

RELATIVE VALUATION OF SAP SE



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**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MANAGEMENT
COLLEGE OF MANAGEMENT
MAHIDOL UNIVERSITY
2024**

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Thematic paper
entitled
RELATIVE VALUATION OF SAP SE

was submitted to the College of Management, Mahidol University
for the degree of Master of Management
on
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ACKNOWLEDGEMENTS

This thematic paper would not have been possible without the support of my advisor, Prof. Dr. Roy Kouwenberg. His valuable guidance and constructive feedback were instrumental throughout all stages of this work, enhancing my understanding of relative valuation from a practical perspective. I also wish to express my sincere gratitude to Asst. Prof. Dr. Simon Zaby for his intensive finance management class and for addressing all my queries during my academic journey. Additionally, I extend my thanks to Dr. Eakapat Manitkajornkit for making my defense a memorable experience.

I am deeply appreciative of all my professors at CMMU for their comprehensive courses in the fields of finance and business. Special thanks should go to Aj. Susheel Narula and Dr. Worapong Janyangyuen for their applicable knowledge of valuation methods. I am also grateful to Assoc. Prof. Dr. Randall Shannon for his encouragement and support throughout the program. Furthermore, I wish to extend my thanks to Ms. Ammaraluk Tanutong for her team spirit and knowledge sharing during this master's degree program.

I would like to recognize my classmates for the kind assistance and friendship that have made my time at CMMU truly remarkable. I am also thankful for the academic support provided by the program coordinators throughout all courses.

Most importantly, I wish to express my heartfelt gratitude to my family and friends for their continuous support. I am indebted to my boss for his inspirational motivation and to my colleagues for their understanding during this challenging period.

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RELATIVE VALUATION OF SAP SE

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M.M. (CORPORATE FINANCE)

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ABSTRACT

This thematic paper presents SAP SE's relative valuation for the target price in 2024. It includes a business description, macro-economic analysis, industry and competition analysis, relative valuation, assessment of investment risks, and a conclusion. The paper analyzes SAP SE's historical valuation over the past five years using key metrics: P/E ratio, P/BV ratio, and EV/EBITDA ratio, comparing historical metrics. Additionally, SAP SE is benchmarked against peers such as ORCL, CRM, INTU, ADBE, IBM, SNPS, and CDNS, focusing on companies within the software and ERP solutions sectors that generate revenue from a subscription model. The target price is derived by averaging the trailing and forward estimates of the P/E and EV/EBITDA multiples of the peer group. As of July 12, 2024, SAP SE's market capitalization is 220.30 billion euros, with a closing price of 188.74 euros. This is above the average target price of 176.31 euros, indicating a downside potential of 6.58%. Therefore, the recommendation is to 'HOLD.'

KEY WORDS: Relative Valuation/ Historical Multiples/ Peer Group Multiples/ SAP

64 pages

CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
LIST OF TABLES	vii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER I INTRODUCTION	1
CHAPTER II BUSINESS DESCRIPTION	3
2.1 Company Overview	3
2.2 Products and Services Characteristics	5
2.3 Revenue Structure	8
2.4 Business Strategy	10
2.5 Management and Governance	12
2.5.1 Management	12
2.5.2 Corporate Governance	14
2.5.3 Shareholder Structure	14
CHAPTER III MACRO-ECONOMIC, INDUSTRY AND COMPETITION ANALYSIS	17
3.1 Macro-Economic Analysis	17
3.1.1 Global GDP	17
3.1.2 Interest, Inflation and Exchange Rate	19
3.2 Industry Analysis	22
3.3 Competition Analysis	24
3.3.1 SWOT	24
3.3.2 Five Forces Analysis	26
3.3.3 Competitors	28
3.3.3.1 Oracle Corporation	28

CONTENTS (Cont.)

	Page
3.3.3.2 Workday Inc.	29
3.3.3.3 Salesforce Inc.	29
3.3.3.4 Microsoft Corporation	29
3.3.3.5 Intuit Inc.	29
3.3.3.6 Sage Group Plc.	30
CHAPTER IV FINANCIAL ANALYSIS AND VALUATION	31
4.1 Financial Analysis	31
4.1.1 Growth Analysis	31
4.1.2 Dupont Analysis (of ROE)	34
4.2 Relative Valuation	36
4.2.1 Historical Multiples Bands	36
4.2.1.1 Trailing and Forward P/E Bands	36
4.2.1.2 Trailing and Forward P/BV Bands	39
4.2.1.3 Trailing and Forward EV/EBITDA Bands	41
4.2.1.4 Target Price from Historical Multiples	43
4.2.1.5 Sensitivity Analysis of Historical Multiples	46
4.2.2 Peer Group Multiples	47
4.2.2.1 Selection of Peers	47
4.2.2.2 Peer Group Comparison of Multiples	49
4.2.2.3 Target Price from Peer Multiples	53
4.2.2.4 Sensitivity Analysis of Peer Multiples	55
4.3 Valuation Recommendation	56
CHAPTER V INVESTMENT RISKS	59
CHAPTER VI CONCLUSIONS	62
6.1 Investment Recommendation	62
6.2 Triggers for Re-assessment	63

CONTENTS (Cont.)

	Page
6.3 Limitation	63
REFERENCES	65



LIST OF TABLES

Table	Page
2.1 SAP's Revenue Structure for the year 2021 to 2023	9
2.2 SAP's Income Statement for the year 2021 to 2023	10
2.3 SAP SE Executive Board	13
2.4 SAP's Major Shareholder	16
4.1 SAP's Growth Trend from 2018 to 2023	32
4.2 Oracle's Growth Trend from 2018 to 2023	33
4.3 Salesforce's Growth Trend from 2018 to 2023	34
4.4 SAP's Dupont (of ROE) from 2018 to 2023	34
4.5 Oracle's Dupont (of ROE) from 2018 to 2023	35
4.6 Salesforce's Dupont (of ROE) from 2018 to 2023	35
4.7 SAP's Dividend Payout Ratio from 2018 to 2023	41
4.8 Expected Price Based on Five-Year Average P/E and EV/EBITDA	45
4.9 Target Current Price Based on Historical Multiples	45
4.10 Target Forward Price Based on Historical Multiples	46
4.11 Sensitivity Analysis of P/E in Historical Multiples	46
4.12 Sensitivity Analysis of EV/EBITDA in Historical Multiples	47
4.13 Peer Group's General Information	49
4.14 Peer Group Financial Ratios	51
4.15 Current Peer Group Multiples	52
4.16 Forward Peer Group Multiples	53
4.17 Expected Price Based on Peer Multiples	54
4.18 Target Current Price Based on Peer Multiples	55
4.19 Target Forward Price Based on Peer Multiples	55
4.20 Sensitivity Analysis of P/E in Peer Multiples	56
4.21 Sensitivity Analysis of EV/EBITDA in Peer Multiples	56
4.22 Summary of SAP's Target Share Price	57

LIST OF TABLES (Cont.)

Table	Page
4.23 Valuation Recommendation	57
5.1 Summary of SAP's Risks	60



LIST OF FIGURES

Figure	Page
2.1 SAP's Subsidiaries	4
2.2 List of Product Categories	6
2.3 SAP HANA Architecture Diagram	7
2.4 SAP Customer Experience	7
2.5 SAP's Corporate Governance Structure	12
2.6 SAP's Shareholder Structure	15
2.7 SAP's Ownership Overview	15
3.1 Real GDP Trend of the World, Western Europe, and North America	18
3.2 SAP's Revenue Trend from 2018 to 2023	19
3.3 SAP's Revenue Growth from 2018 to 2023	19
3.4 Inflation Rates Trend of the World, Western Europe, and North America	20
3.5 US Interest Rate over the past 10 years	21
3.6 EU Interest Rate over the past 10 years	22
4.1 Trailing P/E Band (July 2019 - July 2024)	37
4.2 Forward P/E Band (July 2019 - July 2024)	38
4.3 Trailing P/BV Band (July 2019 - July 2024)	39
4.4 Forward P/BV Band (July 2019 - July 2024)	40
4.5 The Outstanding Bonds as of July 12, 2024	41
4.6 Trailing EV/EBITDA Band (July 2019 - July 2024)	42
4.7 Forward EV/EBITDA Band (July 2019 - July 2024)	43
4.8 Football Field of SAP	58
5.1 Classification of SAP's Risk	59

LIST OF ABBREVIATIONS

ADBE	Adobe Inc.
ADRs	American Depositary Receipts
AG	a public limited company (in German: Aktiengesellschaft)
AI	Artificial Intelligence
APJ	Asia Pacific Japan
AVG	average
bp	basis points
BV	book value
CAGR	Compound Annual Growth Rate
CDNS	Cadence Design Systems Inc.
Code	The German Corporate Government Code
CRM	Customer Relationship Management
CRM	Salesforce Inc.
DAX	German Stock Index (in German: Deutscher Aktien Index)
DBMS	a database management system
D/E	Debt-to-Equity
EBITDA	Earnings before interest, taxes, depreciation, and amortization
EDA	electronic design automation
EMEA	Europe, Middle East, Africa
EPS	earnings per share
ERP	enterprise resource planning
EUR	euro
EV	enterprise value
EV/EBITDA	Enterprise value-to-Earnings before interest, taxes, depreciation, and amortization
exc.	exclude
Fed	The US Federal Reserve

LIST OF ABBREVIATIONS (Cont.)

FWB	Frankfurt Stock Exchange (in German: Frankfurter Wertpapierbörse)
GDP	gross domestic product
GDPR	General Data Protection Regulation
GmbH	a limited liability company (in German: Gesellschaft mit beschränkter Haftung)
h.c. mult.	many honorary degrees (in Latin: honoris causa multi)
IaaS	Infrastructure as a Service
IBM	International Business Machines Corporation
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
Inc.	incorporated
INTU	Intuit Inc.
LSE	London Stock Exchange
MSFT	Microsoft Corporation
NASDAQ	The National Association of Securities Dealers Automated Quotations
NYSE	The New York Stock Exchange
OLAP	online analytical processing
OLTP	online transactional processing
ORCL	Oracle Corporation
PaaS	Platform as a Service
pp	percentage point
P/BV	Price-to-Book value
P/E	Price-to-Earnings
SaaS	Software as a Service
SAGE	Sage Group Plc.
SAP	Systems Applications and Products in Data Processing (in German: Systeme, Anwendungen, Produkte in der Datenverarbeitung)

LIST OF ABBREVIATIONS (Cont.)

SAP HANA	SAP High-performance ANalytic Appliance
SE	a public company incorporated under the European Union corporate law, (in Latin: Societas Europea)
SNPS	Synopsys Inc.
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TecDAX	Technology Index DAX
US GAAP	US Generally Accepted Accounting Principles
WDAY	Workday Inc.
XETRA	eXchange Electronic TRAding (Frankfurt Stock Exchange with its electronic platform)

CHAPTER I

INTRODUCTION

In the fast-paced technology sector, SAP SE stands out as a key player, offering vital software solutions that help businesses improve efficiency and stay competitive. As one of the top providers of enterprise resource planning (ERP) software, SAP SE is crucial to the digital transformation of companies worldwide.

SAP's revenue can be segmented into cloud, software licenses and support, cloud and software, and services. It generates revenue through the sale of software licenses and subscriptions to its cloud applications, in addition to other support services. SAP SE's revenue primarily comes from four segments: software support, cloud services, software licenses, and consulting. In 2023, SAP SE achieved a total revenue of 31,207 million euros. Of this, 44.9% was generated from the Europe, Middle East, and Africa region, 40.9% from the Americas, and 14.2% from the Asia Pacific and Japan region.

SAP SE faces several significant risks that affect its operations and reputation. Key concerns include cybersecurity threats due to its large-scale data handling and cloud solutions, data protection and privacy challenges from stringent global regulations, global economic and political instability impacting financial stability, and technological risks related to software defects and integration issues. These risks pose potential threats to SAP's financial performance, compliance, and customer satisfaction.

This thematic paper aims to analyze SAP SE's valuation over the past five years using key metrics: Price-to-Earnings (P/E) ratio, Price-to-Book Value (P/BV) ratio, and Enterprise value-to-Earnings before interest, taxes, depreciation, and amortization (EV/EBITDA) ratio. We will compare these historical metrics to SAP SE's current valuation. Additionally, we will benchmark SAP SE against its peers, including ORCL, CRM, INTU, ADBE, IBM, SNPS, and CDNS, focusing on companies involved in software and ERP solutions, particularly those with significant revenue from

subscription fees. This comparison will provide insight into SAP SE's market position and investment potential.

The P/E ratio evaluates profitability and helps identify growth or value stocks but overlooks debt and working capital. The EV/EBITDA ratio provides a broader view by including debt and adjusting for interest, taxes, depreciation, and amortization, yet it does not account for working capital. Therefore, the target price is calculated using average trailing and forward estimates of the P/E and EV/EBITDA multiples, based on peer averages. This method offers a benchmark that reflects current market conditions in the information technology industry and the performance of its peers.

As of July 12, 2024, SAP SE's market capitalization is 220.30 billion euros, and its closing price is 188.74 euros. This compares to an average target price of 176.31 euros, suggesting a downside potential of 6.58%. In conclusion, our recommendation for SAP SE is to 'HOLD.'

CHAPTER II

BUSINESS DESCRIPTION

As a market leader in the enterprise software industry, SAP SE turns its customers into intelligence solutions and systems enterprises. In this chapter, we will conduct an overall analysis of SAP SE, beginning with a review of the company's overview, product characteristics, and service offerings. We will then explore SAP SE's revenue structure and business strategy to understand how the company manages its resources for profitability. We will also focus on management and governance practices to evaluate their effectiveness in ensuring long-term success. Lastly, we will investigate the shareholder structure to understand ownership dynamics and their impact on the company's strategic objectives.

2.1 Company Overview

SAP SE is an acronym for Systems, Applications & Products in Data Processing (Systeme, Anwendungen und Produkte in der Datenverarbeitung in German language), Societas Europaea. It began with five entrepreneurs who saw the potential of technological advancement and brought their vision to invent software solutions for companies. SAP SE is a multinational software development and consulting company based in Walldorf, Baden-Württemberg, Germany. It was founded in 1972 as a private partnership named "Systemanalyse Programmentwicklung" or "System Analysis Program Development" before changing to SAP GmbH (Gesellschaft mit beschränkter Haftung, or limited liability company) in 1981. In 1988, the company changed its name to SAP AG (Aktiengesellschaft, or public limited company under German law) and was listed as a public company on the Stuttgart Stock Exchange. After that, there was approval from the shareholders during the Annual General Meeting of Shareholders in 2014 to convert the legal form of the company to a European stock corporation and change its name to SAP SE under European Union corporate law.

As mentioned, SAP SE, originating in Germany, then expanded its business around the world. Nowadays, there are several subsidiaries under SAP SE in more than ten countries and three continents, including Europe, Middle East, and Africa (EMEA), Americas, and Asia-Pacific, as shown in **Figure 2.1**. It has more than 437,000 customers and plans to continue growing in the future.

As of December 31, 2023, SAP SE reported a robust total revenue of 31.20 billion euros, with a profit after tax of 5.96 billion euros (19.10% of total revenue). Its capital stock stands at 1.23 billion euros, with total assets of 68.34 billion euros and total liabilities of 24.93 billion euros. These impressive financial figures underscore SAP SE's stability and potential for future growth. (SAP 2023 Integrated Report on Form 20-F, 2024, Part III, Item 18, F-9 and F-11).

