

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



**Czech University
of Life Sciences Prague**

Master's Thesis

Financial analysis of the selected company

Kaisar Kulbayev

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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DIPLOMA THESIS ASSIGNMENT

Bc. Kaisar Kulbayev

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Financial analysis of the selected company

Objectives of thesis

The objective of this diploma thesis is to evaluate financial situation of the one of the biggest multinational IT company – SAP SE. The work is focused on the effectiveness of the financial and economic activities of the company during the period of 2016-2020. It aims to identify the factors affecting the efficiency of the company's financial activities.

As a sub-objective, the research work aims to:

- To select and explain terms used in the theory of Financial Analysis
- To collect available data from official open source
- To evaluate SAP SE's financial performance in 2016 – 2020
- To identify any potential weaknesses and provide suggestions to strengthen the existing situation of the firm on the market

Methodology

The research consists of the theoretical and practical parts. In the theoretical part, the theory behind the thesis is explained. The reviewed literature defines fundamental terms, theories and methods of financial analysis.

Practical part of this thesis contains results of the financial analysis of SAP SE, employing chosen methodology. Based on the results, conclusions can be made whether the industry in which the company operates represents an area where further growth can be attained. In addition summarizing all the provisions of the company, it is necessary to provide a number of recommendations for the company.

The proposed extent of the thesis

60-80 pages + appendices

Keywords

IT, Vertical analysis, Horizontal analysis, Ratio analysis, Financial statement analysis

Recommended information sources

BERNSTEIN, L. A. *Analysis of financial statements..*

KOVANIC, P. – KOVANICOVÁ, D. *Poklady skryté v účetnictví. Díl 2, Finanční analýza účetních výkazů..*

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The Diploma Thesis Supervisor

Ing. Pavel Kotyza, Ph.D.

Supervising department

Department of Economics

Electronic approval: 10. 3. 2022

prof. Ing. Miroslav Svatoš, CSc.

Head of department

Electronic approval: 11. 3. 2022

doc. Ing. Tomáš Šubrt, Ph.D.

Dean

Prague on 30. 11. 2022

Declaration

I declare that I have worked on my master's thesis titled " Financial analysis of the selected company" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 30.11.2022

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Financial analysis of the selected company

Abstract

The thesis focuses on using financial methodologies to assess the financial performance of a selected company. Financial health and stability are assessed based on the results, and appropriate recommendations for improving economic and financial efficiency are made. In the first chapter, theoretical concepts are defined, and they are then used in the analytical section of the thesis. All of the findings are methodically reported, analysed, and the explanations of their changes are determined. In addition, the results are compared to industry averages, and any discrepancies are evaluated. All of the results are taken into account, and recommendations for enhancing the company's financial performance are made while considering financial and economic circumstances into account.

Keywords: IT, Vertical analysis, Horizontal analysis, Ratio analysis, financial statement analysis

Finanční analýza vybrané společnosti

Abstrakt

Práce se zaměřuje na využití finančních metodologií k hodnocení finanční výkonnosti určitého podniku. Na základě výsledků je hodnoceno finanční zdraví a stabilita a jsou vydávána vhodná doporučení pro zlepšení ekonomické a finanční efektivnosti. V první kapitole jsou definovány teoretické pojmy, které jsou následně použity v analytické části diplomové práce. Všechny výsledky jsou metodicky reportovány, analyzovány a změny vysvětleny. Výsledky jsou navíc porovnávány s odvětvové průměry a případné nesrovnalosti jsou vyhodnoceny. Všechny výsledky jsou zohledněny a doporučení byli řečeny pro zlepšení finanční výkonnosti společnosti s ohledem na finanční a ekonomické okolnosti.

Klíčová slova: IT, Vertikální analýza, Horizontální analýza, Poměrová analýza, Analýza účetních výkazů.

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1. Introduction

Financial analysis is a comprehensive process of evaluating a company, including but not limited to its profitability, capital structure, capital efficiency, and liquidity, using a variety of analytical methodologies and standardized techniques based on past financial statements. In general, financial analysis can be viewed from many standpoints, such as of investors, management, government, special-purpose institutions, etc. The topic is relevant as in today's competitive business environment, the issue of a business object's financial stability is at the forefront, because the financial challenges that businesses encounter are mostly similar in economic nature, they may be solved using universal instruments and standard measures that create a mechanism for controlling an organization's financial stability.

In this thesis, I will be covering and performing the financial analysis of SAP SE - multinational software company. The company develops business software, including e-business and enterprise management software, consults on organizational usage of its applications software, and provides training services. SAP markets its products and services worldwide. The rapid rise of the IT industry has not always been accompanied by the rapid development of economic and finance sciences. Distinct enterprises around the world are inventing new business models and in particular, new ways of employing available resources to generate a profit, but there is no consensus in academic discussion about the consequences, positive and negative externalities, that all these new approaches might have. Deep analysis of the IT industry and IT companies is required to expand scientific understanding and to be better able to foresee potential social and economic impacts.

In the first part of the diploma thesis, I will look at the current scientific observations regarding the importance of financial analysis. In this chapter I will look for the main definitions and approaches of financial analysis. The aim of this chapter is to look for reasonable evidence of how certain factors can impact the financial performance of the company and to look for counterarguments between certain statements with proper justification of these standpoints.

Practical part of this thesis contains results of the financial analysis of SAP SE, employing chosen methodology, i.e., horizontal and vertical analysis of financial statements, ratio analysis and DuPont model with Altman Z-Score.

Results and Discussion part is devoted to compare the results of the current research with other existing pieces of research, as well as to compare with industry average and benchmark company. This chapter also generalizes the results of the research, evaluating the results of the research and discussing possible outcomes. The last part of this thesis is a conclusion, where research questions will be answered.

2. Objectives and Methodology

2.1. Objectives

The implementation of financial analysis is worthy for every company because it provides deep and detailed picture of a company's economic activities, its strengths, weaknesses, opportunities, and threats, information about financial health and of course firm's total quality management. (Kovanicová, 2005)¹

Concerning the statement above, the main thesis goal is to describe the methodology of financial analysis and based on provided theory bring deep analysis of financial performance of a selected company SAP SE. The aim of this paper is to evaluate financial health of the company within defined time-period 2015 – 2020. On the basis of the results, make various proposals to improve the company's long-term direction. To achieve the general goal of this thesis, it is crucial to set the following sub-objectives:

- To select and explain terms used in the theory of Financial Analysis
- To collect available data from official open source
- To evaluate SAP SE's financial performance in 2015 – 2020
- To identify any potential weaknesses and provide suggestions to strengthen the existing situation of the firm on the market.

Consequently, the author is focused on the following research questions that needed to be answered:

- 1) What factors impact an overall performance of SAP between the period of 2015 – 2020.
- 2) What kind of relevant information was highlighted in the financial statements of the SAP SE by auditor, that could help the author distinguish the annual changes in: Assets, Liabilities and Equity?

¹ Kovanicová, D. (2005): Financial accounting: the world concept of IFRS/IAS. Bova Polygon. ISBN: 807-273-129-7. Page of citation: 246.

2.2. Methodology

In order to evaluate the company's financial situation, both quantitative and qualitative analysis techniques will be used in this diploma thesis. This process will be done by evaluating the financial indicators based on the balance sheets, cash flow statement and income statements of the company. The financial statement would be examined and processed by the author based on the company's previous official statements. Time period of the research cover 2015-2020, and annual values of individual indicators are considered. Vertical analysis is done in classic way, where each line item is listed as a percentage of a base figure in the document, so line items on a income statement can be reported as a percentage of gross revenue, while line items on a balance sheet can be stated as a percentage of total assets or liabilities, and vertical review of a statement of cash flow reveals each cash inflow or outflow as a percentage of total cash inflow. The year 2015 is used as the base year for horizontal analysis in current research. This method was chosen to find trends in the development of various balance sheet components. Since the company makes a significant number of new business acquisitions and adds new product lines to its product portfolio on a regular basis, it is critical to understand how these business operations affect the development of individual financial indicators over a given time-period. A significant part of the literature review also outlines ratio indicators such as: liquidity, profitability, leverage, activity ratio and with Altman Z-Score and DuPont model.

The empirical part of the thesis is strictly based on the financial analysis of SAP SE. The author applied the following methodology: horizontal and vertical analysis of financial statements, DuPont model and ratio of annual changes of a certain raw in the financial analysis.

Based on the results, conclusions can be made whether the industry in which the company operates represents an area where further growth can be attained. In addition, summarizing all the provisions of the company, it is necessary to provide a few recommendations for the company.

3. Literature review

This chapter is dedicated to the theoretical background of financial analysis. There are different methods of evaluation of a company's financial performance and how management make decisions about its future investments into the tangible assets or intangible assets. However, it is determined to evaluate the financial health of a company as well as defining the strengths and weaknesses.

3.1. Definition of financial analysis

In terms of financial analysis, three elements should be highlighted: the concept of financial analysis, its tools, and its role. According to Gil Lafuente (2005), financial analysis in business is considered an aspect of financial management in business, and it includes the investigation of the connections that exist between monetary facts and internal phenomena in the same, as well as the consequences. As Steven Bragg (2007) pointed out, the controller is expected to do more than just execute transactions, he or she is also expected to analyze business operations on a regular basis, evaluate investments, report difficulties, and make recommendations to management. Therefore, to respond to special investigation requests from the management team. All of these new responsibilities can be classified as financial analysis because they entail applying financial review methodologies to a company's operational and investment activities.

The financial health reflects the company's condition and its financial situation of an enterprise which is heavily depends on an efficiency of how the capital is used. Eventually, at the end of the year, management evaluates its profitability with the special indicators.

Bank and Tarasquina (2006) claim that the liquidation measurement can depict the financial position and that is directly linked with the financial risk, as liquidity is associated with an ability to cover its financial obligations, whether of a short-time or long term. Tarasquina et., el. (2006) states that it is very important to evaluate the company's decision regarding capital structure and it could predict the future performance of a company.

Regarding the above statements we can conclude that financial analysis is the process of distinguishing the financial quality and identifying of weaknesses of the chosen firm or company

by properly setting up connection between financial statements items. A financial statement is consisting of conceptual and logical framework collection of the data, steady accounting procedure. Its aim is to communicate an understanding of some financial aspects of the business. It may appear a position at a moment of time as time, as within the case of and income statement.

3.2. Financial statement

The financial statements are split into three different statements, balance sheet statement, income statement or (profit & loss statement), and cash flow statement. The author focuses on describing all statement below, however, there are lots of approaches on how to view those statements.

Each financial statement reflects the transactions which goes through accounting system and based on those transaction, the users of financial statements can detect the movement of assets, liabilities and an overall positioning of the company for a certain period of time. As mentioned by Bocharov (2007) that information obtained from the stated statements, managers, investors, and users of financial statements are able to make conclusions based on the company's performance over a year. However, when performing financial analyses, there are a few aspects needed to be considered, such as: objectivity, efficiency, and applicability (Steven Bragg, 2007).

Applicability is deemed to implement the methods which are adequate in light of practical options and conditions of the company.

Objectivity considers the defined goals of the company, more on a realistic level, however, from an audit perspective, there is always a materiality^[2] to consider.

Efficiency – the performance of the company should be efficient, in a way that its costs doesn't exceed the gross profit. To conclude, the evaluation of any company should consider the mentioned aspects.

