

Measuring the Financial Performance of Portfolio Companies Owned by Private Equity Funds: A Case Study of Deutsche Bank AG

Prof. Roberto Mazzei

RELATORE

Claudio Apuzzo (274071)

CANDIDATO

Measuring the Financial Performance of Portfolio Companies Owned by Private Equity
Funds,
A Case Study of Deutsche Bank AG

Contents

List of Figures	3
List of Abbreviations	4
Introduction	5
1.1 Private Equity Funds Overview	5
1.2 Importance of Financial Performance Analysis	6
1.3 Overview Deutsche Bank AG	8
1.4 Statement of the Problem.....	8
1.5 Objectives	10
1.6 Questions.....	11
1.7 Applications and Significance.....	11
Literature Review	13
2.1 Introduction.....	13
2.2 Theoretical Framework on Private Equity Investments.....	13
2.2.1 History and evolution of private equity	13
2.2.2 Definitions and classifications of private equity.....	15
2.2.3 Theoretical underpinnings of private equity as a financial instrument.....	15
2.3 Financial Performance Metrics in Private Equity.	17
2.3.1 The factor impact on financial performance of firms	17
2.3.2 Strategic Implications of Financial Choices	21
2.4 Methodologies for financial performance evaluation	21
2.4.1 Liquidity.....	21
2.4.2 Solvency.....	22
2.4.3 Integrating Liquidity and Solvency Analysis for Comprehensive Financial Evaluation.	24
2.5 Differences in Financial Metrics: Private vs. Public Companies	25
2.6 Impact of Private Equity Ownership on Portfolio Companies	26
2.7 Strategies and Performance of Private Equity Firms.....	28
2.7.1 Leverage Buyout.....	28
2.7.2 Growth Capital.....	28
2.7.3 Venture Capital.....	28
2.7.4 Secondaries	28
2.7.5 Fund of Funds	29
2.8 Correlation between investment strategies and financial outcomes	29
2.9 Deutsche Bank AG Strategic Evolution and Financial Performance.....	30
2.9.1 Investment Strategies of Deutsche Bank AG.....	31

2.10 Challenges in Measuring Financial Performance	32
2.11 Regulatory and Ethical Considerations in Private Equity.....	33
2.12 Summary	34
Private Equity Investment Analysis	35
3.1 Introduction.....	35
3.2 Dataset Overview and Preprocessing.....	35
3.2.1 Portfolio Composition.....	35
3.2.2 Industry Distribution Dataset.....	36
3.2.3 Selected Securities Dataset	37
3.3 Industry Distribution Analysis	38
3.4 DB AG's Portfolio Composition Analysis	40
3.4.1 Portfolio Allocation by Security	41
3.5 Key Performance Metrics	43
3.5.1 Portfolio Allocation.....	43
3.5.2 Return Distribution Across Securities.....	46
3.6 Share Dynamics	47
3.6.1 Share change	47
3.6.2 Share Dynamics	48
3.6.3 Correlation Analysis Between Allocation Changes, Profit, and Return	50
3.7 Top/Bottom Performers.....	51
3.8 Deutsche Bank's Top 3 Increased Securities This Quarter	52
3.8.1 Analysis of Share Volume Changes	53
3.8.2 Analysis of Percentage Changes	57
3.8.3 Analysis of Value Changes.....	61
3.8.4 Analysis of Investment Cost and Profit	64
3.8.5 Comparative Analysis	67
Bibliography	68

List of Figures

Fig 1. Top 10 industries with the most securities.....	38
Fig 2. Top 10 industries with the list securities.....	38
Fig 3. Top 10 industries with the highest market value	39
Fig 4. DB AG's Portfolio Composition	40
Fig 5. Top 10 securities with the largest change in portfolio allocation	41
Fig 6. Bottom 10 securities with the largest change in portfolio allocation	42
Fig 7. Distribution of profit vs cost basis across securities.....	43
Fig 8. Distribution of portfolio allocation vs profit across securities	44
Fig 9. Distribution of portfolio allocation vs return across securities.....	45
Fig 10. Return distribution across securities.....	46
Fig 11. Share change vs profit distribution across securities	47
Fig 12. Top 10 securities with the largest change in shares held	48
Fig 13. Bottom 10 securities with the smallest change in shares held.....	49
Fig 14. Correlation heatmap for portfolio allocation change vs profit/return.....	50
Fig 15. Top and bottom-performing securities.....	51
Fig 16. Changes in share volume for Amazon	53
Fig 17. Percentage change in share volume for Amazon.....	53
Fig 18. Changes in share volume for Microsoft	54
Fig 19. Percentage change in shares volume for Microsoft.....	54
Fig 20. Changes in share volume for Meta	55
Fig 21. Percentage change in share volume for Meta.....	55
Fig 22. Change in value percentage for Amazon	58
Fig 23. Change in value percentage for Meta	58
Fig 24. Change in value percentage for Microsoft	59
Fig 25. The net change in value for Amazon security	61
Fig 26. The net change in value for Meta security.....	62
Fig 27. The net change in value for Microsoft security	62
Fig 28. Distribution of cost basis vs profit across Amazon	64
Fig 29. Distribution of cost basis vs profit across Microsoft.....	65
Fig 30. Distribution of cost basis vs profit across for Meta.....	66

List of Abbreviations

1. PE - Private Equity
2. ARDC - American Research and Development Corporation
3. KKR - Kohlberg Kravis Roberts
4. EBITDA - Earnings Before Interest, Taxes, Depreciation, and Amortization
5. ROI - Return on Investment
6. DSCR - Debt Service Coverage Ratio
7. R - Revenue
8. DBPE - Deutsche Bank Private Equity
9. AG - Aktiengesellschaft (equivalent to "corporation" in English)
10. SEC - Securities and Exchange Commission
11. MSFT - Microsoft Corporation
12. AMZN - Amazon.com, Inc.
13. META - Meta Platforms, Inc.
14. DLR - Digital Realty Trust, Inc.
15. ATVI - Activision Blizzard, Inc.
16. VMW - VMware, Inc.
17. MS Excel - Microsoft Excel
18. LBO - Leveraged Buyout
19. FoF - Fund of Funds
20. FCA - Financial Conduct Authority
21. CET1 - Common Equity Tier 1
22. UHC - UnitedHealth Group Incorporated (UnitedHealthcare)
23. ETF - Exchange-Traded Fund
24. ΔQ - Change in Quantity
25. ΔP - Change in Price
26. EMA - Exponential Moving Average
27. VaR - Value at Risk
28. GARCH - Generalized Autoregressive Conditional Heteroskedasticity

Introduction

1.1 Private Equity Funds Overview

In the expansive domain of finance, private equity (PE) emerges as a pivotal capital form, distinctively earmarked for private corporations—those outside the public stock market's reach. Investment funds and limited partnerships mainly dominate this investment path, and the specialised entities are directly involved in reshaping and redirecting the managerial policies of the investee firms. Initially, "private equity" denoted two things: the investments in private enterprises and the collective organisation of these funds. As such, private equity goes beyond the financial injection function; it becomes a strategic partnership purposefully meant to drive company growth, product innovation and operational overhauls. The core of private equity investment involves combining capital with strategic vision to move companies closer to superior profitability and operational efficiency.

Going further into private equity operations, the process involves a sophisticated mix of equity and debt financing carried out by investment managers or private equity investors. Such managers will be in charge of the investment initiative, attracting capital from a broad spectrum of institutional investors, such as hedge funds, pension funds, and very high-net-worth individuals, relying on a well-thought-out strategic blueprint to set the foundation for their investment decision-making. The collected funds are then directed towards private companies smart enough to use equity investments and debt instruments to design the growth path to value realisation. This elaborate financial modelling heavily depends on the pivotal factors of revenue generation, margin optimisation, cash flow multiplication and multiplier growth, which will pave the way for economic success.

Notably, the evolution of private equity reflects its vibrant and multicoloured past, having begun with the establishment of venture capital as a formal investment instrument in the era after World War II. As ARDC and J.H. Whitney & Company came into being in 1946, so did modern private equity and the seed for the sector to develop was planted. These years saw the transition of venture capital from an investment mechanism practised exclusively by the affluent to a structured one introduced by Georges Doriot – the father of venture capitalism. ARDC's fortune in Digital Equipment Corporation, which generated a return multiple that exceeded 5000 times, was a testament to the unlimited potential of private equity in accelerating the transition of infancy firms into mighty giants.

In the 1980s, the face of private equity was entirely altered by the leveraged buyout blast that swept its terrain. This time was defined by the wave of mega deals, the RJR Nabisco acquisition by Kohlberg Kravis Roberts (KKR) being the most prominent, valued at \$31.1 billion, the biggest buyout of its time. This period was also known for the advent of "corporate raiders," investors who extensively used aggressive takeover tactics, frequently resulting in significant restructuring and operational changes within acquired companies. However, this practice calmed down in subsequent years, and there was a shift towards implementing mitigation methods and financial sustainability in private equity deals.

The 21st century saw the introduction of a new age for private equity, characterised by regulatory changes and the plying of mega-buyouts, mainly during the peak years of 2005 to 2007. While the financial markets experienced ups and downs, especially the 2007 credit

crunch and the subsequent financial crisis, the private equity industry remained a resilient player and adapted to the changing regulatory and economic landscape. The post-crisis period was a much more scrutinised and regulated time, particularly in Europe, ensuring the transparency and reliability of the investment process. This period was also characterised by private equity firms such as KKR, Carlyle, and Apollo going public, thereby widening their investor base and expanding horizons for operation.

Today, private equity stands out as an important part of the global financial system, developing more and more various strategies, from the classic leveraged buyouts to venture capital, growth capital, and distressed investments. The sector's ability to adapt to evolving market conditions and its proactive investment approach will be instrumental in driving consistent performance across the industry. Amidst the dynamics of the present-day economy, the role of private equity firms as accelerators of innovation, operations optimisers and growth catalysts is unquestionable. With a persistent intention of strategic value building, private equity is ready to continue being a key player in transforming the world's businesses forever.

1.2 Importance of Financial Performance Analysis

Financial performance evaluation is considered the central theme in the corporate world, as it serves as the leading indicator to measure the viability and health of companies solely financed by private equity funds and the economy in general. For investors, the capability to analyse and understand financial indicators is not a mere addition of figures but is a dynamic process of safeguarding and increasing investment capital¹. This deliberating process enables investors to select projects with the best profitable potential and remove the projects that are not financially stable. Investees that will go through such an efficiency test will strive to enhance transparency and efficiency in their operations, building a culture of accountability and continuous improvement. Finally, financial performance analysis is not only limited to the study of financial figures but gives a view of the market and sector health and exposes the financial system workflow. Consequently, the role of financial performance analysis surpasses that of single firms to involve investors, corporates and policymakers.

The primary metrics are at the core of financial performance analysis, which is the basis of a comprehensive assessment. Besides revenue growth, which is the main indicator of the company's market gains and operational scalability, among others. It is the percentage of increase in the revenue and it illustrates whether the market demand is increasing or not also how well the business model and marketing strategies are working. Another significant parameter, EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization), presents the operating performance while both dismissing the financing choices and the accounting complexities². The formula for EBITDA margin;

¹ Rory Knight and Marc Bertoneche, *Financial Performance*, Google Books (Elsevier, 2000), https://books.google.co.ke/books?hl=en&lr=&id=TBiPUsf6jGoC&oi=fnd&pg=PP1&dq=Importance+of+Financial+Performance+Analysis&ots=-oQX5NevZ3&sig=PPN7I7VGEW2XHXR2dGTGRFb1kKM&redir_esc=y#v=onepage&q=Importance%20of%20Financial%20Performance%20Analysis&f=false.

² Jan Bouwens, Ties de Kok, and Arnt Verriest, "The Prevalence and Validity of EBITDA as a Performance Measure," *Comptabilite Controle Audit* 25, no. 1 (April 17, 2019): 55–105, <https://www.cairn.info/revue-comptabilite-controle-audit-2019-1-page-55.htm>.

$$EBITDA \text{ Margin} = \frac{EBITDA}{Total \text{ Revenue } (R)} * 100$$

reflects the proportion of revenue that remains as profit after operating expenses are accounted for, excluding interest, taxes, depreciation, and amortisation. Private equity investors especially favour this metric because it provides a clear picture of operational profitability and cash generation potential.