Figure 2.1 SAP's Subsidiaries

Name of Subsidiary	Country of Incorporation
Germany	
SAP Deutschland SE & Co. KG, Walldorf	Germany
Rest of EMEA	
SAP (Schweiz) AG, Biel	Switzerland
SAP (UK) Limited, Feltham	United Kingdom
SAP España – Sistemas, Aplicaciones y Productos en la Informática, S.A., Madrid	Spain
SAP France, Levallois Perret	France
SAP Italia Sistemi Applicazioni Prodotti in Data Processing S.p.A., Vimercate	Italy
SAP Nederland B.V., 's-Hertogenbosch	The Netherlands
United States	
Ariba, Inc., Palo Alto	USA
Concur Technologies, Inc., Bellevue	USA
SAP America, Inc., Newtown Square	USA
SAP Industries, Inc., Newtown Square	USA
SAP National Security Services, Inc., Newtown Square	USA
Rest of Americas	
SAP Brasil Ltda., São Paulo	Brazil
SAP Canada, Inc., Toronto	Canada
SAP México S.A. de C.V., Mexico City	Mexico
Japan	
SAP Japan Co., Ltd., Tokyo	Japan
Rest of APJ	
SAP Australia Pty Ltd., Sydney	Australia
SAP China Co., Ltd., Shanghai	China
SAP India Private Limited, Bangalore	India

Source: SAP 2023 Integrated Report on Form 20-F

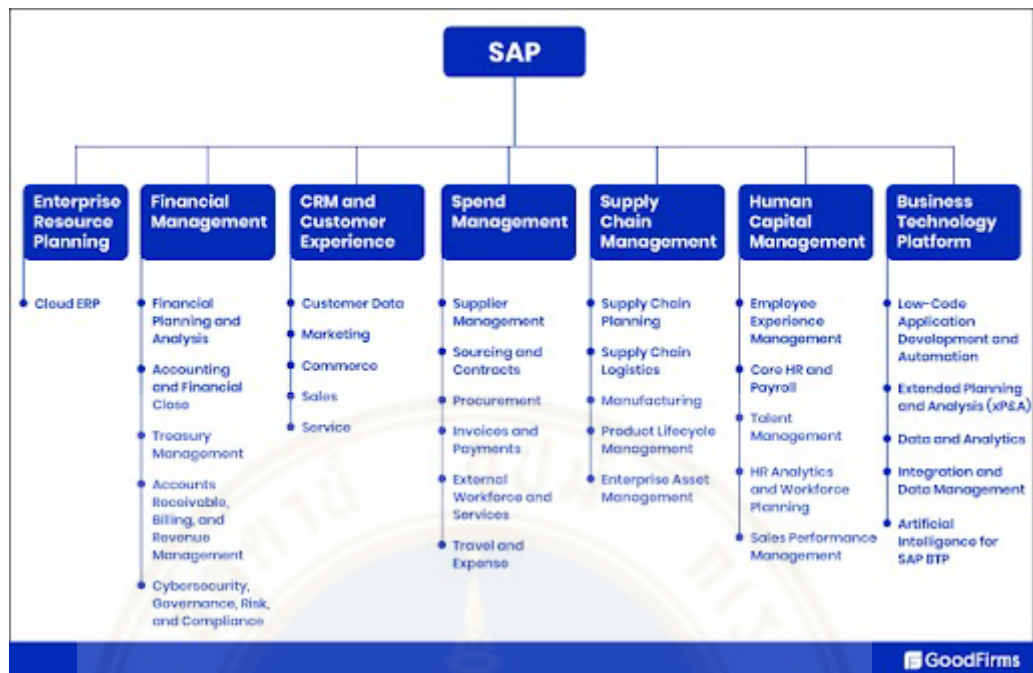
According to the SAP Integrated Report, SAP's ordinary shares are listed on the Frankfurt Stock Exchange (Frankfurter Wertpapierbörse, or FWB) and the XETRA trading platform (Frankfurt Stock Exchange's electronic platform). The ordinary shares of SAP SE traded on the New York Stock Exchange (NYSE) are represented by American Depositary Receipts (ADRs) (SAP 2023 Integrated Report on Form 20-F, 2024, Introduction). SAP is included in the Deutscher Aktien Index (DAX), the Technology Index DAX (TecDAX), the Dow Jones EURO STOXX 50, the Dow Jones Sustainability Index World, and the Dow Jones Sustainability Index Europe.

2.2 Products and Services Characteristics

SAP SE, a leader in enterprise software, offers a diverse range of software and cloud-engineered systems. It streamlines business processes by integrating all data with all business functions. These solutions are industry-specific and highly adaptable, catering to a wide range of sectors, including automotive, banking, consumer products, energy, and retail. This flexibility makes SAP SE a valuable partner for businesses across various industries. The list of product categories can be shown in **Figure 2.2**.

1. Enterprise Resource Planning
2. CRM and Customer Experience
3. Human Capital Management
4. Business Technology Platform
5. Supply Chain Management
6. Spending Management
7. Business Networking

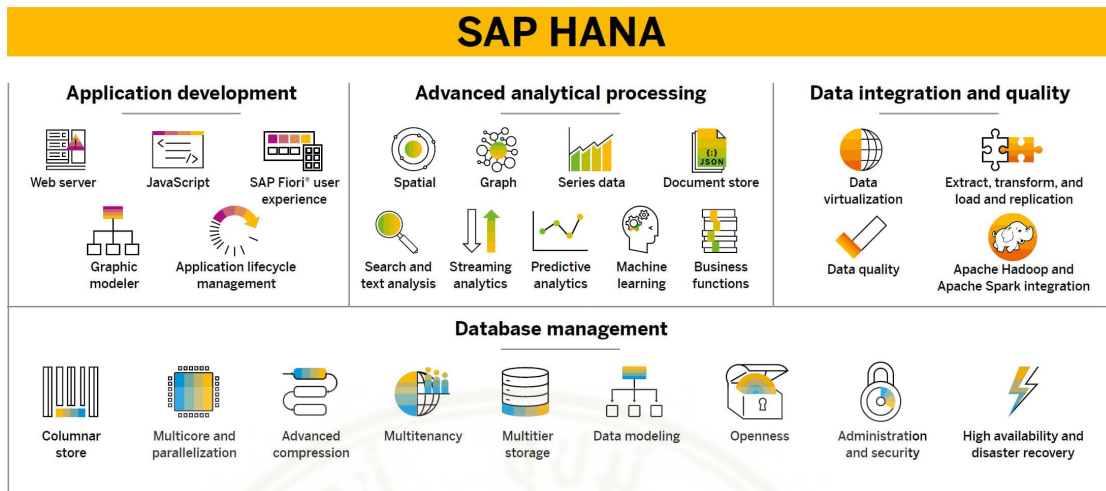
Figure 2.2 List of Product Categories



Source: GoodFirms

SAP SE provides a wide range of software solutions and offers support services such as a knowledge-sharing base, maintenance services, consulting, and implementation services. In 2015, the company launched the cloud with SAP High-performance ANalytic Appliance (SAP HANA), the latest software offering for customers, which is called Software as a Service (SaaS). SAP HANA is a database management system (DBMS) that offers advanced search, analytics, and data integration capabilities for all types of data. Instead of keeping it on a disk, SAP HANA stores the data in memory, bringing online analytical processing (OLAP) and online transactional processing (OLTP) together. This is a clear demonstration of SAP SE's commitment to a sustainable future. As stated on SAP.com, in 2024, "SAP launched SAP S/4HANA, its latest business application software, running entirely on SAP HANA. SAP enables its customers to become intelligent and grow in a sustainable world. It offers customers value by bringing together the solutions, technology, and best practices needed to run integrated, digital business processes in the cloud." SAP HANA architecture diagram can be shown in **Figure 2.3** below:

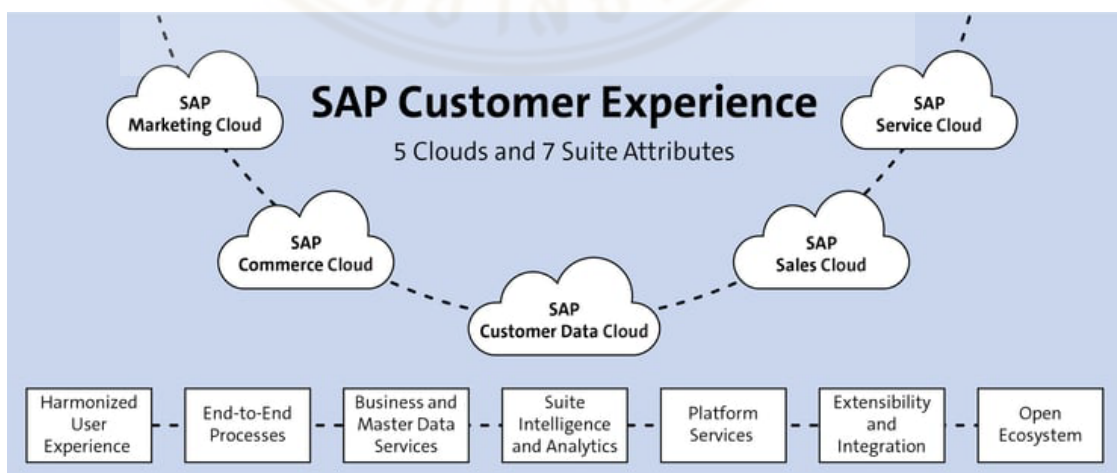
Figure 2.3 SAP HANA Architecture Diagram



Source: news.sap.com

As shown in **Figure 2.4**, SAP provides a customer experience that includes a cloud for storage and host servers to allow customers to access all information over the internet, which is called Infrastructure as a Service (IaaS). Additionally, SAP offers customized SAP extensibility options for customers and creates new applications that can run alongside the SAP system. SAP has a cloud that allows its customers to work on it, which is called Platform as a Service (PaaS), SAP Business Technology Platform (SAP BTP). SAP also provides integration with SAP and non-SAP systems.

Figure 2.4 SAP Customer Experience



Source: Learning.sap-press

2.3 Revenue Structure

Understanding a company's revenue and cost structure is crucial for evaluating its stock price thoroughly. It involves analyzing how the company earns its revenue, which provides insights into profitability dynamics across different segments.

According to the SAP Integrated Report for the year 2023, SAP SE uses a subscription-based model. SAP generates revenue through periodic fixed fees for cloud subscription services, software support services, and other multi-period agreements, usually invoiced yearly or quarterly in advance. Additionally, revenue includes fees based on actual transaction volumes for non-periodic services, which are invoiced as the services are delivered. This revenue structure allows SAP to combine stable recurring income with variable income tied to customer usage and transactions, providing flexibility and reflecting the ongoing nature of its service engagements. The company's revenue can be divided into four categories: cloud revenue, software licenses revenue, software support revenue, and services revenue.

Cloud revenue includes fees for using cloud-based platforms and cloud subscription services. SAP provides Software as a Service (SaaS) for accessing software functionality through its cloud infrastructure or approved third-party providers. This includes standard features, custom cloud applications, and extensions, with customers unable to terminate hosting contracts to run the software independently. SaaS also covers transaction and agent fees from activities on SAP's cloud transaction platforms. Platform as a Service (PaaS) offers a cloud-based platform for application development, deployment, integration, and management. Infrastructure as a Service (IaaS) includes hosting and application management services for SAP-hosted software or third-party hosted solutions. These services cater to diverse customer needs, offering access, development capabilities, and comprehensive hosting solutions within SAP's cloud ecosystem.

Software license revenue includes revenue from selling software licenses to customers, both standardized and customized software. Software support revenue includes revenue from providing technical support and software upgrade services. Service revenue includes revenue from providing professional consulting services, premium support services, and training services to customers.

Table 2.1 shows the revenue structure of SAP. Cloud and software support revenue represents 86% of total revenue in 2022 and 2023 and 87% of total revenue in 2021. In 2023, the company had a total revenue of 31,207 million euros. 44.9% of total revenue (14,004 million euros) was from the EMEA region, 40.9% (12,762 million euros) was from the Americas region, and the remaining 14.2% (4,441 million euros) was from the Asia Pacific Japan (APJ) region. Revenue continually increases from 2021 to 2023, resulting from the accelerated transition of customers to the cloud.

Table 2.1 SAP's Revenue Structure for the year 2021 to 2023

Revenue structure	2021		2021		2023	
	€ millions	%	€ millions	%	€ millions	%
Cloud	8,701	32.3	11,426	38.7	13,664	43.8
Software licenses	3,248	12.1	2,056	7.0	1,764	5.7
Software support	11,412	42.3	11,909	40.3	11,496	36.8
Software licenses and support	14,660	54.4	13,965	47.3	13,261	42.5
Cloud and software	23,361	86.7	25,391	86.0	26,924	86.3
Services	3,592	13.3	4,128	14.0	4,283	13.7
Total revenue	26,953	100.0	29,520	100.0	31,207	100.0

Source: SAP Integrated Report 2023

Table 2.2 shows the income statement of SAP for the years 2021 to 2023. The cost of revenue is stable at 26-28% of total revenue, divided into the cost of cloud and software, which was from deploying and operating cloud solutions, and the cost of service, which was from the cost of consulting and training courses for customers.

The company spends 19-21% of total revenue on research and development to closely engage with customers to create innovation in the cloud, enable multi-cloud collaboration between the customers and their partners, and train the R&D workforce. Sales and marketing expenses are around 25-29% of total revenue, including commissions for direct sales, marketing activities, and sponsorships in the sport and entertainment industries. General and administrative expenses are around 4% of total revenue and consist of expenses related to finance and administrative functions, human resources, and general management. In conclusion, there is operating profit at 18-24% of total revenue.

Table 2.2 SAP's Income Statement for the year 2021 to 2023

Income Statement	2021		2022		2023	
	€ millions	%	€ millions	%	€ millions	%
Cloud	8,701	32.3	11,426	38.7	13,664	43.8
Software licenses and support	14,660	54.4	13,965	47.3	13,261	42.5
Cloud and software	23,361	86.7	25,391	86.0	26,924	86.3
Services	3,592	13.3	4,128	14.0	4,283	13.7
Total revenue	26,953	100.0	29,520	100.0	31,207	100.0
Cost of cloud	-2,881	-10.7	-3,499	-11.9	-3,884	-12.4
Cost of software licenses and support	-1,598	-5.9	-1,384	-4.7	-1,383	-4.4
Cost of cloud and software	-4,479	-16.6	-4,883	-16.5	-5,267	-16.9
Cost of services	-2,740	-10.2	-3,155	-10.7	-3,407	-10.9
Total cost of revenue	-7,219	-26.8	-8,038	-27.2	-8,674	-27.8
Gross profit	19,734	73.2	21,482	72.8	22,534	72.2
Research and development	-5,270	-19.6	-6,080	-20.6	-6,324	-20.3
Sales and marketing	-6,856	-25.4	-7,946	-26.9	-8,828	-28.3
General and administration	-1,187	-4.4	-1,289	-4.4	-1,364	-4.4
Restructuring	-157	-0.6	-138	-0.5	-215	-0.7
Other operating income/expense, net	44	0.2	60	0.2	-16	-0.1
Total operating expenses	-20,645	-76.6	-23,429	-79.4	-25,420	-81.5
Operating profit	6,308	23.4	6,090	20.6	5,787	18.5
Other non-operating income/expense, net	19	0.1	-187	-0.6	9	0.0
Finance income	3,123	11.6	811	2.7	857	2.7
Finance costs	-945	-3.5	-2,200	-7.5	-1,313	-4.2
Financial income, net	2,178	8.1	-1,389	-4.7	-456	-1.5
Profit before tax from continuing operations	8,505	31.6	4,513	15.3	5,341	17.1
Income tax expense	-1,682	-6.2	-1,446	-4.9	-1,741	-5.6
Profit after tax from continuing operations	6,824	25.3	3,068	10.4	3,600	11.5
Profit (loss) after tax from discontinued operations	-1,447	-5.4	-1,359	-4.6	2,363	7.6
Profit after tax	5,376	19.9	1,708	5.8	5,964	19.1

Source: SAP Integrated Report 2023

2.4 Business Strategy

SAP has grown into a global software leader, with a presence in over 180 countries and 437,000 customers. Beyond ERP, SAP focuses on cloud solutions and digital transformation, investing significantly in AI, machine learning, and blockchain to drive innovation and customer growth. According to SAP's website, its vision is to bring out the best in every business. SAP's mission is to drive business excellence through three principal focus areas:

- 1. Agility at Scale:** Providing solutions that enable businesses to adapt to market dynamics through integrated data insights and cloud-based ERP systems.
- 2. Achieve More Across the Value Chain:** Facilitating optimized performance by linking and enhancing core processes across various business functions to promote efficiency and growth.
- 3. Sustainability at Your Core:** Advancing actionable sustainability practices through the Green Ledger initiative, which offers tools for documenting impacts, reporting ESG metrics, and integrating sustainability into business operations.

SAP's commitment is to deliver innovative, effective, and responsible solutions for ongoing business transformation. SAP prioritizes enhancing the customer experience and building partnerships to drive its strategy. It focuses on user-friendly interfaces, customized services, proactive support, and continuous innovation to enhance efficiency and productive operations. In addition, SAP collaborates with a diverse range of technology providers, consulting firms, and system integrators to deliver comprehensive solutions globally. This ecosystem of partners is crucial for extending SAP's delivery of value-added solutions to customers to improve their royalty.

According to the SAP Integrated Report for the year 2023, SAP offers 'RISE with SAP' and 'GROW with SAP' strategies based on customers specific requirements. RISE with SAP helps large companies get started with cloud SAP solutions and provides an automated process to help existing customers migrate their information to the cloud. In contrast, GROW with SAP is for smaller and mid-size customers who never use ERP systems to benefit from the expansion of midmarket businesses without increasing the complexity of business processes and management. SAP also focuses on growth strategy by implementing AI to streamline the business and create a sustainable enterprise.

Referring to 'SAP Updates Its Ambition 2025 and Announces Transformation Program for 2024', SAP plans to execute a restructuring program for voluntary leave programs and internal re-skilling measures that will affect 8,000 positions (around 7% of its workforce) in 2024. This is to prepare the company for

highly scalable future revenue growth and transform its operations into synergies with AI.