² Materiality means not just a quantified amount, but the effect that amount will have in various contexts. During the audit planning process, the auditor decides what the level of materiality will be, considering the entirety of the financial statements to be audited.

3.2.1. Consolidated Balance Sheet

The balance sheet statement is one of the basic reports that every company uses to establish its equivalent of Assets, Liabilities and Equity. The golden rule of balance is that all non-current assets should be financed by equity and long – term liabilities, whereas, current – assets should only be used to cover its current liabilities, which leads to a summarization of a balance that, the equity and long – term liabilities would cover non – current assets. The **Table – 1**, summarizes the records on the right side, which mostly concern company’s assets and left – side illustrate the liabilities and the source of founding in case of (monetary loan, registered capital, etc.) et, el. Houston (2009), the balance equation is illustrated below:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Total Equity}$$

Table 1: Balance sheet

Balance sheet	
Assets	Liabilities
A. Receivables from subscriptions	A. Equity
	A. I. Registered capital
B. Fixed assets	A. II. Share premium and capital funds
B. I. Intangible fixed assets	A. III. Funds from earnings
B. II. Tangible fixed assets	A. IV. Profit/loss previous year
B. III. Long-term financial assets	A. V. Profit/loss current year
C. Current assets	B. Other sources
C. I. Inventory	B. I. Reserves
C. II. Receivables	C. Payables
C. III. Short-term financial assets	C. I. Long-term payables
C. IV. Cash and bank accounts	C. II. Short-term payables
D. Accruals	D. Accruals

Source: 1 Own creation of the author. Data are based on standardized Balance sheet used in the Czech Republic

(1) Assets: defines by ISA-7³ on what the company owns, assets could be split into different categories, Fixed Assets and Current Assets.

(a) Fixed assets:

- **Tangible** – such assets which has physical form in nature (land, buildings, machinery, equipment, storage and etc.)
- **Intangible** – an asset that is not physical in nature. Goodwill, brand recognition and intellectual property, such as patents, trademarks, and copyrights, are all intangible assets. Intangible assets exist in opposition to tangible assets, which include land, vehicles, equipment, and inventory (Edwards & K. Webb,1984).

(b) Current assets: are defined by IFRS-1⁴ standards as:

- **Current inventories**
- **Trade and other current receivables**
- **Current tax assets**
- **Current biological assets**
- **Other current financial assets**
- **Other current non-financial assets**
- **Cash and cash equivalents**

Note: An entity shall classify an asset as current when:

- **it expects to realize the asset, or intends to sell or consume it, in its normal operating cycle**
- **it holds the asset primarily for the purpose of trading**
- **it expects to realize the asset within twelve months after the reporting period; or**

³ ISA 7 – An asset is deemed to have a resource with economic value that an individual, corporation, or country owns or controls with the expectation that it will provide a future benefit.

⁴ IFRS 1 - On a balance sheet ([statement of financial position](#)), assets are typically classified into current assets and non-current assets (long-term assets). An entity shall classify an asset as current when (IFRS 1, IAS 1).

- **the asset is cash or a cash equivalent (as defined in IAS 7) unless the asset is restricted from being exchanged or used to settle a liability for at least 12 months after the reporting period.**

(2) **Liabilities:** as defined by IFRS 1 as A present obligation of the entity to transfer an economic resource because of past events. It could be classified into 3 different categories.

- Long term - these are all types of borrowed financial resources used by the enterprise with the due of more than one year. (Long term bank loans, issues bonds and etc.)
- Current - these are items of the balance sheet that shows liabilities with the due less than one year. (Short term bank loans, compensations, account payable and etc.)

(3) **Equity:** defined as, an amount of funds which was initially put by its owner, to start its business. The share price or a value set by valuation experts or investors is used to figure out the equity value.

- Registered capital – the capital which is registered in Commercial Registry (according to the Czech Republic law), every business owner should be registered with its VAT number (DIČ), Kovanicová (2005) on justice.cz⁵
- Retained earnings – the comparison of retained profits from previous years and actual year's profit)
- Capital funds – the difference between nominal price of shares and issuing price of shares
- Funds created from profit – funds which are created according to the company charter.

The golden rule of Balance Sheet Statement:

$$\text{Shareholders' Equity} = \text{Total Assets} - \text{Total Liabilities}$$

⁵ Justice.cz - The justice.cz portal mainly contains the official online commercial register, which brings together information from the register courts in the Czech Republic. In the public commercial register on the justice.cz portal, you will find basic information about entities registered in the commercial register - about Czech and Moravian legal entities, about certain natural persons for whom this is stipulated by law, and also about selected foreign entities.

3.3. Consolidated Financial Report

Consolidated financial statements is established in accordance with the IFRS 10, which meant to cover a group or a union of accounting, which are usually connected between a parent company and a subsidiary. Group accountings might have a few subsidiaries under its name, however, not all of them are listed on the stock markets.

For example, Niskanen (1998) describes a consolidated reporting as an environment of the whole economic entity, which demonstrates the health of the whole group. This type of reporting represents an aggregate look of the entity and makes those reports look more understandable and clearer, especially for investors with big funds.

Krimpmann (2015) defined a set of companies that merge in one entity and the group should consider the preparation of Consolidated Financial Statement (here after CFS). When all companies with their Financial Statements (here after FS) merge into a single enterprise, however, the acquisition of a parent company should always have more than 50 % of shares, such a structure listed below in the **Table – below**.

Investment	Associate	Subsidiary
Less than 20 % of shares	20 – 50 % of shares	More than 50 % shares

Source: ACCA Study Manual (2019)

- (1) **Parent:** IFRS defines a parent company which has a control over one or more subsidiaries which directly report its FS to its parent. It is almost the same as biological parents, however, a parent company has got a power over its subsidiary. Eventually, a parent company is also obliged to prepare its own FS, because they provide relevant information, besides its subsidiaries.
- (2) **Subsidiary:** Is often called as a daughter company, which is in control of its parent company, see, chapter above. The parent company is obliged to monitor its subsidiary; however, subsidiaries operate normally. Still, the subsidiary company should prepare its FS in the same way as a parent company proceeds.
- (3) **Control:** Control is not as easy as it seems, thus, the parent company always needs a confirmation of an auditor letter at the end of the financial year, due to an assessment of a third

party, which is independent. Therefore, such cases refer to the IFRS 10.8. which specify the requirement of control, especially for investors.

(4) Returns: The main objective of the investors are returns. Returns considered as a right on what investor is able to place, with monetary funds or provide with another assets, with the expectancy of repayment a certain level of interest. This refers to the IFRS 10.15-16.

3.3.1. Consolidated Cash-Flow Statement

They say that cash is a king. In truth, every business is heavily dependent on the cash flow and cannot function properly, due to constant payments to its suppliers, wage payments, returns to its investors. Eventually, if management set – up the correct monthly reports on cash – flow, they could track the flows of cash in and out of the enterprise and provide a relevant information.

More importantly, the cash flow statement is hard to manipulate with. The business might illustrate a healthy profit in its financial statements and yet have a shortage with the cash.

Based on the main objective of IAS7^[6] it deals with the history of cash-flow in order to track the movement of cash. There are several classifications to consider performing marking a transaction as an operating activity:

(1) Operating activity: is defined by: “Revenue produced with the principal of entity’s activity”.

Cash flows and outflows are raised due to the following:

- Cash received from sales of goods and services
- Cash payments from fees, commissions, and other revenue
- Cash payments due to its own employees
- Cash payments and its refunds due to income tax

(2) Investing activities is defined by: “An acquisition activity of a disposal asset for long–term and other activities which concern cash equivalents”.

^[6] ISA – IAS 7 *Statement of Cash Flows* requires an entity to present a statement of cash flows as an integral part of its primary financial statements. Cash flows are classified and presented into operating activities (either using the 'direct' or 'indirect' method), investing activities or financing activities, with the latter two categories generally presented on a gross basis.

- Cash payments to acquire property, plants, equipment, of tangible and intangible characters for a long-time period.
 - Cash payments to acquire equity or debt instruments (e.g. derivative's administrative fees, lawyers and etc.)
 - Cash receipts from the sale of equity
 - Cash advances and loans made to other entities, either within a subsidiary or third parties.
- (3) Financing activities:** is defined by: “Activity the result in changes of size and composition of the contributed equity and borrowings of the entity”
- Cash proceeds from issuance of shares
 - Cash proceeds from issuing loans and other types of borrowings
 - Cash payments to owners to acquire or buy-out the entity's own shares
 - Cash repayments of amounts borrowed

Reporting cash flow

A statement of cash-flow begins with the reporting cash flow activities which arose because of the operations from entity's activity. The cash-flow might be reported by using direct or indirect method.

Direct method – shows major classes (yet this method is required by IAS7, as it provides more detailed and effective information than the opposite “Indirect method”. The indirect method is acknowledged by IAS7 and used quite often in practice (Mahoney, 1988).

Indirect method – or “reconciliation” is more focused on differences in the net income and net cash flow operations. Many financial analysis and auditors, when performing the financial reports claim that the direct method requires an additional procedure to illustrate a reconciliation of net income and net cash, meaning that a company which performs its financial statements according to U.S. GAAP^[7] standards, should provide with additional supplements with indirect reconciliation (Edwards and Hemanson, 2014).

^[7] **Generally Accepted Accounting Principles** (GAAP or US GAAP) are a collection of commonly-followed accounting rules and standards for financial reporting.

3.4. Users of financial analysis

There are a lot of varieties of users of financial analysis of different business. The users can be external and internal. External users are limited by using only public-available sources to estimate the financial welfare of the company and decide “Is it worthy to cooperate with certain business or not”. Whereas internal users can rely on internal information to measure the financial situation of the business and finding ways how to increase or decrease certain financial numbers (Brealey, 2020).

O’Reagan (2016) categorized the users of financial information the following way:

- Shareholders and investors: This group uses financial information in order to determine the value of their investments. The source of information in their case are usually annual reports.
- Financial analysts: Analysts play a key role in the world of finance as it was earlier mentioned that reading financial statements can be hard to understand because reporting has to be according to regulations and laws. This group, therefore, uses the information provided in annual reports to advise their clients regarding their investments
- Management: This group uses primary financial information to navigate the direction of the set operating decisions.
- Employees: For the employees of the company financial data might be relevant in order to find out whether the company can offer them safe long-term employment.
- Lenders: Banks and other institutions need to know whether their loans are going to be repaid, so for them it is crucial to analyze financial statements in order to find out if the borrowers will be able to repay the loan on time.
- Taxation or other authorities: Official authorities will follow financial statements in order to determine whether the company recorded their financial information in line with the regulation in order to prevent customers from fraud.

Brigham and Houston (2013) The most important users out of the above mentioned can be narrowed down to management, lenders, and shareholders.

3.5. Financial analysis and its relevance

There are a lot of financial analysis that could be performed to evaluate the performance of an entity and identify its weakest points of all. In general, those analysis are required by parties which are directly related to an entity, such as Investors, banks that provide loans in big amounts, to track the economic behavior of a company Brigham and Houston (2013). The author has focused on vertical and horizontal analysis as well as the potential indicators that could illustrate the performance of a company based on its reported statement. However, the financial report statements are always noted by auditors, in this case, the author had to work with an audit letter of SAP, that was an additional part for financial reporting, to evaluate the importance of transactions for the further calculations Jermakomich (2007).