Further, Return on Investment (ROI) emerges as a critical gauge of the financial gain from an investment relative to its cost. The ROI formula;

$$ROI = \frac{Net \text{ Profit}}{Cost \text{ of Investment}} * 100$$

encapsulates the efficiency of an investment, serving as a comparative benchmark across diverse investment opportunities. This metric is instrumental for investors in evaluating the performance of their portfolio companies and guiding strategic decisions regarding additional investments, divestitures, or restructuring³. Additionally, the Debt Service Coverage Ratio (DSCR), is calculated as;

$$DSCR = \frac{Net \text{ Operating Income}}{Total \text{ Debt Service}}$$

provides a lens through which investors assess a company's financial robustness and its ability to service debt. A higher DSCR indicates excellent financial health, signalling a company's capacity to meet its debt obligations without compromising operational sustainability⁴.

These primary financial metrics along with others form the main basis of financial performance analysis through which investors, portfolio companies, and economists explore ways to simplify the complex world of financial decisions. These metrics reflect the maximization of value to the investors and therefore will facilitate strategic interventions and portfolio optimization places. On the other side, the portfolio companies apply the gathered knowledge to perform operational improvements, business expansion, and financial stability and robustness. At the macro level, the financial performance data is combined to give a more in-depth understanding of economic performance, giving an input into the policy formulation and economic forecasting. Fundamentally, the financial performance analysis does not identify past or present financial performance but rather, acts as a compass of economic wise forward-thinking across economic sectors.

By conscientiously complying with the metrics, the stakeholders of the financial ecosystem at large can master financial information in the sense that they can transform highly intricate data flows into useful information. This embeddedness in strategic business decisions contributes

³ Christopher Ari Setiawan and Tina Rosa, "The Analysis of the Effect of Return of Investment (ROI) on Stock Price and Financial Performance of a Company," *Journal of Accounting, Management, Economics, and Business (ANALYSIS)* 1, no. 1 (January 24, 2023): 20–29, <https://doi.org/10.56855/analysis.v1i1.177>.

⁴ Danu Ade Setiawan, "THE EFFECT of FINANCIAL LEVERAGE on DEBT REPAYMENT CAPACITY : EVIDENCE from LISTED SHIPPING COMPANY in INDONESIA," *Hasanuddin Economics and Business Review* 2, no. 2 (October 18, 2018): 113, <https://doi.org/10.26487/hebr.v2i2.1513>.

to increased returns on investment and higher economic stability, and the importance of performance analysis in the current financial world reflects this.

1.3 Overview Deutsche Bank AG

Deutsche Bank AG is an entity in the web of global finance, each with its own particular patterns in the private equity sector. Deutsche Bank, which has its roots in the German financial history of 1870, has radically transformed over time⁵. Over time, it has moved beyond its banking operations to become a world power in investment banking. One of the main drivers of the transformation has been its investment arm, Deutsche Bank Private Equity (DBPE), which has successfully created a sizable private equity investment business. The DBPE strategy is based on three pillars – direct investments, fund commitments, and secondary purchasing of private equity assets that are made to harness the strategic value and progress across the lifecycle of the investment⁶. This diversified investment strategy reaffirms Deutsche Bank's innovative spirit and role in leading private equity's future.

The private equity market is exemplified by the roles and strategies employed by Deutsche Bank AG, which are a few of the strategies that exist in the sector. Through its network in the financial market and by direct equity investments, Deutsche Bank cooperates with the major private equity funds and gets involved in the secondary market. Consequently, this strategy has a couple of advantages: it not only does it diversifies the Bank's portfolio but also plays a key role in determining market dynamics and encouraging the growth and development of the investors' companies.

An assessment of Deutsche Bank AG's private equity portfolio reveals the full scope and level of their participation in the private equity business. The portfolio of Deutsche Bank features a great variety of investments in different industries and markets, which is directly correlated with the strategy for diversification that the bank follows. The bank's investment portfolio involves both the established sectors like manufacturing and services and the emerging areas like tech and renewable energies, proving its flexibility to anticipate market trends as well as its commitment to innovation.

1.4 Statement of the Problem

Financial performance analysis, mostly in private equity-owned portfolio companies, presents a wealth of information and outcomes in previous studies. The fact that there is a lot of research does not mean that the gap is filled, especially by the comparative analysis of the strategies and results of investments of various private equity firms. This gap is most markedly manifested in the case of Deutsche Bank AG which holds significant and unique positions in the private equity market. Although comprehensive research has been done on the entire impact of private

⁵ Deutsche Bank, "History of Deutsche Bank," www.db.com, n.d., <https://www.db.com/who-we-are/history/history-of-deutsche-bank>.

⁶ Deutsche Bank, "Deutsche Bank Announces Launch of DB Investment Partners," Db.com, 2023, https://www.db.com/news/detail/20230912-deutsche-bank-announces-launch-of-db-investment-partners?language_id=1.

equity on portfolio companies, little has been done to compare the various investment segments within this sector. For this purpose, such a comparison is critical for understanding the immediate implications of their investment strategies and assessing the broader implications for the industries and economies in which they invest. Therefore, the research gap involves the in-depth and comparative analysis of portfolio enterprises under the management control of these unique players.

Addressing this problem faces many challenges, the most important of which are data availability and transparency. By their nature, private equity companies tend to operate within an atmosphere of confidentiality and partial disclosure, which presents a severe data collection issue that is very tough. The unavailability of the financial specifics of portfolio companies, particularly those that are not publicly listed on stock exchanges, is one of the major hindrances to thorough analysis. Additionally, uniformity in the reporting standard metric across the companies and jurisdictions makes aggregating and comparison of the data difficult. This issue is more than just a procedural one but rather a fundamental one because it directly affects an investor's ability to make a comprehensive and factual assessment of performance in private equity.

In addition, various complexities appear when we try to make financial performance comparisons for different sectors in different economic conditions. A portfolio company works in a wide range of industries, each with its specific market dynamics, regulatory environment, and business cycles. Such industry-specific factors can significantly influence the company's financial results, thus complicating the task of differentiating the impact of private equity ownership from other external factors. Besides, the question of time in investment can be subject to volatile economic conditions during the investment's lifetime, making the analysis more difficult. Therefore, the task is to collect and assess information and place this information within the overall picture of market and economic ups and downs.

The focal point for this analysis is Deutsche Bank AG, a well-known private equity investor separated. With its direct investment approach worldwide, Deutsche Bank AG provides a broad picture of private equity as the driving force behind company growth and the efficiency of its operations.

It is a very urgent issue to fill these gaps for several reasons. On the one hand, it enriches private equity academics by offering a more complex understanding of how investment strategies and firm characteristics affect the performance of portfolios. Such knowledge is a treasure for scholars, practitioners and policymakers, who get a microscopic view of the role of private equity in the economy. More so, the research could lead to better methods in financial performance analysis by overcoming data availability and sectoral comparison; thus, it would be possible to have very precise and applicable results in future studies. Finally, research results can be used to develop investment strategies, rules, and regulations that will make the PE market better organised and more transparent.

1.5 Objectives

To measure the financial performance of portfolio companies owned by the investment arm of Deutsche Bank AG.

The study's general objective is to carefully compare and contrast the financial performance of the portfolio firms owned by the investment arms of Deutsche Bank AG. Primarily, the research aims to expose how different investment strategies and management practices adopted by these entities affect the performance of their respective portfolio companies and their overall financial success. Through a critical lens, this research aims to reveal the subtleties of the effect of private ownership on financial results, adding to a more profound knowledge of private equity's role in shaping corporate financial outcomes. This primary end necessitates a multifaceted strategy that integrates multiple specific targets aimed at unravelling the complicated nature of financial results within the private equity industry.

The first specific objective is to analyse the financial ratios such as revenue growth, profitability, EBITDA margins, ROI, and debt payment schedule. This analysis will look into the portfolio companies' financial prominence and operational efficiency, offering a thorough-looking view of their growth and profitability after the private equity investment. Through this evaluation, the study seeks to isolate the financial areas most affected by the involvement of private equity ownership, thus giving insights into the value addition of strategic management by Deutsche Bank AG.

However, this study will implement sophisticated statistical methods for rigorous and detailed analysis. The study would apply methods like regression analysis, paired-sample t-tests, and sensitivity analysis to systemically compare financial performances between entities and discover the patterns and divergence that may be attributed to the different investment philosophies and approaches. This is fundamental in substantiating the comparison through empirical data to strengthen the credibility and depth of the research findings.

Finally, this study intends to identify and communicate the effects of private equity ownership on the financial performance of the portfolio companies. This will be achieved by calculating the short-term economic gains and investigating the multifaceted prospects of these investments for the company's growth, market competitiveness, and strategic direction. Correlation of particular investment activities with financial results to understand to what extent private equity is a tool for business change and generation of value.

- 1. To analyse key financial metrics such as revenue growth, profitability, EBITDA margins, ROI, and debt repayment schedules.*
- 2. To employ statistical techniques for a comprehensive analysis.*
- 3. To identify the impacts of private equity ownership on financial performance.*

Through fulfilling these objectives, the research endeavours to provide a comprehensive, empirically grounded understanding of how Deutsche Bank AG's investment arms influence their portfolio companies' financial trajectories. The study aspires to contribute to the knowledge of private equity investments, offering actionable insights for investors, managers, and policymakers engaged in the private equity sector.

1.6 Questions

1. *What fundamental financial metrics indicate the performance of portfolio companies owned by Deutsche Bank AG?*
2. *How do these portfolio companies perform regarding revenue growth, profitability, and other selected financial metrics?*

Financial indicators represent the basis for analysing the performance and contribution of private equity ownership, focusing on the companies covered by Deutsche Bank AG. This research finds essential financial indicators that accurately reflect operational and financial health among these organisations. Indicators like the growth in revenues, EBITDA margins, ROI, and debt repayment are expected to reflect a complete picture of financial performance. This research plans to sell the purpose by determining these measurements that will serve as the standardised framework for evaluation, which is crucial in understanding how private equity investments affect the financial future of the portfolio companies. Firstly, this question sets the scene for the analysis and contributes to the main objective of enlightening the financial implications of private equity management.

From identifying critical financial metrics, the study goes on to determine the performance of portfolio companies, which will focus mainly on revenue growth, profitability, and performance compared to other selected financial indicators. This field of investigation is crucial in determining the effectiveness of such companies' operations and their market positioning after the investment. By examining these ratios, the research will reveal the financial effects of Deutsche Bank AG as a private equity owner, which vary from improved value addition to strategic enhancement. This analysis is vital in perceiving the concrete advantage of private equity investment; hence, people have a more complete view of its contribution to the company's growth and financial health.

1.7 Applications and Significance

The academic community stands to gain significantly from this study simply because it closes some of the existing research gaps concerning the financial performance of portfolio companies privately owned venture capital-backed companies. The analysis of the Deutsche Bank AG's portfolio company helps to fill the gap with empirical data and research into the complex effects of private equity investment models. However, this contribution is both qualitative and quantitative, increasing the general statistical knowledge of financial performance and the theoretical basis of financial analysis in the private equity segment. The research presents a framework for future academic endeavours, which calls for more meticulous scrutiny of the strategies within private equity and the consequential effects on the performance of portfolio companies. Moreover, from a modernistic point of view, the study utilises a holistic methodological approach that advocates combining quantitative and qualitative analysis modes to unravel the intricate nature of private equity investments.

Not only individual and institutional investors but also the potential impacts of this study are wide-ranging. The research that scrutinises the financial results yielded by the investment strategies of Deutsche Bank AG allows the learning of essential lessons about how these strategies generate value for portfolio companies. These data play a key role in facilitating

investors to form meaningful investment decisions, especially for those investors who would like to diversify their portfolios with private equity holdings. This study is particularly important as it distinguishes the arrangements of investments with different strategies and provides investors with a thorough picture that allows them to choose strategies that reflect their objectives and risk tolerances. Therefore, the research serves as a map to show investors how to execute this difficult journey of private equity investments with a strategy and information-oriented portfolio management.