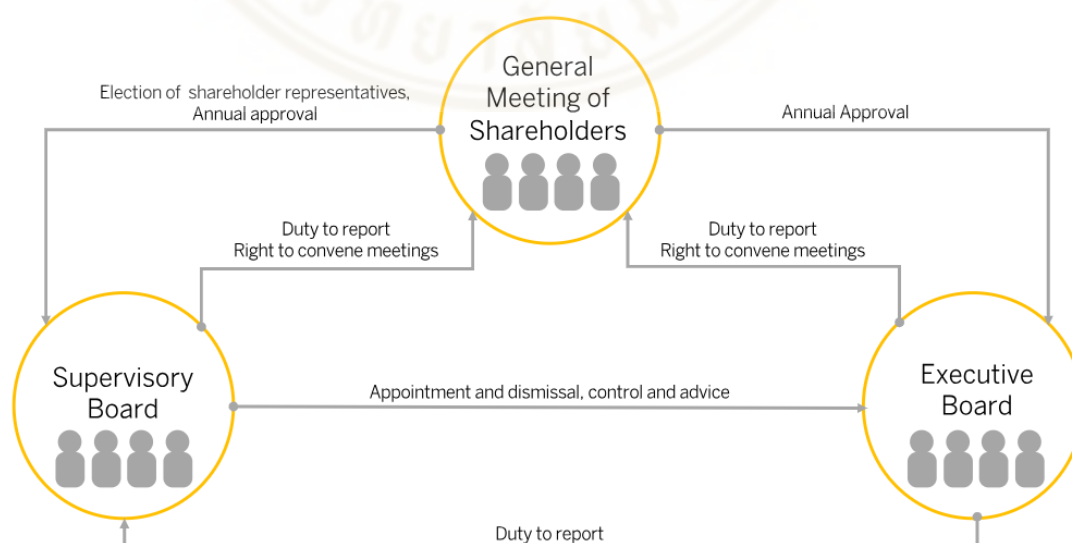
2.5 Management and Governance

SAP is a public limited liability company under European law for commercial enterprises within the European Union. SAP focuses on effective corporate governance and transparency to achieve corporate goals and enhance the company's value.

2.5.1 Management

Figure 2.5 shows SAP's corporate governance structure. According to the company law of the European Union, SAP's Annual General Meeting is organized annually for shareholders of SAP to resolve on the formal approval of the acts of the Executive Board and the acts of the Supervisory Board in fiscal year 2023, elect Supervisory Board members and set remuneration. Other than that, they need to approve the financial statement, appoint an auditor, and approve the compensation report for fiscal year 2023.

Figure 2.5 SAP's Corporate Governance Structure



Source: Corporate Governance Structure

As shown in **Table 2.3**, the SAP SE Executive Board is required by law, and the company's article of association includes the following:

Table 2.3 SAP SE Executive Board

Christian Klein	Chief Executive Officer (CEO)
Muhammad Alam	SAP Product Engineering
Dominik Asam	Chief Financial Officer
Juergen Mueller	Chief Technology Officer
Scott Russell	Chief Revenue Officer, Customer Success
Thomas Saueressig	Customer Services & Delivery
Gina Vargiu-Breuer	Chief People Officer and Labor Director
Julia White	Chief Marketing and Solutions Officer

Source: SAP's website

The SAP SE Executive Board duly responds to developing and implementing SAP's strategy. It needs to report the business performance, potential risks, and compliance, including ESG and sustainability, to the Supervisory Board. According to SAP SE Corporate Governance, the SAP SE Supervisory Board consists of nine members elected by the General Meeting and nine members representing the European employees of the SAP group. It regularly advises and supervises the SAP SE Executive Board in relation to business performance and potential risks. In addition, it has an obligation to handle conflicts of interest.

During the year 2023, the topics discussed between the SAP SE Supervisory Board and the SAP SE Executive Board are as follows:

Artificial Intelligence: The SAP Supervisory Board discussed innovation plans in AI and monitored SAP's efforts to integrate AI into its software solutions and future investments in expanding AI.

Cloud Transformation: SAP faces challenges in the public cloud, so it closely reviews strategies to realign the product and service portfolio and measures cloud gross margins.

New Government Security Committee: The SAP Supervisory Board decided to establish a Government Security Committee in 2023. It is subjected to monitoring SAP's activities in security-sensitive areas, aligning with legal regulations.

Sustainability: The SAP Supervisory Board addressed the strategic importance of ESG (environmental, social, and governance), considering both SAP's

own sustainability efforts and its solutions empowering customers to become more sustainable enterprises. These efforts are monitored across various committees due to their cross-functional nature, without the formation of a dedicated sustainability committee.

2.5.2 Corporate Governance

At SAP, maintaining high standards of governance and accountability is fundamental to fostering confidence among shareholders, customers, and employees. According to SAP Corporate Governance, SAP needs to follow policies and statutes as below:

Articles of Incorporation: The purpose of this article is to outline essential corporate details such as corporate purpose, capital structure, share classes, and the organizational structure of the Executive Board and Supervisory Board. These articles not only meet statutory requirements but also incorporate additional provisions that enhance governance and operational clarity, aligning with legal standards while providing flexibility for supplementary guidelines that do not contradict existing laws.

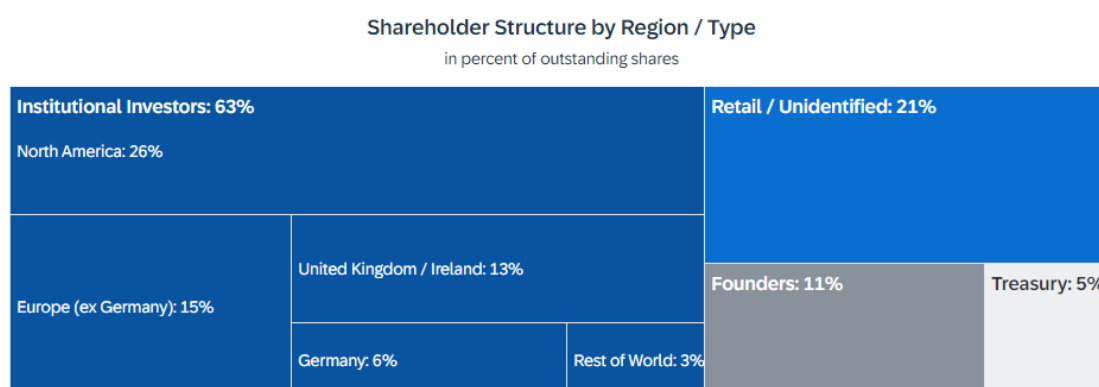
The German Corporate Government Code (Code): The purpose of this statutory regulation is to reinforce the confidence of the German listed company and enhance transparency to promote trust among international and national investors. It aims to continuously improve corporate governance standards in German companies.

Global Code of Ethics and Business Conduct for Employees: The purpose of this code is to commit compliance and integrity to the employees to improve ecosystems and people's lives. It emphasizes fair treatment and respect for employees and promotes human rights to be a sustainable company.

2.5.3 Shareholder Structure

According to SAP's shareholder structure, as shown in **Figure 2.6**, SAP's capital stock as of December 29, 2023, was 1,228,504,232 euros. It is issued as 1,228,504,232 no-par shares with an attribute value of 1 euro. The free-float shares were at 83.6%.

Figure 2.6 SAP's Shareholder Structure

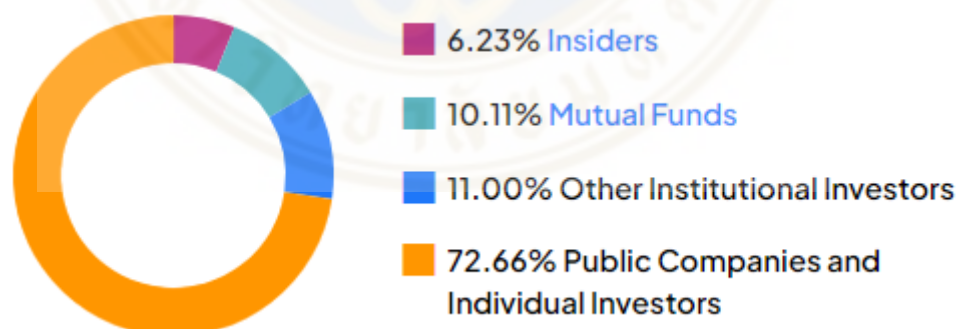


Source: Nasdaq OMX

Source: SAP's website

According to the latest information from Tipranks, as shown in **Figure 2.7**, SAP's stock categories include ordinary shares and bearer shares. The shareholder structure is a mix of institutional, retail, and individual investors. Approximately 21.11% of the company's stock is owned by institutional investors, 6.23% is owned by insiders, and 72.66% is owned by public companies and individual investors. 41% of institutional investors are ESG investors.

Figure 2.7 SAP's Ownership Overview



Source: Tipranks, 2024

As shown in **Table 2.4**, as of May 28, 2024, the largest shareholder of SAP is Prof. Dr. h.c. mult. Hasso Plattner, one of the co-founders. He was chairman of the Supervisory Board since 2003 and was replaced by Dr. h.c. mult. Pekka Ala-Pietilä in January 2024. According to information from Forbes, Hasso Plattner and his family are

ranked 164th among the richest people in the world, with a net worth of 12.1 billion dollars as of June 2024.

Table 2.4 SAP's Major Shareholder

Shareholder	Current shares in %
Hasso Plattner	6.59
Black Rock	5.48
SAP SE (Eigene Aktien / Treasury Shares)	5.23
Dietmar Hopp	5.09

Source: Frankfurt Stock Exchange



CHAPTER III

MACRO-ECONOMIC, INDUSTRY AND COMPETITION ANALYSIS

The stock prices of individual companies are influenced not only by their financial performance but also by several critical micro-economic factors. These include gross domestic product (GDP), interest rates, inflation levels, and exchange rates, all of which shape expectations regarding future profitability. Additionally, thorough competitor analysis plays a crucial role in enhancing investment decisions by evaluating market share and strategic initiatives within the industry. This chapter will provide a comprehensive analysis of macro-economic, industry, and competitors to develop an understanding of their impacts.

3.1 Macro-Economic Analysis

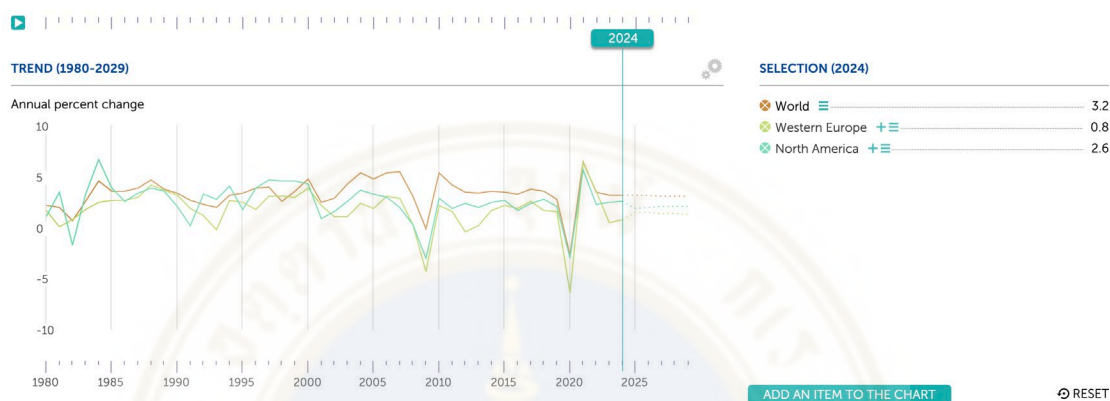
Three primary macro-economic factors influence the stock market: GDP, inflation, and interest rates. These factors serve as critical indicators that provide insights into economic conditions and potential future market trends.

3.1.1 Global GDP

Figure 3.1 shows the real GDP trend of the world, Western Europe, and North America. The real GDP is an inflation-adjusted measure that reflects the actual growth of the economy over a period of time. The COVID-19 pandemic hurt the world's economic real GDP growth, resulting in real GDP growth dropping by 2.7% in 2020 and then growing by 6.5% in 2021 after recovering from the pandemic impact. After that, it remained at the same level as pre-COVID-19, with around 3.2% growth in the following years. In the meantime, Western Europe and North America are on the same trend as the world's real GDP growth, but Western Europe's real GDP growth was hit

more by the pandemic than global and North America's due to the Ukraine-Russia war. According to the International Monetary Fund website, the future forecast of the real GDP for the world, Western Europe, and North America is still growing. Nevertheless, the rate for North America and Western Europe is even lower.

Figure 3.1 Real GDP Trend of the World, Western Europe, and North America



Source: International Monetary Fund Website, 2024

SAP SE is a multinational software company. Its primary revenue came from EMEA and the Americas region, especially the USA. SAP SE has been impacted by the pandemic and the Ukraine-Russia war. **Figures 3.2 and 3.3** illustrate SAP SE's total revenue trend and growth from pre-COVID-19 until post-COVID-19. It shows an upward trend from 2017 to 2019 before hitting negative growth by 1% each year during the pandemic. After the world recovered from the pandemic, it started growing again by 10% and 6% in 2022 and 2023, respectively. However, SAP is still continually growing from the digital transformation trend, which attracts new customers to spend on cloud services and ERP.

Figure 3.2 SAP's Revenue Trend from 2018 to 2023

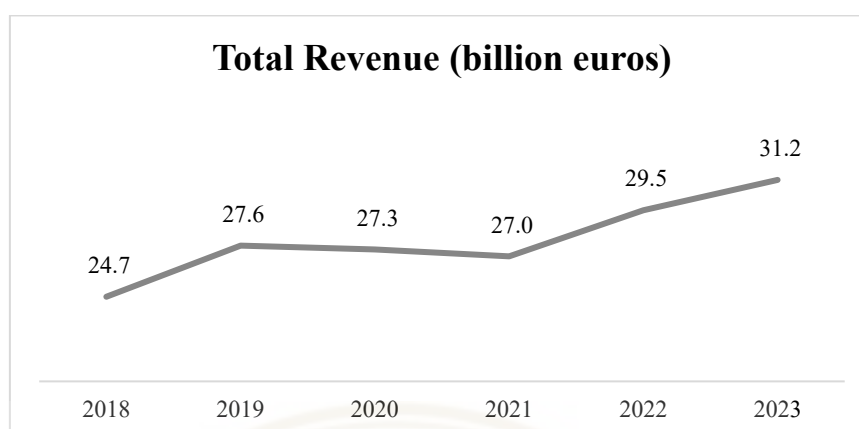
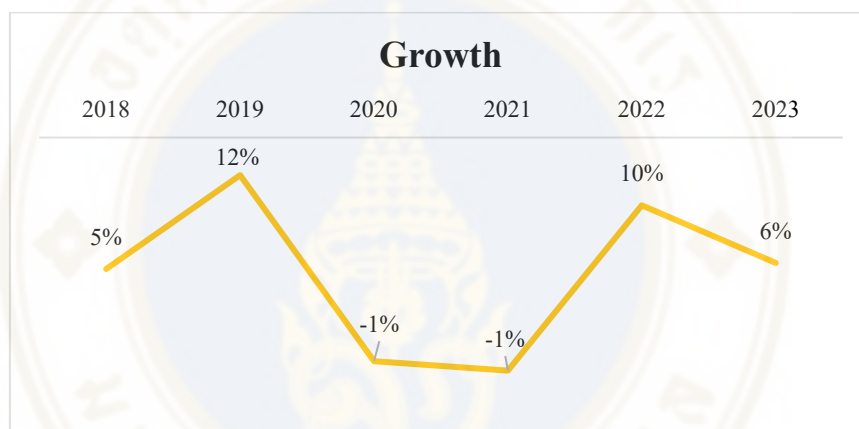


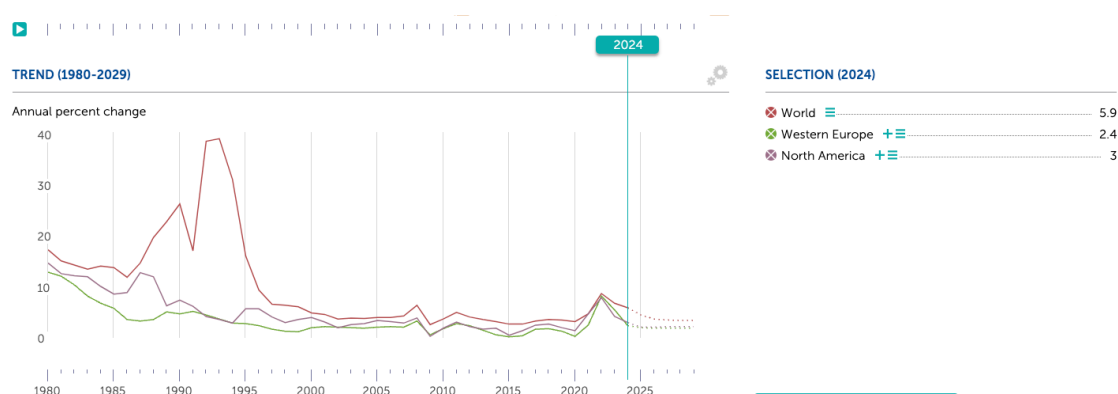
Figure 3.3 SAP's Revenue Growth from 2018 to 2023



3.1.2 Interest, Inflation and Exchange Rate

According to **Figure 3.4**, inflation has been in the range of 2.7% to 3.6% for a decade. Then, the COVID-19 pandemic, combined with the invasion of Ukraine, caused world inflation to reach a peak at 8.7% in 2022 before gradually falling to 5.9% in 2024. It is estimated to continue to plunge in the following years. The World Economic Outlook, April 2024, said that global inflation will reach targets earlier than in emerging markets and developing economies.