3.5.1. Vertical analysis

The use of vertical analysis is vital for evaluation of a firm's performance, as it focuses on the structural measurement of the separate items in the financial statements. The primary objective of the analysis is to determine the proportional value of each item of a financial statement in relation to a total base, accounting for 100%. In this respect, the technical analysis is also called a structural analysis.

$$P_i = (B_i / \sum B_i) * 100, \text{ whereas: } P_i - \text{is the share of } I - \text{the item in } (\%)$$

B_i – size

∑ B_i – summarization of all items

I – item number

3.5.2. Horizontal analysis

Horizontal analysis is the comparison of changes in particular items of financial statements over a series of reporting periods. It depicts the development of data horizontally over time, line by line, which enables observation of trends and comparison of the value of a particular item with its previous performance, as it deals with a relative change over time (Pinson, 2013).

$$\text{Absolute change} = \text{value}_t - \text{value}_{t-1}$$

$$\text{Relative (\&) Change} = (\text{Absolute Change} * 100) / \text{Value}_{t-1}$$

3.5.3. Ratio analysis

In this chapter the author has focused on main indicators that will be calculated within the practical part.

(1) Liquidity Ratio: defines the ability of a company to pay-off its liabilities due to workers, suppliers, tax, interests of loans etc. Liquidity ratios indicate the economic opportunities to pay its obligations otherwise, it might alarm the investors about the insolvency or in the worst-case scenario, to bankruptcy. However, it is considered to have a direct link between liquidity and insolvency. It might also illustrate how company is able to pay its unexpected needs that might come along with the entity's operations (Pinson, 2013).

The net working capital expresses the difference between the current assets and current liabilities, which eventually demonstrates the availability of cash after all liabilities are paid out. It shows the stability of a firm. The indicator directly linked with the liquidity criterion, how quickly a firm is able to convert its fund into cash and support its operations further with the available funds et el., Bragg (2007).

$$\text{Net working capital} = \text{Current assets} - \text{Current liabilities}$$

$$\text{Net working capital} = (\text{Equity} + \text{Long-term liabilities}) - \text{Fixed assets}$$

(a) Cash ratio - It is the most liquid ratio as it measures the relationship between cash and current liabilities that could be paid out.

$$\text{Cash ratio} = \text{Cash} + \text{Cash equivalents} + \text{Invested funds} / \text{Current liabilities}$$

(b) The current ratio – is considered to take a second place after cash ratio. It shows whether the enterprise has enough funds that can be used to pay off short-term obligations. According to international practice, the liquidity ratio should be between one and two. The value of the coefficient below the norm indicates the probable difficulties in the organization's repayment of its current obligations. However, to complete the picture, you need to look at the cash flow

from the organization's operational activities. Often, a low ratio is justified by a powerful cash flow. It is deemed that large companies, which is exactly the case of SAP company, operate in between 1.5 – 2 points of current ratio, based on the current assets and liabilities mentioned on the financial reports Jermakomich (2007).

$$\text{Current ratio} = \text{Currents assets} / \text{Current liabilities}$$

(c) **The quick ratio** – demonstrate the liquid part of capital such as (cash, receivables, short term – financing) in relation to short-term liabilities. The quick ratio is heavily important for a solvency ratio, and for the most time, the lenders of the company are interested in such ratio (Brealey, 2020). He also notes that the recommended ratio should be ranging close to 1.

$$\text{Quick ratio} = \text{Current assets} - \text{Inventories} / \text{Current liabilities}$$

(2) **Profitability Ratio:** defines the company's ability to produce the investments returns and generally generate the profit because of its activities. It demonstrates the performance of an entity and how management is capable to make effective decisions. Calculations of profitability ratios are based on the purpose of financial analysis and usually differentiate among each other. The Anglo-Saxon terminology is used to express the following (Brealey, 2020):

EBITDA (Earnings before amortization, depreciation, interest and taxes) is used to compare entities who operate within the same industry scope.

EBIT (Earnings before interest and taxes) indicate the remaining earnings after deduction of long-term costs.

EBT (Earnings before taxes) is used to compare the entities within the same industry scope however, with different taxation systems.

EAT (Earnings after taxes or, net income) demonstrates the business results which company achieved for a calendar year.

Profitability ratio can be classified between sales, equity, and assets. It indicates the ability of a firm to generate profit from the product's manufacturing and selling. However, the profitability usually indicates the Gross profit margin is a financial portion left from revenue after considering the costs of goods sold (hereafter COGS), the bigger gross profit margin the better it is for a company et. el. (Alvarez, 2011).

$$\textbf{Gross Profit Margin} = (\textbf{Revenue} - \textbf{COGS}) / \textbf{Revenue}$$

The following indicator is Operating profit margin which is known as a return of sales (hereafter ROS) indicates the profit after all expenses are paid to employees, variables costs, material utilized, before paying taxes and interest, also expressed in percentage.

$$\textbf{Operating Profit Margin} = \textbf{Operating Income} / \textbf{Revenue}$$

Net profit margin is the left portion of income after all expenses are paid out, even taxes and interest.

$$\textbf{Net profit margin} = \textbf{Net Income} / \textbf{Revenue}$$

(3) Activity Ratios: define the company's asset management, measures the effectiveness of company's operations. The assets of any company should somehow produce the profit; thus, a financial analyst should consider the sufficiency of these assets. For example, a rented building of a firm, which doesn't bring any profit to the company is an unnecessary cost for such company, which might lead the company spend more on its renting without any effect (Nobes, 2016).

(a) Asset turnover ratio: indicates how business owners uses its assets to generate profit. Basically, it indicates how many times per year total assets turn into sales. However, some companies include leases into the assets which later misleads the information about assets and the calculations should not consider neither financial leases nor operating leases as an asset of a company (Mahoney, 1988). The formula is shown below.

$$\textbf{Total Asset Turnover} = \textbf{Sales} / (\textbf{Total Assets})$$

(b) **Receivables turnover ratio:** indicates the turnover of receivables and how quickly based on sold goods and services, a company receives its payments from buyers. (Mahoney, 1988).

$$\text{Receivables Turnover Ratio} = \text{Revenue} / \text{Account Receivables}$$

(c) **Accounts payable turnover:** indicates how quickly the company pays out its debt to its suppliers based on bough material, goods, services and etc, however, the indicator doesn't consider the interest and obligations to banks. (Mahoney, 1988).

$$\text{Accounts Payable Turnover} = \text{Purchases} / \text{Accounts Payable}$$

(4) **Leverage Ratios:** define the proportion of total assets which are financed with debt. A high ration of assets to equity the same ratio will be proportionally equal of debt to equity. Another words, this ratio indicates a level of solvency of a firm.

(a) **Debt to equity ratio** indicates the level at which management is able to finance its operations with the use of debt, instead of own equity. leverage ratio O'Reagan (2016).

$$\text{Debt to Equity} = (\text{Long} - \text{term Debt} + \text{Short} - \text{term Debt} + \text{Lease} / \text{Equity}$$

(b) **Debt ratio:** indicates the ratio of total liability to its total assets. The optimal level of the ratio varies from 0.5 to 0.7. The optimal ratio is 0.5. The ratio below those indicates that the company is fully reliant on its own fund, hence, the ratio above the norm indicates the dependency of a firm on creditors.

$$\text{Debt Ratio} = \text{Total Liabilities} / \text{Total Assets}$$

(c) **Equity ratio:** indicates the share of assets which is covered by its own funds.

$$\text{Equity ratio} = \text{Equity} / \text{Total Assets}$$

3.5.4. Analysis of the cumulative ratios

Regardless of the fact that analysts regularly utilize several financial indicators listed above, individually they have a limited explanatory power since they focus exclusively on a single sector of business factors (profitability, activity, debt management, and others) (profitability, activity, debt management, and others). To measure the complex financial performance comprehensively, analyses of selected cumulative indicators are used. They're made to present a comprehensive picture of a company's entire financial and economic performance by linking different indicators and analyzing existing interconnections and dependencies.

A variety of methods are used to create a set of cumulative indicators. One of the most widely used methods is the pyramid decomposition of ratios. It demonstrates how a top indication is divided into several partial components using mathematical relationships, allowing analysts to properly capture logical and economic interdependency between the individual indicators. Credibility and bankruptcy models are part of a set of cumulative indicators in which a number of partial qualities are combined into a single variable (an index) that allows users to assess a company's performance holistically or alerts them to a company's risk of default. The techniques are discussed in more detail below. (Marshall Hargrave Investopedia, 2019).

3.5.4.1. *DuPont model*

There are several different ratios that are involved in the calculation of Du Pont model. The model helps to identify the impact of individual indicators on return on equity (ROE) and (ROA). The model helps to identify the strangeness and weaknesses of a company. It considers the following indicators, and its decomposition will be shown below: Net Profit Margin, Asset Turnover and Equity Multiplier.

$$\mathbf{DuPont = Net Profit Margin * AT * EM}$$

Net Profit Margin measures the amount of profit after taxes and all expenses have been deducted from net sales (Steven M. B. Second Edition of Business Ratios and Formulas: Comprehensive Guide 2006).

$$\text{Net Profit Margin} = \text{Net Income} / \text{Revenue}$$

AT - Represents company's efficiency in a use of assets (Marshall Hargrave Investopedia, 2019).

$$\text{Asset Turnover} = \text{Sales} / \text{Average Total Assets}$$

Equity multiplier represents the amount of a financial leverage (impact) used by a company (Marshall Hargrave Investopedia, 2019).

$$\text{Equity Multiplier} = \text{Average Total Assets} / \text{Average Shareholder's Equity}$$

3.5.4.2. Altman – Z score

The model tests a firm for its creditworthiness and identifies the level of probable bankruptcy, whereas Z – score is define by the following factor. The financial ratios which are included in the formula are

$$Z - score = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

Whereas:

$$A = \text{Working Capital} / \text{Total Assets}$$

$$B = \text{Retained Earnings} / \text{Total Assets}$$

$$C = \text{EBIT} / \text{Total Assets}$$

$$D = \text{Market value of Equity} / \text{Total Liabilities}$$

$$E = \text{Sales} / \text{Total Sales}$$

The outcome of Z – score, after considering all relevant transactions and properly performed financial statements, if the number of Z – score is higher than **2.99**, it indicates the financial health of the company and most probably, the company won't go bankrupt soon. The z-score value as **1.81** is called „distress zone“ indicates a high probability of being bankrupt. The ratios in between those two are called „a grey area“.

4. Practical part

4.1. Overview of SAP SE

Founded in 1972, SAP is a global company headquartered in Walldorf, Germany, legal corporate name is SAP SE. SAP has been named a market share leader in the following areas worldwide: enterprise applications software, enterprise resource management applications, supply chain management applications, procurement applications software, travel and expense management software, and enterprise resource planning software, among others. The SAP Group has a global presence and employs more than 100,000 people. The company offers a comprehensive range of business software and enterprise applications that are designed for applications, analytics, cloud, mobile, and database, and technology operations. SAP serves clients in the areas of consumer, discrete manufacturing, energy, and natural resources, financial services, and public services. The company has an operational presence in Europe, the Middle East, Africa, the Americas, and Asia-Pacific. (SAP SE, 2021)

SAP SE is the world's seventh largest independent software manufacturer by market capitalization. SAP SE serves more than 450,000 clients in more than 180 countries, according to the company's official figures. Simultaneously, small and medium businesses account for over 87% of SAP clients. Almost 92 percent of the Forbes Global 2000 corporations, 99 percent of the 100 most valuable brands. SAP clients generate 78 percent of the world's food and 82 percent of the world's medical products, according to their economic impact. (2021 SAP Corporate Fact Sheet) It's worth noting that 80 percent of global transaction income passes through one or more SAP systems.