On the other hand, policymakers can leverage information obtained from the research to understand more deeply private equity's role in ensuring growth and stability in the economy. This is a demonstration that some investment approaches could harm the finance of portfolio companies and hence, affect economics in general. This approach is very significant for the policies that are aimed at enhancing economic stability and promoting long-term growth. Awareness of the role played by private equity through innovations, job creation and the improvement of competitiveness in portfolio companies will guide the process of designing such policies that promote investment and entrepreneurship while at the same minimizing risks related to capital markets. Therefore, this study is a tool for policymakers to consider private equity purposes and secure economic stability and growth.

The research of this present study provides a solid basis for further research into the field of private equity and financial performance. The report focuses on the challenges concerning data accessibility and compatibility to reveal that more innovative data collection and analysis approaches are required. The next step would be to consider using different approaches to tackle these issues and analyse more variables for a complete picture of the financial performance. Furthermore, the following studies could consider the industry-specific performance and address what role a sectoral strategy could play in improving the results. In fact, this work builds on the body of contemporary science and lays the foundation for further investigations, leading to a more profound and all-encompassing comprehension of private equity's impact on financial performance.

The applications of this research are many and range from the academic community itself to investors, policymakers, and future research agendas. The study's objective is to offer a comprehensive analysis of the financial performance of portfolio firms under the guidance of Deutsche Bank AG. The study provides useful insights and creates a good base for further investigations. These research findings could help investment strategies, policy decisions, or academic discourse as they potentially impact all stakeholders of the financial system.

Literature Review

2.1 Introduction

The literature review is a cornerstone of academic research that gives a basis on which new knowledge builds and a contextual background of how the study contributes to the field. In the financial performance analysis of the portfolio companies owned by private equity funds, including Deutsche Bank AG, the literature on private equity investments and their financial result is the main focus. The chapter will start with a theoretical framework outlining the basic principles and concepts of private equity. Then it dives into the financial metrics that are the foundation of the company's performance measurement. The review continues to cover the different effects of private equity ownership, strategies used by private equity companies and hurdles encountered while measuring financial performance, ending with a debate on the regulation and ethics issues. The structure is centred on a comprehensive understanding of the topic and also highlights issues that the current study intends to fill in the literature.

The selection of literature for this review was based on several criteria; thus, it is both relevant and rigorous. Firstly, the sources were selected concerning academic merit, and preference was given to peer-reviewed articles, books, and reports from reliable financial organisations. The scope of the literature was given temporal consideration, focusing on publications by scholars during the last two decades to capture the present insights and trends in the private equity sector. Moreover, the literature was chosen to encompass a wide range of geographies and industries, which is a reflection of the global and variable scope of private equity investments. The main function of this process of choice is to formulate research questions in a proper way. The review is achieved through a critical analysis of previous literature, highlighting areas where knowledge is still lacking or contested. This systematic approach ensures the study is grounded on a solid theoretical base, thus, for a targeted investigation of the financial performance dynamics of private equity-owned portfolio companies.

2.2 Theoretical Framework on Private Equity Investments

2.2.1 History and evolution of private equity

The private equity trajectory and history of private equity give us a glimpse of the most important events shaping the modern investment landscape and performance. This historical review starts in the mid-20th century but has deep roots in financial practices that were initiated as early as the industrial revolutions during the 19th century⁷. The origins of early private investments are reflected in the actions of the merchant bankers in London and Paris during the financing of industrial companies such as *Crédit Mobilier* in the 1850s and the wealthiest

⁷ Mike Wright et al., *The Routledge Companion to Management Buyouts*, ed. Wright Mike et al. (Abingdon, Oxon ; New York, NY : Routledge, 2018.: Routledge, 2018), <https://doi.org/10.4324/9781315230597>.

financiers in America like Jay Gould, who restructured railroads and telegraph companies⁸. These elements serve as the pillars for which private equity is later constructed.

By the beginning of the 20th century, personalities such as J.P. Morgan appeared as the first enthusiasts of modern private equity through their extensive buyouts, the most notable being Morgan's acquisition of Carnegie Steel Company in 1901⁹. The period brought to light the boundaries and difficulties imposed by regulatory systems like the Glass–Steagall Act, which stipulated the investment activities of American banking companies, contrasting sharply with the more liberal circumstances for merchant banking in Europe. The regulatory environment of the time held back the growth of private equity in America until mid-century changes started to transform the landscape.

The formal start of the current private equity class can be traced to the period right after World War II, 1946 to be exact when the first venture capital companies were founded: American Research and Development Corporation (ARDC) and J.H. Whitney & Company. These corporations were disruptive in two ways: their investment focus on innovation funding and their organisational structure that changed from the source of family funds to the institutional one. ARDC's choice to invest in Digital Equipment Corporation, a firm that achieved exceptional returns, vividly illustrated how venture capital investments can contribute to technological progress and the generation of outstanding economic profits.

The legislative changes greatly affected the trajectory of private equity and venture capital, for example, the Small Business Investment Act of 1958 aimed to establish Small Business Investment Companies (SBICs)¹⁰. With this move, private equity capital could be democratised, and it would attract a more diverse range of investors. The program's success later strengthened the private equity market with some regulatory barriers.

As the venture capital industry grew through the 1960s and 1970s, it became amplified with the funding for technological innovation, especially in developing regions like Silicon Valley¹¹. This was when specialised venture capital firms such as Kleiner Perkins and Sequoia Capital emerged and not only funded the growth of technology firms but also formed the structuring, which became standard in the private equity funds subsequently, like the limited partnerships and the carried interest compensation structures. Through that, the role of VC in the technology sphere was firmly secured, and it set the model for other private equity investments.

This historical understanding is essential to interpreting the current trends and strategies of the private equity sector. It emphasises past financial innovations and regulatory environments that have shaped today's investment practices and legacy influences that still affect portfolio companies' financial performance. This historical view is integral to framing the hypotheses and how private equity firms like Deutsche Bank AG operate in a well-developed and incessantly evolving environment.

⁸ Mike Wright et al.

⁹ Steven Toms, Nick Wilson, and Mike Wright, “The Evolution of Private Equity: Corporate Restructuring in the UK, C.1945–2010,” *Business History* 57, no. 5 (June 2, 2015): 736–68, <https://doi.org/10.1080/00076791.2014.977262>.

¹⁰ Michael Ewens and Joan Farre-Mensa, “The Evolution of the Private Equity Market and the Decline in IPOs,” *SSRN Electronic Journal*, 2017, <https://doi.org/10.2139/ssrn.3017610>.

¹¹ Brian Cheffins and John Armour, “The Eclipse of Private Equity,” *Delaware Journal of Corporate Law* 33 (2008): 1, <https://heinonline.org/HOL/LandingPage?handle=hein.journals/decor33&div=6&id=&page=>.

2.2.2 Definitions and classifications of private equity

Private equity is a form of investment capital not listed on a public market. It comprises funds and investors that invest directly in private companies or buy out public companies, leading to the de-listing of public equity. At the heart of private equity investments is the expectation of a hard return when exiting the investment, with strategies like initial public offerings (IPOs), sales to other private equity firms, or buyouts by big public companies being some of the alternatives¹². In this kind of investment, the approach usually differs from that of the public equity market in that it involves direct business management, highly selective investment criteria, and a long-term investment horizon. Private equity companies use various methods to increase the value of the businesses they manage, such as streamlining operations, driving growth through strategic acquisitions, and improving financial management.

Private equity is a diverse type of investment. It is usually classified into leveraged buyouts (LBOs), venture capital, growth capital, distressed assets, and mezzanine capital, all with unique risk profiles and investment principles¹³. Buyouts through leverages are the most common type, wherein existing companies are acquired mainly with borrowed money. On the other hand, venture capital is for companies in their early stages with high growth perspectives. In return for the funding, equity is offered. Growth capital in this context is an investment in a reasonably stable organisation that requires capital for its expansion or restructuring of operations, new market entry, or a significant acquisition without a change of control. In the case of distressed investing, one is interested in realising returns through the recovery or restructuring of troubled companies. As for mezzanine capital is a hybrid finance where equity and debt are combined to support expansions and acquisitions, typically in quieter markets. Each of these strategies demonstrates the flexibility and agility of private equity in adjusting to the diverse market conditions and company stages.

2.2.3 Theoretical underpinnings of private equity as a financial instrument

As a financial instrument, private equity operates on several core theoretical underpinnings that differentiate it from other forms of investment, such as public equity or debt financing. The first fundamental principle is the concept of active ownership. Unlike passive investments where investors may hold stocks and have little to no involvement in the management of the companies they invest in, private equity firms take on a significant role in guiding the strategic direction and operations of the companies within their portfolios¹⁴. This active management approach is predicated on the belief that direct involvement can significantly enhance value by implementing operational improvements, driving growth initiatives, and optimising financial strategies. This approach is rooted in the agency theory, which discusses the conflicts of interest between shareholders (principals) and company managers (agents). By taking an active role, private equity firms aim to reduce agency costs and align the interests of managers with those of the shareholders.

¹² Michael Ewens and Joan Farre-Mensa

¹³ Stephen Fraidin and Meredith Foster, “The Evolution of Private Equity and the Change in General Partner Compensation Terms in the 1980s,” *Fordham Journal of Corporate and Financial Law* 24 (2018): 321, <https://heinonline.org/HOL/LandingPage?handle=hein.journals/fjcf24&div=17&id=&page=>.

¹⁴ Greg Brown et al., “Private Equity: Accomplishments and Challenges,” *Journal of Applied Corporate Finance* 32, no. 3 (August 20, 2020): 8–20, <https://doi.org/10.1111/jacf.12415>.

The value creation model of private equity is another critical theoretical framework. This model suggests that private equity firms add value through three primary mechanisms: operational enhancements, financial engineering, and strategic realignment. Operational enhancements may include streamlining processes, cost-cutting, and investing in technology to improve efficiency and profitability¹⁵. Financial engineering involves restructuring a company's finances to optimise its capital structure, often using higher levels of debt to leverage the company's performance, which can enhance returns on equity. Strategic realignment might involve refocusing the company on core areas, divesting non-core assets, or pursuing acquisitions to enter new markets or gain new capabilities. This model ties closely to the theory of economic value added (EVA), which posits that actual value is created when companies earn returns exceeding their capital cost.

Risk management in private equity presupposes portfolio theory as a foundation. Many private equity firms manage their risk by diversifying their investments across different sectors, geographies, and development stages of the companies they invest in, however, unlike portfolio theory, which points to diversification mainly by acquiring many small, unrelated investments, venture capital centres on diversification while ensuring control and influence over the investment¹⁶. Such control empowers the organisation to take an active role in risk management through direct intervention, an attribute that does not exist in public equity risk management.

One of the cornerstones of private equity investments is the theory of market inefficiencies. Private equity companies usually capitalise on these inefficiencies by finding undervalued companies or sectors where they can employ their expertise and resources to increase their value. This strategy assumes that inefficiencies like mispriced assets, underperforming leadership, or unused market potentials give rise to very attractive returns. This approach is based on the investment theory as it stipulates that returns are the highest when capital is invested in the assets overlooked by most stock market participants.

The financial theories of incentives and remuneration also support the structure of private equity funds. The two components of private equity fund managers' compensation are a management fee and a "carried interest", which is a share in profits that the investments have generated¹⁷. Hence, the managers' interests become identical to the fund's performance and they are motivated to achieve maximum returns. This incentive structure is based on contract theory, which focuses on how contractual arrangements can be set up to ensure optimal performance and alignment of parties' interests.

Lastly, the exit mechanisms put in place by private equity, such as IPOs, sales to strategic buyers, and secondary buyouts, are grounded on the realisation theory, which focuses on the

¹⁵ John Gilligan and Mike Wright, *Private Equity Demystified: An Explanatory Guide*, Google Books (Oxford University Press, 2020), https://books.google.co.ke/books?hl=en&lr=&id=GocEEAAQBAJ&oi=fnd&pg=PP1&dq=History+and+evolution+of+private+equity&ots=iv7g4iR7le&sig=fzzByKn_smcG0K0SAQb8oa-3Wmw&redir_esc=y#v=onepage&q=History%20and%20evolution%20of%20private%20equity&f=false.