Figure 3.4 Inflation Rates Trend of the World, Western Europe, and North America



Source: International Monetary Fund Website, 2024

In the first quarter of 2022, the US Federal Reserve (Fed) raised interest since the US economy was overheating due to higher inflation, as shown in **Figure 3.5**. The interest rate continuously increased until it reached more than five percentage points (pp), slowing the economy and reducing American purchasing power. Not only inflation but other factors such as GDP, consumer spending, and industrial production also impact the Fed's decision (Katzeff, 2024). This also happened to the European economy, as shown in **Figure 3.6**. During the pandemic and the Ukraine-Russia war, the European Central Bank raised interest rates from July 2022 until September 2023. Then, in June 2024, the European Central Bank confirmed reducing interest rates by 25 basis points (bp) due to the better result of the inflation forecast and the strength of monetary policy transmission (Reid, 2024).

Higher interest and inflation rates do affect people's spending and borrowing. However, according to the financial statement of SAP SE at the end of December 31, 2023, SAP SE did not have any bank loans. A significant portion of financial debt comes from several Eurobonds and one USD bond maturing between 2014 and 2020. The balance of bonds as of December 31, 2023 is 6,780 million euros (27.2% of total liabilities, 2023); one bond issued in 2018 will mature in 2024, and the company will repay this bond by 850 million euros. Thus, higher interest and inflation rates do not affect the company's debt costs, as it has no plan to make a loan agreement or issue a new bond shortly. However, if the company plans to do a big project that requires large investments, a high interest rate might restrict the company's future access to finance unless it has sufficient cash or cash flows from operations.

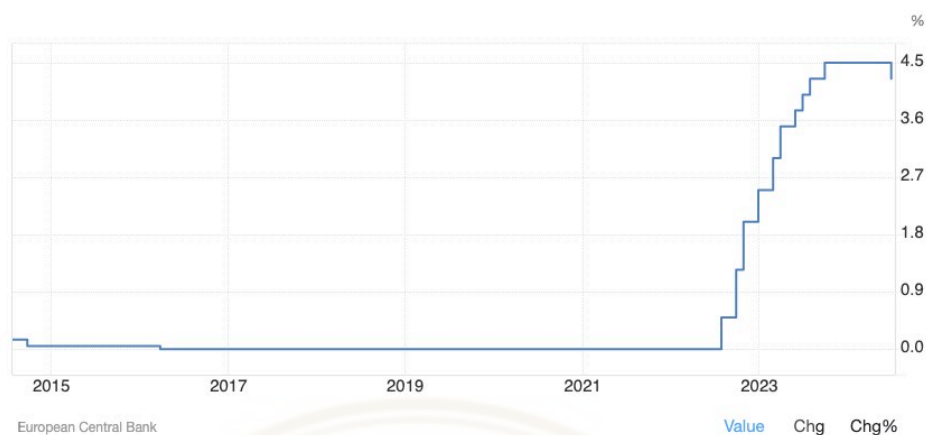
Exchange rate risk refers to changes in foreign exchange rates that might affect a company's operations. Regarding SAP SE's Annual Report 2023, exchange rate fluctuations have some effects on SAP SE. An essential proportion of SAP SE transactions, approximately 74% in 2023 and 73% in 2022, are conducted worldwide in other currencies than euros, which is the reporting currency in euros. However, the group's entities operate in their functional currencies, resulting in a limited impact on the exchange rate. Only specific transactions, such as account receivables, account payables, and other financial items, involve conducting business in a currency different from the functional currencies. According to the Q4 2023 Quarterly Statement, exchange rate fluctuation is expected to impact operating profit growth between 0.0 pp and 2.0 pp in 2024. Further, SAP SE is hedging to reduce exchange rate risks. There is an exchange rate impact reported in the Annual Report as follows: "Fluctuations in the exchange rate of the Euro had an unfavorable impact of 826 million euros on our total revenue for 2023, a favorable impact of 1,620 million euros on our total revenue for 2022, and an unfavorable impact of 375 million euros on our total revenue for 2021." (SAP Annual Report on Form 20-F, 2023, p. 81) The currency impact was -2.65%, 5.49%, and -1.35% of the total revenue for the years 2023, 2022, and 2021, respectively, which is considered an insignificant impact for the company.

Figure 3.5 US Interest Rate over the past 10 years



Source: International Monetary Fund Website, 2024

Figure 3.6 EU Interest Rate over the past 10 years



Source: International Monetary Fund Website, 2024

3.2 Industry Analysis

SAP offers cloud-based enterprise resource planning (ERP) software, facilitating convenient access to updated information via cloud infrastructure. MarkWide Research reports that the cloud empowers remote servers to handle data storage, processing, and application access efficiently. As stated in Mordor Intelligence, the ERP market can be segmented by offering (solutions and services), function (human resources, supply chain, finance and marketing), deployment (on-premise and hybrid), company size (small and medium, and large enterprises), industry vertical, and geography. As highlighted in the HG Insights ERP Market Report, the recent digital transformation trend plays a vital role for ERP in driving business growth. The ERP market is expected to reach 183 billion dollars by 2024, with North America and the Asia-Pacific region contributing significantly. The outstanding segments in ERP include Customer Relationship Management (CRM) and Financial Applications. The global market for cloud ERP was estimated by Fortune Business Insight to be valued at 57.17 billion dollars in 2024 and 181.04 billion dollars by 2032, at a compound annual growth rate (CAGR) of 15.5%.

Referring to ERP Market Size and Share Analysis: Growth Trends and Forecasts (2024-2029) from Mordor Intelligence, the demand for ERP software, particularly cloud-based solutions, is growing due to several key factors. These include

the integration of innovative technologies, enhanced security measures, and the reduction of third-party dependencies. Businesses increasingly prioritize customer-centric strategies for enhancing customer satisfaction, loyalty, and overall operational efficiency. Mobile-friendly ERP solutions are also in high demand, catering to the need for operational agility by enabling real-time decision-making and workflow management on mobile devices. The flexibility of ERP systems is critical as businesses seek to scale, adapt to organizational changes, and meet evolving market demands, ensuring they can effectively optimize workflows and enhance productivity across their operations.

Currently, North America holds the largest market share in ERP. The increasing adoption of ERP software in the United States derives from the need for businesses to gain a competitive edge in the market by integrating all business functions. ERP solutions are built for mid- and large-sized companies to assist them in upgrading their basic accounting systems and evolving through digital transformation.

In June 2023, SAP expanded its strategic partnerships with Bain and Microsoft to enhance ERP transformation and business solutions. SAP and Bain teamed up to leverage RISE with SAP and Bain's expertise, aiming to accelerate cloud-enabled ERP transformations and help executives achieve their business goals more effectively. In addition, SAP and Microsoft strengthened their collaboration to integrate SAP Success Factors with Microsoft 365 Copilot, Microsoft Viva Learning, and Azure OpenAI Service. This integration seeks to enhance organizational capabilities by leveraging advanced language models to improve employee attraction, retention, and development.

In September 2023, Oracle and Mastercard launched a partnership to automate B2B payment transactions by integrating Mastercard's virtual card platform with Oracle Fusion Cloud ERP, aiming to streamline and enhance financial processes and facilitate seamless transactions between enterprises and banks. Meanwhile, Microsoft unveiled Dynamics 365 Copilot, the first AI-powered copilot for CRM and ERP systems, designed to reduce repetitive tasks across sales, service, marketing, operations, and supply chain roles. By leveraging advanced AI capabilities, this tool aims to boost efficiency and enable employees to concentrate more on strategic aspects of their work.

According to Deloitte 2024 Technology Industry Outlook, the digital transformation trend is currently accelerating, but the market faces challenges in the meantime, as below:

The businesses focus on artificial intelligence (AI), Cloud Computing, and Cybersecurity. The spending is projected to drive significant growth in software and IT services, which aim to enhance businesses' efficiency, productivity, and security.

The technology industry faces challenges from supply chain disruptions, raw material shortages, and new regulations. Balancing globalization with the need for self-reliance will be crucial to mitigating risks and ensuring operational continuity.

Governments worldwide are increasingly scrutinizing large tech platforms and social networks for their impacts on businesses and consumers. As regulatory frameworks evolve, tech companies will need to adapt to comply with new regulations while minimizing potential impacts on their operations.

3.3 Competition Analysis

Competitor analysis using frameworks like SWOT analysis and Porter's Five Forces provides a structured approach to comprehensively understanding competitive dynamics within an industry. SWOT is a method of strategic planning that generates new ideas and fact-based perspectives, while the five-force model analyzes the competitive environment of an industry.

3.3.1 SWOT

SAP develops the business plan to take advantage of competitors by using SWOT (strengths, weaknesses, opportunities, and threats). According to the strategy story, SAP's SWOT can be summarized as below:

Strength

SAP provides end-to-end cloud solutions to businesses, covering all business functions, including finance, procurement, human resources, and customer relationship management. In addition, SAP's software solutions are designed

to scale efficiently, catering to businesses of all sizes, from small startups to large enterprises. The wide range of products and their scalability support operational flexibility and growth across diverse global markets.

SAP has established a robust global footprint by serving diverse industries in many countries across the world. This extensive reach enables SAP to understand and meet the specific needs of businesses in different regions, offering localized support and tailored solutions to customers.

SAP invests a lot in research and development with highly skilled employees, focusing on cutting-edge technologies such as artificial intelligence (AI) and blockchain. This commitment allows SAP to deliver advanced software solutions that help its customers stay competitive and drive digital transformation.

Weaknesses

SAP solutions require a high initial investment and ongoing costs for licensing, implementation, and maintenance. This financial burden can be an obstacle for smaller businesses with constrained budgets, prompting them to consider more affordable alternatives.

SAP's software can be complex and challenging to implement and use, particularly for smaller businesses lacking dedicated IT resources. This complexity may hinder these businesses from fully realizing the potential benefits of SAP's solutions. Additionally, the complexity could potentially affect user satisfaction negatively.

While SAP offers highly customizable solutions, extensive customization can introduce complexity and additional costs. Businesses may face challenges in managing these complexities effectively due to significant modifications to align the software with their specific requirements.

Opportunities

SAP is actively investing in cloud-based solutions, recognizing the increasing demand for flexibility and scalability among businesses. This focus presents a significant opportunity for SAP to expand its customer base and increase revenue by offering cloud alternatives to traditional software solutions.

SAP is investing in emerging technologies such as AI, machine learning, and blockchain to streamline operations. This positions SAP well to capitalize on the ongoing trend of digital transformation across various industries.

SAP has established strategic partnerships with leading technology companies like Microsoft and Google. These partnerships enable SAP to offer integrated solutions that provide enhanced value to customers by combining SAP's expertise with the capabilities of other industry leaders.

SAP is committed to achieving net zero by offering eco-friendly products to customers, which encourages customers to shift towards sustainability.

Threats

SAP competes fiercely with other major enterprise software vendors like Oracle, Microsoft, and Salesforce, all offering similar solutions. This competition poses potential price pressures and challenges to maintaining market share. Additionally, SAP may be impacted by copied and low-quality software in the small business market.

Rapid advancements in technologies like cloud computing and AI present both opportunities and threats. SAP must innovate and adapt its software solutions to stay competitive. Failure to keep pace with technological changes could lead to the loss of market share to more agile competitors.

SAP's solutions involve handling sensitive personal and business data, subject to stringent data privacy regulations globally. In addition, SAP, as enterprise software, is a main target for cyberattacks. These could damage SAP's reputation and erode customer trust, impacting its market position and financial performance.

3.3.2 Five Forces Analysis

Porter's Five Forces framework provides SAP with a strategic approach to building a sustainable competitive advantage in the application software industry and exploring profitable opportunities in the broader technology sector. According to Fern Fort University, SAP's Five Forces Analysis can be identified below:

Threats of New Entrants (High)

SAP maintains its competitive edge in the application software industry through continuous innovation, building economies of scale, and strategic investment in research and development (R&D). By consistently introducing new products and services, SAP not only attracts new customers but also retains existing ones by enhancing its value propositions in a dynamic market. Expanding its operations and customer base allows SAP to achieve economies of scale while maintaining cost-effectiveness compared to new entrants.

Bargaining Power of Suppliers (High)

SAP cultivates relationships with multiple suppliers to enhance negotiation leverage and minimize the impact of potential price increases. The company also explores product designs that offer flexibility in material usage, allowing it to maintain competitive pricing and favorable terms without compromising quality or timelines.

Bargaining Power of Buyers (High)

Continuous innovation and the introduction of new products have a crucial role in mitigating buyer bargaining power by attracting new customers and encouraging existing ones to upgrade or switch to more advanced offerings. This strategy shifts customer focus away from seeking discounts on established products towards adopting newer solutions, thereby maintaining SAP's pricing power and market competitiveness.

Threats of Substitute Products or Services (Moderate)

By shifting towards a service-oriented approach that includes consulting, customization, and ongoing support alongside software solutions, SAP enhances its value proposition over substitutes. SAP focuses on understanding customers' underlying needs and pain points, enabling the development of innovative solutions that directly address these concerns. Furthermore, SAP implements strategies to increase switching costs for customers considering substitutes, such as offering

integrated solutions tailored to specific workflows and unique features that competitors cannot easily replicate.

Rivalry among the Existing Competitors (Moderate)

SAP focuses on developing unique value propositions that differentiate its products and services from competitors. This includes integrating innovative features, offering superior customer service, developing industry-specific solutions, and enhancing integration capabilities to improve the overall customer experience and foster loyalty. SAP scales its operations and expands its market reach to achieve economies of scale, which allows cost efficiency to counteract pressures from intense competition. Lastly, collaborative efforts with competitors through partnerships contribute to expanding the market size and addressing industry-wide challenges, promoting innovation while mitigating direct competition.

3.3.3 Competitors

There are three big names dominating the ERP market, including SAP, Oracle, and Microsoft Dynamics 365. Oracle has a higher market capitalization than SAP, mainly due to Oracle's strategic acquisitions to strengthen its competitive position and create shareholder value, while SAP's acquisition purpose is to expand its portfolios. Oracle's largest acquisitions were PeopleSoft for 10.3 billion dollars in 2005 and Cerner for 28.3 billion dollars in 2021. As Microsoft is known for personal computer software, Microsoft Dynamics 365 accounts for only 2.6% of Microsoft's total revenue as of March 2024. Further, there are smaller players who compete in SAP's market, including Workday, Intuit, and Sage. Salesforce specializes in customer relationship management platforms but also focuses on resource planning and internal process management. SAP competitors are listed below:

3.3.3.1 Oracle Corporation

Oracle Corporation (NYSE: ORCL) is an American-based information technology company. It offers products and services related to enterprise applications and infrastructure worldwide. Oracle's products include Oracle Cloud Infrastructure, Cloud Applications, Industries, Oracle Hardware and Engineered

Systems, Enterprise Applications, and Oracle Software. Oracle services include Oracle Consulting, Oracle Premier Support, Oracle University, Oracle Financing, Customer Success Services, and Cloud Customer Connect. Oracle's strategy is to provide choice and flexibility to its customers.

3.3.3.2 Workday Inc.

Workday Inc. (NASDAQ: WDAY) is an American company. It is a prominent enterprise platform that serves AI-powered cloud solutions aimed at addressing significant business challenges. It focuses on managing workforce empowerment, financial management in dynamic environments, and strategic planning for unforeseen circumstances. It is popular among various business sizes, especially for its human capital management (HCM) features.

3.3.3.3 Salesforce Inc.

Salesforce Inc. (NYSE: CRM) is an American cloud-based software company that specializes in customer relationship management (CRM). It focuses on sales, customer service, marketing automation, e-commerce, analytics, and application development and brings companies and their customers together.

3.3.3.4 Microsoft Corporation

Microsoft Dynamics 365 is a set of business applications offered by Microsoft Corporation (NASDAQ: MSFT), an American multinational technology company. Microsoft operates in three segments: Intelligence Cloud, Productivity and Business processes, and Personal Computing. Microsoft Dynamics 365 is designed to enhance operational efficiency and deliver exceptional customer experiences. It helps businesses achieve greater agility and simplicity at a controllable cost. It connects the business processes, including sales and marketing, service, finance, and supply chain.

3.3.3.5 Intuit Inc.

Intuit, Inc. (NASDAQ: INTU) is an American software company. It specializes in financial management, compliance, and marketing products

and services. Intuit offers various products for small businesses, such as TurboTax, Credit Karma, QuickBooks, and Mailchimp.

3.3.3.6 Sage Group Plc.

Sage Group Plc. (LSE: SGE) is a British enterprise software company. Sage is a market leader providing integrated accounting, payroll, and payment systems that support entrepreneurs and small businesses worldwide.



CHAPTER IV

FINANCIAL ANALYSIS AND VALUATION

Financial analysis and valuation are necessary for determining the worth of a company. Financial analysis involves assessing a company's financial statements to project future cash flows and assess growth prospects. Valuation, on the other hand, provides an estimate of a company's fair value and significantly influences investment decisions. This chapter will discuss both financial analysis and valuation in detail.