SAP SE is formed under one of Europe's most unusual corporate structures. SE stands for Societas Europaea (or European society or corporation), a type of business entity registered under European corporate law. The Council Regulation (EC) No 2157/2001 defines this sort of corporation (The Council of European Union, 2001).

From 2014 to 2018, SAP used techniques such as linear regression analysis to document the financial impact of four non-financial indicators: the Business Health Culture Index, the Employee Engagement Index, employee retention, and carbon emissions. In the past, SAP has assessed each indicator to see what a change of one percentage point (or 1% for carbon emissions) would mean

for our operating profit. The results for 2018, for example, showed that a 1pp change in the Business Health Culture Index affected our operating profit by €90 million to €100 million. (SAP SE, 2021)

SAP provides a comprehensive set of solutions for customers to better navigate spend management decisions aligned with corporate strategies. It brings together SAP's intelligent spend management solutions including products branded under *SAP Ariba*, *SAP Concur*, and *SAP Fieldglass* as well as *SAP Business Network*. SAP's intelligent spend management solutions aim to address its customers end-to-end procurement, travel and expense, and external workforce needs with visibility across the entire supply chain.

One of the latest news of year 2021 is that SAP announces its intent to acquire Signavio, closed on March 5, 2021, and deepens SAP's business process intelligence capabilities, which represent the process layer within the SAP portfolio. Solutions from Signavio augment the spectrum of business process management solutions offered by SAP by adding process modeling, process mining, and process management capabilities. (SAP SE, 2021)

SAP continues to focus on organic investments in technology and innovations that ensure sustainable growth of its solution portfolio to drive their short-term, mid-term, and long-term ambitions. Additionally, SAP may make targeted acquisitions to complement the solution offerings and improve coverage in key strategic markets.

4.2. Financial analysis of SAP SE

The information used in the analysis comes from SAP's annual reports and audited consolidated financial statements, which are prepared in accordance with International Financial Reporting Standards (IFRS).

4.2.1. Vertical Analysis of Consolidated Balance Sheet

The author has chosen to begin the horizontal analysis of the balance sheet – as the source of the company's financial position – as one of the first stages in the practical part. The purpose of performing a vertical balance sheet analysis is to show how each item impacts the total values. The main balance sheet items will be shown in the following graph over time, since certain components

may increase their influence while others may decrease. Assets side of common-size statement of financial position is shown in **Table - 2**.

Table 2: Common-size statement of financial position of SAP SE for the fiscal year 2015-2020, assets.

	2015	2016	2017	2018	2019	2020
Cash and cash equivalents	8,24%	8,36%	9,44%	16,75%	8,83%	9,08%
Other financial assets	0,85%	2,54%	2,33%	0,87%	0,49%	2,80%
Trade and other receivables	12,74%	13,38%	13,88%	12,36%	13,13%	11,28%
Other non-financial assets	1,13%	1,31%	1,71%	1,73%	1,97%	2,26%
Tax assets	0,57%	0,53%	0,72%	0,57%	0,84%	0,36%
Total current assets	23,53%	26,12%	28,07%	32,28%	25,26%	25,77%
Goodwill	54,82%	52,65%	50,06%	46,08%	48,43%	47,13%
Intangible assets	10,34%	8,55%	6,98%	6,27%	7,46%	6,47%
Property, plant, and equipment	5,30%	5,83%	6,98%	6,90%	9,13%	8,62%
Other financial assets	3,23%	3,07%	2,72%	2,98%	3,88%	6,01%
Trade and other receivables	0,21%	0,28%	0,28%	0,23%	0,21%	0,23%
Other non-financial assets	0,80%	1,20%	1,46%	2,53%	2,82%	3,29%
Tax assets	0,68%	1,02%	1,04%	0,77%	0,72%	0,46%
Deferred tax assets	1,09%	1,29%	2,40%	1,97%	2,08%	2,01%
Total non-current assets	76,47%	73,88%	71,93%	67,72%	74,74%	74,23%
Total assets	100%	100%	100%	100%	100%	100%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

The structure of SAP SE's assets from 2015 to 2020 demonstrates that non-current assets outnumber current assets. Non-current assets reached their highest value in 2015, accounting for 76.47% of total assets, The following two years were followed by a slow decline which resulted in a total of 8.75% decline in 2018 compared to 2015, however got back to track in 2019. The author might see a minor effect of recent crisis of COVID-19, as its non-current assets haven't changes in between 2019 and 2020. Fixed assets, such as equipment, property, plants, and intangible assets, as well as long-term financial investments, might contribute to the increase of non-current assets I the last two years 2019-2020. Non-current assets are less likely to be converted to cash quickly,

hence this might be seen as an indication of decreasing liquidity. Non-current assets are expected to continue to have a dominant position in the future, based on the current corporate structure.

In the years 2015-2020, the common-size statement of financial position shows that only one balance sheet item, goodwill, comprised more than half of SAP SE's total assets. At the same time, goodwill was marginally smaller in 2018 and 2020, accounting for nearly half of SAP SE total assets. **Table - 2** demonstrates that the value of Total Assets was mainly supported by the component of the Total Long-term Assets – Intangible Assets. Intangible Assets beside the Goodwill, represent the brand recognition and intellectual property, such as patents, trademarks, and copyrights.

During the period 2015-2020, goodwill accounts for the majority of non-current assets. Mergers and acquisition of Signavio has certainly increased the goodwill indicator, and other companies result in the creation of goodwill on the balance sheet.

When looking at current assets more closely, Trade and other receivables are the item that has the largest impact on the assets. This can be interpreted as a statement indicating the company is profitable, but that the profits have not yet been transferred to the company's bank accounts. However, in order to have a deeper understanding of receivables, an analysis of the Receivables Turnover Ratio is required, this will be a part of a broader liquidity ratio analysis in the next chapters.

Concerning the company's equity and liability items, they were growing considerably over time, liabilities, and equity side of common-size statement of financial position is shown on **Table - 3**. Liabilities and equity illustrate how the assets of the company are being financed. In the graph below all items are divided by total equity and liability. The main aim of this approach is to show how much of the total assets are being financed by liabilities and equity.

Table 3: Common-size statement of financial position of SAP SE for the fiscal year 2015-2020, Liabilities and equity.

	2015	2016	2017	2018	2019	2020
Trade and other payables	2,63%	2,89%	2,71%	2,89%	2,63%	2,07%
Tax liabilities	0,56%	0,71%	1,41%	1,19%	0,42%	0,71%

Financial liabilities	2,03%	4,09%	3,67%	2,18%	5,44%	4,02%
Other non-financial liabilities	8,23%	8,35%	9,37%	8,00%	8,04%	7,94%
Provisions	0,72%	0,41%	0,35%	0,21%	0,41%	0,12%
Deferred income	4,83%	5,38%	6,52%	5,88%	7,08%	7,10%
Total current liabilities	19,01%	21,85%	24,03%	20,36%	24,02%	21,96%
Trade and other payables	0,20%	0,29%	0,28%	0,25%	0,01%	0,17%
Tax liabilities	0,97%	0,82%	1,02%	0,96%	0,89%	1,14%
Financial liabilities	20,97%	14,64%	11,85%	20,49%	21,46%	23,27%
Other non-financial liabilities	0,80%	1,04%	1,21%	0,97%	1,59%	1,32%
Provisions	0,43%	0,49%	0,77%	0,52%	0,56%	0,63%
Deferred tax liabilities	1,08%	0,93%	0,59%	0,19%	0,13%	0,27%
Deferred income	0,26%	0,32%	0,19%	0,17%	0,15%	0,06%
Total non-current liabilities	24,71%	18,53%	15,91%	23,56%	24,79%	26,85%
Total liabilities	43,72%	40,38%	39,94%	43,92%	48,81%	48,82%
Issued capital	2,97%	2,78%	2,89%	2,39%	2,04%	2,10%
Share premium	1,35%	1,35%	1,34%	1,05%	0,91%	0,93%
Retained earnings	48,43%	50,37%	58,30%	53,23%	47,80%	54,77%
Other components of equity	6,19%	7,56%	1,20%	2,40%	2,94%	1,73%
Treasury shares	-2,72%	-2,48%	3,74%	3,07%	2,62%	5,25%
Equity attributable to owners of parent	56,21%	59,57%	59,98%	55,99%	51,06%	50,82%
Non-controlling interests	0,07%	0,05%	0,07%	0,09%	0,13%	0,36%
Total equity	56,28%	59,62%	60,06%	56,08%	51,19%	51,18%
Total equity and liabilities	100%	100%	100%	100%	100%	100%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

In accordance with the proposed data in **Table - 3**, it is clearly seen that capital is the fundamental source for financing the company throughout the entire time. Total equity represents the biggest portion of total equity and liabilities, accounting for maximum of 60.06% in 2017 and minimum 56,8% in 2018, at the end of 2020 there is still a high percentage ratio of total equity over 51.18%. The equity represents a high part of total assets, which indicates that company barely uses

external source of financing from banks and third parties, which gives a positive impression for investors.

Based on the analysis of Consolidated Statement of Financial Position data, the proportion between long-term and short-term was determined. Retained earnings seem to have a major part of total liabilities with the equity attributable to owners of a parent. Which says that, most of its liabilities are in side of one subsidiary. It probably indicates the effectiveness of working groups among each other. The retained earnings also high which demonstrates that company's gross profit hasn't been settled yet. Overall, liabilities demonstrates that company is highly profitable

4.2.2. Horizontal Analysis of Consolidated Balance Sheet

Horizontal analysis is used in current research to identify possible trends in development of balance sheet items. It is the second step of absolute indicator analysis. This analysis is required to diagnose the company's financial position and track significant changes in the results provided.

Table 4: Changes in statement of financial position of SAP SE for the fiscal years ended in 2015-2020, assets, € millions

	2015	2016 % change to 2015	2017 % change to 2015	2018 % change to 2015	2019 % change to 2015	2020 % change to 2015
Cash and cash	3411	8,53%	17,59%	152,92%	55,79%	55,70%
Other financial assets	351	220,23%	182,05%	27,64%	-15,38%	365,81%
Trade and other receivables	5274	12,32%	11,85%	20,63%	49,94%	25,01%
Other non-financial assets	468	24,15%	54,91%	89,96%	153,85%	182,26%
Tax assets	235	-0,85%	30,21%	24,68%	115,32%	-10,64%
Total current assets	9739	18,74%	22,50%	70,65%	56,21%	54,73%
Goodwill	22689	2,74%	-6,24%	4,57%	28,53%	21,47%
Intangible assets	4280	-11,54%	-30,68%	-24,60%	4,93%	-11,59%
Property, plant, and equipment	2192	17,70%	35,36%	62,09%	150,73%	129,97%
Other financial assets	1336	1,65%	-13,55%	14,97%	74,85%	162,87%

Trade and other receivables	87	44,83%	35,63%	35,63%	48,28%	57,47%
Other non-financial assets	332	60,24%	87,05%	291,87%	412,35%	480,12%
Tax assets	282	59,57%	57,09%	40,78%	54,26%	-3,90%
Deferred tax assets	453	26,05%	125,61%	124,06%	176,16%	158,94%
Total non-current assets	31651	3,36%	-3,42%	10,17%	42,18%	37,13%
Total assets	41390	6,98%	2,67%	24,40%	45,48%	41,27%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

The **Table - 4** and **Table - 5** illustrate the changes which occurred in the main parts of the balance sheet over the analyzed period, full table is available under appendix 1. All balance sheet items showed growth during 2015-2020, and in general this might be considered as positive sign. On the other hand, it is important to note that the results over time also have negative values. Total assets reflect constant growth in values from year to year. The maximum increase in total assets was recorded in 2019 (60215 million EUR). The rate of growth for various balance sheet elements, however, varied. In 2017 the total non-current assets decreased by 3,42 %. The biggest impact on the decline had the changes in intangible assets (-30,68 %), only non-current assets influenced by this.