¹⁶ Axel Buchner, "Risk Management for Private Equity Funds," Social Science Research Network (Rochester, NY, August 2, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3012551.

¹⁷ James M. Schell, Pamela Lawrence Endreny, and Kristine M. Koren, *Private Equity Funds: Business Structure and Operations*, Google Books (Law Journal Press, 2024), https://books.google.co.ke/books?hl=en&lr=&id=9CXLWwVGDbQC&oi=fnd&pg=PA9&dq=components+of+private+equity+fund&ots=2utk6MImSQ&sig=d1CSS_pv9TVwxfJp7h18JE1429c&redir_esc=y#v=onepage&q=components%20of%20private%20equity%20fund&f=false.

transformation of investment into profits¹⁸. This theory focuses on the timing and exit technique to make profit, implying that the exit strategy has to be developed at the time of the investment. Obtaining returns is affected by the market situation and the readiness of the portfolio company to provide sustainable financial performance, in accordance with financial and strategic business cycles.

These theoretical frameworks are the base of private equity as a complex financial instrument and they determine many strategies and operations used by the private equity which differs from other investment forms. For private equity professionals, each of these pillars both influences their daily decisions and determines the impact the private equity industry has on the global financial architecture.

2.3 Financial Performance Metrics in Private Equity.

2.3 1 The factor impact on financial performance of firms

The exploration of what affects companies' financial results is a complicated area that receives a lot of attention in the fields of corporate finance and strategic management. The study of Demirhan and Wassem (2014) identified the structure of these factors and provided a four-fold categorization that serves as a foundation of financial analysis¹⁹. "Liquidity," referring to the capacity of the company to meet its short-term liabilities without the need of external funding, is the first of them. It is usually evaluated by liquidity ratios such as current ratio and acid-test (quick) ratio²⁰. These ratios are indicative of the company's financial flexibility, revealing if it has enough liquid assets to face its short-term obligations. High liquidity ratios may indicate a strong buffer against buyers' remorse, but also the over-utilization of assets.

The second group, "profitability" provides information on a company's earning capacity in relation to the revenue, assets, and equity it has. Measurements like net profit margin, operating profit margin, and return on assets are incredibly important in evaluating how well a company processes its operations into a profit²¹. These profitability ratios provide stakeholders with a snapshot of company performance from various angles: the profit margin gives us the percentage of revenue left as profit after paying all expenses, the operating profit margin ignores the non-operating income and expenses, and the return on assets demonstrates how efficiently a company is able to use its resources to generate profits. Collectively, these indicators provide the most complete picture of the firm's operational effectiveness and strategic execution.

The third strategic pillar, "Asset management efficiency," concentrates on how well a company uses its resources and generates revenue. Generally, this is reflected in such ratios as inventory

¹⁸ Michael Ewens and Joan Farre-Mensa

¹⁹ H.Gökçehan DEMIRHAN and Waseem Anwar, "Factors Affecting the Financial Performance of the Firms during the Financial Crisis: Evidence from Turkey," *Ege Stratejik Araştırmalar Dergisi* 5, no. 2 (July 1, 2014): 65, <https://doi.org/10.18354/esam.70099>.

²⁰ Thi Dang and Thuy, "Literature Review on Factors Affecting Financial Performance of Firms I," *International Journal of Business and Management Invention (IJBMI)* ISSN 12, no. 6 (2023): 181–88, <https://doi.org/10.35629/8028-1206181188>.

²¹ Thi Dang and Thuy.

turnover, accounts receivable turnover, and total asset turnover²². Efficient inventory management and a strong sales function are indicated by a high inventory turnover, and account receivables turnover is significant in maintaining cash flow, which is crucial. In contrast, total asset turnover represents the overall efficiency of the firm in terms of how it uses its assets to achieve revenue. The management then uses these metrics to identify operational inefficiencies as well as to devise strategies for cost minimization and asset utilization optimization.

The fourth factor, financial leverage, deals with the amount of borrowing a company does to support its business. Some important indicators include the debt-to-equity ratio and the return on equity, which shed some light on the financial structure of any business and its debt capability²³. Whilst a little amount of financial leverage can multiply the returns on equity because of the lower cost of borrowing, it also brings higher risk, such as the changes in interest rates and weather in the market. The strategic management of leverage plays hence a crucial role, entailing a fine balance between capitalizing on growth opportunities and preserving the financial stability.

The integration of the different categories, the case studies such as those of Sulairnan, Jili, and Sanda (2001), and Abdullah et al. (2008) have added more support for the predictive power of financial ratios in the evaluation of business performance and operational efficiency. These studies therefore underline the imperative of a comprehensive concept in corporate financial strategy, and the necessity to assess both internal and external political factors that influence the crafting of a corporation's financial policies. By applying such integrative financial analysis, businesses are not only able to strengthen their market presence but also to being more adaptable to shifting economies, ultimately giving them a competitive advantage that will be sustained.

2.3.1.1 Enterprise Scale

Corporate scale is a critical determinant of financial performance as shown by the research results interpreting the multiple factors of business size and its consequences. As noted by Hvide et al. (2007), larger firms tend to be more vigorous as they are able to make use of economies of scale, which in turn promotes their profitability and transactional strength, as shown by Rozaimah et al. (2018). Further, Athanasoglou et al. (2005) hold that in a larger organization, scale economies usually apply by decreasing expenses and increasing market presence. On the other hand, the economies of scale are not without restrictions. Most gigantic enterprises are generally susceptible to more bureaucratic problems that could affect matters such as agility and efficiency. This is in line with Yuqi (2017) who observes that at vast scales, negative aspects tend to outweigh the positive outcomes.

However, Lin and Fu (2017) as well as Mishra and Kapil (2017) provide a different view as they recommend that enterprise scale can lead to serious and negative consequences on financial activities because agency issues in large firms escalate significantly. Such issues emerge as there is a conflict between the interests of managers and shareholders, which might consequently reduce the effectiveness of the business. However, Bhabra suggests that, as a rule, the bigger companies enjoy more economies of scale and are, consequently, more profitable

²² Eugene Brigham and Joel Houston, "Fundamentals of Financial Management Brigham Houston 12th Edition," 2012, http://uni.delf.pro/uploads/7/1/0/7/7107980/fundamentals_of_financial_management_-_brigham_houston_-_12th_edition.pdf.

²³ Eugene Brigham and Joel Houston.

financially²⁴. Such a contrast shows that enterprise scale can bring operational benefits yet bring new complexities that contradict these advantages.

2.3.1.2 Enterprise Age

An enterprise's age, however, is another important factor which shapes its profitability. Established businesses have operational inertia that makes them less adaptable to environmental changes, a subject addressed by Sorensen and Stuart (2000), who suggest that age of the business may work against innovation and company survival. Agarwal & Gort (2002) underscore that an older business usually becomes obsolete and hence its vitality tends to decrease. This gradual fall of performance more often than not forces organizations to succession in order to give their company a fresh market position. Nevertheless, the issue is not settled, as Liargovas and Skandalis (2008) argue that contrary to this view, older companies usually demonstrate higher performance due to their accumulated operational experience and learning advantages which allow them to avoid the inexperience effect and excel.

2.3.1.3 Board of Directors' Scale

The scale of a company's board of directors has a great impact on the company's financial performance. Having a larger board could enhance the company's governance by providing for effective oversight and preventing any management practices that would be detrimental to shareholders, as mentioned in the papers by Mishra and Kapil (2017) and Ping and Hsien (2009). While, on the one hand, a larger board may trigger issues with coordination and enhance the chances of conflicts, as has been stated by Cheng et al. (2008), the company may then suffer losses by cultivating inefficiencies and increased agency problems. This points out the multifaceted nature of how board size is used in corporate governance where the balancing act between more effective supervision and bureaucratic inefficiency is a delicate matter.

2.3.1.4 Business Ownership

Business ownership structure is of paramount importance when it comes to determining financial performance. Active entrepreneurs can thoroughly monitor management so that the incidence of agency problems can be minimized and consequently costs associated with the issues can be reduced as illustrated by Lin and Fu (2017) and Mishra and Kapil (2017). On the contrary, Ping and Hsien (2009) argue that sometimes investors' involvement does not always improve the financial performance, especially when they look for short term gains and act as the passive monitors. In contrast, with the internal ownership, management's interests become parallel with shareholders, by lowering agency costs, as described by Jensen and Meckling (1976), which in turn influences financial performance positively.

2.3.1.5 Leverage Ratio and Capital Structure

Leverage ratio, particularly the debt-to-equity ratio, is a decisive factor determining both profitability and risks of financial structure. It was mentioned in Pandey (2007) that leverage can increase return on equity by facilitating larger operations with less shareholder equity, but it also increases risk by impacting the dividends and the overall cost of capital. For instance, studies including those by Ghosh, Nag, and Sirmans (2000) and Berger & Bonaccorsi di Patti

²⁴ Gurmeet Singh Bhabra, "Insider Ownership and Firm Value in New Zealand," *Journal of Multinational Financial Management* 17, no. 2 (2007): 142–54, <https://ideas.repec.org/a/eee/mulfin/v17y2007i2p142-154.html>.

(2006) found a positive correlation between borrowing and financial performance, but Gleason et al. (2000) and Zeitun and Tian (2007) recorded negative impacts, showing the two-sided nature of borrowing. This in turn emphasizes the importance of containing debts proportionally to gains in order to optimally reap from potential gains and risk, the personalized nature of this decision reflecting the organization's broad capital structure strategy.

2.3.1.6 Capital Structure Considerations

The capital structure of a company—its debt and equity financing mix—is a fundamental determinant of the firm's financial performance and market valuation. Decisions on capital structure have strong effect on financial standing of the company, defining its risk profile, cost of capital and the possibility to get investments²⁵. Equity financing, which reduces the ownership of the company, does not burden the company with obligations concerning debt and may provide greater flexibility during the difficult times. While on the other hand debt financing enhances return on equity it also imposes fixed payment obligations that increased financial risk of the company especially during economic recessions.

The trade-off theory helps in understanding the trade-offs that the companies make in this context, as they seek to strike a balance between the tax advantages of debt (interest is tax-deductible) and the bankruptcy costs linked to high levels of debt. This is evidenced in literature which reflects the optimal debt-to-equity ratio at which debt magnifies profits to a certain level, after which it becomes detrimental to the financial performance as a result of increased financial risk and possibility of distress (Upneja and Dalbor, 2001; Gu, 1993). Thus, choosing the best capital structure is a key strategic decision that requires consideration of operational norms, market conditions, and a company's financial strategy and its risk tolerance.

2.3.1.7 Internal Ownership Dynamics

Another essential point is that internal ownership and financial performance have a close relationship. Internal ownership making managers and employees to be stakeholders of the company is said to align the interests of the agents (managers) with the owners (principals), thus reducing agency costs. It is expected that such an alignment will promote those behaviors that would not only lead to the company's long-term achievements but also improve financial performance. On the one hand, having too many insiders may result in entrenchment where insiders may resist changes that are threats to them, eventually reducing their responsiveness and market performance. (Lin & Fu, 2017).

Additionally, the principal-agent problem, one of the fundamental theories of corporate governance, refers to the discrepancies in goals between managers and shareholders which can create inefficiencies if unaddressed. The expenses of managing managers and aligning such interests with those of shareholders (the agency costs) can affect the financial performance in an essential way. Successful management of such relationships through internal ownership of a reasonable amount and good governance structure is necessary in order to reduce agency costs and increase shareholders value.

²⁵ James M. Schell, Pamela Lawrence Endreny, and Kristine M. Koren.

2.3.1.8 Leverage's Dual Effects

Delving deeper into the debt utilization in a company's books, there are subtle consequences of debt on the firm's financial performance. Although leverage can potentially amplify the profits by providing tax shields and similar financial benefits, it also creates risks of elevating the firm's chances of getting into financial trouble and bankruptcy. The two-sided nature of leverage means that a well-planned approach to raising capital, where the benefits of debt are balanced against the risk, is required. Studies have shown mixed effects of leverage on the financial performance of the company. Some have argued that a moderate level of debt keeps a company focused on its cash flows and its decisions about investment, while others have pointed to the negative effects of excessive debt, particularly in volatile market conditions (Gleason et al., 2000; Simerly and Li, 2000).