4.1 Financial Analysis

Financial statements provide a snapshot of a company's revenue, expenses, financial obligations, cash flow, and overall financial health. Investors commonly use financial analysis to analyze stock prices and assess the attractiveness of potential investments. To assess financial performance effectively, financial ratios should be computed to evaluate the profitability, liquidity, and solvency of the company compared with its industry peers.

4.1.1 Growth Analysis

From **Table 4.1**, SAP has generated revenue growth in a range of 5% to 12% during the past six years, except for the COVID-19 years in 2020 and 2021, which are considered outliers. SAP continuously improves operations, mainly by focusing on cloud development over the past decade. The growth of cloud revenue has been driven by customers' accelerated transition to the cloud. In contrast, software license revenue growth has declined over the past six years. Gross profit has continuously grown, followed by revenue growth from cloud and service gross profit. Operating expenses increased by 21% in 2019 from restructuring, administrative headcounts to support future growth, and research and development costs, resulting in a declining net income and earnings per share growth rate. The pandemic had a significant impact on SAP's

financial performance, causing a temporary rise in operating expenses. Despite this, revenue saw an uptick in the year following the pandemic. However, net income and earnings per share showed a negative growth rate in 2022, primarily due to higher finance costs. This is further illustrated in the annual report 2022, "IFRS 9-related fair value adjustments or losses from disposal of Sapphire Ventures investments totaling 1,802 million euros (2021: 654 million euros), and interest expense on financial liabilities amounting to 208 million euros (2021: 160 million euros)." Despite these challenges, SAP's free cash flow has shown resilience over the past six years, with a notable growth rate of 138% in 2020, attributed to higher operating income from saving sales, marketing, and general and administration costs.

Table 4.1 SAP's Growth Trend from 2018 to 2023

SAP	2018	2019	2020	2021	2022	2023
Revenue	5%	12%	-1%	-1%	10%	6%
Gross profit	5%	11%	1%	1%	9%	5%
Operating expenses	2%	21%	-10%	0%	13%	8%
Net income	1%	-18%	57%	29%	-55%	17%
EPS Diluted	2%	-19%	56%	2%	-56%	168%
Free Cash Flow	-25%	-6%	138%	-15%	-12%	16%

Oracle, a software company that provides customers with ERP software and cloud services, is SAP's primary competitor. Oracle's revenue structure can be divided into cloud and license revenues, hardware revenue, and service revenue. 62.5% of its total revenue in the fiscal year 2023 was from the Americas and followed by EMEA at 24.6%. However, it is important to note that Oracle's financial statements are reported every May 31 yearly, which differs from SAP's reporting schedule, which is reported every December 31 annually. Therefore, this 5-month information lag might have an effect.

Before the pandemic, SAP's revenue growth was higher than Oracle's by 5% and 13% in 2018 and 2019, respectively, as shown in **Table 4.1 and 4.2**. However, the pandemic significantly impacted both companies, with SAP experiencing lower growth until it reached the same increase as Oracle in 2023. In addition, both companies successfully maintained gross profit growth over the period. After the pandemic, both companies' operating incomes are higher, indicating that they are investing in research

and development on the cloud and pushing more sales and marketing expenses. Moreover, Oracle also invested in fixed assets, mostly computer equipment at the data centers, resulting in higher operating expenses in 2021.

In summary, Oracle was able to increase its profit by 27% and 23% in 2022 and 2023, respectively, showcasing its resilience and adaptability in the face of market challenges more than SAP did after the pandemic years.

Table 4.2 Oracle's Growth Trend from 2018 to 2023

Oracle	2018*	2019*	2020*	2021*	2022*	2023*
Revenue	0%	-1%	4%	5%	18%	6%
Gross profit	1%	-1%	5%	3%	8%	4%
Operating expenses	0%	-3%	-1%	5%	28%	-4%
Net income	209%	-9%	36%	-51%	27%	23%
EPS Diluted	249%	4%	48%	-47%	27%	21%
Free Cash Flow	-6%	-10%	19%	-63%	68%	39%

**As Oracle has reported a period every May 31 annually, this table shows numbers calculated from information on May 31 of the year after SAP reported by five months.*

Salesforce is an American cloud-based customer relationship management (CRM) software company. 93.3% of Salesforce's revenue in 2023 was from subscriptions and support from application software. 66.8% of its total revenue was from the Americas, followed by Europe at 24.6%. However, Salesforce's financial statements are reported every January, which differs from SAP's reporting schedule, which might have a slight effect.

As shown in **Table 4.3**, Salesforce's revenue and gross profit continually grow from improving its products with new technology. It launched Einstein, the first comprehensive AI technology for CRM, in 2017 and Salesforce Customer 360, a platform service that efficiently manages customer data across clouds, in 2018. During the pandemic, it also had products and resources that supported customers, especially in the healthcare sector. Therefore, Salesforce is continuously growing.

Table 4.3 Salesforce's Growth Trend from 2018 to 2023

Salesforce	2018	2019	2020	2021	2022	2023
Revenue	26%	29%	24%	25%	18%	11%
Gross profit	27%	31%	23%	23%	18%	14%
Operating expenses	27%	33%	24%	23%	12%	-4%
Net income	208%	-89%	3132%	-65%	-86%	1888%
EPS Diluted	192%	-90%	2820%	-66%	-86%	1900%
FCF	124%	-20%	12%	195%	-47%	24%

4.1.2 Dupont Analysis (of ROE)

This section analyzes Dupont's return on equity (ROE) over the last six years of SAP compared to its competitor, Oracle. As shown in **Table 4.4**, SAP's ROE was in an increasing trend from 2018 to 2021 before dropping in the last two years, mainly because of higher finance costs, research and development, and sales and marketing costs to boost revenue after COVID-19. Moreover, asset turnover has decreased for six years, indicating the lower efficiency of using assets to generate revenue. Nevertheless, goodwill is significant in total assets (42.6% of total assets in 2023). It refers to acquisition activities in the past in order to achieve inorganic growth. The equity multipliers are slightly dropped in 2022 and 2023 compared to the year before the pandemic.

Table 4.4 SAP's Dupont (of ROE) from 2018 to 2023

SAP	2018	2019	2020	2021	2022	2023
Asset Turnover	53%	49%	46%	42%	41%	44%
Equity multiplier	1.73	1.87	1.95	1.81	1.70	1.63
Net Profit Margin	17%	12%	19%	25%	10%	12%
Return on Equity	15%	11%	17%	19%	7%	8%

On the other hand, Oracle's ROE has fluctuated over the period, as shown in **Table 4.5**; this is because of the fluctuation of the equity and the stock buyback, resulting in negative equity in 2022 and 2023, which is considered abnormal. Overall, the ROE of SAP is lower than Oracle every year, mainly due to a significantly lower equity multiplier and net profit margin. This means Oracle could be more successful internally in generating profit and more return to shareholders than SAP. In the meantime, a higher ROE reveals Oracle's excess debt. As of May 31, 2024, Oracle has a debt-to-equity ratio of 14.26, which means the funding source mainly comes from debt

and may indicate that Oracle borrows large amounts of debt for a stock buyback according to the expansion of net income and the free cash flow growth.

In addition, the net profit margins for both companies show a downward trend from 2018 to 2022 and an increase in 2023, referring to the business recovering from the pandemic. At the same time, SAP has a higher asset turnover than Oracle, which indicates that SAP is more efficient in using assets to generate revenue than Oracle.

Table 4.5 Oracle's Dupont (of ROE) from 2018 to 2023

Oracle	2018*	2019*	2020*	2021*	2022*	2023*
Asset Turnover	32%	35%	33%	35%	41%	38%
Equity multiplier	3.56	6.39	13.21	1,306.54	-57.85	25.51
Net Profit Margin	28%	26%	34%	16%	17%	20%
Return on Equity	32%	58%	147%	7,301%	-404%	194%

**As Oracle has reported a period every May 31 annually, this table shows numbers calculated from information on May 31 of the year after SAP reported by five months.*

Salesforce continues to grow in the marketing cloud after the pandemic. As shown in **Table 4.6**, the asset turnover is in the range of 32%-50%, which is slightly lower than SAP and Oracle, mainly affected by high goodwill from mergers and acquisitions for expanded market opportunities from integrating companies into other advanced cloud technologies and channel-based messaging platforms, including Demandware, Quip, Heroku, Pardot, Mulesoft, Tableau, and Slack. In 2020 and 2022, Salesforce will spend a huge amount on research and development, marketing, and sales for the new technology. This also led to a variation in the net profit margin.

Table 4.6 Salesforce's Dupont (of ROE) from 2018 to 2023

Salesforce	2018	2019	2020	2021	2022	2023
Asset Turnover	50%	40%	35%	33%	32%	35%
Equity multiplier	2.03	1.73	1.61	1.62	1.67	1.68
Net Profit Margin	8%	1%	19%	5%	1%	12%
Return on Equity	9%	1%	11%	3%	0%	7%

4.2 Relative valuation

Relative valuation, or valuation using multiples, offers the value of an asset compared to the benchmark. In contrast with discounted cash flow valuation, which focuses on the intrinsic value of an asset based on its ability to generate cash flow in the future. In this chapter, we apply the relative valuation model to assess SAP's target stock price by comparing it with its historical and peer averages.

4.2.1 Historical Multiples Bands

Firstly, we use the reliance of historical stock price activity to predict target prices. A single stock could be compared with its historical averages to determine whether the current price is reasonable relative to itself.

In this part, the historical information related to price, earnings per share (EPS), book value (BV), enterprise value (EV), and earnings before interest, taxes, depreciation, and amortization (EBITDA) for SAP SE is obtained from the Frankfurt Stock Exchange (FWB), while the estimated information is obtained from Bloomberg. The five years of historical data for SAP SE starting from July 2019 to July 2024 have been used because they cover the time to make decisions on changes to products and services' pricing or new potential investments for the information technology industry.

Then, we illustrate a line with the historical multiples for trailing and forward Price-to-Earnings (P/E), Price-to-Book value (P/BV), and Enterprise value-to-Earnings before interest, taxes, depreciation, and amortization (EV/EBITDA) bands. We use five-year consecutive data until July 12, 2024, and draw lines for the mean and standard deviation of the historical multiples, mean $\pm 1SD$, and mean $\pm 2SD$.

4.2.1.1 Trailing and Forward P/E Bands

The main line in the figure is the historical P/E ratio. The P/E ratio is widely used to compare the market value of stock with the company's earnings. It is calculated by dividing the company's stock price by its annual EPS. It shows what investors are willing to pay for a stock based on its past or future earnings. More simply, it can be considered the number of years it takes for the investors to earn back the price they paid for the stock. The diluted EPS should be used in the calculation, as the

potential dilutive effect of options and other dilutive contracts is already included in the diluted EPS.

To determine whether the stock is overvalued or undervalued, we compare the P/E ratio with its past or other stocks in the same industry. A high P/E ratio indicates that investors expect high earnings from the company's growth in the future. Meanwhile, a low P/E ratio indicates lower expectations from investors.

Figure 4.1 displays the trailing P/E band from July 12, 2019 to July 12, 2024. It is calculated by using the closing share price divided by the average EPS for the past 12 consecutive months. The average trailing P/E ratio and the standard valuation are 34.00 and 9.77, respectively. SAP's trailing P/E as of July 12, 2024 is 43.35, which is nearby the +1SD band (43.78).

Figure 4.1 Trailing P/E Band (July 2019 - July 2024)

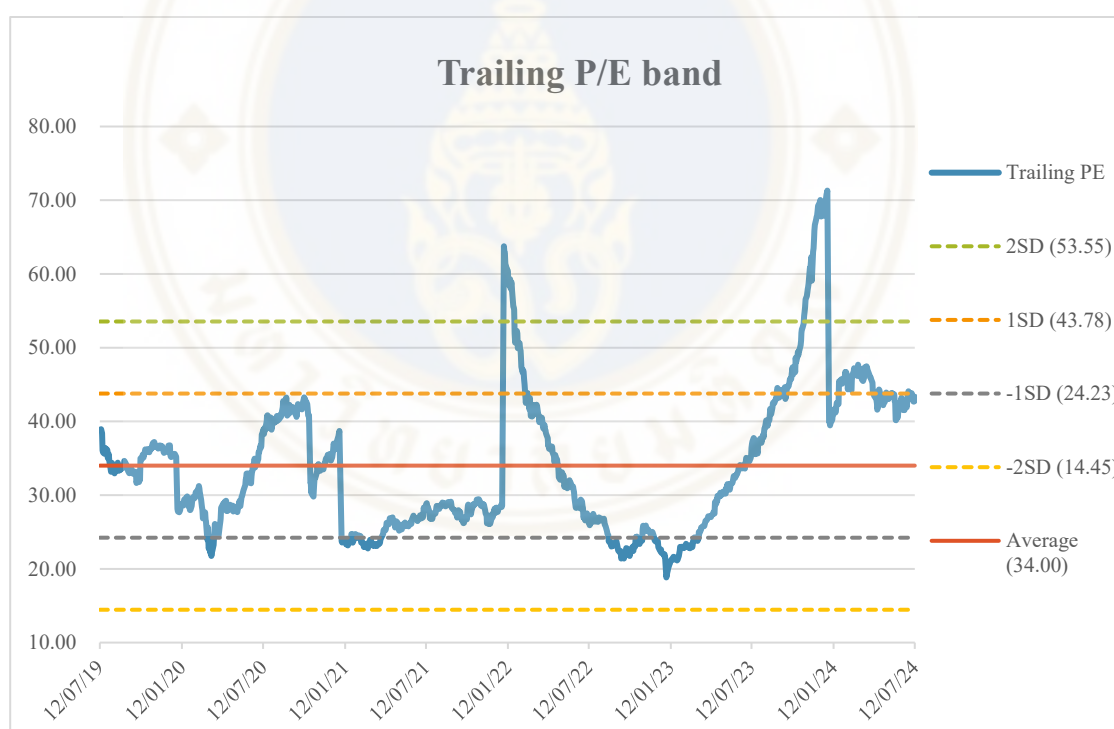
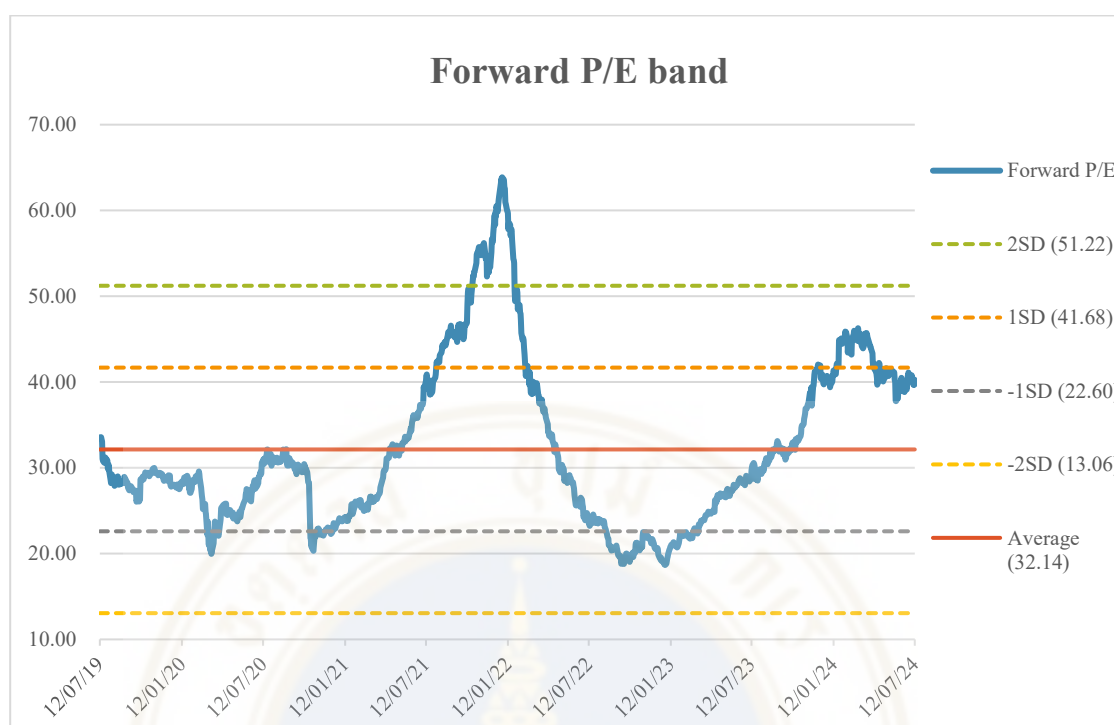


Figure 4.2 displays the forward P/E band from July 12, 2019 to July 12, 2024. It is calculated by using the closing share price divided by the forecasted EPS for the next 12 months. The average forward P/E ratio and the standard valuation are 32.14 and 9.54, respectively. SAP's forward P/E as of July 12, 2024, is 40.25, which is slightly less than the +1SD band (41.68).

Figure 4.2 Forward P/E Band (July 2019 - July 2024)

When comparing the trailing and forward P/E ratios, the current forward P/E ratio as of July 12, 2024, is slightly lower than the current trailing P/E ratio. Additionally, SAP's average trailing P/E ratio is higher than the average forward P/E ratio, which reflects the fact that the projected earnings per share for the next 12 months are anticipated to be higher than the average trailing earnings per share.