From the financial report of SAP SE and auditing letter, the SAP SE has acquired a US company Gigya, Inc. which focused on access management solutions. As a consequence of that, the goodwill of a company rose due to such transaction. Additionally, the foreign currency exchange rate was impacted negatively, meaning that SAP SE has paid out more of its own currency. The data is shown in **Table – 5**.

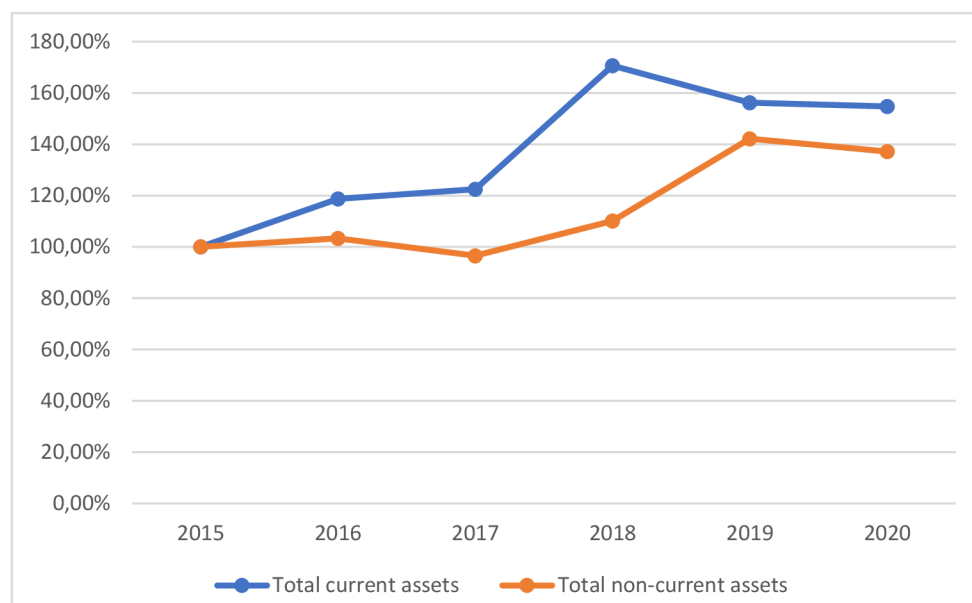
Table 5: Goodwill in 2017

	Single Segment
January 1, 2017	23311
Foreign currency exchange difference	-2249
Additions from business combinations	208
December 31, 2017	21274

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP

However, the pace of this growth was different for different balance sheet items. **Figure - 1** shows the trend in decreasing non-current and current assets for the period 2019-2020, however for the period of 2017-2018 total current assets rose more than 70%.

Figure 1: Changes in total assets of SAP SE for the period of 2015-2020, %



Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

The development of the structure of shareholders' equity and liabilities of SAP SE in the period 2015-2020 is illustrated in **Table - 6**, full table is available under **Appendix - 2**. Equity accounts for the largest portion of total assets, as shown in the vertical analysis of the financial statements. In this context, a detailed analysis of changes in equity accounts should help to determine SAP SE's financial health.

Table 6: Changes in statement of financial position of SAP SE for the fiscal years ended in 2015-2020, liabilities and equity, € millions

	2015	2016	%	2017	%	2018	%	2019	%	2020	%
		change		change		change	to	change	to	change	
		to 2015		to 2015		to 2015	2015	to 2015	to 2015	to 2015	
Trade and other payables	1088	17,74%		5,79%		36,58%		45,31%		11,49%	
Tax liabilities	230	37,39%		159,57%		165,65%		10,87%		80,00%	

Financial liabilities	841	115,58%	85,61%	33,77%	289,18%	179,19%
Other non-financial liabilities	3407	8,57%	15,82%	20,93%	42,03%	36,28%
Provisions	299	-38,80%	-38,46%	-63,21%	-17,39%	-75,59%
Deferred income	2001	19,09%	38,48%	51,32%	113,19%	107,40%
Total current liabilities	7867	22,97%	29,78%	33,23%	83,83%	63,24%
Trade and other payables	81	56,79%	46,91%	59,26%	-90,12%	20,99%
Tax liabilities	402	-9,20%	16,92%	23,13%	33,83%	65,92%
Financial liabilities	8681	-25,34%	-42,01%	21,56%	48,87%	56,72%
Other non-financial liabilities	331	39,27%	51,96%	51,36%	189,12%	132,63%
Provisions	180	20,56%	68,33%	50,00%	86,11%	104,44%
Deferred tax liabilities	448	-8,26%	-46,43%	-78,35%	-82,37%	-64,73%
Deferred income	106	34,91%	-25,47%	-16,98%	-16,04%	-66,04%
Total non-current liabilities	10228	-19,78%	-34,03%	18,63%	45,96%	53,52%
Total liabilities	18095	-1,19%	-6,28%	24,97%	62,42%	57,75%
Issued capital	1229	0,00%	0,00%	0,00%	0,00%	0,00%
Share premium	558	7,35%	2,15%	-2,69%	-2,33%	-2,33%
Retained earnings	20044	11,27%	23,70%	36,73%	43,60%	59,78%
Other components of equity	2561	30,65%	-80,16%	-51,82%	-30,89%	-60,52%
Treasury shares	-1124	-2,22%	41,55%	40,57%	-240,57%	173,31%
Equity attributable to owners of parent	23267	13,36%	9,64%	23,92%	32,14%	27,72%
Non-controlling interests	28	-25,00%	10,71%	60,71%	171,43%	653,57%
Total equity	23295	13,32%	9,64%	23,96%	32,31%	28,47%
Total equity and liabilities	41390	6,98%	2,67%	24,40%	45,47%	41,27%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

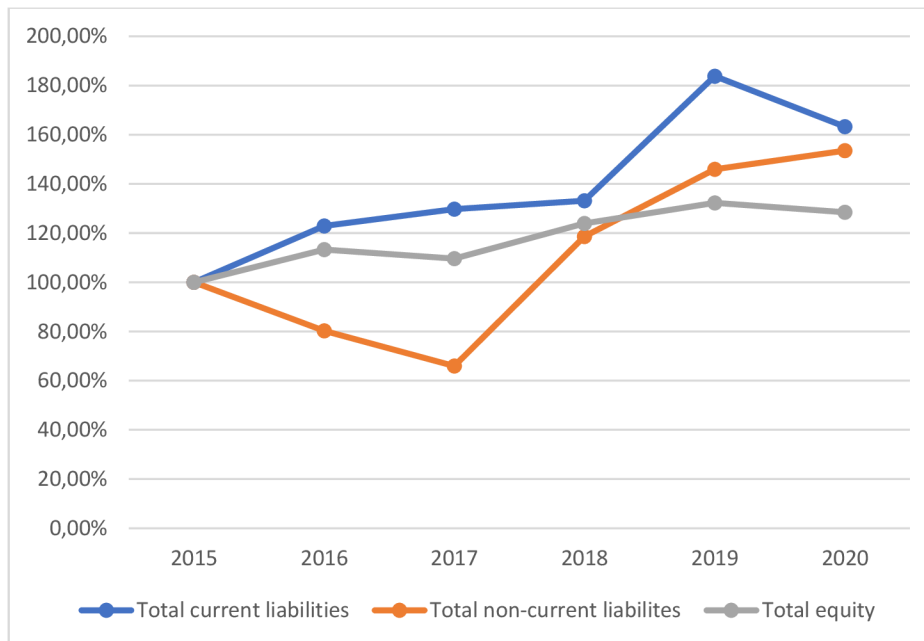
The results show that the total liabilities have mostly upward effect over the period from 2018-2020, except for 2015-2017. On the one hand, the highest growth in liabilities was recorded in 2019 (29 390 million EUR), that is not a positive growth because SAP SE attracted borrowing funds to finance its assets, on the other hand such a significant decline in 2017 (16 958 million

EUR) reflects that company is able to finance its assets by using own capital (equity) , this indicates a positive cash effect. From 2015 to 2018, there were an increase in accounts payable, this is due to the fact that the company used borrowed funds to finance its assets. On the contrary, 2019 recorded a decrease in accounts payable indicating that the company has repaid debts to suppliers. There are no significant fluctuations in values for the entire period in the total equity section.

Regarding the structure of equity, the most significant portion was made up by Retained earnings and Equity attributable to owners of parent. Retained earnings demonstrated positive dynamics over the period 2015-2020, resulting in a 59.78 percent gain until 2020. Retained earnings also account for the majority of total assets, which is a good sign for SAP SE's financial health. Companies with higher retained earnings balances are more likely to use internal means of funding rather than external sources of financing, such as debt or equity, and hence take on less credit risk. During economic or financial recessions, such a company is more stable and has a higher chance of overcoming crises.

Figure - 2 illustrates a comprehensive overview of the developments of current and non-current liabilities and equity from 2015 to 2020.

Figure 2: Changes in liabilities and equity of SAP SE for the period of 2015- 2020, %



Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

4.2.3. Horizontal analysis of Consolidated Income Statement

Horizontal analysis of the profit and loss statement (Income Statement) allows to track changes in individual account items over time (2015-2020). In this case dynamics are reflected in absolute (numerical) value- million EUR.

The **Table – 8**, demonstrates the overall sales and focus on the company.

Table 7: Income statement of SAP SE for the fiscal years ended in 2015-2020, millions, EUR, % change to 2015, part 1

	2015	2016	%	2017	%	2018	%	2019	%	2020	%
Cloud sub. and support	2286	2993	30,93%	3769	64,87%	4993	118,42%	6933	203,28%	8080	253,46%
Software licenses	4835	4860	0,52%	4872	0,77%	4647	-3,89%	4533	-6,25%	3642	-24,67%
Software support	10093	10571	4,74%	10908	8,07%	10981	8,80%	11547	14,41%	11506	14,00%
Cloud and software	17214	18424	7,03%	19549	13,56%	20622	19,80%	23012	33,68%	23228	34,94%
Services	3579	3638	1,65%	3911	9,28%	4086	14,17%	4541	26,88%	4110	14,84%
Total revenue	20793	22062	6,10%	23461	12,83%	24708	18,83%	27553	32,51%	27338	31,48%
Cost of cloud	-1022	-1313	28,47%	-1660	62,43%	-2068	102,35%	-2534	147,95%	-2699	164,09%
Cost of software licenses and support	-2291	-2182	-4,76%	-2234	-2,49%	-2092	-8,69%	-2159	-5,76%	-2008	-12,35%
Cost of services	-3313	-3089	-6,76%	-3158	-4,68%	-3302	-0,33%	-3662	10,53%	-3178	-4,07%
Total cost of revenue	-6626	-6583	-0,65%	-7051	6,41%	-7462	12,62%	-8355	26,09%	-7886	19,02%
Gross profit	14167	15479	9,26%	16410	15,83%	17246	21,73%	19199	35,52%	19453	37,31%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

By 2015, the company mostly oriented on supplying the cloud software and support of the software, those were the main focus of production. However, in comparison to 2020, the focus of

the company has drastically changed, it mainly shifted to supporting the cloud subscription support and cloud software and software support also stayed high. However, there is certainly a big increase in relation to 2015. The relative change is accounted for 253.46 % in cloud subscription support. However, most of its costs are also related to cost of services, which is accounted for almost 50 % of total costs in 2015. Still, there is also a shift in cost of cloud, a big increase in costs due to a higher demand in production, the numbers seem to have a common logic here. For the period of 2020, the costs of cloud increased by 164.09 %, in comparison to 2015.

