilities increased significantly by €9,904 million (105.18%), which could be attributed to increased operational costs or changes in regulations. Retained profits increased by €5,824 million (6.39%) indicating ongoing profitability, while other reserves saw a

substantial fall of €1,229 million (50.85%), presumably as a result of changes in accounting methods. These movements in liabilities were reflected in equity.

By 2020, the company's financial situation had changed even more. A rise in financial liabilities of €736 million (0.84%) may be a sign of increased financing for growth projects. Trade payables had a little decline of €68 million (-0.3%), which could be attributed to stable terms of payment or procurement procedures. Notably, other provisions fell by €1,471 million (-6.02%), indicating cost-cutting or contingent liability adjustments. Retained earnings increased by €3,843 million (3.96%) and equity attributable to shareholders increased by €5,268 million (4.33%) despite these swings, demonstrating continued profitability and investor confidence.

The company's financial situation underwent major adjustments in 2021. Financial liabilities dropped significantly by €10,064 million (-11.35%), which may have been the result of refinancing or successful attempts to reduce debt. Trade payables, on the other hand, rose by €947 million (4.18%), indicating either greater operating activity or modified payment terms. A significant increase of €2,615 million (11.39%) was observed in other provisions, suggesting possible adjustments to long-term obligations or contingency plans. Retained earnings increased by €16,570 million (16.44%), and equity attributable to shareholders increased by €17,400 million (13.70%), indicating continuous profitability and investor confidence, notwithstanding significant swings in equity.

Finally, the business managed to successfully negotiate changing financial conditions in 2022. By €13,149 million (16.73%), financial liabilities climbed considerably, which might be a symptom of more funding activity for key objectives. A significant increase in trade payables of €5,124 million (21.69%) may indicate increased operating activity or modifications to payment conditions. Other provisions, on the other hand, dropped precipitously by €3,400 million (-13.29%), suggesting that long-term obligations or contingency arrangements may need to be adjusted. Retained earnings increased by €19,925 million (16.98%) and equity attributable to shareholders increased by €19,757 million (13.68%) despite these swings in the market, indicating continued profitability and investor confidence.

In general, the financial development of the company between 2018 and 2022 illustrates the dynamic interaction between strategic choices and outside market factors. While the overall growth in total equity and liabilities demonstrates the company's strong financial health and strategic vision, fluctuations in the components of liabilities and equity highlight the company's adaptability and resilience in navigating shifting business situations.

3.4 Horizontal Analysis of Revenues, Expenses, and Income

The chosen revenue, expense, and income components from 2018 to 2022 are expressed in € million in Table 5, which was compiled from annual reports. The completed horizontal analysis of the company's income statement is then shown in Table 6, along with absolute and percentage changes in income, costs, and revenues.

Table 6: Horizontal analysis of revenues, expenses, and income (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Sales/Revenue	235,849	252,632	222,884	250,200	279,232
Cost of Goods Sold (COGS) incl. D&A	188,335	203,317	183,758	203,139	226,619
Depreciation & Amortization Expense	21,495	24,390	25,732	27,263	28,230
Depreciation	17,158	19,659	20,483	21,434	22,059
Amortization of Intangibles	4,337	4,731	5,249	5,829	6,171
Gross Income	47,514	49,315	39,126	47,061	52,613
SG&A Expense	29,891	31,062	28,122	29,242	31,475
Research & Development	12,116	13,199	12,056	12,790	14,329
Other SG&A	17,775	17,863	16,066	16,452	17,146
Non Operating Income/Expense	1,164	1,378	55	252	(1,202)
Non-Operating Interest Income	950	904	788	974	1,325
Interest Expense	1,001	1,618	1,705	1,617	1,096
Gross Interest Expense	1,063	1,686	1,770	1,694	1,274
Interest Capitalized	62	68	65	77	178
Pretax Income	12,274	15,007	8,911	17,805	19,649
Income Tax	3,490	4,327	2,843	4,698	6,208
Income Tax - Current Domestic	1,131	1,473	940	1,230	1,180
Income Tax - Current Foreign	2,402	2,674	2,210	3,382	4,082
Income Tax - Deferred Domestic	429	115	(1,026)	1,072	3,323
Income Tax - Deferred Foreign	(472)	65	719	(986)	(2,377)
Equity in Affiliates	3,369	3,349	2,756	2,321	2,395
Consolidated Net Income	11,844	13,489	8,291	14,889	15,260
Minority Interest Expense	17	143	(43)	46	393
Net Income	11,827	13,346	8,334	14,843	14,867
EPS (Basic)	23.59	26.62	16.62	29.61	29.66
Basic Shares Outstanding	501	501	501	501	501
EPS (Diluted)	23.59	26.62	16.62	29.61	29.66
Diluted Shares Outstanding	501	501	501	501	501
EBITDA	39,612	42,748	36,111	45,454	47,999
EBIT	18,117	18,358	10,379	18,191	19,769

Source: Own processing according to Volkswagen (2018-2022)

Table 7: Horizontal analysis of revenues, expenses, and income (€ million)

Items	2019/2018		2020/2019		2021/2020		2022/2021	
	ABS	%	ABS	%	ABS	c	ABS	%
Sales/Revenue	16,783	7.11%	29,748	-11.78%	27,316	12.26%	29,032	11.60%
Cost of Goods Sold (COGS) incl. D&A	14,982	7.95%	19,559	-9.63%	19,381	10.55%	23,480	11.56%
Depreciation & Amortization Expense	2,895	13.47%	1,342	5.51%	1,531	5.96%	967	3.55%
Depreciation	2,501	14.56%	824	4.19%	951	4.64%	625	2.92%
Amortization of Intangibles	394	9.08%	518	10.94%	580	11.04%	342	5.86%
Gross Income	1,801	3.79%	10,189	-20.66%	7,935	20.27%	5,552	11.80%
SG&A Expense	1,171	3.92%	2,940	-9.46%	1,120	3.98%	2,233	7.64%
Research & Development	1,083	8.94%	1,143	-8.65%	734	6.08%	1,539	12.02%
Other SG&A	88	0.49%	1,797	-10.06%	386	2.40%	694	4.22%
Non Operating Income/Expense	214	18.40%	1,323	-95.89%	197	358.18%	1,454	-576.19%
Non-Operating Interest Income	46	-4.84%	116	-12.83%	186	23.61%	351	36.05%
Interest Expense	617	61.63%	87	5.38%	88	-5.15%	521	-32.20%
Gross Interest Expense	623	58.62%	84	4.99%	76	-4.29%	420	-24.77%
Interest Capitalized	6	9.68%	3	-4.41%	12	18.46%	101	131.17%
Pretax Income	2,733	22.27%	6,096	-40.62%	8,894	99.80%	1,844	10.36%
Income Tax	837	23.96%	1,484	-34.30%	1,855	65.19%	1,510	32.12%
Income Tax - Current Domestic	342	30.26%	533	-36.21%	290	30.85%	50	-4.07%
Income Tax - Current Foreign	272	11.32%	464	-17.35%	1,172	53.01%	700	20.68%
Income Tax - Deferred Domestic	314	-73.13%	1,141	-993.04%	2,098	53.01%	2,251	209.83%
Income Tax - Deferred Foreign	537	-113.64%	654	1006.15%	1,705	-237.24%	1,391	141.07%
Equity in Affiliates	20	-0.59%	593	-17.73%	435	-15.77%	74	3.19%
Consolidated Net Income	1,645	13.89%	5,198	-38.56%	6,598	79.57%	371	2.49%
Minority Interest Expense	126	741.18%	186	-130.07%	89	-206.98%	347	754.35%
Net Income	1,519	12.86%	5,012	-37.55%	6,509	78.11%	24	0.16%
EPS (Basic)	3.03	12.86%	10	-37.59%	12.99	78.17%	0.05	0.17%
Basic Shares Outstanding	0	0.00%	0	0.00%	0	0.00%	0	0.00%
EPS (Diluted)	3.03	12.86%	10	-37.59%	12.99	78.17%	0.05	0.17%
Diluted Shares Outstanding	0	0.00%	0	0.00%	0	0.00%	0	0.00%
EBITDA	3,136	7.92%	6,637	-15.53%	9,343	25.87%	2,545	5.60%
EBIT	241	1.33%	-	-	-	75.22%	1,578	8.68%

Source: Own processing according to Volkswagen (2018-2022)

Volkswagen's revenue increased significantly in 2019 compared to the previous year, rising by €16,783 million (7.11%) in sales. This significant expansion is a sign of the company's successful sales tactics and robust market demand. The company's increased operational activities and investments in production facilities and technology, however, are reflected in the cost of goods sold (COGS), which climbed by €14,982 million (7.95%) despite the upward trend in revenue. COGS also includes depreciation and amortization charges.

As 2020 drew near, VW encountered several difficulties, chief among them the worldwide economic recession brought on by the COVID-19 epidemic. Consequently, the business experienced a precipitous drop in income, as revenues fell by €29,748 million (-11.78%) in comparison to the prior year. In order to offset the effects of lower demand, Volkswagen altered its manufacturing and supply chain operations and adopted cost-cutting initiatives, which resulted in a decrease in COGS of €19,559 million (-9.63%).

But Volkswagen bounced back quickly in 2021, proving its versatility and resilience. Revenue increased by €27,316 million (12.26%) over the prior year, reflecting a significant recovery in market demand and well-executed strategic initiatives. The business also had a noteworthy growth in gross income, up €10,189 million (20.27%), which was a result of enhanced cost control and operational efficiency.

Positive momentum persisted into 2022, and VW kept up its current growth track. Revenue increased further, hitting €29,032 million (11.60%) more than the year before, demonstrating the company's capacity to seize new possibilities and skillfully handle shifting market conditions. Volkswagen maintained its emphasis on advancing innovation, maximizing operational performance, and providing value to its stakeholders in the face of persistent difficulties and uncertainty.

In general, the financial performance of Volkswagen can be analyzed horizontally to provide important insights into how well the company can adjust to shifting market conditions, weather obstacles, and growth prospects. The company is well-positioned for ongoing success in the ever-changing automotive industry landscape thanks to its strategic resilience, efficient operations, and excellent cost management.

3.5 Vertical Analysis of Assets, Equity, and Liabilities

Table 8: Vertical analysis of assets, equity, and liabilities (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Current Assets					
Cash and cash equivalents	6.32%	5.33%	6.84%	7.52%	5.16%
Short-term investments	4.61%	425%	4.96%	5.14%	7.36%
Accounts receivable	11.89%	11.86%	11.20%	9.97%	10.68%
Inventory	9.96%	9.52%	8.74%	8.24%	9.06%
Other Current Assets	7.32%	7.23%	7.31%	6.89%	6.61%
Total current assets	40.10%	38.19%	38.05%	37.76%	38.87%
Non Current Assets					
Property, plant and equipment	22.08%	23.60%	23.05%	21.72%	21.84%
Intangibles	14.11%	13.57%	13.64%	14.68%	14.74%
Deferred Income Taxes	2.21%	2.68%	2.71%	2.54%	2.29%
Other Long-Term Assets	21.57%	21.75%	21.56%	21.50%	21.44%
Total non-current assets	59.97%	61.61%	60.95%	60.44%	60.31%
Total Assets	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Own processing according to Volkswagen (2018-2022)