There was a loss from the disposal of Sapphire Ventures investment, and the impact of COVID-19 in 2019 and the Ukraine war in 2022 led to a fluctuation in both trailing and forward P/E during the last five years. Nevertheless, the graph is in an upward trend because SAP benefits from continuing strengths in the cloud business, together with the announced restructuring plans at the beginning of 2024 in a push toward AI growth. The restructuring plan, costing 2 billion euros, will reduce the expected diluted EPS in 2024. However, it aims to enhance sales growth and streamline operations by focusing on AI heading into 2025. Overall, the graph shows that SAP's stock is overvalued based on its actual past average multiples.

4.2.1.2 Trailing and Forward P/BV Bands

The second band is the P/BV ratio. The P/BV ratio shows a company's market value in comparison to its BV per share. It is calculated by subtracting the total liabilities from the total assets and then dividing by the total number of shares. It reflects the value that the shareholders would receive if the company were liquidated. In other words, it measures the trading price of the company's stock relative to its book value. The higher P/BV indicates that stock is traded at a premium. The lower P/BV indicates that the stock is undervalued. However, some investors believe the market wrongly values the stock and search for investing opportunities.

Figure 4.3 displays the trailing P/BV band from July 12, 2019 to July 12, 2024. It is calculated by using the closing share price divided by the average BV per share for the past 12 consecutive months. The average trailing P/BV ratio and the standard valuation are 3.92 and 0.81, respectively. SAP's trailing P/BV as of July 12, 2024 is 5.10, which is in the middle of +1SD (4.73) and +2SD (5.55).

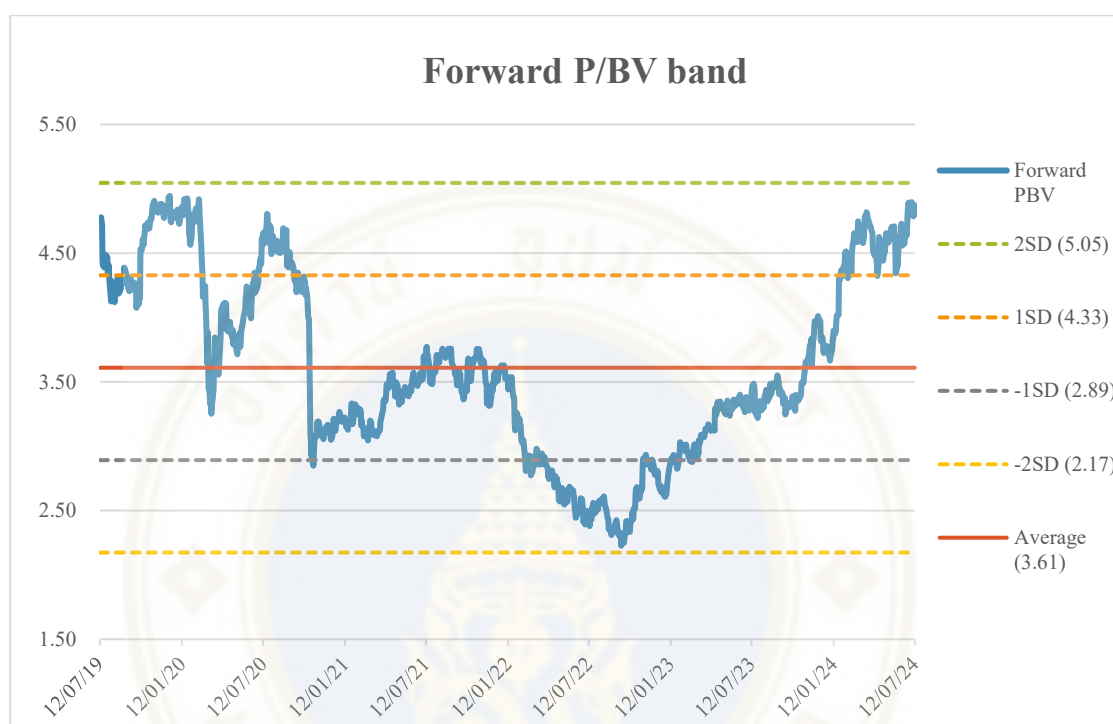
Figure 4.3 Trailing P/BV Band (July 2019 - July 2024)



Figure 4.4 displays the forward P/BV band from July 12, 2019 to July 12, 2024. It is calculated by using the closing share price divided by the

forecasted BV per share for the next 12 months. The average forward P/BV ratio and the standard valuation are 3.61 and 0.72, respectively. SAP's forward P/BV as of July 12, 2024, is 4.87, which is slightly less than the +2SD band (5.05).

Figure 4.4 Forward P/BV Band (July 2019 - July 2024)



Both trailing and forward P/BV fluctuated significantly between the -2SD and +2SD bands. SAP's trailing P/BV ratio is higher than the forward P/BV ratio and has also been in an upward trend since 2022, which is in the same direction as the P/E ratio. This shows that SAP's stock seems strongly overvalued. However, when compared to ROE, SAP's ROE in the last five years has fluctuated around 7.27%-19.10%, while the global return on equity by sector from Aswath Damodaran as of January 2024 for software (systems and applications) is 16.96% for the global market. It was a result of the bond issuing in 2018 to finance the acquisition of Callidus and Qualtrics of 3,900 million euros and in 2020 of 800 million euros for stock buybacks, as shown in **Figure 4.5**.

However, SAP has a high dividend-payout ratio, which has averaged 54.81% for the last five years, as shown in **Table 4.7**. SAP had a dividend policy to pay at least 40% of the SAP Group's International Financial Reporting

Standards (IFRS) profit after tax until 2023 (in 2024, at least 40% of non-IFRS profit after tax from continuing operations).

Figure 4.5 The Outstanding Bonds as of July 12, 2024

Bonds

Instrument	Issue date	Maturity	Volume (in million)	Issue currency	Coupon	Security code (WKN)	ISIN No.
Eurobond 4 - 2014	Nov. 20, 2014	Feb. 22, 2027	1,000	EUR	1.750% (fix)	A13SL3	DE000A13SL34
Eurobond 5 - 2015	Apr. 1, 2015	Apr. 1, 2025	600	EUR	1.000% (fix)	A14KJF	DE000A14KJF5
Eurobond 7 - 2018	Mar. 13, 2018	Mar. 13, 2026	500	EUR	1.000% (fix)	A2G8VT	DE000A2G8VT5
Eurobond 7 - 2018	Mar. 13, 2018	Mar. 13, 2030	500	EUR	1.380% (fix)	A2G8VU	DE000A2G8VU3
US Dollar Bond - 2018	Sep. 28, 2018	Sep. 28, 2025	300	USD	4.690% (fix)	A2RSD4	DE000A2RSD40
Eurobond 8 - 2018	Dec 10, 2018	Dec 10, 2024	850	EUR	0.75%	A2TSTE	DE000A2TSTE8
Eurobond 8 - 2018	Dec 10, 2018	Mar 10, 2028	1,000	EUR	1.25%	A2TSTF	DE000A2TSTF5
Eurobond 8 - 2018	Dec 10, 2018	Mar 10, 2031	1,250	EUR	1.63%	A2TSTG	DE000A2TSTG3
Eurobond 10 - 2020	May 18, 2020	May 18, 2026	600	EUR	0.125%	A289CY	XS2176715584
Eurobond 10 - 2020	May 18, 2020	May 18, 2029	800	EUR	0.375%	A289CZ	XS2176715667
Total outstanding Bonds in EUR			7,377	EUR			

Source: SAP's website

Table 4.7 SAP's Dividend Payout Ratio from 2018 to 2023

	2018	2019	2020	2021	2022	2023
Return on Equity (%)	15.02	11.29	17.39	19.10	7.27	8.35
Dividend Payout Ratio (%)	43.84	56.79	44.18	54.99	65.68	63.38
Average Payout Ratio (%)						54.81

4.2.1.3 Trailing and Forward EV/EBITDA Bands

The EV/EBITDA ratio is commonly used to evaluate the relationship between the company's enterprise value (EV) and its earnings before interest, taxes, depreciation, and amortization (EBITDA). It is calculated by dividing a company's EV by its EBITDA. EV is the total company value, including the market value of debt, common stocks, and preferred stocks. It subtracts the value of cash and short-term investments. EBITDA was known as an estimate of pre-interest and pretax operating cash flow. Therefore, EV/EBITDA indicates how many times EBITDA investors have to pay to acquire the company.

As with P/E and P/BV, a lower EV/EBITDA ratio suggests a company may be more attractive as a potential investment because the market potentially undervalues the company. In contrast, companies with a higher EV/EBITDA

ratio may indicate higher growth expectations, stronger market positions, or unique competitive advantages.

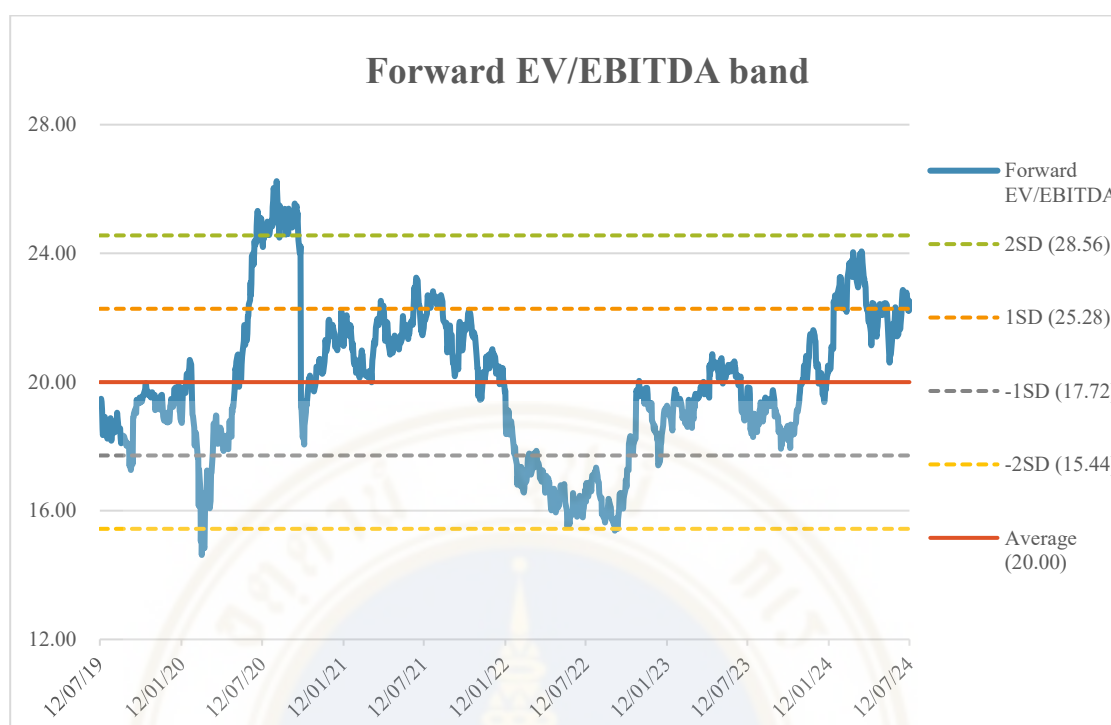
Figure 4.6 displays the trailing EV/EBITDA band from July 12, 2019 to July 12, 2024. It is calculated by using the EV divided by the averaged EBITDA for the past 12 consecutive months. The average trailing EV/EBITDA ratio and the standard valuation are 20.82 and 2.69, respectively. SAP's trailing EV/EBITDA as of July 12, 2024, is 29.28, which is slightly higher than the +2SD band (26.20). This shows that SAP's stock is strongly overvalued based on its past performance.

Figure 4.6 Trailing EV/EBITDA Band (July 2019 - July 2024)



Figure 4.7 displays the forward EV/EBITDA band from July 12, 2019 to July 12, 2024. It is calculated by using the current EV divided by the forecasted EBITDA for the next 12 months. The average forward EV/EBITDA ratio and the standard valuation are 20.00 and 2.28, respectively. SAP's forward EV/EBITDA as of July 12, 2024, is 22.52, which is at a similar level with the +1SD band (22.28).

Figure 4.7 Forward EV/EBITDA Band (July 2019 - July 2024)



Mostly trailing and forward EV/EBITDA fluctuated significantly between the -2SD and +2SD bands. When compared with the trailing EV/EBITDA, SAP's forward EV/EBITDA ratio is less than the trailing EV/EBITDA ratio. This is the same direction as with the P/E and P/BV bands, leading to the conclusion that SAP is currently overvalued compared to historical average valuation in the last five years.

4.2.1.4 Target Price from Historical Multiples

Relative valuation provides investors with a method to quickly compare a company's current market price against the prices of its peers, offering insights into the market's short-term sentiment. Therefore, this thematic paper will utilize relative valuation to calculate the target price for the current period and for December 2024. The target price from P/E and EV/EBITDA multiples can be computed as below.

Target Price for P/E

Target price for P/E = base EPS x 5-year P/E average

Target Price for EV/EBITDA

Target Enterprise Value = Market Capitalization + Net debt

Target Price for EV/EBITDA = Market Capitalization/ number of shares

P/E and EV/EBITDA would be good measures for SAP's valuation due to the fact that P/E takes profitability into account, including non-operating profit and stock repurchases. P/E also helps to identify growth stocks or indicate value stocks. However, P/E does not account for a company's debt level. A company can report positive earnings while having negative free cash flow, meaning it spends more than it earns. EV/EBITDA eliminates some of the P/E ratio's drawbacks by capturing a holistic business view that includes the value of debt. EBITDA controls for differences in interest costs, taxes, depreciation, and amortization. Regardless, EBITDA fails to take account of working capital; P/E complements this by focusing directly on net income and reflecting the impact of working capital management on profitability.

SAP has high intangible assets acquired in business combinations (average for FY2021-2023 at 47% of total assets), including goodwill and intellectual property, which tends to boost stock prices. Further, SAP has a lower amount of tangible assets, mainly land and buildings. As aforementioned, we average both trailing and forward P/E and EV/EBITDA to drive SAP's target price. Book value has a small relationship to SAP's share price, so we exclude P/BV from the relative valuation.

Table 4.8 shows the current expected price and the price for December 2024 using historical multiples. For the current expected price, the 5-year average trailing multiples are multiplied by the actual fundamental data for the current fiscal year (FY0) to provide a historical valuation measure based on past performance. In contrast, the 5-year average forward multiples are multiplied by the forecasted fundamental data for the next fiscal year (FY1) to reflect future growth expectations.

Based on the five-year average P/E and EV/EBITDA as of July 12, 2024, the expected current price as of July 12, 2024 is 136.94 euros, reflecting a downside of 27.44% compared to the current price of 188.74 euros. The expected price for December 2024 is 160.01 euros, reflecting a downside of 15.22%.

The upside indicates that the expected stock price will increase. In contrast, the downside indicates that the expected stock price will decrease compared to the current price. In conclusion, the relative valuation based on historical multiples shows that SAP's expected price in the future would be lower than its current price.

Table 4.8 Expected Price Based on Five-Year Average P/E and EV/EBITDA

SAP	FY0 2023	FY1 2024	FY2 2025
EPS (€)	5.17	3.42	5.80
BV per shares (€)	36.98	37.00	40.20
EBITDA (€ millions)	7,160	8,450	11,552
Weighted average outstanding share diluted (million shares)	1,180	1,180	1,180
Net debt (€ millions)	4,400	4,400	4,400

SAP	P/E Multiple		EV/EBITDA Multiple		AVG P/E and EV/EBITDA	Upside/ (Downside)
	Trailing	Forward	Trailing	Forward		
5Y AVR Multiples (12/07/24)	34.00	32.14	20.82	20.00		
Expected Price, Current (€)	175.80	109.92	122.58	139.47	136.94	-27.44%
Expected Price, Dec-2024 (€)	116.29	186.39	145.34	192.03	160.01	-15.22%
Current actual price (€)	188.74					

Current Price

Table 4.9 shows the range of the target price based on historical multiples of average P/E and EV/EBITDA. The maximum target price is 236.44 euros, while the minimum is 86.86 euros. With a median price of 136.94 euros, SAP's current price of 188.74 euros is higher than its historical valuation.

Table 4.9 Target Current Price Based on Historical Multiples

Current	Trailing P/E	Forward P/E	Trailing EV/EBITDA	Forward EV/EBITDA	AVG P/E and EV/EBITDA	Upside/ (Downside)
Target Price - Median (€)	175.80	109.92	122.58	139.47	136.94	-27.44%
Target Price - Max (€)	368.66	218.42	174.45	184.21	236.44	25.27%
Target Price - Min (€)	97.39	63.85	85.21	101.00	86.86	-53.98%

Forward Price

Valuation is a forward-looking process because investors want to buy the stock for future earnings. Therefore, forward data will be used for predicting prices. The inputs are obtained from Bloomberg.

Table 4.10 shows ranges of the target forward price from historical multiples. At the end of December 2024, the maximum target price is 268.49 euros, indicating an upside of 42.26%. Conversely, the minimum target price is 103.34 euros, indicating a downside of 45.25%. The median price is 160.01 euros, indicating a downside of 15.22%. In conclusion, SAP's forward price is above its historical average.