Except for the cost of software licenses and support, the cost of revenue column of the income statement showed the same characteristics as the revenue section. The percentage and absolute changes in this income statement item were lower than the comparable revenue item, indicating that SAP SE's business is becoming more efficient.

The income statement's operating expenses area has very different characteristics than the revenue column. Research and development is the largest operating expenditure account, and it also has the fastest growing dynamics among the other operating expense accounts. Research and development expenses can be defined as an expense arising from studies and product development processes, the increase is mainly due to growing personnel costs and continued strategic investments. Also the sales and marketing expenses increased by 31.57 % between 2015 and 2020, rising from 5401 million EUR in 2015 to 7106 million EUR in 2020.

As a result of that the company releases new products and acquiring new companies, for example Concur in 2014, Qualtrics in 2019 allowing it to obtain fresh market awareness of its brand and engage with new audiences who were previously clients of different companies. Moreover, the effort put on new products and mergers began to straighten results year by year. The company's revenue began to become more predictable, as seen in the **Table - 8** operating profit rise from 4252 million EUR in 2015 to 6623 million EUR in 2020. This steady stream of positive revenue became a reliable source of funding for the company.

Table 8: Income statement of SAP SE for the fiscal years ended in 2015-2020, millions, EUR, part 2

2015	2016	%	2017	%	2018	%	2019	%	2020	%
	change		change	to	change		change	to	change	to
	to 2015		to 2015	2015	to 2015		to 2015	2015	to 2015	2015

Research and development	-2845	6,99%	17,82%	27,38%	50,86%	56,56%
Sales and marketing	-5401	16,00%	28,20%	25,55%	42,44%	31,57%
General and administration	-1048	-4,10%	2,58%	4,77%	55,44%	29,39%
Restructuring	-621	-95,49%	-70,69%	-96,94%	81,96%	-100,48%
Other operating income/expense, net	1	-400,00%	0,00%	-	1700,00%	8300,00%
				2100,00%		
Total operating expenses	-16541	2,34%	12,35%	14,90%	39,54%	25,23%
Operating profit	4252	20,77%	14,70%	34,13%	5,20%	55,76%
Other non-operating income/expense, net	-256	-8,59%	-85,94%	-78,13%	-71,09%	-30,08%
Finance income	241	-4,56%	92,12%	53,94%	226,56%	511,20%
Finance costs	-246	8,94%	13,01%	69,92%	139,43%	183,33%
Financial income, net	-5	660,00%	-3800,00%	840,00%	-4060,00%	-15620,00%
Profit before tax	3991	21,85%	25,93%	40,32%	15,16%	80,91%
Income tax expense	-935	31,44%	3,74%	61,60%	31,12%	107,27%
Profit after tax	3056	18,91%	32,72%	33,77%	10,27%	72,87%
Attributable to owners of parent	3064	18,99%	31,14%	33,26%	8,39%	67,92%
Attributable to non-controlling interests	-8	62,50%	-575,00%	-175,00%	-725,00%	-1825,00%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

Consequently, the horizontal analysis of the income statement demonstrated steady revenue and cost of revenue changes

4.2.4. Ratio analysis of SAP SE

The calculation and evaluation of ratio analysis are the subject of this chapter. Proportion ratios are an important instrument in a company's financial analysis. It gives a clear picture of the company's financial strengths and weaknesses.

4.2.4.1. Liquidity ratios

Liquidity analysis demonstrates a company's ability to pay off its debts on time. Liquidity indicators evaluate company's ability to transform various forms of assets into money that can be used to repay the debts.

According to current ratio indicator demonstrated in **Table - 9**, the company has stayed within the acceptable range of **1,0 -2,0** for the last five years. SAP's current liability coverage was quite excellent in 2018, indicating that the company is in good condition.

Table :9 Liquidity ratios

	2015	2016	2017	2018	2019	2020
Current Ratio	1,24	1,20	1,17	1,59	1,05	1,17
Quick Ratio	1,10	1,00	0,97	1,43	0,91	0,93
Cash ratio	0,43	0,38	0,39	0,82	0,37	0,41

Source: Own creation of the author

Since quick ratio mainly considers liquidity position, it is a more relevant and accurate indicator of a company's liquidity. It's worth mentioning the mixed year on-year dynamics of both current and quick ratios over several years. Overall, SAP's quick ratio changed throughout time, ranging in between the optimal level, which is **1.0 – 1.5**. If the value is less than one, the company would not have enough cash assets to pay its short-term obligations, which could be seen in the years 2017, 2019, 2020.

The most liquid assets, which including cash and cash equivalents, are used to compute the cash ratio. SAP shows signs that are within the acceptable range of **0.6 – 1.0**. As it can be seen from the **Table - 9**, only in the year 2018 the number was above the acceptable range. As all other indicators are still lower than 0.5 the cash ratio strategy of the company is considered to not healthy, and management should pay special attention to these issues.

4.2.4.2. Profitability ratios

Profitability indicators are obtained using the respective cost and sales calculations. A greater number could be interpreted as a positive indicator, that the company manage its capital effectively. SAP SE had a highly consistent gross profit margin, the average Gross Profit Margin calculated from the **Table – 10**, in 2020, for a company is 71.51% which means that the company has 71.15% of its capital paid to cover operational expenses, taxation, and the excess amount is considered as a profit.

Table 10: Profitability ratios

	2015	2016	2017	2018	2019	2020
Gross Profit Margin	68.13%	70.16%	69.95%	69,80%	69,68%	71,15%
Net profit Margin	14.69%	16.47%	17.28%	16,55%	12,23%	19,32%
ROE	14.27%	14.62%	15.61%	14,16%	10,93%	17,65%
ROA	7.64%	8.48%	9.34%	9,31%	7,94%	5,60%

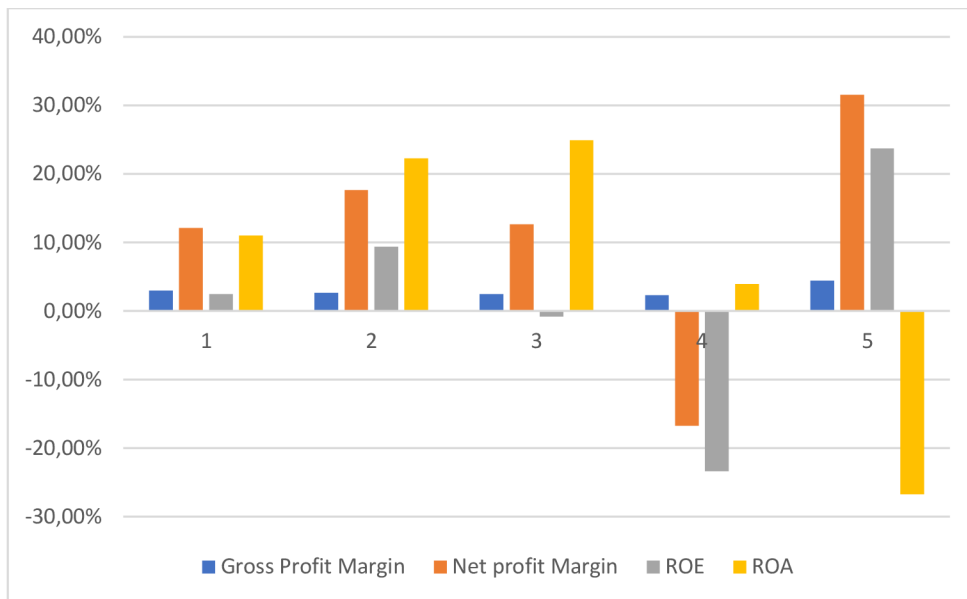
Source: Own creation of the author

The Net Profit Margin indicator was used to determine the net profit after all expenses were deducted. NPM decreased to 12.23 % from 16.55 % in 2019 and had the highest value in 2020 19.32 %. with an average of 16.09 % during the period 2015-2020.

The ROA number is significantly lower than the calculated ROE values. ROE considered as a Return on Investment for investors with regards to the risks involved. The return on equity should be greater than the cost of equity. **Figure - 3** below illustrates changes in profitability ratios from between the year 2015-2020.

The highest value of ROE was in 2020, as shown in **Table - 10**, demonstrating that the company was effectively leveraging shareholders' equity. In comparison to ROA, that the company has a lower number, indicating that profits are generated from equity rather than overall assets.

Figure 3: Changes in profitability ratios



Source: Own creation of the author

4.2.4.3. Activity ratios

Total asset turnover indicators evaluates if the company is effectively using its assets to generate income and profit. SAP's activity ratios were less than industry average from 2015 to 2020, indicating that the firm was not properly allocating and using its resources. The optimal industry asset turnover is **1.0** industry average results will be shown in the next chapter. The indicator that came closest to the optimal within 6 years was in 2017, with a ratio of 0,55. The lowest value of 0.46 was recorded in 2019. Asset turnover ratios of more than 50 % are generally could be considered as to be efficient in terms of revenue growth. The fact that goodwill accounts for more than half of SAP SE's assets as it was mentioned earlier could explain the lower asset turnover ratio. To summarize, SAP SE failed to realize synergetic benefits from acquisitions between 2015-2020.

Table 11: Activity ratios

	2015	2016	2017	2018	2019	2020
Total asset turnover	0,50	0,50	0,55	0,48	0,46	0,47
Receivables turnover	3,94	3,72	3,98	3,88	3,48	4,15
Payables period	19,10	21,19	17,91	21,95	20,94	16,20

Source: Own creation of the author

The accounts receivable turnover ratio indicates how frequently a firm gets payment from its consumers for goods and services sold during the year. The industry average is **6**, from the **Table -12** above it could be said that SAP is quite unproductive in collecting its receivables. According to the analyzed data in 2019, the lowest receivables turnover ratio was 3.48 which was followed by an increase to 4.15 in 2020.

The payables period, on the other hand, indicates how many days the company owes on average for its trade payables. For customers and vendors, a long time of account payables is a negative consequence. From the **Table -11** we can see that there no major variations in the scope towards which obligations were fulfilled, in 2020 the value reached 16.2 which is a good sign.