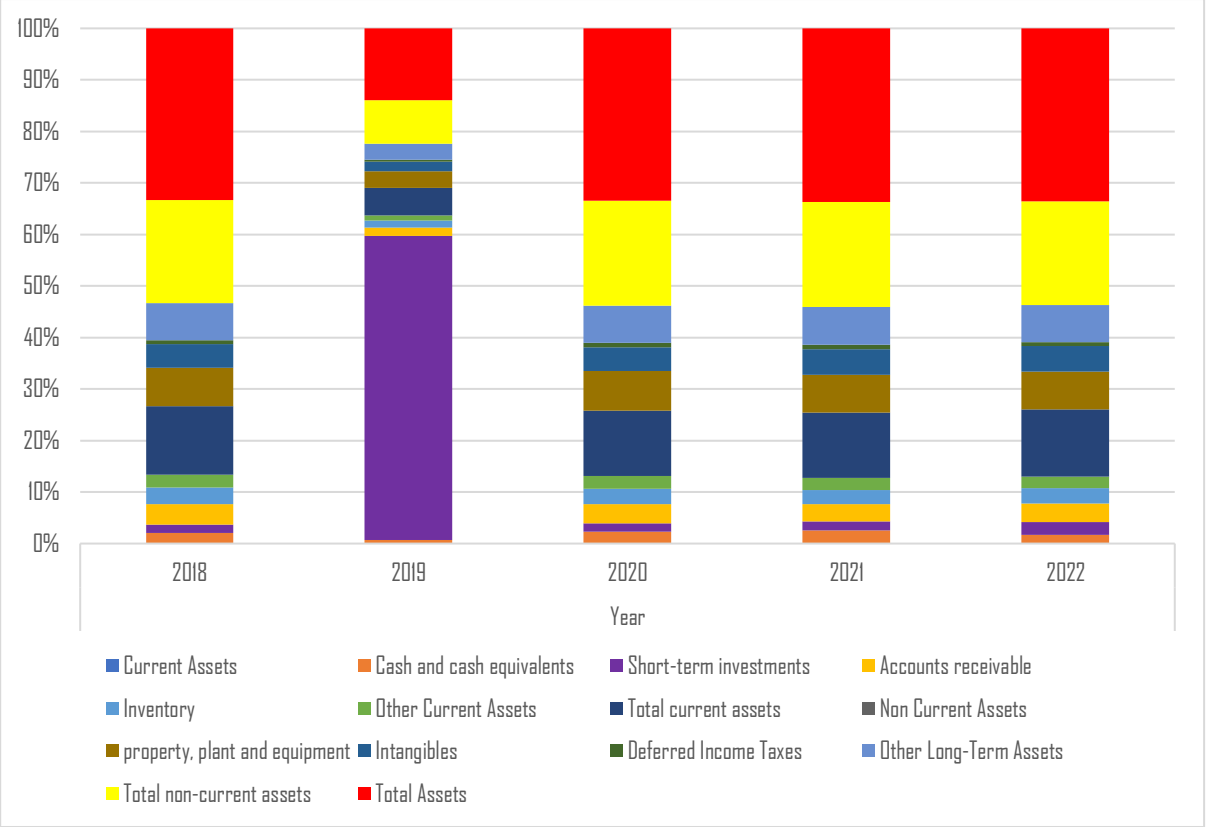

Figure 11: Portion of current and non-current assets (2018 – 2022)
Source: Own processing according to Volkswagen (2018-2022)

Volkswagen's balance sheet from 2018 to 2019 showed an asset composition that was steady but flexible. Current assets showed durability in the face of market volatility, making up about 40.10% and 38.19% of total assets, respectively. Notably, despite shifting financial environments, cash and cash equivalents varied moderately from 6.32% to 5.33%, indicating cautious liquidity management. The significant rise in short-term investments from 4.61% to 425% further suggests Volkswagen's strategic shift toward maximizing returns while preserving liquidity. Volkswagen has demonstrated its pro-active approach to managing short-term financial obligations while optimizing asset utilization for long-term growth through its flexibility in investment plans.

Even in the face of historically high market volatility in 2020, Volkswagen's asset mix held up well. With 38.05% of total assets, current assets continued to be important in sustaining Volkswagen's operational liquidity. Notwithstanding difficulties, cash and cash equivalents rose to 6.84%, indicating Volkswagen's focus on strengthening short-term liquidity buffers to successfully manage risks. Volkswagen's capacity to sustain operational efficiency in the face of market upheavals was further demonstrated by the stability of its inventories, accounts receivable, and other current assets. Furthermore, non-current assets remained the majority,

accounting for 60.95% of total assets, demonstrating Volkswagen's steadfast dedication to long-term investments in spite of immediate difficulties.

Volkswagen's asset mix from 2021 to 2022 demonstrated its strategy emphasis on sustainability and long-term growth. Current assets continued to be crucial in sustaining Volkswagen's daily operations, making up 37.76% and 38.87% of total assets, respectively. Interestingly, cash and cash equivalents dropped to 5.16% in 2022 from 7.52% in 2021, indicating Volkswagen's deliberate use of liquidity for debt reduction or potential investments. In the meantime, Volkswagen's unwavering commitment to capital investments in property, plant, and equipment as well as intangible assets to fuel future innovation and competitiveness was highlighted by non-current assets, which regularly accounted for about 60% of total assets. Volkswagen is positioned for long-term growth and resilience in the ever-changing automotive industry thanks to this wise resource allocation.

3.6 Vertical Analysis of Equity and Liabilities

Table 9: Vertical analysis of equity and liabilities (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Current Liabilities					
Financial liabilities	53.44%	52.34%	53.63%	47.84%	51.45%
Trade payables	14.03%	13.55%	13.71%	14.38%	15.11%
Tax payables	0.27%	0.24%	0.21%	0.37%	0.57%
Other financial liabilities	6.70%	6.47%	6.40%	7.91%	7.67%
Other liabilities	5.59%	11.52%	10.88%	12.12%	12.62%
Provisions for taxes	10.46%	1.12%	1.34%	1.74%	1.90%
Other provisions	0.84%	14.57%	13.89%	15.59%	14.59%
Liabilities associated with assets held for sale	14.20%	0.22%		0.14%	
Total Current liabilities	36.66%	34.41%	33.27%	31.11%	32.40%
Non-current liabilities					
Financial liabilities	58.96%	67.69%	69.45%	78.56%	63.50%
Other financial liabilities	1.87%	2.32%	2.03%	2.47%	2.23%
Other liabilities	3.76%	3.82%	3.95%	3.84%	3.86%
Deferred tax liabilities	2.93%	2.59%	2.48%	2.61%	2.93%
Provisions for pensions	19.31%	25.26%	26.89%	23.80%	29.33%
Provisions for taxes	1.78%	1.78%	1.99%	2.06%	3.07%
Other provisions	12.16%	11.06%	11.18%	11.14%	11.55%
Total Non-current liabilities	37.73%	40.26%	40.82%	41.25%	38.32%
Equity					
Subscribed capital	1.10%	1.04%	1.00%	0.88%	0.78%
Capital reserve	12.50%	11.87%	11.63%	10.82%	10.17%
Retained earnings	77.82%	78.59%	80.07%	81.96%	82.89%
Other reserves	-2.06%	-2.96%	-5.20%	-2.17%	-1.11%
Equity attributable to Volkswagen AG hybrid capital investors	10.77%	10.29%	11.81%	9.86%	7.81%
Equity attributable to Volkswagen AG shareholders and hybrid capital investors	100.00%	99.93%	99.31%	99.34%	99.74%
Noncontrolling interests	0.19%	1.52%	1.35%	1.17%	0.71%
Total Equity	25.61%	25.33%	25.91%	27.65%	29.28%
Total equity and liabilities	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Own processing according to Volkswagen (2018-2022)

Over time, Volkswagen's existing liability management underwent subtle changes. 2018 saw current liabilities make up 36.66% of total equity and liabilities, with trade payables at 14.03% and financial liabilities at 53.44% being the main drivers. Nonetheless, VW deliberately decreased its current obligations to 32.40% by 2022, exhibiting a pro-active attitude to financial management. Interestingly, tax provisions dropped dramatically from 10.46% in 2018 to 1.90%

in 2022, suggesting either less tax responsibilities or more efficient tax planning. Volkswagen's goal to minimize short-term debt while increasing liquidity and financial flexibility for ongoing operations and strategic investments is reflected in this decrease in current liabilities.

Volkswagen adopted a somewhat steady although flexible strategy across the board for non-current liabilities. Long-term borrowings represented by financial liabilities fluctuated, peaking at 78.56% in 2021 and then declining to 63.50% in 2022. This demonstrates how Volkswagen strategically uses long-term borrowing to fund capital expenditures and expansion plans. In parallel, pension provisions grew over time, from 19.31% in 2018 to 29.33% in 2022, demonstrating Volkswagen's continued dedication to worker welfare and retirement benefits. VW has demonstrated its ability to manage long-term financial obligations prudently in order to maintain operational continuity and support future growth objectives, even in the face of slight changes.

VW's equity composition held up well over the course of the analysis, demonstrating a stable profitability and a well-balanced ownership structure. The majority of stock was always made up of retained earnings, which is indicative of VW's past profitability and practice of reinvesting earnings back into the company. The percentage of total equity attributable to hybrid capital investors and Volkswagen AG shareholders stayed constant, ranging from 99.31% to 99.74%, demonstrating their substantial ownership involvement and congruence with Volkswagen's long-term strategic goals. The steady rise in total equity from 25.33% in 2019 to 29.28% in 2022 is indicative of Volkswagen's continued endeavors to fortify its financial basis and augment shareholder value in the face of changing market conditions.

Volkswagen has positioned itself for long-term growth and value creation in the automotive industry through a comprehensive financial management approach that includes strategic investments in long-term initiatives, prudent liability management, and a stable equity structure. This is essentially revealed by the company's vertical analysis of equity and liabilities.

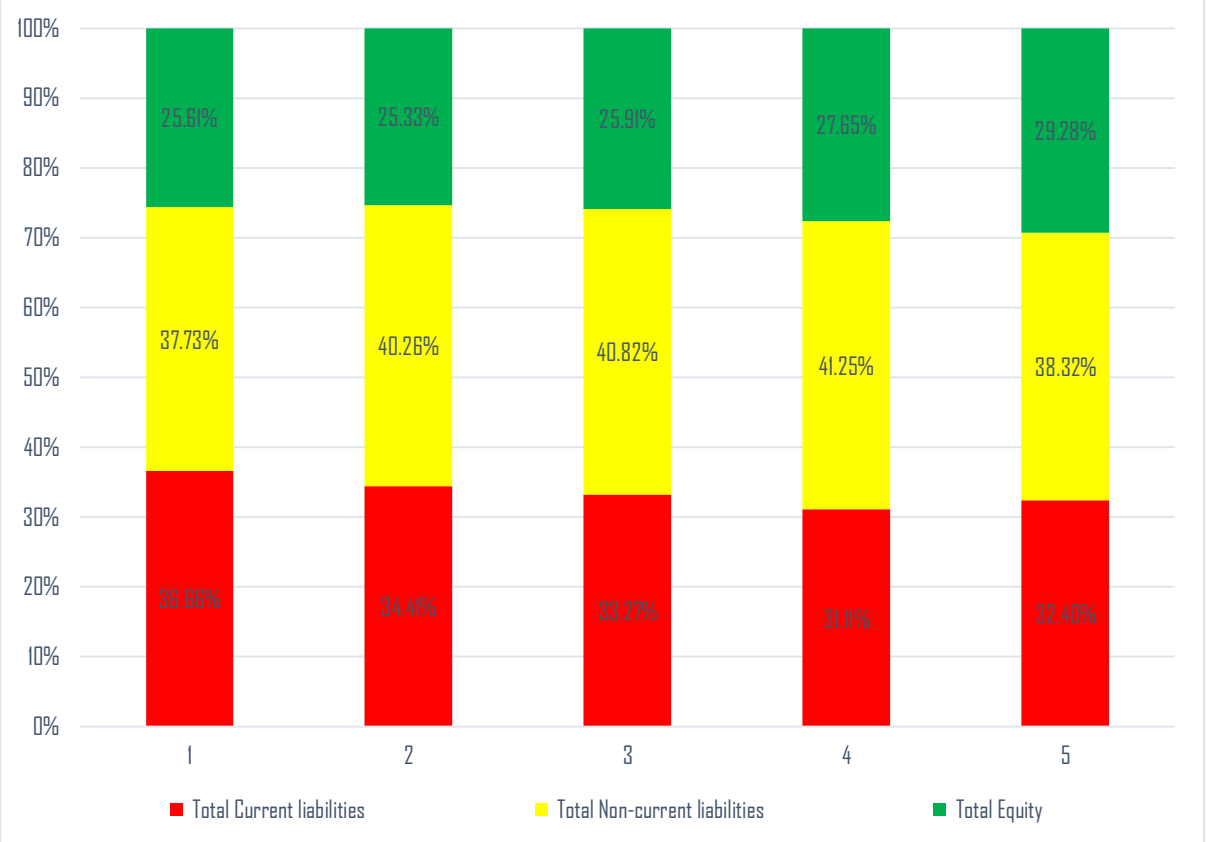

Figure 12: Portion of equity, current and non-current liabilities (2018-2022)
Source: Own processing according to Volkswagen (2018-2022)