Table 4.10 Target Forward Price Based on Historical Multiples

December 2024	Trailing P/E	Forward P/E	Trailing EV/EBITDA	Forward EV/EBITDA	AVG P/E and EV/EBITDA	Upside/ (Downside)
Target Price - Median (€)	116.29	186.39	145.34	192.03	160.01	-15.22%
Target Price - Max (€)	243.87	370.36	206.55	253.19	268.49	42.26%
Target Price - Min (€)	64.43	108.27	101.24	139.43	103.34	-45.25%

4.2.1.5 Sensitivity Analysis of Historical Multiples

Forward prices can be volatile, depending on the inputs. In this section, we will observe how sensitive the price is when the variables change. The variables refer to EPS and EBITDA. **Table 4.11** exhibits the sensitivity of target SAP's stock price as of December 2024 when EPS changes. The base case is when EPS is 4.05 euros per share, which is obtained from Bloomberg. The average target price is 160.01 euros; it will shift to 156.23 euros, 152.45 euros, 148.66 euros, and 144.88 euros when EPS decreases by 5%, 10%, 15%, and 20%, respectively, while other factors remain constant. Whereas the number opposite shifts to 163.80 euros, 167.58 euros, 171.36 euros, and 175.15 euros when the EPS increases by the same percentage, respectively.

Table 4.11 Sensitivity Analysis of P/E in Historical Multiples

Target share price	-20%	-15%	-10%	-5%	Base	5%	10%	15%	20%
EPS (€)	2.74	2.91	3.08	3.25	3.42	3.59	3.76	3.93	4.10
Target Price	144.88	148.66	152.45	156.23	160.01	163.80	167.58	171.36	175.15
Target Price - Max	237.78	245.46	253.14	260.82	268.49	276.17	283.85	291.53	299.21
Target Price - Min	94.71	96.87	99.02	101.18	103.34	105.50	107.66	109.82	111.98

Table 4.12 exhibits the sensitivity of target SAP's stock price as of December 2024 when EBITDA changes. The share price is primarily influenced by EBITDA, with relatively minor impacts from changes in debt and cash positions, despite their fluctuations. The base case is when EBITDA is 8,450.18 euros, which is obtained from Bloomberg. The average target price is 160.01 euros; it will shift to

155.80 euros, 151.58 euros, 147.36 euros, and 143.15 euros when EPS decreases by 5%, 10%, 15%, and 20%, respectively. Whereas the number opposite shifts to 164.23 euros, 168.45 euros, 172.67 euros, and 176.88 euros when the EBITDA increases by the same percentage, respectively.

Table 4.12 Sensitivity Analysis of EV/EBITDA in Historical Multiples

Target share price	-20%	-15%	-10%	-5%	Base	5%	10%	15%	20%
EBITDA (€ millions)	6,760.14	7,182.65	7,605.16	8,027.67	8,450.18	8,872.68	9,295.19	9,717.70	10,140.21
Target Price - AVG	143.15	147.36	151.58	155.80	160.01	164.23	168.45	172.67	176.88
Target Price - Max	245.51	251.25	257.00	262.75	268.49	274.24	279.99	285.73	291.48
Target Price - Min	91.31	94.32	97.32	100.33	103.34	106.35	109.36	112.37	115.38

4.2.2 Peer Group Multiples

The rationale behind the relative valuation is the law of one price in a competitive market. The stocks in the same business or industry group are used as a comparison to evaluate whether the selected stock is relatively overvalued, undervalued, or fairly valued in relation to its benchmark.

4.2.2.1 Selection of Peers

For the peers, we focus on the companies with software and ERP solutions, especially cloud-based ones like SAP. ERP companies offer a full range of integrated applications that let businesses increase productivity, optimize workflows, and provide better customer service. In addition, we limit the revenue of peers from subscriptions to an annual fee or monthly package for both domestic and international customers. **Table 4.13** shows the peer group's general information.

As mentioned in Chapter 3, Oracle, Workday, Salesforce, Microsoft, Intuit, and Sage are identified as SAP's main competitors. However, Workday has reported operational losses through fiscal year 2023 due to high spending on sales, marketing, and product development. Sage also has a relatively small market capitalization of 12.86 billion British pounds as of March 31, 2024. Therefore, we recommend considering Oracle Corporation, Salesforce Inc., Intuit Inc., Adobe Inc., International Business Machines Corporation, Synopsys Inc., and Cadence Design Systems Inc. as peers that are more suitable.

Oracle Corporation (NYSE: ORCL) is a multinational computer technology company specializing in database software and technology, cloud-engineered systems, and enterprise software products. The remaining revenue comes from hardware and services. For the most recent period, 94% of its revenue was from cloud services and on-premises licenses. Of this, 55% was generated from the Americas, with the remainder coming from the United Kingdom and other countries as of May 31, 2024.

Salesforce Inc. (NYSE: CRM) specializes in customer relationship management. For FY2021-2023, 94% of its total revenue came from cloud services, software licenses, and support, while the remaining revenue was from professional services and other sources. Revenue was distributed across the Americas (67%), Europe (25%), and Asia Pacific (8%).

Intuit Inc. (NASDAQ: INTU) specializes in financial management, compliance, and marketing products and services. As of July 31, 2024, 86% of revenue came from services and other sources, including platform revenue from the small business and self-employed group online ecosystem, TurboTax online, and Credit Karma. The remaining 14% of revenue was from products such as QuickBooks.

Adobe Inc. (NASDAQ: ADBE) is a global technology company specializing in software and products for creating and publishing a wide range of content. For FY2021-2023, 87% of revenue was generated from subscriptions to digital media, digital experiences, publishing, and advertising. The remaining revenue came from products and services. Revenue was distributed across the Americas (60%), Europe (25%), and Asia Pacific (15%).

International Business Machines Corporation (NYSE: IBM) focuses on hybrid cloud and AI opportunities with a platform-centric approach that combines technology and business expertise. For FY2021-2023, 40% of revenue came from hybrid platforms and solutions, and transaction processing; 33% came from business transformation, application operations, and technology consulting; and 25% was from hybrid infrastructure. The remaining revenue came from financing and other sources. Revenue distribution was 50% from the Americas, 30% from Europe, the Middle East, and Africa, and 20% from Asia Pacific.

Synopsys Inc. (NASDAQ: SNPS) provides electronic design automation focusing on silicon design and verification, silicon intellectual property, and software security and quality. As of October 31, 2023, 63% of revenue was from design services in the cloud, while the remaining 37% came from software and other sources. Revenue distribution was 46% from the Americas and 54% from other regions, including China, Korea, and Europe.

Cadence Design Systems Inc. (NASDAQ: CDNS) is an electronic system design software and intellectual property company for the semiconductor industry. For FY2021-2023, 94% of revenue came from electronic design automation (EDA) software, with the remaining 6% from other services offered to customers. Revenue distribution was 45% from the Americas, 17% from Europe, the Middle East, and Africa, 33% from Asia Pacific, and 5% from Japan.

Table 4.13 Peer Group's General Information

Peer	Ticker	Head quarter	Exchange	Functional Currency
Oracle Corporation	ORCL	Austin, Texas, USA	NYSE	US dollar
Salesforce Inc.	CRM	San Francisco, California, USA	NYSE	US dollar
Intuit Inc.	INTU	Mountain View, California, USA	NASDAQ	US dollar
Adobe Inc.	ADBE	San Jose, California, USA	NASDAQ	US dollar
International Business Machines Corporation	IBM	Armonk, New York, USA	NYSE	US dollar
Synopsys Inc.	SNPS	Sunnyvale, California, USA	NASDAQ	US dollar
Cadence Design Systems Inc.	CDNS	San Jose, California, USA	NASDAQ	US dollar

4.2.2.2 Peer Group Comparison of Multiples

The recent financial ratios of SAP and its peers as of the first quarter of 2024 are obtained from Bloomberg, as shown in **Table 4.14**, in order to understand multiples better. Beta is a measurement of a stock's sensitivity and volatility of returns relative to the market. Most of SAP's peers five-year beta is near 1, which indicates the stocks are consistent with market volatility. Except for IBM, beta is less than 1, indicating that it has historically been less volatile than the market.

The current ratio measures a company's current assets to cover its short-term obligations. Most peers' current ratio greater than 1.0 indicates that a company has enough short-term assets on hand to liquidate to cover all short-term

liabilities if necessary. For SNPS, a huge amount of cash and cash equivalents are held by its international subsidiaries in terms of taxable money, market mutual funds, time deposits, and highly liquid investments to respond to US liquidity requirements. Oracle's lower current ratio compared to others comes from its investments in capital assets to support the growth of its cloud and license businesses, while it also issues additional senior notes and term loan credit agreements for corporate purposes.

The debt-to-equity (D/E) ratio measures the weight of total debt and financial liabilities against total shareholder equity. Most of SAP's peers have a low D/E ratio of less than 1, indicating that the company's capital structure is tilted toward equity financing rather than debt financing. For IBM, a higher D/E ratio was a result of its use of leverage to boost returns. When looking at the interest coverage of 10.0, that is very high, so we can conclude that IBM has no liquidation issue. For Oracle, the unusually high D/E of 1021.9% was mainly derived from stock buybacks during 2019-2022 and from the restructuring plan announced for 2024.

The dividend payout ratio measures the earnings paid out to shareholders in dividends. The peers' dividend yields are 0.6%-3.7%. The dividend yield shows the dividend income earned per share as a percentage of the current stock price. The dividend payout ratio of peers is 8.9%-66.9%, indicating that dividends were paid out of profits for the year. SAP's dividend payout ratio and dividend yield are slightly lower than those of its peers. Investors may be interested in a company with a stable payout ratio and a high dividend yield.

The net profit margin measures the percentage of profit a company generates from its total revenue in the period. The return on equity (ROE) measures a company's performance in relation to stockholders' equity. SAP has a net profit margin and ROE of 16.4% and 3.2%, respectively, which is less than the peers average of 23.3% and 7.3%, respectively. Compared with INTU and ADBE, which have a high net profit margin ratio and ROE, these companies are more effective at generating profit from their existing assets. As with the D/E ratio, Oracle's high ROE of 193.9% was a result of the stock buyback program.

Table 4.14 Peer Group Financial Ratios

Company	Q1 2024*						
	Beta 5Y	Current ratio	Debt/Equity ratio	Dividend yield	Dividend Payout Ratio**	Net profit Margin	ROE
SAP	0.92	1.25	22.0%	1.2%	46.4%	16.4%	3.2%
ORCL	1.01	0.72	1021.9%	1.2%	41.9%	19.8%	193.9%
CRM	1.29	1.09	21.0%	0.6%	8.9%	16.8%	2.6%
INTU	1.23	1.50	34.0%	0.4%	21.6%	35.5%	12.7%
ADBE	1.30	1.16	26.0%	N/A	N/A	29.6%	10.6%
IBM	0.71	1.13	270.0%	3.7%	66.9%	11.1%	6.9%
SNPS	1.07	1.86	9.0%	N/A	N/A	22.2%	4.1%
CDNS	1.03	1.32	18.0%	N/A	N/A	24.5%	6.9%
Peer AVG (exc. SAP and outliers)		1.25	21.6%	1.5%	34.8%	22.8%	7.3%

Source: Bloomberg/ NASDAQ/ FWB

* Some peers have a different accounting closing period from SAP, so we use the information from 01/02/2024 to 30/04/2024.

** trailing twelve months

The current multiples reflect the market's current perception of a company's recent earnings performance and allow an immediate comparison of how the market values similar companies. However, the current ratios can be volatile in the short term, so we also use forward ratios to look into future earnings expectations rather than historical results alone.

Table 4.15 presents historical information for peer groups, including market capitalization, closing price as of July 12, 2024, and the current P/E, EV/EBITDA, and P/BV multiples. As of July 12, 2024, SAP has a market capitalization of 220.30 billion euros and a closing price of 188.74 euros. In comparison, Oracle exhibits the highest market capitalization among its peers, at 398.97 billion dollars, while CDNS has the lowest market capitalization, amounting to 86.00 billion dollars. Regarding closing prices, SNPS reports the highest price at 614.05 dollars, whereas ORCL has the lowest closing price at 144.77 dollars.

As of July 12, 2024, CDNS exhibits the highest current P/E ratio at 91.21, whereas IBM has the lowest at 19.45. The average current P/E ratio across the peer group is 50.61, with a median of 42.68. Additionally, CDNS holds the highest current EV/EBITDA multiple, while IBM shows the lowest multiples at 64.44 and 16.03, respectively. The average current EV/EBITDA multiple is 33.07, and the median is 34.56. ORCL reports the highest current P/BV ratio at 45.19, in contrast to CRM's

lowest at 4.38. The average current P/BV ratio stands at 17.12, with a median of 13.04. As of July 12, 2024, SAP's current P/E ratio is 84.58, its EV/EBITDA multiple is 38.71, and its P/BV ratio is 5.31. Based on these metrics, it appears that SAP is overvalued relative to its peers.

Table 4.15 Current Peer Group Multiples

Company	Market Cap (billion)*	Closing Price 12/07/24*	Current P/E	Current EV/EBITDA	Current P/BV
SAP	€220.30	€188.74	84.58	38.71	5.31
ORCL	\$398.97	\$144.77	36.74	21.06	45.19
CRM	\$246.10	\$253.97	42.68	22.51	4.38
INTU	\$179.46	\$641.95	57.85	38.10	9.39
ADBE	\$247.88	\$559.05	42.03	34.56	16.87
IBM	\$167.95	\$182.83	19.45	16.03	7.04
SNPS	\$94.08	\$614.05	64.31	34.76	13.04
CDNS	\$86.00	\$315.67	91.21	64.44	23.96
Peer AVG (exc. SAP)			50.61	33.07	17.12
Peer Median (exc. SAP)			42.68	34.56	13.04
Peer Max (exc. SAP)			91.21	64.44	45.19
Peer Min (exc. SAP)			19.45	16.03	4.38

Source: Bloomberg/ Yahoo Finance

*From European Central Bank, €1 = \$1.1089 as of July 12, 2024

Table 4.16 presents the peer groups' forward P/E, EV/EBITDA, and P/BV multiples. The maximum forward P/E ratio is recorded by CDNS at 53.00, while IBM has the minimum at 17.82. The average forward P/E ratio across the peer group is 33.43, with a median of 30.70. CDNS also exhibits the highest forward EV/EBITDA ratio at 43.95, in contrast to IBM's minimum of 13.67. The average forward EV/EBITDA ratio is 25.63, and the median is 24.77. For the forward P/BV ratio, ORCL has the highest value at 42.20, whereas CRM has the lowest at 3.83. The average forward P/BV ratio is 15.64, with a median of 11.49. As of July 12, 2024, SAP's forward P/E ratio stands at 39.87, its EV/EBITDA ratio at 25.29, and its P/BV ratio at 5.02. These forward ratios suggest that SAP is overvalued relative to both the average and median values of its peers.

As shown in **Table 4.16**, the mostly forward ratios are smaller than the current ratios since the forwards incorporate anticipated future earnings growth.

This forward-looking approach reflects optimistic projections regarding the company's future performance as perceived by the market.

Table 4.16 Forward Peer Group Multiples

Company	Forward P/E	Forward EV/EBITDA	Forward P/BV
SAP	39.87	25.29	5.02
ORCL	22.81	15.70	42.20
CRM	25.35	15.68	3.83
INTU	37.43	26.23	9.34
ADBE	30.70	24.77	15.82
IBM	17.82	13.67	6.30
SNPS	46.88	39.38	11.49
CDNS	53.00	43.95	20.47
Peer AVG (exc. SAP)	33.43	25.63	15.64
Peer Median (exc. SAP)	30.70	24.77	11.49
Peer Max (exc. SAP)	53.00	43.95	42.20
Peer Min (exc. SAP)	17.82	13.67	3.83

Source: Bloomberg/ Yahoo Finance

The high valuation multiples observed for CDNS reflect the company's strong position in the technological sector, primarily driven by its innovative AI solutions, such as the JedAI Generative AI platform, which has positioned CDNS as a leading player in the evolving technology landscape. Conversely, IBM exhibits the lowest multiples among its peers due to its forecasted growth being lower than the growth expectations for the broader market. This was a result of IBM's mixing of sales execution and slowing cloud migrations. ORCL's unusually high P/BV was a result of the stock-buyback program to enhance shareholder value through increased EPS and potential stock price appreciation. Additionally, when comparing SAP's multiple ratios to its peers, it indicates that the stock is trading at a premium, indicating a higher valuation relative to market conditions.

4.2.2.3 Target Price from Peer Multiples

As with historical bands, we use average P/E and EV/EBITDA in calculating target prices. The reason is that the peers are listed on the New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotations (NASDAQ), which adhere to US Generally Accepted Accounting Principles

(US GAAP), whereas SAP uses International Financial Reporting Standards (IFRS). The key difference between US GAAP and IFRS is in the treatment of intangible assets: US GAAP requires that these assets be reported at cost, while IFRS allows for fair value measurement. Furthermore, significant stock buybacks by ORCL from 2019 to 2021 led to negative shareholder equity during 2019-2022 and lower shareholder equity values in 2024. These buybacks can affect the book value of ORCL, contributing to differences in valuation metrics between SAP and its peers.