4.2.4.4. Solvency ratios

Leverage ratios (solvency) provides insight into the company's financial stability by the proportion of debt and equity or sources of funding. High valuations of debt ratio led to more risky behaviors, as the company's funding shifts more toward the debt side, perhaps resulting in unpredictable returns. Form the other side, the lower value indicates a low risk, which may be explained by the fact that stockholders have a stronger presence in the firm's portfolio due to the large number of equities in the company.

Throughout the period 2015-2020, SAP SE's debt ratio was stronger than the industry average, which is fluctuating around **0.4** also financial debt / equity ratio of **0.5-0.7** is recognized as a healthy. Company, on average, uses more internal sources than external sources of finance than, showing the lowest value of 0.399 in 2019-2020.

Table 12: Solvency ratios

	2015	2016	2017	2018	2019	2020
Debt ratio	0,437	0,404	0,399	0,439	0,488	0,488
Equity ratio	0,563	0,596	0,601	0,561	0,512	0,512
Debt to equity ratio	0,777	0,677	0,664	0,783	0,954	0,954
Debt to capital	0,437	0,404	0,399	0,439	0,488	0,488

Source: Own creation of the author

During the period of 2015-2020, the company's equity ratio numbers have fluctuated just a little. The maximum level of 0.601 was set in 2017, which aligns with the previous calculation of debt ratio. The lowest number 0.512 was in years 2019-2020, which corresponds with the previous high debt ratio.

This finding demonstrates that increases in financial leverage were more attributable to changes in ROE than increases in net profit margin or asset turnover. Therefore, the Du Pont analysis shown below provides a more extensive look into this.

4.2.5. Analysis of the cumulative ratios

4.2.5.1. Du Pont - model

The SAP return on equity ratio is broken down in the Du Pont model below demonstrated in the **Table - 13**. Net profit margin, total asset turnover, and financial leverage are the three main components of the analysis. The company's return on equity is affected by changes in each of these components.

Table 13: Du Pont model

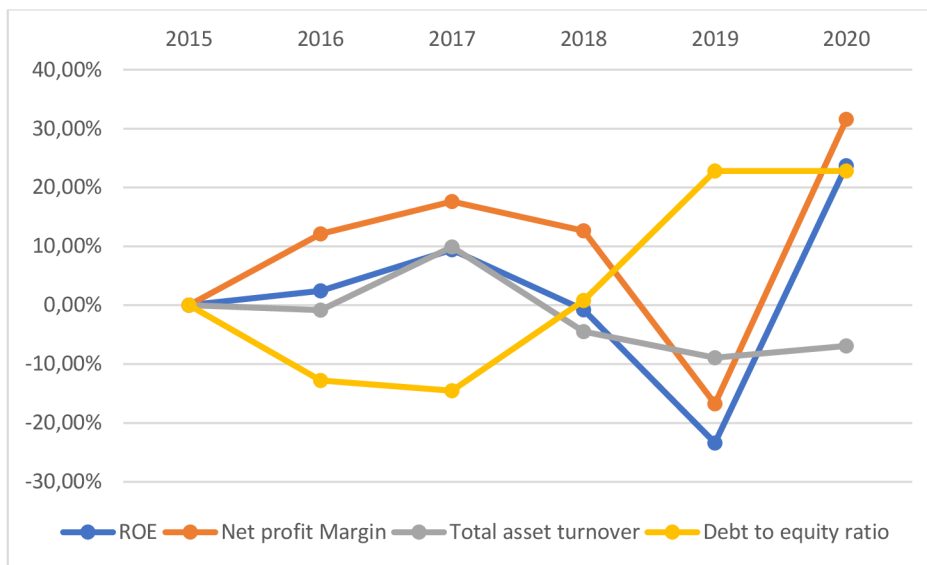
	2015	2016	2017	2018	2019	2020
ROE	0,143	0,146	0,156	0,142	0,109	0,177
Net profit Margin	0,147	0,165	0,173	0,165	0,122	0,193
Total asset turnover	0,502	0,498	0,552	0,480	0,458	0,468
Debt to equity ratio	0,777	0,677	0,664	0,783	0,954	0,954

Source: Own creation of the author

From the **Figure - 4** it could be seen that ROE had a steady growth from 2015 to 2020, which was accompanied also with the growth of NPM and asset turnover. Furthermore, there was a sharp decline of these indicators between the years 2017-2019. SAP delivered the lowest ROE value in

2019 with the value of 0.109. This was due to a decreased Net Profit Margin and Total Asset Turnover subsequently. The same year's rise in financial leverage, in general, signifies that a company has been aggressive in using debt to fund its operations. In 2020 it could be seen a growth of all components meaning that SAP was leveraging all components most effectively, SAP did take substantial steps to raise revenues, as demonstrated by the analysis.

Figure 4: Changes in Du Pont model, ref. year 2015



Source: Own creation of the author

4.2.5.2. Altman Z-Score

The Altman Z-score was used to SAP SE's financial statements to evaluate the company's financial performance and identify potential risks to its financial health and the possibility of declaring bankruptcy in the short term. This index's outcome is determined by the Z-score, which should be as great as feasible.

Net Working Capital needed for calculation of variable A is shown in the **Table - 14** below, it will be used also in the next chapter while comparing the results using benchmarking.

Table 14: NWC of SAP SE

	2015	2016	2017	2018	2019	2020
NWC	1872,00	1890,00	1720,00	6139,00	751,00	2227,00

Source: Own creation of the author

The results over the period 2015-2020 are shown in the **Table – 15**.

Table 15: Altman Z-Score

	2015	2016	2017	2018	2019	2020
A	0,054274	0,051223	0,048568	0,143070	0,014966	0,045704
B	0,677980	0,705170	0,816801	0,745175	0,669205	0,766801
C	0,339009	0,382716	0,378711	0,365499	0,245137	0,373784
D	3,186516	3,519996	4,731143	3,149111	3,284067	3,308786
E	0,502368	0,498272	0,552062	0,479851	0,457577	0,467540
Altman Z-Score	4,76	5,16	6,53	4,88	4,67	4,96

Source: Own creation of the author

As it could be seen from the table above, with values more than 3 over the years 2015-2020, the overall values show company's negative relationship to bankruptcy. As it is clearly seen from the **Table - 14**, variable D (Market Value of Equity/Book Value of Total Liabilities) is greater over the other financial indicators throughout the entire period. The second-largest component was generated by variable B (Retained Earnings/Total Assets), companies with higher retained earnings balances are more likely to utilize internal rather than external sources of funding, placing them at a lower risk of bankruptcy. During economic or financial crisis, SAP SE tends to be more stable and has a higher probability of recovering.

5. Results and Discussion

This chapter is the final component of comprehensive summarization of all preceding analysis and assessments. The obtained results will be compared with the SAP SE's direct competitor Oracle in the period of 2018-2020. Oracle is a computer technology corporation best known for its software products and services like Java. Through the company's four main business segments—cloud and license, hardware, and services - Oracle sells its cloud-engineering services and systems and database management systems. (Fortune, 2022)

Financial statements analysis

The financial analysis of balance sheet and income statement of SAP SE can be summarized in the following way:

Several components of the consolidated balance sheet and consolidated income statement have been examined through horizontal and vertical analyses. The structure of SAP SE's assets between the years 2015-2020 demonstrates that non-current assets outnumber current assets, which is inherent to IT companies. Non-current assets are less likely to be converted to cash quickly, hence this might be seen as an indication of declining liquidity. Non-current assets are expected to continue to have a dominant position in the future, based on the current corporate structure, this significantly increases the risk because non-current assets are more likely to lose value over time.

In the years 2015-2017, a single balance sheet item, goodwill, represented more than half of SAP SE's total assets. Over the six-year period 2015-2020, goodwill decreased from 54,82 percent in 2015 to 47,13 percent in 2020 and had the lowest value of 46,08 percent in 2018.

When comparing current with non-current payables, current payables appear to be more prevalent, which could be a disadvantage for a company. The overall structure of SAP SE's financial obligations indicates a short-term gradual decline, which can be seen as a good indicator because it reduces the company's need on external sources of financing, but it also reduces ROE. Long-term trends of growing financial liabilities and financial leverage have been observed between the years 2017-2020. SAP SE's financial stability is reinforced by the fact that retained earnings accounts for the majority of total assets. Also, it could be stated that increased concentration of

total equity as a percentage of the total assets indicates a highly stable financing structure. It could be perceived as a good indicator, particularly if there is a big risk of financial crisis.

Regarding the analysis of income statement, the relative variations in services cost of revenue remained smaller than the related revenue item, indicating that revenue of SAP SE's company is becoming more efficient. From the perspective of revenue, it could be concluded that SAP SE is transitioning to a cloud subscriptions-based business model rather than software publisher with the 253,46 percent growth in 2020 in comparison to 2015, while software licenses revenue account was declined by 24,67 percent in 2020. Sales and marketing is the largest operating expenditure account between the analyzed years 2015-2020 and it also has the fastest growing dynamics among the other operating expense accounts.

NWC

The official data from the Consolidated Statement of Financial Position is used in this assessment of net working capital. Throughout the period, the findings indicate positive values, indicating that current assets surpass current liabilities. As a result, the discovered findings effectively reflect the company's financial position, meaning that, its own working capital is sufficient for the effective realization of current activities without requiring the use of borrowed funds.

Table 16: NWC comparison, ref. year 2018

	2018	2019	% changes	2020	% changes
SAP SE	6139	751	-87,77%	2227	-64%
Oracle	30642	24342	-20,56%	50020	63%

Source: Own creation of the author according to annual reports

From the table above it could be seen that Oracle has higher results of NWC than SAP SE for the whole analysis period from 2018 to 2020. It's worth mentioning that a growth in the NWC value indicates that the company's liquidity and creditworthiness have improved also if the company's NWC grows too high, perhaps, company is inefficiently leveraging short-term liabilities and attracting long-term liabilities to fund its assets.

Liquidity ratio

Comparison of the liquidity ratio is shown on **Table - 17**. Based on the assessment of indicators, it can be determined that SAP SE`s liquidity ratios are lower than the industry average in the years 2019-2020, while competitor Oracle has higher values in the same years.

Table 17: Liquidity ratio comparison

	SAP SE			Oracle			Industry average		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Current Ratio	1,59	1,05	1,17	3,98	2,49	3,04	1,18	1,40	1,70
Quick Ratio	1,43	0,91	0,93	3,87	2,38	2,93	1,16	1,26	1,43
Cash ratio	0,82	0,37	0,41	2,17	1,10	1,13	0,62	0,85	1,03

Source: Own creation of the author according to annual reports, industry financial ratios benchmarking

Throughout the period, as it was mentioned in the previous chapters SAP SE`s values are not within acceptable range, the company would not have enough cash assets to pay its short-term obligations, which could be seen in the years 2019,2020. About the Oracle we can conclude opposite that company is within the acceptable ranges, even more, has no financial issues and can be classified as a solvent company competent of paying its outstanding obligations.

Profitability Ratio

Industry average values of profitability ratios for technology industry and profitability ratios of Oracle in comparison to SAP SE are shown on **Table - 18**.

When compared to industry average values of gross profit margin, SAP SE`s values were lower than industry average between the analyzed period, at the meantime, Oracle`s values were higher than industry average. The gross profit margin with high values means the company can cover its expenses of goods sold with net revenues. On the other hand, net profit margin of both SAP SE and Oracle were higher than average, which is more crucial in terms of profitability.