3.7 Vertical Analysis of Revenues, Expenses, and Income

Table 10: Vertical analysis of revenues, expenses, and income (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Sales/Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of Goods Sold (COGS) incl. D&A	79.87%	80.47%	82.51%	81.22%	81.01%
Depreciation & Amortization Expense	9.12%	9.66%	11.53%	10.90%	10.09%
Depreciation	7.28%	7.79%	9.19%	8.56%	7.88%
Amortization of Intangibles	1.84%	1.87%	2.34%	2.33%	2.20%
Gross Income	20.13%	19.53%	17.49%	18.78%	18.99%
SG&A Expense	12.68%	12.31%	12.62%	11.68%	11.25%
Research & Development	5.14%	5.22%	5.41%	5.11%	5.13%
Other SG&A	7.53%	7.09%	7.21%	6.57%	6.12%
Non Operating Income/Expense	0.49%	0.55%	0.02%	0.10%	-0.43%
Non-Operating Interest Income	0.40%	0.36%	0.35%	0.39%	0.47%
Interest Expense	0.42%	0.64%	0.76%	0.65%	0.39%
Gross Interest Expense	0.45%	0.67%	0.79%	0.68%	0.45%
Interest Capitalized	0.03%	0.03%	0.03%	0.03%	0.06%
Pretax Income	5.21%	5.95%	3.77%	7.12%	7.03%
Income Tax	1.48%	1.71%	1.28%	1.88%	2.22%
Income Tax - Current Domestic	0.48%	0.58%	0.42%	0.49%	0.42%
Income Tax - Current Foreign	1.02%	1.06%	0.99%	1.35%	1.46%
Income Tax - Deferred Domestic	0.18%	0.05%	-0.46%	0.43%	1.19%
Income Tax - Deferred Foreign	-0.20%	0.03%	0.32%	-0.39%	-0.85%
Equity in Affiliates	1.43%	1.33%	1.24%	0.93%	0.86%
Consolidated Net Income	5.03%	5.34%	3.51%	5.94%	5.46%
Minority Interest Expense	0.01%	0.06%	-0.02%	0.02%	0.14%
Net Income	5.02%	5.28%	3.49%	5.93%	5.32%
EPS (Basic)	100.00%	100.00%	100.00%	100.00%	100.00%
Basic Shares Outstanding	-	-	-	-	-
EPS (Diluted)	100.00%	100.00%	100.00%	100.00%	100.00%
Diluted Shares Outstanding	-	-	-	-	-
EBITDA	16.81%	16.92%	16.18%	18.16%	17.08%
EBIT	7.68%	7.29%	4.65%	7.26%	7.02%

Source: Own processing according to Volkswagen (2018-2022)

Volkswagen's revenue throughout the course of the five years remained constant at 100% of its overall revenue, suggesting the lack of any non-operating or exceptional revenue streams.

Nevertheless, the percentage of revenue allotted to cost of goods sold (COGS), which includes amortization and depreciation costs, varied, falling between 79.87% in 2018 and 81.01% in 2022. Notwithstanding these fluctuations, the gross income margin held steady during the time, ranging from 17.49% to 18.99%, indicating Volkswagen's adeptness in controlling manufacturing costs and upholding gross profitability.

Notable trends were observed in operating expenses, which include selling, general, and administrative (SG&A) costs as well as research and development (R&D) expenditures. SG&A costs dropped from 12.68% of sales in 2018 to 11.25% in 2022, indicating possible gains in cost-control or operational effectiveness. R&D costs were somewhat variable but largely stable, demonstrating VW's ongoing dedication to innovation and new product development.

Throughout the period, Volkswagen maintained favorable profitability indicators, despite fluctuations in revenue components and operating expenses. Net income varied from 3.49% in 2020 to 5.93% in 2021, while pretax income varied from 3.77% of revenue in 2020 to 7.12% in 2021. These numbers show Volkswagen's capacity to turn a profit and control its financial performance in the face of shifting market conditions.

Although they occasionally fluctuated, metrics like earnings per share (EPS) and earnings before interest, taxes, depreciation, and amortization (EBITDA) were consistently favorable. Volkswagen showed resiliency and adaptability in the face of difficulties like market instability and regulatory changes, which helped it to maintain a strong financial position and solidify its standing as a competitive player in the automotive sector.

Volkswagen's financial management techniques and strategic priorities over the studied time are highlighted by the vertical analysis. Volkswagen has set itself up for long-term performance and value creation by efficiently managing revenue components, keeping operational expenses under control, and maintaining positive profitability measures. The company's resilience and strategic acumen in a fast-paced business climate are demonstrated by its capacity to overcome obstacles while preserving financial stability.

Table 11: Vertical analysis of economic result (2018-2022) (€ million)

Item	Year				
	2018	2019	2020	2021	2022
Profit before tax	5.20%	5.94%	3.99%	7.12%	7.03%
Operating profit	4.65%	5.59%	4.66%	7.27%	7.07%
Net financial result	1.56%	1.31%	1.38%	1.62%	1.59%
Profit for the year	5.02%	5.29%	3.75%	5.93%	5.33%

Income tax expense	1.48%	1.71%	1.28%	1.88%	2.22%

Source: Own processing according to Volkswagen (2018-2022)

Volkswagen's economic performance from 2018 to 2022 is analyzed vertically to provide light on the makeup of several financial measures expressed as a percentage of profit before taxes. Over the examined period, profit before taxes varied from 3.99% to 7.12%, demonstrating variations in the business's pre-tax performance. The company's operational performance was reflected in its operating profit, which varied between 4.65% and 7.27% and excludes financial income and expenses. The range of the net financial result, which showed how expenses and interest income affect total profitability, was 1.31% to 1.62%. After deducting taxes, profit for the year varied from 3.75% to 5.93%, which illustrates Volkswagen's financial performance.

3.8 Analysis of Differential Indicators of Volkswagen

The net working capital of Volkswagen will be determined in this chapter. The company's statements of financial status serve as the data source for the examination of differential indicators. Currency conversion into euros is required to compute financial numbers of Volkswagen. The evolution of Volkswagen's net working capital in euros between 2018 and 2022 is displayed in the table below. The annual reports, which serve as the main information source, provide the basis for all value calculations.

Table 12: Net working capital of Volkswagen (2018 – 2022) (€ million)

Net working capital	Year				
	2018	2019	2020	2021	2022
Volkswagen	15,568	19,539	29,534	35,954	41,317

Source: Own processing according to Volkswagen (2018-2022)

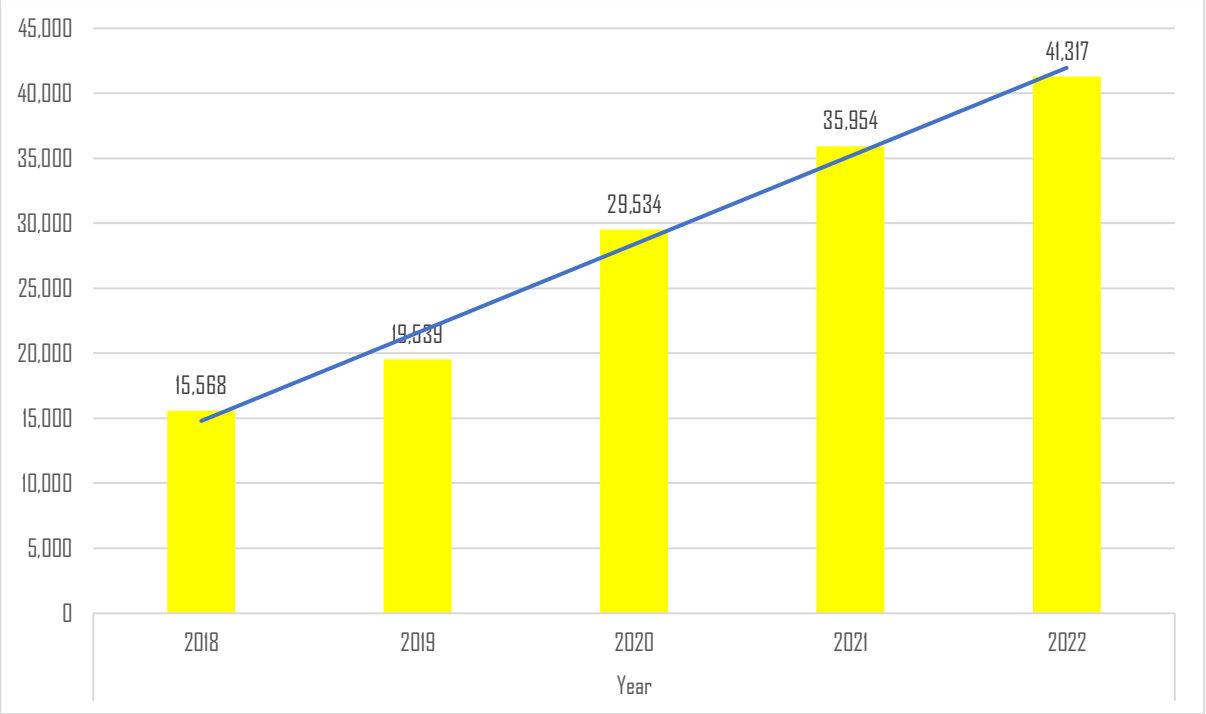

Figure 13: Net working capital of Volkswagen (2018 – 2022) *(€ million)*
Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

From 2018 to 2022, Volkswagen's net working capital exhibited an increasing trend, a sign of their improving liquidity and operational efficiency. VW's net working capital increased significantly, by over 165%, from €15,568 million in 2018 to €41,317 million in 2022. The increased trajectory indicates that the companies have been able to fund their day-to-day operations and future expansion aspirations by properly managing their current assets and liabilities.

3.9 Analysis of Ratio Indicators of Volkswagen

The activity, profitability, liquidity, and leverage ratios of Volkswagen from 2018 to 2022 are calculated in this chapter. Data from annual reports, which are regarded as a key source of information, are utilized to calculate ratio indicators.

3.9.1 Activity Ratios

The table below lists the information that was taken from annual reports and utilized to calculate the activity ratios. Following are the activity ratios for the company: total assets turnover, inventory turnover, days of inventory on hand, days of sales outstanding, receivables turnover, payables turnover, and the number of days of payables.

Table 13: Data used for calculation of the activity ratios (2018-2022) (€ million)

Items	Year				
	2018	2019	2020	2021	2022
Total assets	458,156	488,071	497,114	528,609	564,772
Total sales	235,849	252,632	222,884	250,200	279,232
Inventories	45,577	46,519	43,535	43,380	51,109
Trade receivables	54,440	57,900	55,744	52,750	60,249
Trade liabilities	23,607	22,745	22,677	23,624	28,748

Source: Own processing according to Volkswagen (2018-2022)

Table 14: Activity ratios of Volkswagen (2018-2022) (€ million)

Activity ratios	Year				
	2018	2019	2020	2021	2022
Total asset turnover	0.514	0.517	0.448	0.473	0.494
Inventory turnover	5.178	5.435	5.121	5.76	5.449
Days of inventory on hand	70.546	67.232	71.205	63.314	67.02
Receivables turnover	4.337	4.361	3.995	4.746	4.625
Days of sales outstanding	84.117	83.644	91.403	76.929	78.919
Payables turnover	9.989	11.094	9.841	10.593	9.718
Number of days of payables	36.569	32.902	37.078	34.48	37.522

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Based on the activity ratios over time, Volkswagen demonstrates effective asset and operational management.

Volkswagen's activity ratios from 2018 to 2022 offer important information about how well the business is run. The company's ability to make money from its assets is gauged by the total asset turnover ratio (TAT), which varies little over time between 0.448 and 0.517. This suggests that Volkswagen is using its resources to produce sales in an efficient manner, albeit with some volatility in efficiency over time. Comparably, the company's inventory turnover ratio, which ranges from 5.121 to 5.760 and shows consistency, shows how rapidly it sells its inventory. The days of inventory on hand, on the other hand, show a discernible improvement, suggesting a decrease in the time it takes to sell goods—from 70.546 days in 2018 to 67.020 days in 2022. This implies increased effectiveness in inventory management.

Additionally, the receivables turnover ratio, which measures how well the business gets payments from clients, has been declining over time, ranging from 3.995 to 4.746. The average collection period decreased from 91.403 days in 2020 to 78.919 days in 2022, as indicated by the significant decline in the days of sales outstanding. This shows that VW's credit and collection policies are more effective. Furthermore, the payables turnover ratio, which gauges how well the business pays its suppliers, is consistently consistent, ranging from 9.718 to 11.094, and the number of days of payables is similarly consistent. All things considered, these activity ratios show VW's dedication to operational effectiveness and ongoing efforts to streamline its working capital management procedures.