2.3.2 Strategic Implications of Financial Choices

The synergy of leverage, internal ownership, and capital structure choices altogether constructs the strategic board where a company maneuvers to boost its financial standing. Every factor, from how a company finances itself to who decides its affairs, is so important because they strongly influence the company's financial performance and its competitiveness²⁶. Enterprises need to find the appropriate balance between financial strategies, operational objectives, and market resistance in order to take full advantage of these financial levers and to guarantee long-term growth and profit. Through this strategic financial management both current operational performance and long-term strategic objectives are consistent which gives the company a competitive edge in the highly dynamical global arena.

2.4 Methodologies for financial performance evaluation

2.4 1 Liquidity

Liquidity in the business world is a major parameter of a company's status and its ability to handle both routine financial obligations and unpredictable money crises. What liquidity actually does is measure the company's immediate capability to convert assets into cash to meet both current and short-term obligations²⁷. This financial indicator is very important, and it is not only crucial for day-to-day operations, covering operating expenses and capital investments but it also ensures readiness in difficult scenarios. These can include unforeseeable market collapses as well as previously unanticipated investment opportunities which need immediate financial infusion. Liquidity is much more than just a financial metric, since it is also included in a company's general framework of strategies. It proves a company's durability, displaying

²⁶ Morten Sorensen, Neng Wang, and Jinqiang Yang, "Valuing Private Equity," *SSRN Electronic Journal*, 2012, <https://doi.org/10.2139/ssrn.2180789>.

²⁷ Yolanda Nofita Agustina and Hery Suprayitno, "ANALYSIS of FINANCIAL STATEMENTS USING LIQUIDITY RATIO to MEASURE FINANCIAL PERFORMANCE in 2017-2019":, *JOSAR (Journal of Students Academic Research)* 5, no. 2 (September 1, 2020): 32–39, <https://doi.org/10.35457/josar.v5i2.1144>.

its capability to maintain its operations and protect itself from financial difficulties²⁸. A well-capitalized company builds itself with a solid base, ready to overcome both predictable and unpredictable changes and swings in the business environment that gets the company pathway to stability and growth.

To quantitatively assess liquidity, analysts predominantly rely on two metrics: current ratio and working capital. The current ratio, which is determined by dividing a company's current assets by its current liabilities, acts as a gauge to assess the firm's liquidity²⁹. This ratio indicates the ability of the company to finance its liability through assets that are expected to be realized within a year³⁰. A number higher than 1.00 suggests the liquid nature of the company which implies that it has enough money to pay off its short-term debt. On the other hand, a liquidity ratio below 1.0 indicates a possible liquidity problem that might have arisen in the firm's asset-liability management. This comparative measure of liquidity informs stakeholders about the company's financial flexibility and its ability to address short-term financial issues satisfactorily.

Relative work capital does offer an absolute dollar view by subtracting total current liabilities from total current assets. This data illustrates the amount of cash left over after all the current assets were liquidated and the short-term liabilities were paid. Positive working capital usually shows that a firm is financially healthy since the firm has enough liquid assets to cover its short-term debts³¹. Yet, the amount of working capital needed varies greatly across industries and depends on the operating cycle and the size of the business. A positive working capital can serve as a cushion against financial volatility. A negative working capital however, does not mean doomsday provided that the organization has strategies put in place to effectively manage the cash flows. Hence, a reasonable level of working capital is a vital factor for the smooth operation of the business and financial stability.

Alongside the current ratio and working capital, liquidity measures are fundamental in analyzing the company's liquidity. These metrics showcase the firm's short-term financial liquidity, which is the basis for its operational continuity and strategic flexibility. Through the constant monitoring of these cash flow indicators, organisations can detect possible cash flow problems early on and undertake prudent measures to deal with them before they become serious, even in a highly unpredictable climate for business.

2.4 2 Solvency

The term solvency is a very familiar letter within the financial dictionary of operational management as it is closely related to the firm's financial health over the long run and its ability to fulfil its continuing financial obligations³². In contrast, short-term liquidity assesses the

²⁸ F. Sharifi and E. Taghipour, "Measuring Financial Performance Using New Liquidity Indices," *Management Science Letters* 4, no. 9 (2014): 2139–44, <https://m.growingscience.com/beta/msl/1717-measuring-financial-performance-using-new-liquidity-indices.html>.

²⁹ Haldane Blessing and Gryglewicz Sakouvogui, "Impact of Liquidity and Solvency Ratios on Financial Performance: A Comprehensive Analysis," *Indonesia Auditing Research Journal* 12, no. 3 (September 30, 2023): 102–15, <https://doi.org/10.35335/arj.v12i3.208>.

³⁰ Md Aminul Islam, "An Analysis of the Financial Performance of National Bank Limited Using Financial Ratio," *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport* 2, no. 5 (January 23, 2014): 121–29, <https://doi.org/10.12691/jbc-2-5-3>.

³¹ Haldane Blessing and Gryglewicz Sakouvogui

³² R. J. Taffler, "The Assessment of Company Solvency and Performance Using a Statistical Model," *Accounting and Business Research* 13, no. 52 (September 1983): 295–308, <https://doi.org/10.1080/00014788.1983.9729767>.

company's ability to meet its short-term financial obligations, and solvency assesses that the company can sustain operations over the long haul and fulfil all its liabilities with its assets over time. A healthy firm reflects a balance sheet characterised by a total asset value more significant than total liabilities and implies a foundation not only for financial stability but also for future growth. More than just finance metrics, solvency has a broader implication on investor confidence, creditworthiness and the ability of the firm to draw further capital. The essence of solvency is a company's ability to steer safely through obstacles as well as take advantage of the competitive business environment, thereby securing its long-term viability³³.

Financial analysts use several key ratios to achieve the subjective assessment of solvency. Each of them is informative for understanding the company's financial structure as well as stability. The main solvency index, the equity-asset ratio, indicates the proportion of total assets backed by the owner's equity³⁴. The measure is the ratio between total equity and total assets, reflecting the firm's dependence on internal versus external funding sources. A higher equity-to-asset ratio means that the company's financial standing is more robust as more assets are financed through equity that is not debt-dependent. This ratio represents the firm's financial strength, with a significant equity base providing a cushion against facing insolvency during hard times.

On the contrary, the debt-to-asset ratio looks at how the percentage of the company's assets is financed through debts. It is determined by the proportion of total liabilities to total assets; thus, it shows the degree of a firm's leverage and its dependence on borrowed funds to run its operations and expansion activities. A lower debt-to-asset ratio is usually considered a positive sign as it indicates a lower financial risk and a more robust financial cushion against economic fluctuations. This debt-to-equity ratio provides essential information about the company's financial strategy, mainly your debt structure as a funding source for business growth and capital investments.

The next prominent solvency measure, the debt-to-equity ratio, is derived by comparing the total liability against the company's shareholders' equity to reveal the proportion of debt versus equity used to finance the company's assets³⁵. This ratio, which people sometimes call leverage or gearing, indicates the balance between funds provided by creditors and those supplied by shareholders. A lower debt-to-equity ratio is a positive sign showing a well-equipped balance sheet with less burden imposed on shareholders and steady stability during a financial downturn. It underscores the company's capacity for growth with a viable blend of debt and equity financing to fund its operations and tactical ventures.

Jointly, these solvency ratios paint a complete picture of a firm's financial strength, reflecting its long-term viability and ability to withstand adverse events. By looking at equity-to-asset, debt-to-asset, and debt-to-equity ratios, stakeholders can understand the company's financial structure, risk profile, and general stability³⁶. These metrics are critical in strategic decision-making; they help firms build a capital structure that is growth-driven while financially sound.

³³ R. J. Taffler

³⁴ Talal A. Al-Kassar and Jared S. Soileau, "Financial Performance Evaluation and Bankruptcy Prediction (Failure)1," *Arab Economic and Business Journal* 9, no. 2 (October 2014): 147–55, <https://doi.org/10.1016/j.aebj.2014.05.010>.

³⁵ Jessica Medeline Effendie, Henny A. Manafe, and Stanis Man, "Analysis of the Effect of Liquidity Ratios, Solvency and Activity on the Financial Performance of the Company (Literature Review of Corporate Financial Management)," *Dinasti International Journal of Economics, Finance & Accounting* 3, no. 5 (December 13, 2022): 541–50, <https://doi.org/10.38035/dijefa.v3i5.1507>.

³⁶ Jessica et al.

Debt is a way for companies to take advantage of a moderate amount of capital for investment purposes and still have enough equity to protect against financial risks.

To achieve sustainability and stability, solvency has to be recognized and managed effectively. The solvency ratios should be considered critical indications of a company's financial state, which are necessary for planning, investment and risk management. A business that can manage its solvency successfully beyond mere survival will discover new opportunities to flourish and grow in the dynamic economy. Profound investigation and responsible financial administration will help companies maintain their solvency as they advance their business and secure their place in the market in the long run.

2.4.3 Integrating Liquidity and Solvency Analysis for Comprehensive Financial Evaluation.

The overall financial health of a business becomes best evaluated with the merging of liquidity and solvency analyses together as this provides a comprehensive view reflecting both the short-term capability and the long-term sustainability. Liquidity, or the company's ability to settle current liabilities and solvency shows the ability to pay long-term debts and make up the whole picture of financial health³⁷. Through this dual analysis, the stakeholders get information on how the company uses its present resources to meet the current needs and also makes plans for future securities. A firm with both a high liquidity ratio and a strong capital liquidity ratio takes risks at a lower level, and it stands a chance of operating successfully for a sustained period³⁸. The interaction between these two ratios is also a strong indicator of future financial strategies like altering credit policies, optimizing inventories for better financial health at present and future, or restructuring debt to make ends meet now and in the future.

While liquidity and solvency ratios are priceless when it comes to assessing the financial status of a company, they also come with some shortcomings that deserve adequate consideration. Liquidity ratios like the current ratio and quick ratio are point-in-time data points. They can accordingly be volatile over the course of a given fiscal year due to seasonal sales cycles or inconsistent expenses³⁹. It can end up sharing a completely wrong picture of the financial position of the company. Liquidity ratios might not reflect the current market conditions, or assets may be subject to depreciation; therefore, the long-term accuracy will be compromised from these metrics. Moreover, they apply the historical cost of assets instead of their current market value, which can change in unstable markets. Therefore, analysts need to place these ratios within the economic environment and industry-specific conditions to get an accurate picture.

Awareness of the tactical repercussions of liquidity and solvency metrics is fundamental for proper corporate governance and financial planning. Having liquidity ratios, the management team can be confident that there are enough assets to meet the obligations ahead⁴⁰. This

³⁷ Colleen Baker, Christine Cummings, and Julapa Jagtiani, "The Impacts of Financial Regulations: Solvency and Liquidity in the Post-Crisis Period," *Journal of Financial Regulation and Compliance* 25, no. 3 (July 10, 2017): 253–70, <https://doi.org/10.1108/jfrc-02-2017-0027>.

³⁸ Colleen Baker, Christine Cummings, and Julapa Jagtiani.

³⁹ Renáta Myšková and Peter Hajek, "Comprehensive Assessment of Firm Financial Performance Using Financial Ratios and Linguistic Analysis of Annual Reports," *Journal of International Studies* 10, no. 4 (2017): 96–108, <https://www.cceol.com/search/article-detail?id=607109>.

⁴⁰ Morten Sorensen, Neng Wang, and Jinqiang Yang.

instantaneous financial stability is more important than any other financially related issue for the company's everyday operations, including payroll and supplier payments. On the contrary, solvency ratios are instrumental in long-term strategic planning, where they inform capital expenditure, mergers and debt management. The company's solid solvency status allows it to carry on with new projects and grow sustainably, as well as helps to gain the confidence of potential investors and lenders by showing financial stability and risk management ability.

The volatile environment of financial performance indicators requires ongoing tracking and adjustment by a business's current performance and long-term growth plans. Proper financial management involves not only following the optimal liquidity and solvency levels but also predicting the market's fluctuations and adapting financial practices to these changes. For illustration, a sudden recession might force tightening liquidity for cash conservation purposes. On the other hand, expansion opportunities could be seen as a reason for employing solvency by increasing debt for strategic growth. Hence, efficient management of these financial indicators permits firms to be flexible and adapt to both arising problems and opportunities.