Table 4.17 shows the expected current price and the price for December 2024 using peer multiples. For the expected current price, current multiples use actual fundamental data for the current fiscal year (FY0) to provide a valuation based on recent performance, whereas forward multiples apply to forecasted data for the next fiscal year (FY1) to estimate future growth potential.

Using peer multiples, the target current price as of July 12, 2024, is 176.31 euros, which shows a downside of 6.58% compared to the current price of 188.74 euros. The target price in 2024 is 201.62 euros, which shows an upside of 6.83%.

Table 4.17 Expected Price Based on Peer Multiples

SAP	P/E Multiple		EV/EBITDA Multiple		AVG P/E and EV/EBITDA	Upside/ (Downside)
	Current	Forward	Current	Forward		
Median Multiple of Peers	220.64	104.98	34.56	24.77		
Expected Price, Current (€)	145.95	178.01	205.95	173.68	176.31	-6.58%
Expected Price, Dec-2024 (€)	220.64	104.98	243.73	238.79	201.62	6.83%
Current actual price (€)	188.74					

Current Price

Table 4.18 shows the range of the target price based on peer multiples of average P/E and EV/EBITDA. The maximum target price is 337.78 euros, while the minimum is 87.31 euros. With a median target price of 176.31 euros, SAP's current price of 188.74 euros appears to be overvalued compared to the average of its peers.

Table 4.18 Target Current Price Based on Peer Multiples

Current	Current P/E	Forward P/E	Current EV/EBITDA	Forward EV/EBITDA	AVG P/E and EV/EBITDA	Upside/ (Downside)
Target Price - Median (€)	220.64	104.98	205.95	173.68	176.31	-6.58%
Target Price - Max (€)	471.58	181.26	387.29	311.02	337.78	78.97%
Target Price - Min (€)	100.53	60.95	93.56	94.18	87.31	-53.74%

Forward Price

Table 4.19 shows ranges of the target forward price from peer multiples. At the end of December 2024, the maximum target price is 375.89 euros, representing an upside of 99.16%. Conversely, the minimum target price is 102.76 euros, representing a downside of 45.55%. Comparing the median price of 201.62 euros with the current share price suggests that SAP's stock is currently valued higher than its traded price.

Table 4.19 Target Forward Price Based on Peer Multiples

December 2024	Current P/E	Forward P/E	Current EV/EBITDA	Forward EV/EBITDA	AVG P/E and EV/EBITDA	Upside/ (Downside)
Target Price - Median (€)	145.95	178.01	243.73	238.79	201.62	6.83%
Target Price - Max (€)	311.95	307.34	457.74	426.54	375.89	99.16%
Target Price - Min (€)	66.50	103.34	111.09	130.12	102.76	-45.55%

While SAP's current price is high relative to its historical data and expected future growth, it is slightly undervalued compared to its industry peers. This situation is driven by the fact that investors have overvalued SAP's peers based on their optimistic future return prospects. Additionally, the information technology sector's rapid evolution and high volatility lead to an increase in investors' expectations.

4.2.2.4 Sensitivity Analysis of Peer Multiples

Sensitivity analysis is used to assess how SAP valuation can be affected by changes in the variables. **Table 4.20** exhibits the sensitivity of target SAP's stock price as of December 2024 when EPS changes. Starting with the base case's EPS at 3.42 euros per share with a median price of 201.62 euros, the median EPS decreases by 5%, 10%, 15%, and 20%, which change the median expected price to 197.57 euros, 193.52 euros, 189.47 euros, and 185.42 euros, respectively. In contrast, the median EPS

increases by the same percentage, which changes the median expected price to 205.67 euros, 209.72 euros, 213.77 euros, and 217.82 euros, respectively.

Table 4.20 Sensitivity Analysis of P/E in Peer Multiples

Target share price	-20%	-15%	-10%	-5%	Base	5%	10%	15%	20%
EPS (€)	2.74	2.91	3.08	3.25	3.42	3.59	3.76	3.93	4.10
Target Price - Median	185.42	189.47	193.52	197.57	201.62	205.67	209.72	213.77	217.82
Target Price - Max	344.93	352.67	360.41	368.15	375.89	383.63	391.38	399.12	406.86
Target Price - Min	94.27	96.40	98.52	100.64	102.76	104.89	107.01	109.13	111.26

Table 4.21 exhibits the sensitivity of target SAP's stock price as of December 2024 when EBITDA changes. Starting with the base case's EBITDA with a median price of 201.62 euros, the median EBITDA decreases by 5%, 10%, 15%, and 20%, which change the median expected price to 195.59 euros, 189.56 euros, 183.53 euros, and 177.50 euros, respectively. In contrast, the median EBITDA increases by the same percentage, which changes the median expected price to 207.65 euros, 213.69 euros, 219.72 euros, and 225.75 euros, respectively.

Table 4.21 Sensitivity Analysis of EV/EBITDA in Peer Multiples

Target share price	-20%	-15%	-10%	-5%	Base	5%	10%	15%	20%
EBITDA (€ millions)	6,760.14	7,182.65	7,605.16	8,027.67	8,450.18	8,872.68	9,295.19	9,717.70	10,140.21
Target Price - Median	177.50	183.53	189.56	195.59	201.62	207.65	213.69	219.72	225.75
Target Price - Max	331.68	342.73	353.79	364.84	375.89	386.95	398.00	409.05	420.11
Target Price - Min	90.70	93.72	96.73	99.75	102.76	105.78	108.79	111.81	114.82

4.3 Valuation Recommendation

This thematic paper examines the relative valuation of SAP SE, a German multinational ERP software company based in Walldorf, Baden-Württemberg. As of July 12, 2024, SAP had a closing price of 188.74 euros and a market capitalization of 220.30 billion euros.

To determine the target price based on historical bands, we use the average five-year trailing and forward P/E and EV/EBITDA ratios. We have chosen peer companies from the information technology sector that, like SAP, service international customers. These peers are ORCL, CRM, INTU, ADBE, IBM, SNPS, and CDNS. We

apply both current and forward P/E and EV/EBITDA ratios to calculate the target price from these peer multiples.

Table 4.22 summarizes the target share prices, which are calculated using forecasts based on average peer multiples. This method provides a benchmark that reflects current market conditions in the information technology industry and the performance of its peers. The technology industry has experienced significant growth this year due to accelerated digital transformation, advancements in AI and machine learning, and the expansion of cloud computing.

Table 4.22 Summary of SAP's Target Share Price

SAP's Price	Historical AVG	Peer AVG	Target Price
Current	136.94	176.31	176.31
December 2024 (€)	160.01	201.62	201.62
Current actual price (€)			188.74
Upside/ (Downside) - current			-6.58%
Upside/ (Downside) - December 2024			6.83%

Based on **Table 4.23**, if the current price exceeds the target price by more than 15%, the stock is considered overvalued, and the recommendation is to sell. Conversely, if the current price is lower than the target price by more than 15%, the stock is considered undervalued, suggesting a recommendation to buy. When the current price falls within a 15% range of the expected price, the recommendation is to hold.

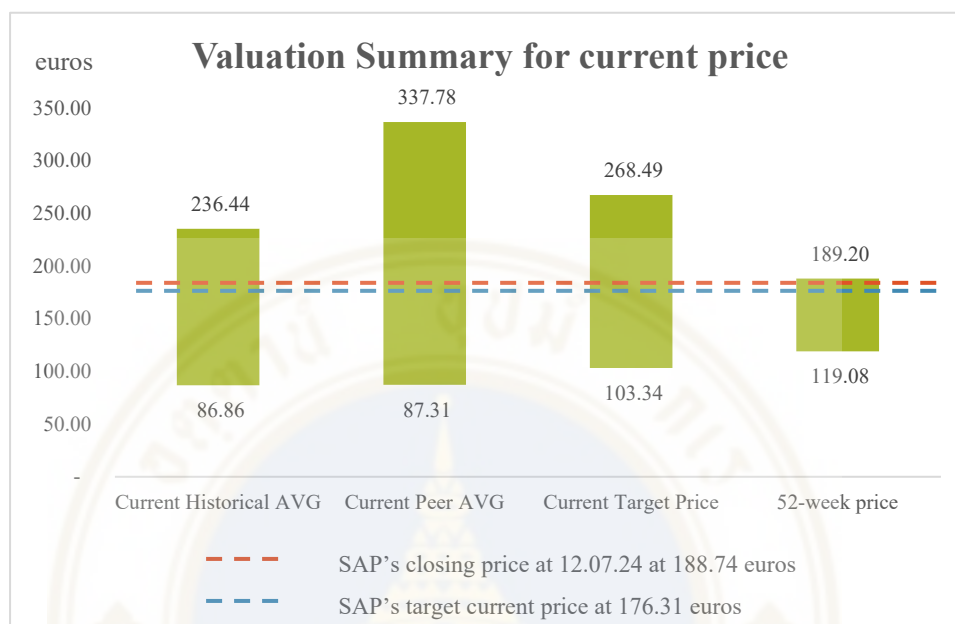
Table 4.23 Valuation Recommendation

Recommendation	% change from the current price	Target Price (€)	Current price (€)
Buy	Greater than or equal to +15% upside potential	≥ 217.05	188.74 (As of July 12, 2024)
Hold	Between +15% upside potential and -15% downside potential	Between 160.43 and 217.05	
Sell	Less than or equal to -15% downside potential	≤ 160.43	

As exhibited in **Figure 4.8**, by using football field, SAP's current price is somewhat high compared to its historical and peer prices. As of July 12, 2024, SAP's target price is 176.31 euros, slightly below the closing price of 188.74 euros, indicating

a downside potential of 6.58%. In conclusion, the recommendation for SAP SE is to **HOLD**.

Figure 4.8 Football Field of SAP



CHAPTER V

INVESTMENT RISKS

It is impossible to earn investment returns without taking some level of risk. Therefore, understanding the risks associated with a company is essential for investors in order not to lose the chance to earn high returns. This chapter will explore the main risks related to SAP SE and assess how these risks might affect the company.

As a global company, SAP faces a wide range of risks across its business operations. To address these risks, SAP's Executive Board has implemented internal control and risk management systems designed to identify, analyze, and mitigate potential threats. According to the SAP Annual Integrated Report 2023, SAP uses a comprehensive governance model and a central software solution to manage and report all risk-related information, which is then directly reported to the Executive Board.

Risk factors are classified as "high," "medium," or "low" based on their likelihood and potential impact as a value on SAP's reputation, business, financial position, profit, and cash flow, as shown in **Figure 5.1**. The company's main risks are categorized in **Table 5.1** as follows:

Figure 5.1 Classification of SAP's Risk

	Insignificant (€0 to €25 million)	Minor (€25 million to €50 million)	Moderate (€50 million to €100 million)	Major (€100 million to €500 million)	Business-Critical (from €500 million)
80% to 99%	L	M	H	H	H
60% to 79%	L	M	M	H	H
40% to 59%	L	L	M	M	H
20% to 39%	L	L	L	M	M
1% to 19%	L	L	L	L	M

Impact
L = Low Risk M = Medium Risk H = High Risk

Source: SAP Annual Integrated Report 2023

Table 5.1 Summary of SAP's Risks

Risks	Probability	Impact	Risk Level
Cybersecurity and Security	Likely	Business-Critical	High
Data Protection and Privacy	Likely	Major	Medium
Global Economic and Political Environment	Likely	Major	Medium
Technology and Products	Unlikely	Business-Critical	Medium

Source: SAP Annual Integrated Report 2023

Cybersecurity and Security

SAP is subjected to cybersecurity risks due to the threat's complex and evolving nature. As the company handles large volumes of data and manages cloud solutions, it is a prime target for cyberattacks from the hostile. Using advanced techniques, cybercriminals are increasingly exploiting vulnerabilities in SAP's systems and those of its partners. Although SAP implements measures such as the NIST Cybersecurity Framework, operates a Cyber Fusion Center, and continuously improves security protocols, vulnerabilities remain. These include ransomware risks, patch application delays, and inadequate security controls. Potential impacts include loss of customers, reputational damage, regulatory penalties, and higher compliance costs. SAP is committed to adapting its cybersecurity strategies, investing in infrastructure, and enforcing strict security policies and training.

Data Protection and Privacy

Due to complex and ever-changing global regulations, SAP faces significant data protection and privacy risks. Non-compliance with strict and sometimes conflicting data protection laws, such as the General Data Protection Regulation (GDPR), could lead to civil liabilities, fines, and the loss of customers. As a global company, SAP must comply with local laws and implement safeguards for international data transfers, especially to countries without adequate protection. New regulations, like the Chinese Personal Information Protection Law and the EU's proposed e-Privacy Regulation, add further compliance challenges, particularly affecting cloud services and emerging technologies such as AI. Non-compliance could result in mandatory breach disclosures, regulatory investigations, customer claims, and fines. SAP has implemented robust measures to address these risks, including internal compliance processes, data protection

integration into product standards, regular policy reviews, enhanced data center operations, legal monitoring, and transparent data handling governance.

Global Economic and Political Environment

SAP's businesses can be influenced by external factors, including global economic uncertainty, financial market volatility, and geopolitical instability from conflicts like Russia's invasion of Ukraine and tensions in Taiwan. Additionally, fluctuations in commodity prices, currency exchange rates, interest rates, and global pandemics such as COVID-19 present significant threats. These risks can negatively affect SAP's reputation, financial position, and cash flows. To mitigate these risks, SAP has implemented strategies such as enhancing predictable revenue through cloud subscriptions and software support and utilizing insights from its global government affairs unit to address potential issues proactively.

Technology and Products

SAP's technology and products are exposed to risks such as undetected defects, coding errors, integration challenges, and unmet customer expectations. Issues may arise from software that is not aligned with market needs, acquired products failing to meet SAP's standards, or new offerings not complying with local regulations. Additionally, security vulnerabilities in updated products, incorrect decisions made by AI algorithms, and delays in defect resolution can all impact customer satisfaction. These risks can significantly affect SAP's reputation, business operations, financial stability, and cash flows. To mitigate these risks, SAP implements robust project management, quality assurance processes, customer feedback mechanisms, and certification programs.

CHAPTER VI

CONCLUSIONS

The final chapter summarizes the investment recommendations for SAP SE. It identifies triggers for reassessment, including changes in market conditions and competitor dynamics. Furthermore, it discusses the limitations associated with relative valuation.

6.1 Investment Recommendation

In this thematic paper, we use the relative valuation method to derive the current target price and the price for 2024, utilizing peer group multiples. The multiples used are P/E and EV/EBITDA, considering both current and forward ratios. Using both P/E and EV/EBITDA ratios together offers a more comprehensive valuation analysis. The P/E ratio captures the market's perspective on future earnings potential, which is crucial for understanding growth expectations. Meanwhile, the EV/EBITDA ratio helps assess the company's overall financial health and profitability from an enterprise value standpoint. We give equal weight to the P/E and EV/EBITDA ratios to cross-verify valuation insights and gain a better understanding of the company's financial position relative to its peers. The peers used for comparison include ORCL, CRM, INTU, ADBE, IBM, SNPS, and CDNS, chosen because their revenue primarily comes from subscriptions from domestic and international customers.

As of July 12, 2024, the closing price of SAP SE is 188.74 euros, while the average target price is 176.31 euros, indicating a downside potential of 6.58%. Therefore, my recommendation for SAP SE is 'HOLD'.

6.2 Triggers for Re-assessment

Finding comparable companies for re-assessment can be challenging due to differences in market capitalization, growth rates, and risk profiles. Most IT companies are listed in the United States because the US stock exchange is the most attractive stock market in the world, offering the broadest investor base and higher market depth and liquidity. The National Association of Securities Dealers Automated Quotations (Nasdaq) is known for its focus on technology and innovation, making its stocks more growth-oriented and volatile, while The New York Stock Exchange (NYSE) is associated with more established and stable companies. Different stock markets might employ different accounting practices, which can distort the financial ratios used for comparison.

SAP's main competitor, Oracle, is heavily investing in mergers and acquisitions and a buyback program, leading to a steady decline in shareholders' equity since 2018 and contributing to negative net income until 2022. Some direct competitors of SAP, such as Infor and CloudSuite Industrial, are privately held and not publicly listed. Additionally, Microsoft Dynamics 365 and Amazon Web Services are part of Microsoft Corporation and Amazon, respectively, both of which operate under diversified business models. Sage, meanwhile, has a relatively modest market capitalization compared to others. In contrast, SAP focuses exclusively on enterprise software, resulting in a distinct revenue model. These factors could significantly impact the need for a re-assessment of SAP's market position.

6.3 Limitations

There are some limitations in the relative valuation of this thematic paper. The multiple bands based on a five-year average involve making assumptions and estimates based on available information. Relative valuation can be influenced by short-term market trends and investor sentiment rather than fundamental value. In addition, the relative valuation assumes that similar businesses will face the same market conditions and pursue the same business strategies without considering potential growth in the future and differences in their sources of revenue. Lastly, SAP plans to execute a

wide transformation program, including restructuring for AI-driven and highly scalable future revenue growth in 2024. These plans can affect SAP's future share price and earnings.



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