3.9.2 Liquidity Ratios

Liquidity ratios are useful for analyzing a company's solvency, or its capacity to pay off its debt by turning its cash holdings into assets. The information needed to compute the individual ratios is contained in the table below, which was gathered from the annual reports of both businesses. The table below lists the current ratio, quick ratio, and cash ratio of the companies. The liquidity ratios of the two corporations are also displayed for graphical comparison.

Table 15: : Data used for calculation of the liquidity ratios (2018-2022) (€ million)

Item	Year				
	2018	2019	2020	2021	2022
Current assets	183,536	187,463	194,944	200,347	224,309
Current liabilities	167,968	167,924	165,410	202,368	182,992
Inventories	45,577	46,519	43,535	43,380	51,109
Cash and cash equivalents	28,938	25,923	33,910	39,724	29,172

Source: Own processing according to Volkswagen (2018-2022)

Table 16: Liquidity ratios (2018-2022) (€ million)

Liquidity ratios	Year				
	2018	2019	2020	2021	2022
Current ratio	1.092	1.118	1.177	0.988	1.225
Quick ratio	1.001	1.128	1.191	1.042	1.289
Cash ratio	0.173	0.173	0.205	0.196	0.159

Source: Own processing according to Volkswagen (2018 - 2022)

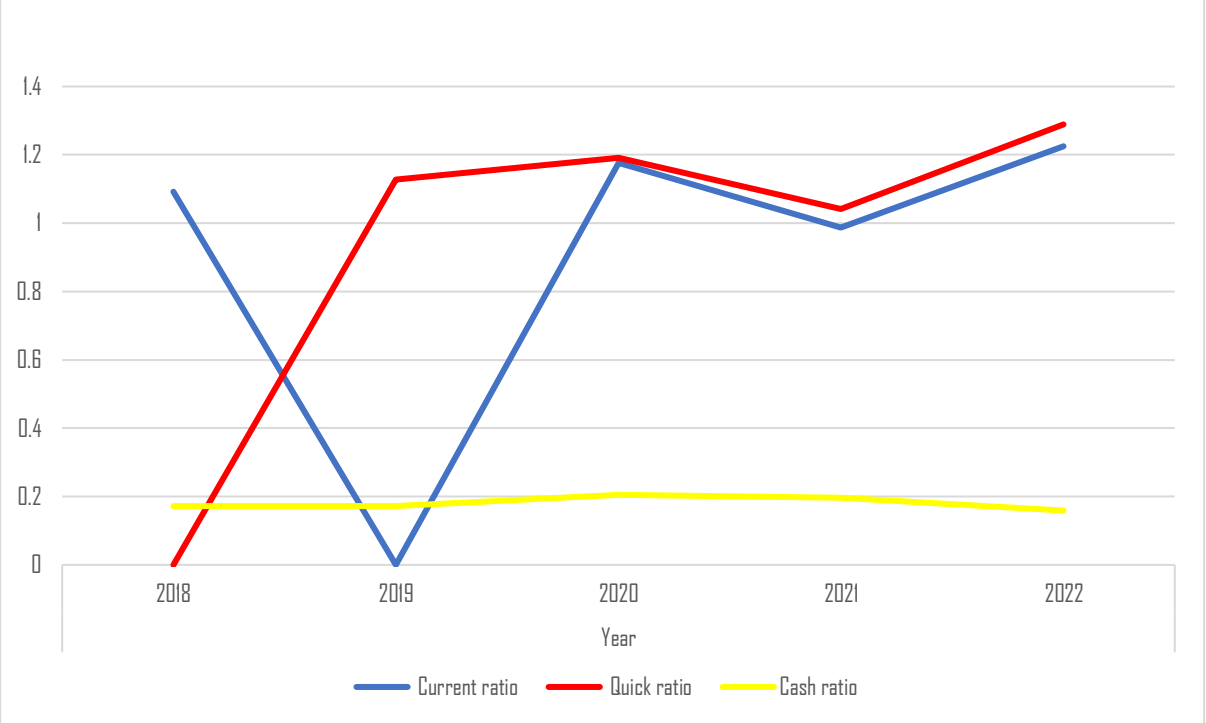

Figure 14:Liquidity ratios of Volkswagen (2018 – 2022) (€ million)
Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Over time, Volkswagen's current ratio—which evaluates the company's capacity to pay short-term obligations using current assets—changed. The ratio was 1.092 in 2018, suggesting a reasonably balanced situation. It rose little to 1.118 in 2019 and then significantly to 1.177 in 2020, indicating more liquidity. Nevertheless, the ratio dropped to 0.988 in 2021, suggesting that fulfilling short-term obligations would be difficult. VW did, however, recover in 2022, as evidenced by the current ratio increasing to 1.225, which indicated improved liquidity and better handling of current assets and obligations.

The quick ratio, which evaluates Volkswagen's capacity to meet short-term obligations with its most liquid assets—aside from inventory—exhibited a comparable pattern of volatility. The liquidity position was shown to be strengthening as it rose from 1.001 in 2018 to 1.128 in 2019 and 1.191 in 2020. The fast ratio increased dramatically to 1.289 in 2022 after slightly declining to 1.042 in 2021, demonstrating Volkswagen's improved capacity to satisfy short-term financial obligations with its liquid assets.

Over the course of the time, Volkswagen's cash ratio, which gauges its capacity to pay for short-term obligations only with cash and cash equivalents, stayed largely consistent. It began at 0.173 in 2018 and stayed there in 2019 before rising little to 0.205 in 2020. VW's cash ratio stayed within a narrow range in 2021, despite a little decrease to 0.196. It dropped little to 0.159 in

2022, suggesting a possible decline in the amount of cash on hand to pay for immediate obligations.

In conclusion, VW's liquidity ratios show a combination of variations and advancements throughout time, underscoring the company's attempts to efficiently manage short-term cash. Volkswagen has shown resilience in sustaining liquidity levels, despite moments of instability. This is important for both operational continuity and financial stability. However, in order for Volkswagen to successfully navigate upcoming possibilities and difficulties in the market, aggressive liquidity management and ongoing monitoring are important.

3.9.3 Profitability Ratios

The company's revenue, asset, and equity profitability is revealed via profitability ratios. The information derived from the annual reports was utilized to calculate the profitability ratios and is displayed. The table below calculates the well-known profitability ratios, such as return on equity, return on assets, return on sales, and return on capital employed. Volkswagen's profitability ratios are displayed below.

Table 17: Data used for calculation of the profitability ratios (2018-2022) (€ million)

Volkswagen	Year				
	2018	2019	2020	2021	2022
EBIT	19,769	18,191	10,379	18,358	18,117
Total assets	458,156	488,071	497,114	528,609	564,772
EAT	11,827	13,346	8,334	14,843	14,867
Equity	117,342	123,651	128,783	146,154	165,378
Sales	235,849	252,632	222,884	250,200	279,232
Current liabilities	167,968	167,924	165,410	960,185	182,992

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Table 18: Profitability ratios (2018-2022) (€ million)

Profitability ratios	Year				
	2018	2019	2020	2021	2022
ROCE	4.93%	3.96%	2.27%	4.40%	3.51%
ROA	2.58%	2.74%	1.68%	2.81%	2.63%
ROS	5.01%	5.28%	3.74%	5.93%	5.32%
ROE	10.08%	10.80%	6.47%	10.15%	8.99%

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

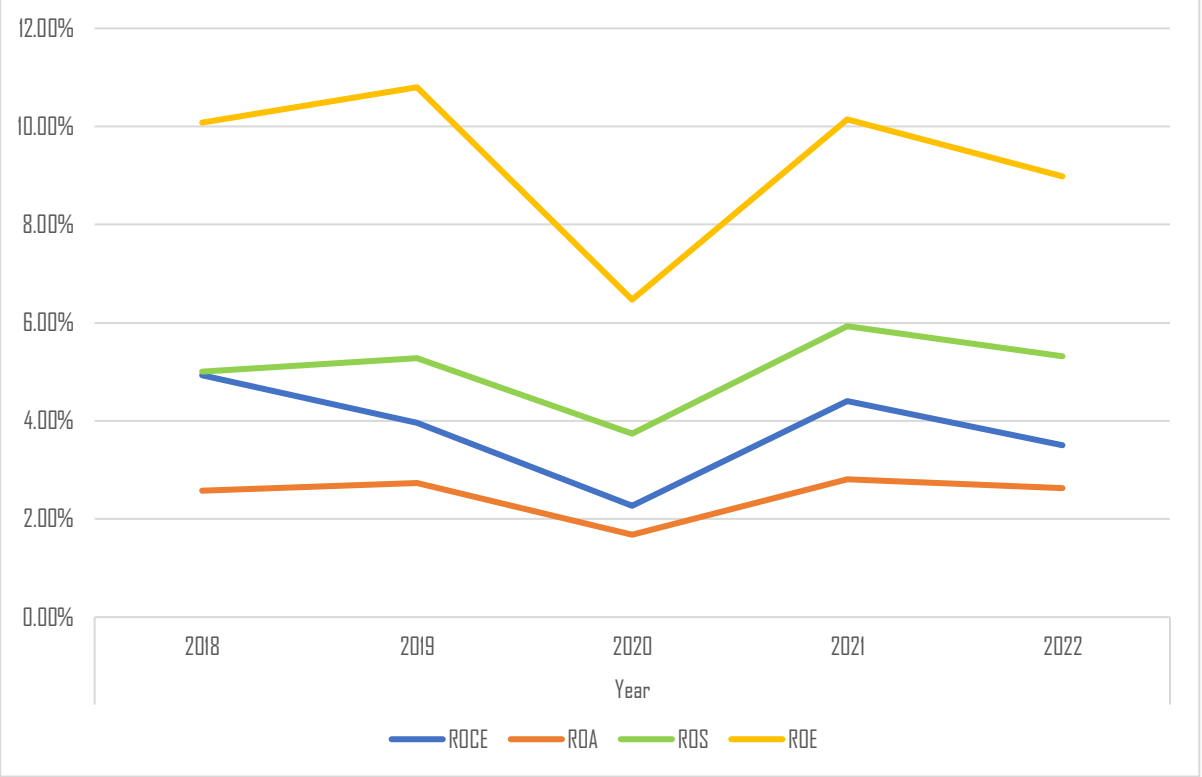

Figure 15: Profitability ratios of Volkswagen (2018 – 2022)(€ million)
Source: Own processing according to Volkswagen (2018 - 2022)

Over the course of the five years, Volkswagen's Return on Capital Employed (ROCE) varied, beginning at 4.93% in 2018, falling to 2.27% in 2020, rising to 4.40% in 2021, and then marginally reducing to 3.51% in 2022. This suggests that variations in operational efficiency or capital allocation methods may have contributed to Volkswagen's varying capacity to turn a profit on its capital investments.

A similar pattern can be seen in the Return on Assets (ROA), which began at 2.58% in 2018 and decreased to 1.68% in 2020 before steadily rising to 2.81% in 2021 and then marginally dipping to 2.63% in 2022. This implies that fluctuations in asset usage and management effectiveness over time have affected Volkswagen's profitability relative to its total assets.

Over the course of the time, the Return on Sales (ROS) varied slightly but stayed mostly consistent, ranging from 3.74% in 2020 to 5.93% in 2021. This demonstrates Volkswagen's capacity to turn a profit on sales income while keeping up a steady level of cost control and operational efficiency.

Last but not least, the Return on Equity (ROE) exhibits a comparable trend, beginning in 2018 at 10.08%, falling to 6.47% in 2020, rising to 10.15% in 2021, and then somewhat dipping to

8.99% in 2022. This indicates that variables including net income, dividend payments, and adjustments to the equity structure may have had an impact on Volkswagen's profitability relative to shareholders' equity. Overall, during the course of the five-year period, Volkswagen showed resilience in maintaining profitability despite shifting market conditions. However, there were variations in certain profitability indices.