Putting together liquidity and solvency analysis makes up the central part of the comprehensive financial evaluation which allows businesses to identify the immediate needs with the long-term objectives. This convergence contributes not only to the sustainability of the business but also to strategic decisions, which can increase competitiveness and market leadership. Through the full understanding and the appropriate management of the financial ratios, companies can guarantee solid financial health, which is the most important for success in the current world.

2.5 Differences in Financial Metrics: Private vs. Public Companies

One of the fundamental differences in the financial metrics of private and public companies is the availability and transparency of financial information. In the UK, public companies are subject to stringent standards of financial reporting set by the Financial Reporting Council (FRC)⁴¹. They are responsible for continuously providing detailed financial data updates, including quarterly and annual reports that give clear-cut information about the company's financial state. It promotes transparency and uniform computation of performance indicators and ratios such as earnings per share (EPS), return on equity (ROE), and others important to investors and stakeholders⁴². On the other hand, private companies are subject to less stringent disclosure guidelines, which can create difficulties in getting adequate financial details. An aspect missing here is transparency, as it becomes challenging for external analysts to evaluate the company's financial health with the same kind of details and compare it with public companies.

The financial indicators used by private and public companies tend to diverge due to the different ownership structures and management goals. Public companies customarily use metrics that they believe are monitored closely by investors and analysts, including quarterly EPS, stock price performance, dividend yield, and market capitalization, because of the

⁴¹ John Kingman, "Independent Review of the Financial Reporting Council," 2018, <https://assets.publishing.service.gov.uk/media/5c1bbe68ed915d7327b92162/frc-independent-review-final-report.pdf>.

⁴² John Kingman.

perpetual pressure on earnings and shareholder value⁴³. On the contrary, private enterprises that aren't bounded by the pressure of public markets may place emphasis on long-term development and sustainability metrics rather than short-term financial results. Indicators like cash flow management, long-term debt levels, and operational efficiency could be more pertinent to privately held companies when they aim to strengthen their market position beyond the gaze of public investors.

Risk management and investment strategies are also significantly different between the two entities, driven by their financial reports and strategic objectives. Public companies, guided mainly by the demands of their shareholders and the public scrutiny of their economic performance, tend to employ more risk-averse financial strategies to protect their assets and attract a wider group of investors⁴⁴. It can affect their financial indicators, where they should retain a solid balance sheet and healthy profitability ratios for investors' trust. On the other hand, private companies could be more aggressive in this area, since they do not have to publicly explain their actions. This may result in higher debt levels or significant ventures in innovation and growth projects, without being adequately demonstrated in traditional financial ratios.

Lastly, the use of financial metrics precisely for private and public companies will certainly make a difference in terms of their financial planning and evaluation. Public companies need to plan their finances with the analysis and shareholder expectations in mind, and since they are in the public eye, a lot of their efforts are directed at coming up with certain numbers that portray a better picture and elevate stock value⁴⁵. Unlike private companies that can customize their financial planning in line with what internal targets and long-term strategies they pursue, metrics that reflect specific business models and particular industries are perhaps used instead of external expectations. This inherent aspect, whether of the financial metrics themselves or the way they are evaluated and perceived against the background of each business' operational and strategic structure, is what makes the two different.

2.6 Impact of Private Equity Ownership on Portfolio Companies

Private equity ownership is often accompanied by a diversified impact on the financial and operational sides of the portfolio companies. A multitude of studies have revealed the positive relationship between PE funding and financial performance via diverse means including improved management practices, strategic realignment as well as operational efficiency. In almost all these studies, the one thing in common they find is the improvement in cost management and profitability margins after PE investment⁴⁶. For example, studies frequently

⁴³ Massimiliano Bonacchi, Antonio Marra, and Paul Zarowin, "Organizational Structure and Earnings Quality of Private and Public Firms," *Review of Accounting Studies* 24, no. 3 (June 28, 2019): 1066–1113, <https://doi.org/10.1007/s11142-019-09495-y>.

⁴⁴ Dominicus Priyarsono et al., "Risk Management in Private Companies and Public Sector Organizations: A Preliminary Comparative Study," *Jurnal Organisasi Dan Manajemen* 19, no. 1 (June 26, 2023): 256–72, <https://doi.org/10.33830/jom.v19i1.4126.2023>.

⁴⁵ Thomas Hall, Cesario Mateus, and Irina Bezhentseva Mateus, "What Determines Cash Holdings at Privately Held and Publicly Traded Firms? Evidence from 20 Emerging Markets," *International Review of Financial Analysis* 33 (May 2014): 104–16, <https://doi.org/10.1016/j.irfa.2013.11.002>.

⁴⁶ Brad Badertscher, Sharon P. Katz, and Sonja O. Rego, "The Impact of Private Equity Ownership on Portfolio Firms' Corporate Tax Avoidance," *SSRN Electronic Journal*, 2011, <https://doi.org/10.2139/ssrn.1338282>.

reveal that PE firms impose tight performance indicators and cost reductions to optimize processes independently. Besides, PE-backed companies often demonstrate higher revenue growth rates because of the aggressive expansion strategies and market consolidation, which are driven by the PE owners' deep industry expertise and networks⁴⁷.

The influence of private equity investments differs largely from sector to sector as it is determined by different market dynamics, regulatory environments, and development potential. As an illustration, technological sectors generally see PE firms focused on scaling up operations and entering new markets while, with regards to traditional industries such as manufacturing, efficiency improvements or restructuring could be the main focus⁴⁸. In medicine, private equity investments have been associated with consolidation with negative consequences as it leads to increased bargaining power and better profitability⁴⁹. These sector-specific approaches highlight the capability of PE investors to take advantage of some sector nuances, which in turn ensures that they make the most out of their investments.

The causes of the temporal effects of private equity ownership are found in both short-term and long-term frames. In the near term, portfolio companies may see some organizational restructuring, including people transitions and fast strategic changes, targeting immediate financial gains⁵⁰. However, such transformations usually bring with them temporary disruptions that result in a decline in the teams' morale and customer relationships. Over the long term, the benefits of these reforms are usually made visible as the firm stabilizes and the strategic initiatives are laid, consequently leading to sustainable growth, improved operational efficiencies and better financial health⁵¹.

Beyond what individual companies achieve, the broader economic impact of private equity also deserves recognition. As PE investments are frequently associated with job creation, this happens directly in the portfolio company or indirectly through the supply chain and related services⁵². Lastly, PE companies support economic development by improving competitors' businesses, which could generate additional tax revenues and decrease the unemployment rate. On the other hand, this opinion should be accompanied by the standpoint that PE can also result in cost-saving measures such as job cuts or underinvestment in some business areas.

However, private equity ownership is not exempt from problems and questions. Critics often refer to the unfavourable debt load placed on portfolio companies, which can jeopardise financial stability, especially in an unstable economic environment. Another criticism is that the short-term orientation of some PE firms, which could lead to attention to fast returns instead of long-term growth. And often, the employees are the ones who suffer, just like the companies that are downsizing and increasing workloads.

⁴⁷ Sophie Manigart and Mike Wright, "Reassessing the Relationships between Private Equity Investors and Their Portfolio Companies," *Small Business Economics* 40, no. 3 (October 30, 2011): 479–92, <https://doi.org/10.1007/s11187-011-9387-7>.

⁴⁸ Garry D. Bruton et al., "Governance, Ownership Structure, and Performance of IPO Firms: The Impact of Different Types of Private Equity Investors and Institutional Environments," *Strategic Management Journal*, 2009, n/a-n/a, <https://doi.org/10.1002/smj.822>.

⁴⁹ Suhas Gondi and Zirui Song.

⁵⁰ Nick Wilson, Moshfique Uddin, and Mike Wright, "Exporting by Private Equity-Backed Portfolio Companies," *British Journal of Management*, November 23, 2021, <https://doi.org/10.1111/1467-8551.12566>.

⁵¹ Nick Wilson, Moshfique Uddin, and Mike Wright.

⁵² Johan Cassel, "What Is the Impact of Managerial Ownership on Firm Performance in Private Equity Portfolio Firms? *," 2020, https://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2021-Leeds/papers/EFMA%202020_stage-1301_question-Full%20Paper_id-434.pdf.

2.7 Strategies and Performance of Private Equity Firms

Private equity firms employ diverse investment strategies tailored to meet specific objectives and market opportunities. These strategies encompass LBOs, growth capital investments, venture capital initiatives, secondaries, and fund-of-funds structures. Each strategy is designed to capitalize on different stages of a company's lifecycle and market dynamics, offering unique risk-return profiles and value creation potential.

2.7.1 Leverage Buyout

LBOs represent the cornerstone of private equity investing, involving the acquisition of a company, business unit, or assets using a significant amount of borrowed capital. These transactions typically target mature companies with stable cash flows and established market positions⁵³. Private equity firms may categorize target companies as platform companies, which serve as standalone entities, or add-ons, which complement existing portfolio holdings. Notable examples of leverage buyouts include Mediq and Roompot/Landal, illustrating how private equity firms leverage financial engineering to unlock value and drive growth.

2.7.2 Growth Capital

Growth capital investments provide equity financing to mature companies seeking funds for expansion, operational improvements, market entry, or strategic acquisitions. Unlike early-stage venture capital, companies pursuing growth capital typically have a proven track record, generating revenue and profits but requiring additional capital to fuel growth initiatives. Notable examples include Action and Partou, highlighting how private equity firms partner with established businesses to accelerate growth and enhance market positioning.

2.7.3 Venture Capital

Venture capital represents a subset of private equity focused on investing in early-stage and high-growth companies with disruptive technologies, innovative business models, or scalable products. These investments target companies at various stages of development, from seed and startup to early-stage growth⁵⁴. Venture capital firms provide crucial funding and strategic guidance to help fledgling businesses navigate market challenges and scale their operations. Iconic examples such as Airbnb and Skype underscore the transformative impact of venture capital on emerging industries and market disruptors.

2.7.4 Secondaries

Secondary investments involve acquiring existing private equity assets, including fund interests or portfolios of direct investments, from institutional investors. These transactions

⁵³ Nicolaus Loos, *Value Creation in Leveraged Buyouts: Analysis of Factors Driving Private Equity Investment Performance*, Google Books (Springer Science & Business Media, 2007), <https://books.google.com/books?hl=en&lr=&id=GHeMY5F61icC&oi=fnd&pg=PR1&dq=Strategies+and+Perfo+rmance+of+Private+Equity+Firms+-+LBO&ots=aYPZWjBXyZ&sig=MRDxzLiVdizAqgibyZNDQe7kcy4>.

⁵⁴ Mike Wright, "Venture Capital and Private Equity: A Review and Synthesis," *Journal of Business Finance Accounting* 25, no. 5&6 (June 1998): 521–70, <https://doi.org/10.1111/1468-5957.00201>.

provide liquidity to existing stakeholders while offering private equity firms access to diversified portfolios with established track records. Private equity firms can mitigate the J-curve effect⁵⁵ associated with new fund investments and accelerate cash flow generation by investing in secondaries⁵⁶. Notable players like Glendower Capital exemplify the growing importance of secondary transactions in the private equity landscape.

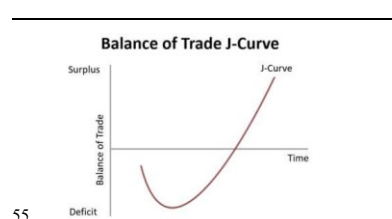
2.7.5 Fund of Funds

Fund of funds (FoFs) structures involve investing in portfolios of other private equity funds, offering investors diversification, risk mitigation, and access to top-performing managers and niche markets. FoFs appeal to investors seeking exposure to private equity without the expertise or resources to build and manage a diversified portfolio independently⁵⁷. Additionally, FoFs provide access to specialized strategies, geographic regions, or emerging sectors through skilled fund managers. Examples such as Reachfund and Marktlink Capital demonstrate how FoFs are vehicles for accessing diverse investment opportunities and optimizing risk-adjusted returns in the private equity asset class.