Table 18: Profitability ratios comparison

	SAP SE			Oracle			Industry average		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Gross Profit Margin	69,80%	69,68%	71,15%	79,54%	79,70%	79,80%	72.42%	77.4%	77.59%
Net profit Margin	16,55%	12,23%	19,32%	33,70%	34,30%	35,60%	13.87%	12.42%	14,43%

ROE	14,16%	10,93%	17,65%	7,60%	49,60%	79,70%	27,40%	19,10%	14,50%
ROA	9,54%	7,94%	5,60%	2,60%	10,10%	8,70%	5,90%	3%	5,40%

Source: Own creation of the author according to annual reports, industry financial ratios benchmarking

When comparing industry average and Oracle`s ROA and ROE to SAP SE's, a different scenario appears. Both companies showed a positive trend with no negative values. Competitors results of ROE were skyrocketed in the year 2019-2020, while SAP SE`s results were around the industry average. ROA of SAP SE and Oracle were higher than industry average, which could be considered as a good sign. It shows that SAP SE is more productive in gaining the revenue from its assets.

Activity ratio

Comparison of activity ratios is shown on **Table - 19**, where it could be seen that SAP SE asset turnover is more effective than the competitors, but still, it is below the industry average. This indicates that the company was not effectively allocating and utilizing its assets.

Table 19: Activity ratios comparison

	SAP SE			Oracle			Industry average		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Total asset turnover	0,48	0,46	0,47	0,29	0,32	0,31	0,66	0,67	0,56
Receivables turnover	3,88	3,48	4,15	7,53	7,59	7,61	5,79	5,89	5,79
Payables period	21,95	20,94	16,20	25,47	25,31	24,89	23,40	29,90	27,80

Source: Own creation of the author according to annual reports, industry financial ratios benchmarking

In the years 2018-2020, the SAP SE had significant delays in receiving payments from buyers. Throughout the whole time-period, SAP SE demonstrated the decreased turnover of receivables. When compared to SAP SE, Oracle collected payment from clients faster, with results that were above than the industry average. Payable period of SAP SE, oppositely, showed greater results than the competitor as well as the industry average because for customers and vendors, a longer time of account payables is a negative consequence.

Solvency ratio

Table 20 shows industry average solvency ratios for the technology industry, as well as Oracle's solvency ratios in comparison to SAP SE. The observed results demonstrated that SAP SE's liabilities being stable also indicating the company's preference funding more from equity capital. In comparison, Oracle's financing structure was completely different, where debt financing was significantly more prevalent.

Table 20: Solvency ratios comparison

	SAP			Oracle			Industry average		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Debt ratio	0,44	0,49	0,49	0,89	0,79	0,66	0,64	0,63	0,58
Equity ratio	0,56	0,51	0,51	0,11	0,21	0,34	0,50	0,44	0,49
Debt to equity ratio	0,78	0,95	0,95	1,50	2,20	1,80	0,09	0,10	0,07
Debt to capital	0,44	0,49	0,49	0,54	0,70	0,84	0,34	0,32	0,35

Source: Own creation of the author according to annual reports, industry financial ratios benchmarking

Throughout the period, SAP SE's debt to equity ratio was greater than the industry average. From the results obtained, it is clearly visible that SAP SE and Oracle, on average, uses more external sources of finance than the industry average companies. For the whole period 2018-2020, the debt to capital ratio of SAP SE and Oracle was greater than the industry average and remained consistent. This result from the DuPont analysis for SAP SE proves that increases in debt to capital ratio were more attributable for the variations in return on equity than changes in asset turnover or NPM.

6. Conclusion

The main goal of the Diploma Thesis was to explain financial analysis techniques and apply them to the selected multinational company SAP SE, as well as to obtain a set of basic characteristics which will help to have an objective and adequate assessment of the company's financial position. An important component is also to evaluate SAP SE's financial performance between the years 2015-2020. The obtained results were compared with SAP SE's competitor Oracle as a benchmark and the industrial average for the analysis period of 2018-2020, allowing for an appropriate assessment of the company's positioning in the IT industry. As a result, the thesis was separated into four main sections, each of which focused on a different aspect of the overall purpose. In the first part the theoretical background is presented. It presents the literature review that contributes to achieve the goal of financial analysis.

Financial analysis is typically done using the methods like horizontal, vertical, and ratio analysis, which allow an analyst to develop an evaluation model. This evaluation model, however, is limited, and it only consider one subject. As a result, in order to assess the company's actual performance, it was required to explore the company's direct competitors as well as the industry average ratios, which was conducted in the previous chapter. In order to fulfill objectives of the research, following research questions will be answered:

- What factors did influence financial performance of SAP SE in 2015-2020?

During analyzed period the prevalence of particular balance sheet components as a goodwill is observed. It caused SAP SE's performance to be lower than the industry average. SAP SE underperformed the industry average in terms of gross profit margin and asset turnover. Simultaneously between the years 2015-2020 declining liquidity, ROA and increasing gross profit margin, net profit margin, financial leverage had a significant impact on SAP SE's financial performance. The actual company structure is considered as acceptable. Explained by the fact that company has made a profit every year and has been capable to handle its costs with revenue.

- What kind of relevant information was highlighted in the financial statements of the SAP SE by auditor, that could help the author distinguish the annual changes in: Assets, Liabilities and Equity?

Based on the retrieved information from balance sheet statements, the SAP SE company is mostly focused on the software products, its main core however, has slightly changed. The author has registered the notes of Auditor – KMPG, as follows:

“On November - 4,2020, we acquired Emarsys eMarketing Systems AG (“Emarsys”), an innovative and easy-to-use cloud-based marketing platform, to complement and enhance our existing SAP Customer Experience solutions. Consequently, this acquisition led to a new operating segment called Emarsys. Due to its size, however, Emarsys is not a reportable segment. The Emarsys segment derives its revenues mainly from the sales of cloud-based customer experience offerings and from the sale of related services”⁸.

Based on the author’s analysis, the shift from to the cloud platforming is clear, the SAP focus has deepen into the “Cloud Subscription and Support” which is illustrated in the Table – 8. The growth in a relative change is massive, comparing to 2015. Thus, the financial statements performed does indicate the relevant aspects and common sense which has been analyzed by the author.

Moreover, there are many information and notes done by Auditors of KMPG in 2020. However, most of the findings of the author are intended to analyze the financial health of the company, whereas: auditing procedures make sure accounting entities are obliged to keep accounts in such a way that the financial statements are compiled on their basis in an understandable way and present a faithful and honest picture of the subject of accounting and the financial situation of the accounting entity so that on its basis the person who uses this information (hereinafter referred to as the "user") can , make economic decisions⁹.

⁸ SAP (2020): Integrated report of financial performance. [online]. [Accessed: 27-10-2022]. Available at: [sap.com](https://www.sap.com) , Page – 28.

⁹ Zákon č. 563/1991 Sb. Odstavec 7.

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Appendix

Appendix 1 Changes in statement of financial position of SAP SE for the fiscal years ended in 2015-2020, assets, € millions

	2015	2016	% change to 2015	2017	% change to 2015	2018	% change to 2015	2019	% change to 2015	2020	% change to 2015
Cash and cash	3411	3702	8,53%	4011	17,59%	8627	152,92%	5314	55,79%	5311	55,70%
Other financial assets	351	1124	220,23%	990	182,05%	448	27,64%	297	-15,38%	1635	365,81%
Trade and other receivables	5274	5924	12,32%	5899	11,85%	6362	20,63%	7908	49,94%	6593	25,01%
Other non-financial assets	468	581	24,15%	725	54,91%	889	89,96%	1188	153,85%	1321	182,26%
Tax assets	235	233	-0,85%	306	30,21%	293	24,68%	506	115,32%	210	-10,64%
Total current assets	9739	11564	18,74%	11930	22,50%	16620	70,65%	15213	56,21%	15069	54,73%
Goodwill	22689	23311	2,74%	21274	-6,24%	23725	4,57%	29162	28,53%	27560	21,47%
Intangible assets	4280	3786	-11,54%	2967	-30,68%	3227	-24,60%	4491	4,93%	3784	-11,59%
Property, plant, and equipment	2192	2580	17,70%	2967	35,36%	3553	62,09%	5496	150,73%	5041	129,97%
Other financial assets	1336	1358	1,65%	1155	-13,55%	1536	14,97%	2336	74,85%	3512	162,87%
Trade and other receivables	87	126	44,83%	118	35,63%	118	35,63%	129	48,28%	137	57,47%
Other non-financial assets	332	532	60,24%	621	87,05%	1301	291,87%	1701	412,35%	1926	480,12%
Tax assets	282	450	59,57%	443	57,09%	397	40,78%	435	54,26%	271	-3,90%
Deferred tax assets	453	571	26,05%	1022	125,61%	1015	124,06%	1251	176,16%	1173	158,94%
Total non-current assets	31651	32713	3,36%	30567	-3,42%	34871	10,17%	45002	42,18%	43402	37,13%
Total assets	41390	44277	6,98%	42497	2,67%	51491	24,40%	60215	45,48%	58472	41,27%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE

Appendix 2 Changes in statement of financial position of SAP SE for the fiscal years ended in 2015-2020, liabilities and equity, € millions

	2015	2016	%	2017	%	2018	%	2019	%	2020	%
Research and development	-2845	-3044	6,99%	-3352	17,82%	-3624	27,38%	-4292	50,86%	-4454	56,56%
Sales and marketing	-5401	-6265	16,00%	-6924	28,20%	-6781	25,55%	-7693	42,44%	-7106	31,57%
General and administration	-1048	-1005	-4,10%	-1075	2,58%	-1098	4,77%	-1629	55,44%	-1356	29,39%
Restructuring	-621	-28	-95,49%	-182	-70,69%	-19	-96,94%	1130	81,96%	3	-100,48%
Other operating income/expense, net	1	-3	-400,00%	1	0,00%	-20	-2100,00%	18	1700,00%	84	8300,00%
Total operating expenses	-16541	-16928	2,34%	-18584	12,35%	-19005	14,90%	-23081	39,54%	-20715	25,23%
Operating profit	4252	5135	20,77%	4877	14,70%	5703	34,13%	4473	5,20%	6623	55,76%
Other non-operating income/expense, net	-256	-234	-8,59%	-36	-85,94%	-56	-78,13%	-74	-71,09%	-179	-30,08%
Finance income	241	230	-4,56%	463	92,12%	371	53,94%	787	226,56%	1473	511,20%
Finance costs	-246	-268	8,94%	-278	13,01%	-418	69,92%	-589	139,43%	-697	183,33%
Financial income, net	-5	-38	660,00%	185	-3800,00%	-47	840,00%	198	-4060,00%	776	-15620,00%
Profit before tax	3991	4863	21,85%	5026	25,93%	5600	40,32%	4596	15,16%	7220	80,91%
Income tax expense	-935	-1229	31,44%	-970	3,74%	-1511	61,60%	-1226	31,12%	-1938	107,27%
Profit after tax	3056	3634	18,91%	4056	32,72%	4088	33,77%	3370	10,27%	5283	72,87%
Attributable to owners of parent	3064	3646	18,99%	4018	31,14%	4083	33,26%	3321	8,39%	5145	67,92%
Attributable to non-controlling interests	-8	-13	62,50%	38	-575,00%	6	-175,00%	50	-725,00%	138	-1825,00%

Source: Own creation of the author. Data are based on the audited consolidated financial statements of SAP SE