3.9.4 Leverage Ratios

Table 19: Data used for calculation of the leverage ratios (2018-2022)(€ million)

Volkswagen	Year				
	2018	2019	2020	2021	2022
Total assets	458,156	488,071	497,114	528,609	564,772
Total Liabilities	340,814	364,421	368,331	382,455	399,394
Equity	155,575.94	160,644.78	169,692.35	202,972.97	214,936.23

Source: Own processing according to Volkswagen (2018 - 2022)

Table 20: Leverage ratios (2018-2022)(€ million)

Company	Leverage ratios	Year				
		2018	2019	2020	2021	2022
Volkswagen	Debt ratio	74.40%	74.60%	74.20%	72.40%	70.70%
	Equity ratio	34%	32.90%	34.10%	38.40%	38%
	Debt-to-equity ratio	219.10%	226.90%	217.20%	188.30%	185.80%

Source: Own processing according to Volkswagen (2018 - 2022)

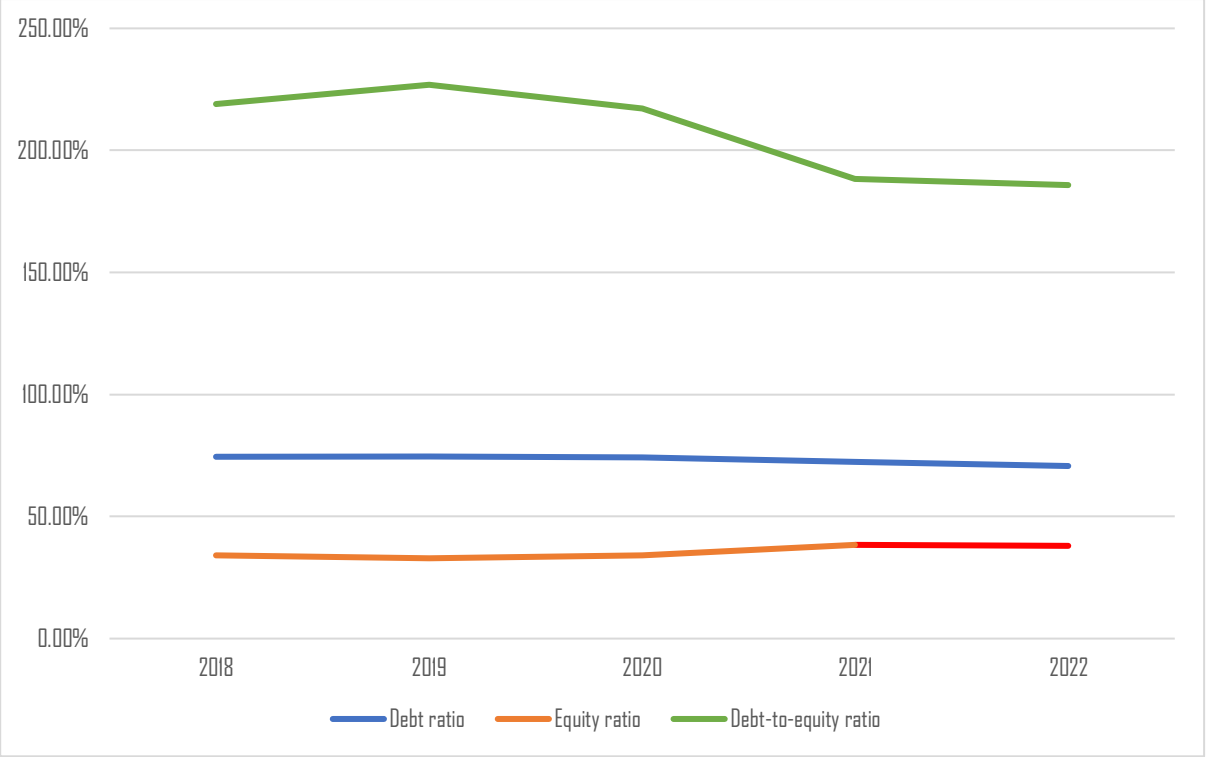

Figure 16: Leverage ratios of Volkswagen (2018 – 2022)(€ million)
Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Volkswagen had significant variations in its leverage ratios from 2018 to 2022, which are related to changes in the company's financial structure and management strategies. The debt ratio, which indicates the percentage of an asset financed by debt, dropped from 74.40% to 70.70% throughout the period of 2018 to 2022. This decline indicates VW's conscious efforts to lessen its reliance on debt financing, which could have been driven by a calculated intention to improve capital structure and financial stability.

On the other hand, the equity ratio, which shows how much of an asset is financed by equity, fluctuated over time. In 2018 it was 34%; in 2021 and 2022, it was 38%. The growing trend that has been seen in recent years points to Volkswagen's preference for equity financing, which may be the result of higher shareholder contributions or improved profitability. This change in strategy highlights the company's efforts to increase its financial resilience in the face of shifting market conditions and diversify its sources of finance.

Volkswagen's debt-to-equity ratio, a significant indicator of financial leverage, fluctuated over time but generally decreased from 219.10% in 2018 to 185.80% in 2022. This drop shows that Volkswagen's financing mix is becoming less dependent on debt than equity. Volkswagen sought to increase its financial flexibility, minimize interest costs, and lessen possible hazards related to high levels of leverage by gradually reducing its debt-to-equity ratio.

VW's leverage ratios from 2018 to 2022 show a calculated approach to financial management with the goal of establishing a stable and well-balanced capital structure. The company has demonstrated its commitment to improving long-term financial performance and resilience in a volatile business environment by its initiatives to expand equity financing, optimize its debt-to-equity ratio, and lower its debt levels.

3.10 Analysis of Cumulative Indicators of Volkswagen

This chapter uses bankruptcy and credibility models to examine how different ratios affect the overall financial health of the organization. First, the Altman Z-score is computed for publicly traded companies on a stock exchange market. Next, the Index IN05 is ascertained. Lastly, the companies' financial health is shown by the renowned Kralicek Quick Test. The companies' annual reports, which are regarded as primary sources of information, are the basis on which the indicators are derived.

3.10.1 Altman Z-score

The data in the table below, which is also used to calculate the Altman Z-score, was taken from the 2018 to 2022 annual reports of the company. The estimated Z-scores for Volkswagen is then graphically shown and illustrated.

Table 21: Data used for calculation of the Altman Z-score (2018-2022)

Volkswagen	Year				
	2018	2019	2020	2021	2022
Net working capital	15,568	19,539	29,534	35,954	41,317
Total assets	458,156	488,071	497,114	528,609	564,772
Retained earnings	91,105	96,929	100,772	117,342	137,267
EBIT	19,769	18,191	10,379	18,358	18,117
Equity	117,342	123,651	128,783	146,154	165,378
Total sales	235,849	252,632	222,884	250,200	279,232
Total liabilities	340,814	364,421	368,331	382,455	399,394

Source: Own processing according to Volkswagen (2018 - 2022)

Table 22: Altman Z-score (2018-2022)

Company	Altman Z-score	Year				
		2018	2019	2020	2021	2022
Volkswagen	X1	0.034	0.04	0.0597	0.068	0.0734
	X2	0.199	0.209	0.204	0.2216	0.2915
	X3	0.05	0.05	0.02	0.035	0.045
	X4	0.674	0.691	0.684	0.6874	0.6838
	X5	0.5149	0.5825	0.5378	0.4998	0.4945
	Z	1.4037	1.5027	1.3714	1.4195	1.5495

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

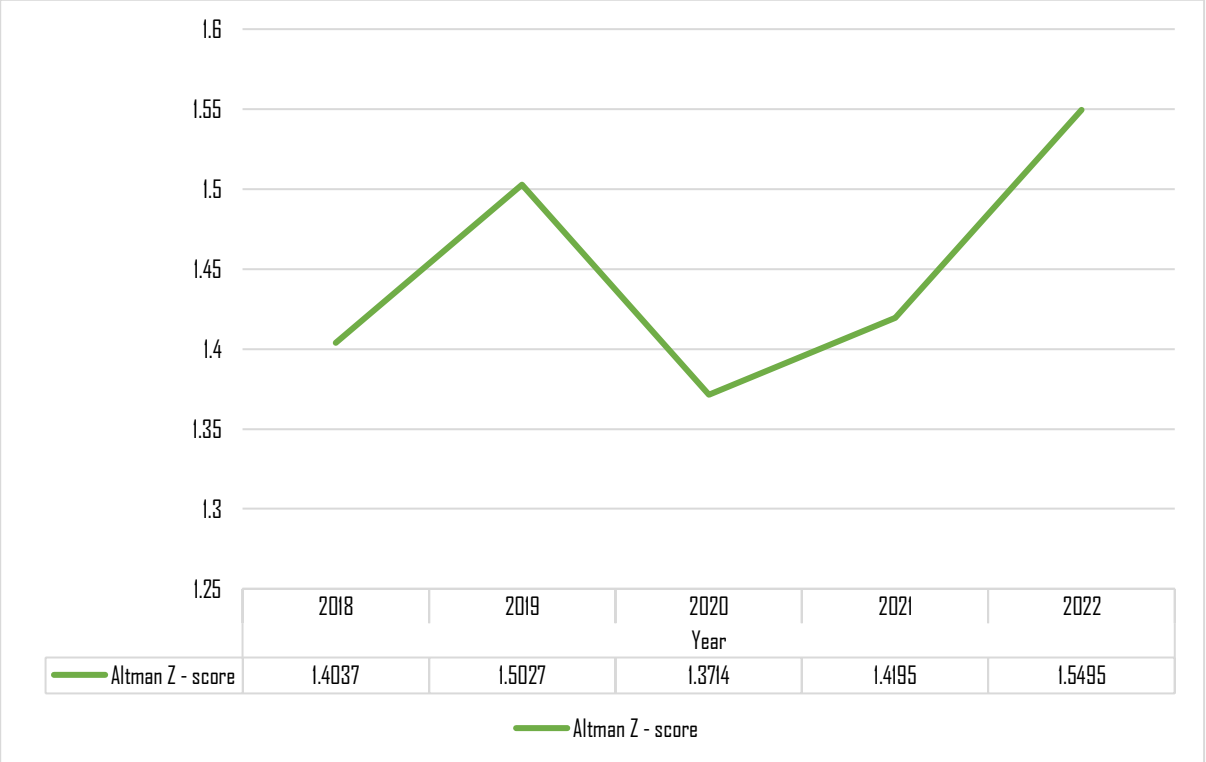

Figure 17: Altman Z-score of Volkswagen (2018 – 2022)
Source: Own processing according to Volkswagen (2018 - 2022)

A popular statistic for evaluating a company's financial standing and danger of insolvency is the Altman Z-score. To learn more about Volkswagen financial stability, let's examine their Altman Z-scores over time.

The Altman Z-score was calculated using the formula suitable for

publicly traded companies: $Z = 1,2X1 + 1,4X2 + 3,3X3 + 0,6X4 + 1X5$.

Volkswagen's stability from 2018 to 2022 is shown by the Altman Z-score, a well-known indicator of a company's financial health and bankruptcy risk. The Z-score for 2018 was 1.4037, which denotes a moderate level of financial risk. The score fluctuated in the following years, rising to 1.5027 in 2019 and then slightly falling to 1.3714 in 2020 before rising to 1.4195 in 2021. Interestingly, VW showed notable progress in 2022, as evidenced by the Z-score of 1.5495, which indicates improved financial health and a lower danger of bankruptcy. This increasing trend highlights VW's adaptability and skillful management in the face of changing market conditions.

To assess Volkswagen's financial stability more accurately, it is necessary to examine the elements that make up the Altman Z-score. Over time, a number of factors were crucial in determining Volkswagen's financial situation. Sales, working capital, and equity all showed increases between 2018 and 2022, which improved the Z-score. On the other hand, variations in EBIT and total liabilities might have affected the trajectory of the score. Volkswagen can uncover areas of strength and weakness by breaking down these components, which enables focused measures to strengthen its financial position and reduce risk.

In summary, VW's Altman Z-score increased significantly in 2022, indicating the company's improved financial stability and decreased danger of bankruptcy. Volkswagen's financial health has been strengthened by its proactive actions and strategic efforts, despite noticeable variations over time. Volkswagen can effectively handle problems and maintain long-term development and profitability by utilizing insights from the Altman Z-score and addressing underlying issues.

3.10.2 Index IN05

Inka and Ivan Neumaier's Index IN05 has been specifically adjusted for Czech conditions, as well as previous IN Indexes. As a result, only the Czech automaker Volkswagen will be subject to the Index IN05, as the outcomes of Toyota Motors may be skewed. The table lists the statistics from the yearly reports that were utilized to calculate IN05. The company's IN05 indexes for the years 2018 through 2022 are then computed and shown graphically.