2.8 Correlation between investment strategies and financial outcomes

The connection between the investment strategies that private equity firms apply to their financial outcomes is complicated and multifaceted. It is governed by several factors, such as market conditions, industry dynamics, and managerial expertise⁵⁸. Risk-return profiles are different for each investment strategy, and the financial outcomes that are achieved depend on the market opportunities and the execution capabilities of a private equity firm.

LBOs are frequently believed to be associated with greater financial returns thanks to the substantial leveraging of debt financing, which multiplies the equity returns when the deal is successful⁵⁹. Through the acquisition of businesses with steady cash flows and operational efficiency, private equity firms have the ability to introduce value-enhancing projects like



⁵⁶ Tommi Huoponen, “The Effect of Secondary Buyouts on Private Equity Fund Performance,” *Aaltodoc.aalto.fi*, November 8, 2017, <https://aaltodoc.aalto.fi/items/703d647f-01d6-4953-865c-39f1d18c54c5>.

⁵⁷ Robert S. Harris et al., “Financial Intermediation in Private Equity: How Well Do Funds of Funds Perform?,” *Journal of Financial Economics* 129, no. 2 (August 2018): 287–305, <https://doi.org/10.1016/j.jfineco.2018.04.013>.

⁵⁸ Ibrahim Arpaci, Omer Aslan, and Mustafa Kevser, “Evaluating Short- and Long-Term Investment Strategies: Development and Validation of the Investment Strategies Scale (ISS),” *Financial Innovation (Heidelberg)* 10, no. 1 (February 19, 2024), <https://doi.org/10.1186/s40854-023-00573-4>.

⁵⁹ Brian Ayash, Robert P. Bartlett, and Annette B. Poulsen, “The Determinants of Buyout Returns: Does Transaction Strategy Matter?,” *Journal of Corporate Finance* 46 (October 2017): 342–60, <https://doi.org/10.1016/j.jcorpfin.2017.07.006>.

operational upgrades, cost minimization, and strategic extension. Applying these strategies creates a possibility of capital gains and a favourable yield for investors.

While VC investments may have the potential for high growth and a good pay-off, they also carry higher levels of risk and uncertainty that go along with them. Venture capital-backed start-ups suffer from less predictable financial streams, indefinite gestation periods and a higher possibility of failure⁶⁰. On the other hand, those VCs investing in disruptive technologies or market innovations could end up with more significant gains, such as what happened to Airbnb and Skype. The core of success in venture capital is choosing ambitious start-ups, strategic supervision and practical support, and competent risk management throughout the investment lifecycle.

Growth capital funds fit in a niche between LBOs and VCs, allowing private equity firms the chance to invest in medium-sized companies in need of expansion capital. Although the returns on growth capital investments may not be the same as those of leverage takeovers or venture capital investments, they usually produce consistent cash flows and reliable revenue streams and have a lower risk than early-stage ventures⁶¹. By leveraging capital investment into mature companies for strategic growth, private equity firms can unlock value, accelerate expansion, and excel in market positioning, ultimately translating into good risk-adjusted returns for investors.

The correlation between investment portfolios and financial results in private equity depends on a delicate balance between risk and reward, timing, and operational capabilities. However, every approach brings different sets of opportunities and difficulties. Thus, a skilful private equity house combines strategy with flexibility and can make the most of changing market conditions, emerging trends, and diverse business areas. Through their know-how, networks, and resources, private equity firms seek to achieve superior financial results for their investors and assist in the progress of the companies they collaborate with in achieving growth and innovation.

2.9 Deutsche Bank AG Strategic Evolution and Financial Performance

Deutsche Bank AG is a pillar in the global banking and financial services industry, and its agenda lies in the strategic reconstruction of the company to enable sustainable growth and shareholder value creation. The bank is committed to its strategic plan for the next 5 years through 4 client-driven business divisions that are the building blocks of its organizational structure and growth path⁶². This strategic direction further highlights the significance of

⁶⁰ Fabio Bertoni, Massimo G. Colombo, and Luca Grilli, "Venture Capital Financing and the Growth of High-Tech Start-Ups: Disentangling Treatment from Selection Effects," *Research Policy* 40, no. 7 (September 2011): 1028–43, <https://doi.org/10.1016/j.respol.2011.03.008>.

⁶¹ Joern Block et al., "Private Equity Investment Criteria: An Experimental Conjoint Analysis of Venture Capital, Business Angels, and Family Offices," *Journal of Corporate Finance* 58 (May 2019), <https://doi.org/10.1016/j.jcorpfin.2019.05.009>.

⁶² Deutsche Bank, "Deutsche Bank Reports 2023 Profit before Tax of € 5.7 Billion and Announces € 1.6 Billion of Proposed Capital Distributions to Shareholders," Db.com, 2023, https://www.db.com/news/detail/20240201-full-year-results-2023?language_id=1.

Deutsche Bank in building its core as a durable strategic direction, considering the main themes of the coming decade.

In a financial sense, Deutsche Bank has made significant strides in its transformation, as proven by the robust data in the latest financial statements. An example is the bank's profit before tax, which jumped over 65% yearly to a significant value of €5.6 billion⁶³. This remarkable growth profile is particularly highlighted by the cost/income ratio drop, from 85% in 2021 to 75% in 2022. Apart from that, Deutsche Bank's net income more than doubled year-on-year to €5.7 billion, showing the effectiveness of its strategic initiatives in driving bottom-line growth⁶⁴.

The bank's strong financial condition is also clearly reflected in its capital ratios, with the standard equity tier 1 (CET1) capital ratio looking healthy at 13.4% and a leverage ratio of 4.6%⁶⁵. These figures show that Deutsche Bank has output capital adequacy and risk management in place, on which the bank can build sustainable growth and robustness against dynamic market threats. Additionally, the proposed dividend of €0.30 per share, a considerable rise from €0.20 in 2021, reflects the bank's dedication to increasing shareholder value and rewarding investors' confidence.

2.9.1 Investment Strategies of Deutsche Bank AG

The investment strategies of Deutsche Bank AG are inseparably connected to its strategic framework, which is in sync with its core principles of customer focus, sustainability, technology, and organizational culture. The bank's client-centric approach is portrayed through its efforts to strengthen client relationships and use digital innovation to improve client experience. By making strategic investments in sustainable finance projects, Deutsche Bank has not only become a key player in the transition towards a more sustainable future, but it has also ensured that its credit portfolio remains consistent and aligned with the Paris Agreement. The bank aims to provide €200 billion in sustainable financing and investments by 2025⁶⁶.

In addition to this, Deutsche Bank's investments in technology and operations are made to improve efficiency, reduce complexity and provide robust risk management systems. The bank, through data analytics, seeks to gain a competitive edge that empowers management to make informed decisions that propel performance across the functions⁶⁷. Besides, Deutsche Bank also pays attention to developing a culture of performance, innovation, and inclusion, which recognizes that its people are the main factor of the company's achievement and sustainable development.

Deutsche Bank's solid financial performance clearly illustrates the efficiency of its investment strategies and the achievement of its strategic targets. The significant rise in profit before tax, together with the decline in the cost/income ratio, points to the success achieved by the bank in improving its performance and financial results. Apart from that, the substantial increase in

⁶³ Deutsche Bank

⁶⁴ Deutsche Bank

⁶⁵ Deutsche Bank, "Deutsche Bank Reports Continued Delivery of Transformation in 2022 and Clear Targets for 2025," Db.com, 2022, https://www.db.com/news/detail/20230317-deutsche-bank-reports-continued-delivery-of-transformation-in-2022-and-clear-targets-for-2025?language_id=1#:~:text=The%20CET1%20capital%20ratio%20was.

⁶⁶ Deutsche Bank, "F R a M E W O R K E X T E R N a L R E v I E W," 2024, <https://www.db.com/files/documents/csr/sustainability/SPO-ISS-Sustainable-Finance-Framework-January-2024.pdf>.

⁶⁷ Deutsche Bank.

net income and the approved dividend increase illustrate Deutsche Bank's improved financial situation and dedication to creating value for shareholders. Gaining solid capital ratios and a robust balance sheet, Deutsche Bank is capable of facing the challenges of the evolving financial landscape and driving sustainable growth in the future.

2.10 Challenges in Measuring Financial Performance

Evaluating financial performance is a complex task that requires the application of multi-faceted approaches. The main challenge is the problem of data transparency and availability. Getting the correct, comprehensive financial data, especially for a privately-owned company or an industry with limited disclosure requirements⁶⁸. Furthermore, it becomes difficult to conduct an in-depth analysis, which weakens the accuracy of the performance assessment. In addition, the absence of standardised reporting practices across industries routes the challenges and makes it even more complicated to measure financial health.

Another significant challenge is comparing financial performance across sectors and economic situations. All industries operate uniquely depending upon critical determining factors such as market dynamics, a regulatory landscape, and technological advances⁶⁹. Furthermore, when direct competitions are conducted between companies that are from different sectors, it may result in biased outcomes. Without considering these sector-specific particularities, the evaluations are shallow and do not provide necessary questions for the relevant parties.

Methodological challenges still make the measurement of financial performance difficult in the research process. Researchers face challenges such as selection bias, limited sample size, and the issue of data quality, which can reduce the credibility and accuracy of study results. Furthermore, the complexity of analytical approaches and performance measures in different studies limits the development of standardized methodologies⁷⁰. Therefore, integrating the discordant results in one way and drawing valid conclusions from the present evidence requires considerable effort from researchers.

Hence, this research article is anticipated to suggest methodological approaches to overcome the methodological complexities of financial performance measurement. They involve using unconventional data sources and models, such as machine learning algorithms and natural language processing techniques, to extract and analyze financial information from non-structured sources. Cooperation among scientists, the representatives of the industry, and the regulators may improve the extent of data transparency and standardization even more, boosting the trustworthiness of financial performance assessments.

In addition, there is a methodological change in the econometric modelling and statistical analysis, which gives hope for overcoming related issues of cross-sectoral and economic

⁶⁸ John Pelozo, "The Challenge of Measuring Financial Impacts from Investments in Corporate Social Performance," *Journal of Management* 35, no. 6 (April 20, 2009): 1518–41, <https://doi.org/10.1177/0149206309335188>.

⁶⁹ Mariam Robleh Farah and Sitki Sönmezer, "The Effects of Private Equity on the Financial Performance of Firms," *International Journal of Social Science and Human Research* 05, no. 08 (August 31, 2022), <https://doi.org/10.47191/ijsshr/v5-i8-68>.

⁷⁰ Christoph Kaserer and Rüdiger Stucke, "Performance of Private Equity," *Alternative Investments*, March 18, 2013, 323–44, <https://doi.org/10.1002/9781118656501.ch16>.

condition comparison. Addressing the issue of confounding factors is one of the priorities in time-series analysis, propensity score matching and control variables used. This helps the isolation of sector-specific dynamics. These improvements in methodology could help improve the accuracy, reliability, and relevance of financial performance appraisal and thus add to the assessment of business performance and economic dynamics.

2.11 Regulatory and Ethical Considerations in Private Equity

The regulatory environment of private equity investments is multiple-layered and extends from legal frameworks to transparency, accountability, and investor protection. In different jurisdictions, private equity firms are supervised by governing authorities like the SEC in the US and the FCA in the UK. These regulatory bodies are responsible for enforcing compliance with such laws as those governing securities offerings, investor disclosures, and market conduct, and other areas as well⁷¹. Moreover, private equity companies are also likely to be subject to specific regulations about fund structuring, capital sufficiency, and reporting standards, depending on the country where the operations occur⁷². Compliance with these regulations is a must to ensure market integrity and investor loyalty in the private equity business.

Ethical concerns carry a lot of weight when defining the societal implications of private equity ownership. While private equity investments can result in massive financial returns for investors and contribute to economic development through capital acquisition and operational enhancements, at the same time, they raise concerns related to the impact on stakeholders like employees, suppliers and the local community⁷³. The unemployment, wage stagnation, and business governance scrutiny cases have prompted the examination of private equity practices in some instances. In addition to that, while private equity firms act for short-term profit, their goal may be in conflict with world-scale objectives like environment preservation, social equity and corporate responsibility. With this in mind, these ethical considerations are increasingly a part of investment decision-making processes, with some investors prioritizing environmental, social and governance criteria in evaluating investment opportunities.