Table 23: Data used for calculation of Index IN05(2018-2022)(Volkswagen)

Volkswagen	Year				
	2018	2019	2020	2021	2022
Total assets	458,156	488,071	497,114	528,609	564,772
Total liabilities	340,814	364,421	368,331	382,455	399,394
EBIT	19,769	18,191	10,379	18,358	18,117
Interest expenses	1,096	1,617	1,705	1,618	1,001
Total revenues	235,849	252,632	222,884	250,200	279,232
Current assets	183,536	187,463	194,944	200,347	224,309
Current liabilities	167,968	167,924	165,410	1,383,608	182,992

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Table 24: Index IN05 (2018-2022)

Company	INDEX IN05	Year				
		2018	2019	2020	2021	2022
Volkswagen	X1	1.34	1.34	1.35	1.38	1.41
	X2	18.04	11.24	6.08	11.34	18.10
	X3	0.043	0.037	0.021	0.035	0.032
	X4	0.51	0.516	0.448	0.474	0.494
	X5	1.09	1.119	1.178	1.098	1.227
	Index IN05	4.536	4.252	3.689	4.126	4.886

Source: Own processing according to Volkswagen (2018 - 2022)

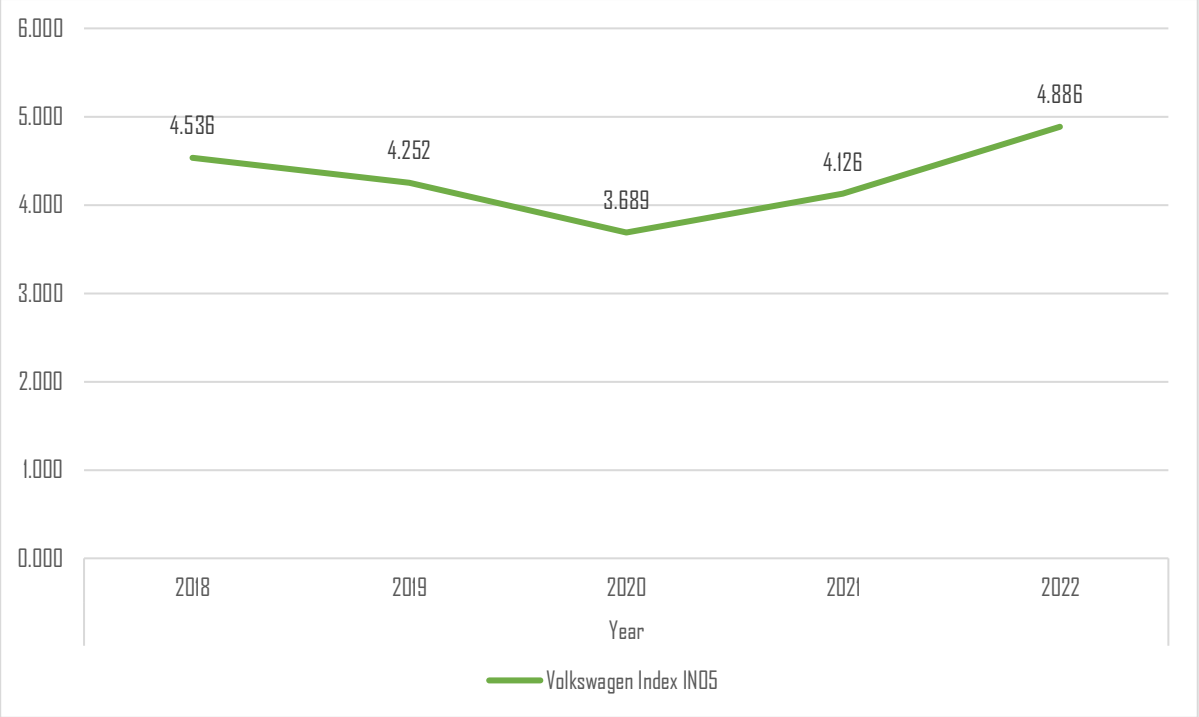

Figure 18: Volkswagen Index IN05 (2018 – 2022)
Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Volkswagen's INDEX IN05 shows the company's performance and financial health in a number of areas. Volkswagen's INDEX IN05 was 4.536 in 2018, suggesting that the company's financial situation was largely steady. But in 2019, this index saw a minor decrease, falling to 4.252, perhaps as a result of difficulties or variations in some financial data. The INDEX IN05 fell even lower in 2020, to 3.689, which may indicate Volkswagen was experiencing financial strain or other issues at the time. But in 2021, the business was able to recover, as evidenced by the INDEX IN05 rising to 4.126, indicating stronger resilience and financial health. VW's financial performance improved greatly in 2022, as shown by the index of financial stability and robustness (INDEX IN05) reaching 4.886.

Analyzing the INDEX IN05's component parts offers further information on Volkswagen's financial performance. For example, profitability ratios are represented by X2, which saw a significant decrease in 2020 before increasing in the following years. This variation can be a result of outside influences or deliberate actions VW has made to increase profitability. Likewise, modifications in the leverage ratios represented by X3 over time may have resulted from adjustments to the capital structure or amount of debt held by the company. The rising trend of the INDEX IN05, which emphasizes the company's resilience and proactive financial management techniques, shows that Volkswagen was able to adjust and enhance its financial position while facing hurdles and volatility in specific financial parameters.

3.10.3 Kralicek Quick Test

The well-known Kralicek Quick Test is a credibility model that looks at the company's profitability and financial stability. Table lists the data from the annual reports that were utilized to calculate Quick Test. Next, based on the Kralicek Quick Test's evaluation scale, the Kralicek Quick Test results for Volkswagen from 2018 to 2022 are computed and compared.

The individual ratios, which the Kralicek Quick Test comprises, are the equity ratio *(R1)*,the debt repayment period from CF *(R2)*, the cash flow in % of sales *(R3)*, and the return on assets *(R4)*. Their calculation is captured below:

- *R1 = (Equity/total assets) x 100 (%),*
- *R2 = (Liabilities – cash)/operating CF (years),*
- *R3 = (Operating CF/sales) x 100 (%),*
- *R4 = (EBIT/total assets) x 100 (%).*

Table 25: Data used for calculation of Kralicek Quick Test (2018-2022)

Volkswagen	Year				
	2018	2019	2020	2021	2022
Equity	117,342	123,651	128,783	146,154	165,378
Total assets	458,156	488,071	497,114	528,609	564,772
Total liabilities	340,814	364,421	368,331	382,455	399,394
Cash and Cash equivalents	28,938	25,923	33,910	39,724	29,172
Operating CF	58,327	27,107	35457	33,223	30,738
Total Sales	235,849	252,632	222,884	250,200	279,232
EBIT	19,769	18,191	10,379	18,358	18,117

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Table 26: Kralicek Quick Test of Volkswagen (2018-2022)

Kralicek Quick Test 2018		Rating scale				
Evaluation	An indicator	1	2	3	4	5
		Very good	Good	Middle	Poor	Insolvency
Financial Stability	R1 = 25.60%	>30%	>20%	>10%	>0%	Negative
	R2 = 5.35 yrs	<3 years	<5 years	<12 years	<30 years	>30 years
Profit situation	R3 = 24.74%	>10%	>8%	>5%	>0%	Negative
	R4 = 4.32%	>15%	>12%	>8%	>0%	Negative
Total (2018)		2.5				
Kralicek Quick Test 2019		Rating scale				
Evaluation	An indicator	1	2	3	4	5
		Very good	Good	Middle	Poor	Insolvency
Financial Stability	R1 = 25.33%	>30%	>20%	>10%	>0%	Negative
	R2 = 12.48 yrs	<3 years	<5 years	<12 years	<30 years	>30 years
Profit situation	R3 = 10.72%	>10%	>8%	>5%	>0%	Negative
	R4 = 10.72%	>15%	>12%	>8%	>0%	Negative
Total (2019)		2.5				
Kralicek Quick Test 2020		Rating scale				
Evaluation	An indicator	1	2	3	4	5
		Very good	Good	Middle	Poor	Insolvency
Financial Stability	R1 = 26.01%	>30%	>20%	>10%	>0%	Negative
	R2 = 13.53 yrs	<3 years	<5 years	<12 years	<30 years	>30 years
Profit situation	R3 = 15.91%	>10%	>8%	>5%	>0%	Negative
	R4 = 2.01%	>15%	>12%	>8%	>0%	Negative
Total (2020)		2.25				
Kralicek Quick Test 2021		Rating scale				
Evaluation	An indicator	1	2	3	4	5
		Very good	Good	Middle	Poor	Insolvency
Financial Stability	R1 = 27.73%	>30%	>20%	>10%	>0%	Negative
	R2 = 15.45 yrs	<3 years	<5 years	<12 years	<30 years	>30 years
Profit situation	R3 = 14.06%	>10%	>8%	>5%	>0%	Negative
	R4 = 3.47%	>15%	>12%	>8%	>0%	Negative
Total (2021)		2.25				
Kralicek Quick Test 2022		Rating scale				
Evaluation	An indicator	1	2	3	4	5
		Very good	Good	Middle	Poor	Insolvency
Financial Stability	R1 = 29.28%	>30%	>20%	>10%	>0%	Negative
	R2 = 12.06 yrs	<3 years	<5 years	<12 years	<30 years	>30 years
Profit situation	R3 = 11.00%	>10%	>8%	>5%	>0%	Negative
	R4 = 3.20%	>15%	>12%	>8%	>0%	Negative
Total (2022)		2.25				

Source: Own processing according to Volkswagen and Toyota Motors (2018 - 2022)

Based on a set of criteria, the Kralicek Quick Test evaluates a company's profitability and financial stability. In 2018, Volkswagen's financial stability indicator (R1) was 25.60%, meaning

it was rated between "Middle" and "Good" on the scale. R2, which calculates how long a business can maintain its present state of affairs financially, was 5.35 years, putting it in the "Middle" and "Good" categories. R3 was 24.74%, which is between "Good" and "Middle," for the profit position, and R4 was 4.32%, which is also between "Good" and "Middle." With a total score of 2.5 for 2018, the financial and profit conditions were stable.

Volkswagen's financial stability in 2019 was largely stable, scoring between "Good" and "Middle" on the scale with R1 at 25.33% and R2 at 12.48 years. R3 and R4 both stood at 10.72% in the profit position, which was marginally worse but still within the "Good" to "Middle" range. The overall score for 2019 stayed at 2.5, demonstrating consistency in spite of some slight variations in profit indicators.

VW's financial stability saw a little improvement in 2020, with R1 rising to 26.01% and R2 to 13.53 years—both still falling into the "Good" to "Middle" category. With R3 at 15.91% and R4 at 2.01%, the profit position, however, decreased and moved closer to the "Middle" category. 2020's overall score dropped little to 2.25, indicating how the earnings situation affected stability in general.

Volkswagen's financial stability improved even more in 2021, as seen by the increases in R1 to 27.73% and R2 to 15.45 years, both of which are comfortably inside the "Good" level. But there was also a decline in the earnings position, with R3 at 14.06% and R4 at 3.47%, respectively, slipping between "Good" and "Middle." Despite difficulties with profitability, the overall score for 2021 stayed at 2.25, suggesting a steady financial state.

During the studied period, VW's financial stability peaked in 2022, with R1 rising to 29.28% and R2 to 12.06 years, both comfortably inside the "Good" category. With R3 at 11.00% and R4 at 3.20%, the profit position witnessed a minor decline but was still in the "Good" to "Middle" category. The 2022 overall score stayed at 2.25, demonstrating consistency in spite of variations in profitability.

4 Company’s Evaluation and Suggestions for Improvement

Volkswagen, a mainstay of the car industry, has been thoroughly assessed on a number of financial fronts in order to determine its performance and pinpoint areas that require improvement. The goal of this thesis is to present a comprehensive evaluation of Volkswagen's financial situation, taking into account factors including activity, leverage, profitability, stability, and overall strategic orientation. Tailored recommendations will be given based on these evaluations in order to propel VW toward increased competitiveness and sustainable growth.

4.1 Company’s Overall Evaluation

Over the years, Volkswagen's financial stability has been comparatively solid, as seen by the progressive decline in its debt ratio from 74.40% in 2018 to 70.70% in 2022. But VW's debt-to-equity ratio is higher, suggesting a stronger reliance on debt financing. The company's return on equity (ROE) has stayed modest, averaging 10% in recent years, despite significant volatility in its profitability indices, especially in return on capital employed (ROCE) and return on assets (ROA).

Volkswagen's financial performance is examined using both horizontal and vertical analytics, which offer insightful information about the company's advantages and shortcomings. According to a horizontal analysis, sales income has increased steadily over the previous five years, showing a stable upward trend from 2018 to 2022. Nevertheless, despite slight increases throughout the period, gross profit margins have fluctuated and have not increased proportionately with this development. Concerns about the company's capacity to control costs, as demonstrated by the cost of goods sold (COGS) and operational expenses, persist, especially in light of the inconsistent patterns in these indicators.

Additional subtleties in Volkswagen's financial structure are revealed through vertical analysis. While current assets have increased—cash and cash equivalents went from 6.32% in 2018 to 7.52% in 2021 before declining slightly to 5.16% in 2022—other assets, like short-term investments, have shown notable volatility—they went from 4.61% in 2018 to 425% in 2019 before stabilizing in the following years. More investigation is necessary since this volatility points to possible inefficiencies in the management of liquidity and asset allocation.

Volkswagen has seen enhancements in its leverage ratios concerning liabilities. Specifically, the debt ratio has decreased from 74.40% in 2018 to 70.70% in 2022, signifying a decreased

dependence on debt financing. Even if it is declining, the debt-to-equity ratio is still somewhat high, indicating that there are still concerns related to the financial structure of the business. Furthermore, the growing trend in non-current liabilities emphasizes how crucial it is to successfully manage long-term financial responsibilities.

Volkswagen's operational efficiency and capacity to yield returns on investment are demonstrated by its profitability ratios. Even if they have improved over time, return on equity (ROE) and return on assets (ROA) are still below ideal levels. While the net margin of the company has remained consistent, there is still room for improvement in order to maximize total profitability.

Volkswagen's liquidity is shown in its current and quick ratios, which range from 0.988 in 2022 to 1.225 in 2018 and 1.042 in 2022 to 1.128 in 2019. These ratios show a rather strong liquidity situation for the company. To maintain liquidity in the face of shifting market conditions, working capital management and close cash flow monitoring are crucial.

Volkswagen needs to concentrate on a few important areas in order to overcome these obstacles and seize these chances. First off, increasing operational efficiency can maximize gross profit margins and total profitability by enforcing stricter cost controls and streamlining processes. Second, the company's financial resilience can be increased by persistently working to diversify funding sources and lessen reliance on debt financing. Thirdly, research and development spending strategically can spur innovation and competitiveness in the market, especially in the areas of sustainable and electric vehicle technology. Ultimately, proactive asset usage and working capital management can strengthen liquidity and stability even more. Volkswagen can position itself for long-term growth and value generation in the ever-changing automotive sector by addressing these areas.

The Altman Z-score and Kralicek Quick Test examination of Volkswagen's financial health offer important insights into the solvency, profitability, and overall stability of the business. These evaluations are essential instruments for evaluating bankruptcy risk and pinpointing areas in need of development.

Let's start with the Altman Z-score. Volkswagen's ratings from 2018 to 2022 have varied within a band indicating moderate to low risk, which indicates the chance of bankruptcy. The Z-score indicated a modest level of risk in 2018 at 1.4037, but by 2022 it had improved to 1.5495. Despite Volkswagen's slightly lower scores, it was able to maintain a position of financial stability during the last five years.

But a closer look reveals some possible areas for development. Volkswagen's profitability ratios, including return on assets (ROA) and return on capital employed (ROCE), have been trending downward, suggesting difficulties in efficiently using assets to produce returns. For example, Volkswagen's ROA dropped from 2.58% to 2.63% during the same period in 2022, while its ROCE dropped from 4.93% in 2018 to 3.51% in 2022.

In addition, the Kralicek Quick Test assesses profitability and financial stability, offering extra information on Volkswagen's performance. Volkswagen's overall scores from 2018 to 2022 fell between 1.75 and 2.5, suggesting a moderate level of stability and profitability.

In order to strengthen its financial position and reduce the likelihood of bankruptcy, VW ought to concentrate on a number of key measures. First and foremost, the business must put increasing profitability first by streamlining costs, boosting productivity, and expanding its sources of income. Research and development expenditures have the potential to stimulate innovation and market competitiveness, which in turn can lead to long-term profitability. This is especially true for sustainable and electric vehicle technologies.

Second, by lowering debt levels and bolstering its equity basis, Volkswagen should actively manage its leverage ratios. Prudent debt management techniques, such refinancing expensive debt, deferring debt maturities, and, where practical, seeking equity financing options, can help achieve this.

Volkswagen should also give liquidity management top priority in order to guarantee enough cash flows for debt repayment and operational requirements. Strengthening liquidity and financial flexibility can be achieved through improved cash flow forecasts, effective working capital management, and strategic capital allocation.

Volkswagen should also keep enhancing its financial reporting and openness in order to reassure investors and lessen their perceptions of risk. Establishing and maintaining trust with stakeholders through transparent communication of financial performance, strategic initiatives, and risk management techniques is crucial for the long-term viability of the business.

In conclusion, VW can strengthen its finances, reduce the danger of bankruptcy, and position itself for long-term growth and value creation in the automotive sector by addressing these areas for improvement and capitalizing on its assets.

Investigating the finer points offered by several financial indicators, such as Altman Z-score, Kralicek Quick Test, horizontal and vertical analysis, is essential to performing a thorough assessment of Volkswagen's financial performance and stability. These evaluations give insightful information about several aspects of Volkswagen's financial situation and serve as a guide for future strategic developments.

Volkswagen's financial accounts can be analyzed horizontally to spot trends and patterns throughout time. From 2018 to 2022, the company's sales revenue stayed mostly consistent, but variations in the cost of goods sold (COGS) had an effect on gross income and profitability. For example, fluctuations in sales growth and operational efficiency led to variations in gross revenue even though COGS excluding depreciation and amortization (D&A) decreased slightly from 70.70% in 2018 to 70.79% in 2022.

Additionally, over time, Volkswagen's profitability ratios—such as return on assets (ROA) and return on equity (ROE)—exhibited a downward tendency. Volkswagen was unable to convert its steady revenue growth into long-term profitability. For instance, the return on equity (ROE) fell from 10.08% in 2018 to 8.99% in 2022, indicating difficulties in effectively leveraging shareholder equity to produce profits. Similarly, within the same time span, ROA decreased from 2.58% to 2.63%, demonstrating inefficiencies in the use of assets.

Furthermore, the Kralicek Quick Test and Altman Z-score offer important insights into Volkswagen's overall financial health and bankruptcy risk. VW's Z-score increased little from 1.4037 in 2018 to 1.5495 in 2022, indicating a moderate danger of bankruptcy; nonetheless, the results of the Kralicek Quick Test varied within a range that suggested a moderate level of profitability and stability. Volkswagen's scores from 2018 to 2022 fell between 1.75 and 2.5, indicating areas in which its profitability and financial stability need to be strengthened.

In order to tackle these obstacles and improve Volkswagen's financial outcomes, a number of strategic moves are suggested. To increase profitability, the business should first concentrate on enhancing operational effectiveness and cost control. This can entail cutting overhead costs, improving supply chain management, and optimizing production processes.

Second, by actively controlling debt levels and boosting equity, Volkswagen should put deleveraging its balance sheet first. This could be accomplished by lowering interest costs and

increasing the company's financial flexibility through equity issuances, asset sales, or debt refinancing.

Apart from that, Volkswagen needs to keep funding R&D in order to promote sustainability and innovation in its line of products. Investing in cutting-edge technologies like autonomous driving and electric cars can set up the business for long-term success and competition in the automotive sector.

To further foster confidence and trust, Volkswagen should improve its openness and communication with stakeholders and investors. Proactive risk management techniques combined with timely and transparent financial reporting can reduce uncertainty and boost market credibility.

In conclusion, Volkswagen can navigate difficulties, reduce the danger of bankruptcy, and position itself for long-term growth and value creation in the ever-changing automotive industry by addressing these strategic imperatives and utilizing its assets.

4.2 Suggestions for Enhancement

Streamlining operations, improving production procedures, and cutting operating costs should be Volkswagen's top priorities in order to increase overall efficiency and competitiveness.

Liquidity Management Optimization: To improve liquidity and guarantee that financial obligations are paid on time, it is recommended to put strong working capital management procedures into place as well as to optimize inventory turnover and accounts receivable turnover.

Revenue Stream Diversification: By investigating new markets and product categories, one can increase stability and resilience, lessen reliance on certain items or markets, and diversify revenue sources.

Research and Development (R&D) Expenditure: Volkswagen will maintain its competitiveness in the changing automotive sector if it continues to invest in R&D to innovate and produce sustainable and technologically sophisticated products.

Maintenance of a Balanced Capital Structure: In order to fund growth plans and successfully manage financial risk, Volkswagen should optimize the ratio of debt to equity financing.

Conclusion

The evaluation of Volkswagen company's financial performance is the main subject of this diploma thesis. A summary of the business's financial status was obtained through the use of financial statements. Additional information made accessible through annual reports was added to this financial data. The five-year evaluation period, which was meant to provide a realistic picture of the company's status, ran from 2018 to 2022. In order to improve the company's financial performance, the diploma thesis sought to assess the company's financial standing and possibly make recommendations.

This diploma thesis's theoretical section is divided into two main chapters. The first chapter included an explanation of the terms financial analysis and financial performance. The sources, users, and instruments of financial analysis—including the metrics for measuring financial performance—are the main topics of the second chapter. Among these tools were bankruptcy models, different ratios, and financial indicators.

The practical portion of this diploma thesis begins with the features of the chosen company, which are covered in the third chapter. The practical portion of this thesis is covered in full in this chapter, which opens with some basic facts about the business, including its industry, range of products, and history. The assessment of the business's performance makes up the majority of the practical section.

The final results were evaluated over time and, when appropriate, against the industry average. Since fixed assets make up the majority of the company's assets, it was discovered that the company was forgoing short-term profitability in order to increase its manufacturing capacities. This is reflected in the balance sheet of the business. In spite of this, the business was competitive in its industry before the COVID-19 epidemic broke out globally. The company's profitability ratios most clearly illustrate this.

Last but not least, the credibility and bankruptcy models, including the Altman Z-score,
Index IN05, and Kralicek Quick Test, are used to disclose the financial health or financial risks of the company. The Altman Z-score varied from 1.4037 in 2018 to 1.5495 in 2022, showing a moderate risk of financial difficulty in 2018 but it improved and by 2022 it was in a more favorable situation. The company’s Index IN05 exceeded value 1.6 four times, indicating that the company creates value and is financially stable. The Kralicek Quick Test highlights the data from earlier models precisely and displays again according to rating that Volkwagen has made little

strides toward financial stability, it still faces problems with profitability, which calls for calculated interventions to support its financial stability.

This diploma thesis's fourth and final chapter provides an overview of the outcomes attained as well as suggestions derived from the analyses that were carried out.

The proposal for Volkswagen is relatively brief due to the necessity to evaluate more than simply financial data. By all criteria, the company was performing well and above industry average prior to the end of the designated time. Though financial research suggests severe financial problems, the company was not alone in this regard, and is well-poised to fully recover in the immediate future. This conclusion is based on the excellent financial position of the corporation in the past, as well as the slowly recovering economies of the world; notably, the swiftly recovering automobile industry.

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List of Appendices

Appendix A: Income Sheet of Volkswagen 2018 – 2022

Items	Year				
	2018	2019	2020	2021	2022
Sales/Revenue	235,849	252,632	222,884	250,200	279,232
Cost of Goods Sold (COGS) incl. D&A	188,335	203,317	183,758	203,139	226,619
COGS excluding D&A	166,840	178,927	158,026	175,876	198,389
Depreciation & Amortization Expense	21,495	24,390	25,732	27,263	28,230
Depreciation	17,158	19,659	20,483	21,434	22,059
Amortization of Intangibles	4,337	4,731	5,249	5,829	6,171
Amortization of Deferred Charges	-	-	-	-	-
COGS Growth	-	7.95%	-9.62%	10.55%	11.56%
Gross Income	47,514	49,315	39,126	47,061	52,613
Gross Income Growth	-	3.79%	-20.66%	20.28%	11.80%
Gross Profit Margin	-	-	-	-	18.84%
SG&A Expense	29,891	31,062	28,122	29,242	31,475
Research & Development	12,116	13,199	12,056	12,790	14,329
Other SG&A	17,775	17,863	16,066	16,452	17,146
SGA Growth	-	3.92%	-9.46%	3.98%	7.64%
Other Operating Expense	(494)	(105)	625	(372)	1,369
EBIT	18,117	18,358	10,379	18,191	19,769
Unusual Expense	6,979	3,962	526	(43)	(850)
Non Operating Income/Expense	1,164	1,378	55	252	(1,202)
Non-Operating Interest Income	950	904	788	974	1,325
Equity in Affiliates (Pretax)	23	(53)	(80)	(38)	3
Interest Expense	1,001	1,618	1,705	1,617	1,096
Interest Expense Growth	-	61.64%	5.38%	-5.16%	-32.22%
Gross Interest Expense	1,063	1,686	1,770	1,694	1,274
Interest Capitalized	62	68	65	77	178
Pretax Income	12,274	15,007	8,911	17,805	19,649

Pretax Income Growth	-	22.27%	-40.62%	99.81%	10.36%
Pretax Margin	-	-	-	-	7.04%
Income Tax	3,490	4,327	2,843	4,698	6,208
Income Tax - Current Domestic	1,131	1,473	940	1,230	1,180
Income Tax - Current Foreign	2,402	2,674	2,210	3,382	4,082
Income Tax - Deferred Domestic	429	115	(1,026)	1,072	3,323
Income Tax - Deferred Foreign	(472)	65	719	(986)	(2,377)
Income Tax Credits	-	-	-	-	-
Equity in Affiliates	3,369	3,349	2,756	2,321	2,395
Other After Tax Income (Expense)	(309)	(540)	(533)	(539)	(576)
Consolidated Net Income	11,844	13,489	8,291	14,889	15,260
Minority Interest Expense	17	143	(43)	46	393
Net Income	11,827	13,346	8,334	14,843	14,867
Net Income Growth	-	12.84%	-37.55%	78.10%	0.16%
Net Margin	-	-	-	-	5.32%
Extraordinaries & Discontinued Operations	-	-	-	-	-
Extra Items & Gain/Loss Sale Of Assets	-	-	-	-	-
Cumulative Effect - Accounting Chg	-	-	-	-	-
Discontinued Operations	-	-	-	-	-
Net Income After Extraordinaries	11,827	13,346	8,334	14,843	14,867
Preferred Dividends	-	-	-	-	-
Net Income Available to Common	11,827	13,346	8,334	14,843	14,867
EPS (Basic)	23.59	26.62	16.62	29.61	29.66
EPS (Basic) Growth	-	12.84%	-37.55%	78.10%	0.16%
Basic Shares Outstanding	501	501	501	501	501
EPS (Diluted)	23.59	26.62	16.62	29.61	29.66
EPS (Diluted) Growth	-	12.84%	-37.55%	78.10%	0.16%
Diluted Shares Outstanding	501	501	501	501	501
EBITDA	39,612	42,748	36,111	45,454	47,999

EBITDA Growth	-	7.92%	-15.53%	25.87%	5.60%
EBITDA Margin	-	-	-	-	17.19%
EBIT	18,117	18,358	10,379	18,191	19,769

Appendix B: Horizontal Analysis of Income sheet 2018 - 2022

Items	2019/2018		2020/2019		2021/2020		2022/2021	
	ABS	%	ABS	%	ABS	c	ABS	%
Sales/Revenue	16,783	7.11%	29,748	-11.78%	27,316	12.26%	29,032	11.60%
Cost of Goods Sold (COGS) incl. D&A	14,982	7.95%	19,559	-9.63%	19,381	10.55%	23,480	11.56%
COGS excluding D&A	12,087	7.25%	20,901	-11.67%	17,850	11.29%	22,513	12.79%
Depreciation & Amortization Expense	2,895	13.47%	1,342	5.51%	1,531	5.96%	967	3.55%
Depreciation	2,501	14.56%	824	4.19%	951	4.64%	625	2.92%
Amortization of Intangibles	394	9.08%	518	10.94%	580	11.04%	342	5.86%
Amortization of Deferred Charges								
COGS Growth								
Gross Income	1,801	3.79%	10,189	-20.66%	7,935	20.27%	5,552	11.80%
Gross Income Growth								
Gross Profit Margin								
SG&A Expense	1,171	3.92%	2,940	-9.46%	1,120	3.98%	2,233	7.64%
Research & Development	1,083	8.94%	1,143	-8.65%	734	6.08%	1,539	12.02%
Other SG&A	88	0.49%	1,797	-10.06%	386	2.40%	694	4.22%
SGA Growth								
Other Operating Expense	389	-78.65%	730	-695.24%	997	-159.52%	1,741	-468.01%
EBIT	241	1.33%	7,979	-43.47%	7,812	75.22%	1,578	8.68%
Unusual Expense	3,017	-43.16%	3,436	-86.71%	569	-108.25%	807	-1876.74%
Non Operating Income/Expense	214	18.40%	1,323	-95.89%	197	358.18%	1,454	-576.19%
Non-Operating Interest Income	46	-4.84%	116	-12.83%	186	23.61%	351	36.05%
Equity in Affiliates (Pretax)	76	-330.43%	27	50.94%	42	-52.50%	41	-107.89%
Interest Expense	617	61.63%	87	5.38%	88	-5.15%	521	-32.20%
Interest Expense Growth								
Gross Interest Expense	623	58.62%	84	4.99%	76	-4.29%	420	-24.77%
Interest Capitalized	6	9.68%	3	-4.41%	12	18.46%	101	131.17%
Pretax Income	2,733	22.27%	6,096	-40.62%	8,894	99.80%	1,844	10.36%
Pretax Income Growth								
Pretax Margin								
Income Tax	837	23.96%	1,484	-34.30%	1,855	65.19%	1,510	32.12%
Income Tax - Current Domestic	342	30.26%	533	-36.21%	290	30.85%	50	-4.07%
Income Tax - Current Foreign	272	11.32%	464	-17.35%	1,172	53.01%	700	20.68%
Income Tax - Deferred Domestic	314	-73.13%	1,141	-993.04%	2,098	53.01%	2,251	209.83%

Income Tax - Deferred Foreign	537	-113.64%	654	1006.15%	1,705	-237.24%	1,391	141.07%
Income Tax Credits								
Equity in Affiliates	20	-0.59%	593	-17.73%	435	-15.77%	74	3.19%
Other After Tax Income (Expense)	231	-74.75%	7	-1.30%	6	1.12%	37	6.86%
Consolidated Net Income	1,645	13.89%	5,198	-38.56%	6,598	79.57%	371	2.49%
Minority Interest Expense	126	741.18%	186	-130.07%	89	-206.98%	347	754.35%
Net Income	1,519	12.86%	5,012	-37.55%	6,509	78.11%	24	0.16%
Net Income Growth	-	-	-	-	-	-	-	-
Net Margin	-	-	-	-	-	-	-	-
Extraordinaries & Discontinued Operations	-	-	-	-	-	-	-	-
Extra Items & Gain/Loss Sale Of Assets	-	-	-	-	-	-	-	-
Cumulative Effect - Accounting Chg	-	-	-	-	-	-	-	-
Discontinued Operations	-	-	-	-	-	-	-	-
Net Income After Extraordinaries	1,519	12.86%	5,012	-37.55%	6,509	78.11%	24	0.16%
Preferred Dividends								
Net Income Available to Common	1,519	12.86%	5,012	-37.55%	6,509	78.11%	24	0.16%
EPS (Basic)	3.03	12.86%	10	-37.59%	12.99	78.17%	0.05	0.17%
EPS (Basic) Growth								
Basic Shares Outstanding	0	0.00%	0	0.00%	0	0.00%	0	0.00%
EPS (Diluted)	3.03	12.86%	10	-37.59%	12.99	78.17%	0.05	0.17%
EPS (Diluted) Growth								
Diluted Shares Outstanding	0	0.00%	0	0.00%	0	0.00%	0	0.00%
EBITDA	3,136	7.92%	6,637	-15.53%	9,343	25.87%	2,545	5.60%
EBITDA Growth					7,812			
EBITDA Margin			7,979	-4.26%				
EBIT	241	1.33%				75.22%	1,578	8.68%

Appendix C: Vertical Analysis of Income sheet 2018 - 2022

Items	Year				
	2018	2019	2020	2021	2022
Sales/Revenue	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of Goods Sold (COGS) incl. D&A	79.87%	80.47%	82.51%	81.22%	81.01%
COGS excluding D&A	70.70%	70.83%	70.89%	70.28%	70.79%
Depreciation & Amortization Expense	9.12%	9.66%	11.53%	10.90%	10.09%
Depreciation	7.28%	7.79%	9.19%	8.56%	7.88%
Amortization of Intangibles	1.84%	1.87%	2.34%	2.33%	2.20%
Amortization of Deferred Charges					
COGS Growth	7.95%	-9.62%	10.55%	11.56%	
Gross Income	20.13%	19.53%	17.49%	18.78%	18.99%
Gross Income Growth	3.79%	-20.66%	20.28%	11.80%	
Gross Profit Margin					18.99%
SG&A Expense	12.68%	12.31%	12.62%	11.68%	11.25%
Research & Development	5.14%	5.22%	5.41%	5.11%	5.13%
Other SG&A	7.53%	7.09%	7.21%	6.57%	6.12%
SGA Growth	3.92%	-9.46%	3.98%	7.64%	
Other Operating Expense	-0.21%	-0.04%	0.28%	-0.15%	0.49%
EBIT	7.68%	7.30%	4.63%	7.26%	7.03%
Unusual Expense	2.96%	1.57%	0.24%	-0.02%	-0.30%
Non Operating Income/Expense	0.49%	0.55%	0.02%	0.10%	-0.43%
Non-Operating Interest Income	0.40%	0.36%	0.35%	0.39%	0.47%
Equity in Affiliates (Pretax)	0.01%	-0.02%	-0.03%	-0.02%	0.01%
Interest Expense	0.42%	0.64%	0.76%	0.65%	0.39%
Interest Expense Growth	61.64%	5.38%	-5.16%	-32.22%	
Gross Interest Expense	0.45%	0.67%	0.79%	0.68%	0.45%
Interest Capitalized	0.03%	0.03%	0.03%	0.03%	0.06%
Pretax Income	5.21%	5.95%	3.77%	7.12%	7.03%

Pretax Income Growth	22.27%	-40.62%	99.81%	10.36%	
Pretax Margin					7.03%
Income Tax	1.48%	1.71%	1.28%	1.88%	2.22%
Income Tax - Current Domestic	0.48%	0.58%	0.42%	0.49%	0.42%
Income Tax - Current Foreign	1.02%	1.06%	0.99%	1.35%	1.46%
Income Tax - Deferred Domestic	0.18%	0.05%	-0.46%	0.43%	1.19%
Income Tax - Deferred Foreign	-0.20%	0.03%	0.32%	-0.39%	-0.85%
Income Tax Credits					
Equity in Affiliates	1.43%	1.33%	1.24%	0.93%	0.86%
Other After Tax Income (Expense)	-0.13%	-0.21%	-0.24%	-0.22%	-0.21%
Consolidated Net Income	5.03%	5.34%	3.51%	5.94%	5.46%
Minority Interest Expense	0.01%	0.06%	-0.02%	0.02%	0.14%
Net Income	5.02%	5.28%	3.49%	5.93%	5.32%
Net Income Growth	12.84%	-37.55%	78.10%	0.16%	
Net Margin					5.32%
Extraordinaries & Discontinued Operations					
Extra Items & Gain/Loss Sale Of Assets					
Cumulative Effect - Accounting Chg					
Discontinued Operations					
Net Income After Extraordinaries	5.02%	5.28%	3.49%	5.93%	5.32%
Preferred Dividends					
Net Income Available to Common	5.02%	5.28%	3.49%	5.93%	5.32%
EPS (Basic)	100.00%	100.00%	100.00%	100.00%	100.00%
EPS (Basic) Growth	12.84%	-37.55%	78.10%	0.16%	
Basic Shares Outstanding					
EPS (Diluted)	100.00%	100.00%	100.00%	100.00%	100.00%
EPS (Diluted) Growth	12.84%	-37.55%	78.10%	0.16%	
Diluted Shares Outstanding					
EBITDA	16.81%	16.92%	16.18%	18.16%	17.08%

EBITDA Growth	7.92%	-15.53%	25.87%	5.60%	
EBITDA Margin					17.08%
EBIT	7.68%	7.29%	4.65%	7.26%	7.02%