The balance between profits for the investors and responsible investments is a very complex question for private equity companies. Achieving a reasonable return to investors remains the biggest goal for private equity firms. However, they are more and more aware of the significance of investments that are sustainable and responsible. This involves incorporating the ESG factors in the investment decision-making process, communicating with the portfolio companies to induce constructive social and environmental outcomes, and promoting transparency and accountability in the reporting system⁷⁴. By creating financial targets that

⁷¹ James M. Schell, Pamela Lawrence Endreny, and Kristine M. Koren, *Private Equity Funds: Business Structure and Operations*, Google Books (Law Journal Press, 2024), https://books.google.co.ke/books?hl=en&lr=&id=9CXLWwVGDbQC&oi=fnd&pg=PA9&dq=components+of+private+equity+fund&ots=2utk6MImSQ&sig=d1CSS_pv9TVwxfJp7hI8JE1429c&redir_esc=y#v=onepage&q=components%20of%20private%20equity%20fund&f=false.

⁷² Christoph Kaserer and Rüdiger Stucke.

⁷³ Frontier Economics Ltd, “Exploring the Impact of Private Equity on Economic Growth in Europe,” 2013, https://www.investeurope.eu/media/1110/frontier_economics_report.pdf.

⁷⁴ Boffo and Patalano, “ESG Investing: Practices, Progress and Challenges,” OECD, Paris, 2020, <https://www.oecd.org/finance/ESG-Investing-Practices-Progress-Challenges.pdf>.

align with the greater social interest, private equity firms can manage reputational risks, thereby creating long-term value and strengthening stakeholder trust. A harmonised approach that involves financial performance measures along with ethical, social, and environmental factors is the essence of responsible investing.

2.12 Summary

The literature review has been indispensable for understanding the multiple features of private equity: investment strategies, financial performance evaluation, regulatory aspects, as well as moral considerations. The main results indicated that private equity investors employed a variety of investment techniques, from classic buyouts to fresh venture capital, and each of them was tuned to specific investor needs and market conditions. Additionally, the literature is a source of information about how liquidity and solvency metrics are used to assess the financial health of private equity investments and the requirements of regulatory compliance and ethical responsibility.

The literature review enhances the study objectives by presenting an integral picture of the private equity status quo and the factors that affect investment decisions as well as performance. The following survey integrates with the subsequent methodology chapter that will focus on the empirical analysis and case studies to further probe the intricacies of private equity investments and their underpinning financial market and stakeholders.

Private Equity Investment Analysis

3.1 Introduction

This chapter will provide a detailed financial analysis of the Deutsche Bank AG private equity portfolio, which is crucial to shedding light on the performance of investments in different securities and industries. Its purpose is to identify the trends, measure the profitability, and check the effect of changes in value—therefore, giving insight into the manner in which strategic decisions have influenced the development of the Deutsche Bank AG private equity strategy. The analysis will make use of both past and present data sets to deliver prominent financial measures, such as growth in revenues and portfolio allocations. This chapter aims to be the core analytical part of this thesis and provide empirical data supporting the broader strategic decisions. The paper uses three data sets to conduct this analysis. The first and primary data set that will be used will be Deutsche Bank's SEC Form 13F filings, which give elaborate information with respect to the composition of the bank's portfolio, security values, and the changes. The second dataset outlines the distribution of the industries under which these portfolios fall. Market value and percentage breakdowns will be shown. The third dataset details the securities and analyses the 10-year filing history of 3 select securities. The datasets, in combination, form very detailed knowledge of the Deutsche Bank AG investment decisions and their financial impact. The statistical and visualization tools to be used on the datasets are advanced to include R and MS Excel. R was useful in the development of statistical models and analysis of regressions, while MS Excel provides a platform that can perform manipulations on the data in a friendly charting format. This chapter, therefore, bequeaths a high-level, extremely robust, and data-rich understanding of the performance and strategic value of private equity investments for Deutsche Bank AG.

3.2 Dataset Overview and Preprocessing

3.2.1 Portfolio Composition

The first dataset is the history of Deutsche Bank AG 2023 SEC Form 13F filing which gives a really detailed picture of the investment portfolio. It consists of 3,832 securities, each one having its own name or ticker. It depicts various financials about the securities: average share price, the number of shares, change in the number of shares, and value in thousands of dollars. Further, it carries important metrics, such as portfolio allocation, change in allocation, cost basis in thousands of dollars, and profit, in order to learn about the historical performance of the security. The "Put/Call" field has also been utilized to distinguish between put or call options, along with commenting on whether the derivative activity is strategic.

The purpose of data pre-processing, conducted at several stages, was to guarantee that both accurate and complete analysis would be performed. First and foremost, all missing values were taken care of by either replacing them with averages/median or using those entries for calculations if the impact on results turned out to be insignificant. Normalization of numerical data was carried out; hence, the effect of the outliers will be removed which can lead to

distorted results in the next analysis step. This dataset was carefully checked for entry errors of the extremely low or high share count securities or extreme changes in value, rather than valid investment decisions. Duplicates were carefully removed on the basis of data uniqueness, such as security names or ticker symbols.

Finally, the securities were grouped together into a sector, which will enable us to compare different investment strategies. Among the setbacks experienced in the data preprocessing phase, there was one key issue: the put/call option classification issue. In some records, there are discrepancies, and in some records, the classification is ambiguous or different. Therefore, cross-verification was done from some other financial databases. Different accounting methods for normalizing the data for the cost basis over different securities meant that more careful steps had to be taken in order to compare them appropriately. Finally, the outliers found in the "Shares Changed" column were extreme, and data had to be confirmed manually to ensure its validity and not to give biased results. With all these pitfalls, meticulous data cleaning and normalization produced a very clean dataset for further financial analysis in order for the final analysis to draw insights into Deutsche Bank AG's portfolio composition and investment strategy.

3.2.2 Industry Distribution Dataset

The industry distribution dataset categories Deutsche Bank AG's investment portfolio into a diverse sector of the economy; it avails valuable market value and allocation percentage for each sector. It covers over 90 industries, from agriculture, energy, technology, finance, and manufacturing. It has the number of companies in an industry, the total market value which is valued in dollars, and the corresponding percentage allocation value. This data avails the backbone of the main dataset since it can provide a sectoral view of Deutsche Bank AG's investment portfolio. This would make the critical all-round analysis of how Deutsche Bank AG invests its funds. For instance, the "Oil and Gas Extraction" industry holds a large quantum of value, worth \$2.6 billion at 1.92%, whereas the "Business Services" sector holds the highest quantum of value, worth over \$13.7 billion at 10.15%.

Structurally, it provides the name of each industry contained in the dataset, whereas the number of companies gives the magnitude of investment coverage within that sector. Market value gives the total worth of securities held, while percentage value implies the relative allocation of the industry within the total portfolio. Last of all, the dataset avails the "Industry Not Reported" category, which gives the value of securities not clearly placed within a particular industry. Some basic transformations had to be done to prepare the dataset for analysis. First, the industry names, which were either not available or not clear, had to be grouped into the "Industry Not Reported" so as not to introduce inaccuracies.

The market values had to be expressed in thousands of dollars, in line with the main dataset's structure. In addition, the percentage allocations had to be made by dividing the market value for the given sector by the sum of the market values of the total securities under management, for consistency in all sectors. It was used to make minor adjustments so that discrepancies that may arise due to rounding errors would be averted. This is essential for the understanding of the portfolio composition of Deutsche Bank AG: the industry distribution dataset complements the primary dataset by revealing what industries are over-weighted, underrepresented, or on priority; that is, it shows which industries have more weight at any given time. This analysis can be made afterward, as this comprehensive view allows an analysis of trends and correlations that influence the general financial strategy and performance of the bank.

3.2.3 Selected Securities Dataset

The security dataset that was chosen comprises three subsets: the history of securities that Deutsche Bank AG chose over the period 2010–2023. In particular, each of these three subsets describes the history of a certain security throughout a period of time, which involves share prices, the number of shares, and the market value. The datasets selected show the most noticeable increases in value across the portfolio at Deutsche Bank over time in order to observe the changes in the given policy and derive some market movements as well. At the same time, "Portfolio %" and " Δ Portfolio %" gave insight into the relative change in the portfolio distribution of each security and indicated some deep insight into the bank's investment rationale.

Data ranges from 2010 to 2023, giving account to historical trends in given securities and showing tendencies at share prices and market value with respect to significant economic events. For instance, the datasets describe how, over the past decade, some stocks like Microsoft Corporation (MSFT), Amazon.com, Inc. (AMZN), and Meta Inc. (META) have grown in their value continually, while other securities, like Digital Realty Trust Inc. (DLR), Activision Blizzard Inc. (ATVI), and VMware Inc. (VMW), lost their value due to changes in market conditions or strategic divestitures. With these trends, the research will establish the securities that led most to Deutsche Bank's portfolio performance, while others may create risks or trigger strategic exits.

In order to allow comparison, the percentage change in the share values and market allocations is standardised, to make changes in the market values as proportions of the total portfolio value, indicating relative securities' importance. For instance, changes in Microsoft Corporation's shares of the portfolio were measured against the whole portfolio to underscore the growing importance. However, similar securities showing such vast losses, such as that of Digital Realty Trust, were normalised by taking the change in value and dividing it by the total value of the portfolio. This way, a meaningful comparison can be conducted between securities with varying market capitalisations and a more transparent view can be obtained of the ever-changing scenario in which Deutsche Bank finds itself invested. This data and its various subsets give a very elaborate insight into the strategic investment decision of Deutsche Bank AG. A close study of the increases and decreases brings out a clearer view of the strategy adopted by the bank in order to manage the risk, as well as to bring to light the trend that firms are tending toward taking across the broad economic changes. A better insight into these trends helps to understand how Deutsche Bank uses private equity investments in increasing its portfolio growth and also expanding its diversification.

3.3 Industry Distribution Analysis

The distribution of Deutsche Bank AG's securities across different industries has created a big picture of its investment direction and risk diversification solutions. Through investments covering a wide range of industries, the fund illustrates the strategic diversification of the investments to avoid major losses in case market conditions take a turn for the worse.

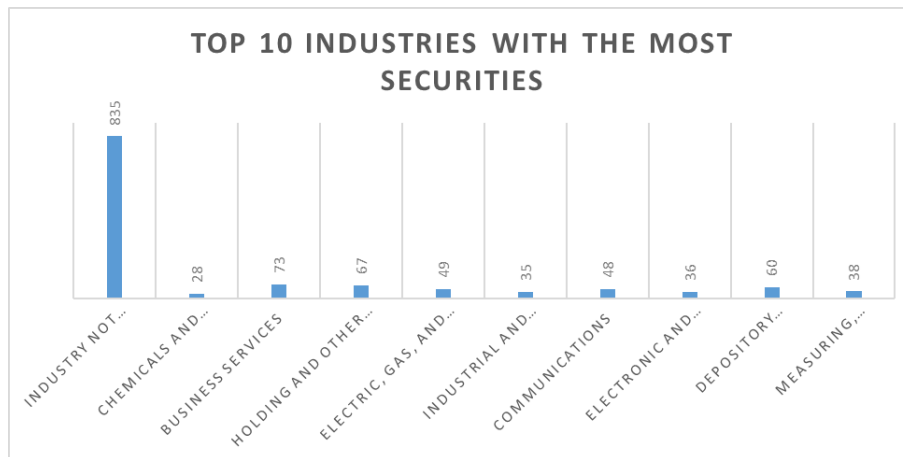


Fig 1. Top 10 industries with the most securities, Source; (Author, from Excel)

Significantly, the market value commanded by 835 companies in the 'Industry Not Reported' segment is the highest at about \$18.25 billion, or 13.48% of the total portfolio. It would infer that a huge proportion of the investments has been made in entities or financial instruments that do not fall under the conventional heads of industry—either emerging or innovative industries. 'Chemicals and Allied Products' are represented by 28 companies and command a large market value of almost \$14.92 billion, forming 11.02% of the portfolio. This once again testifies to a major bet on the sector, which is known for wide applications and is, in the basic sense, stable across economic cycles.

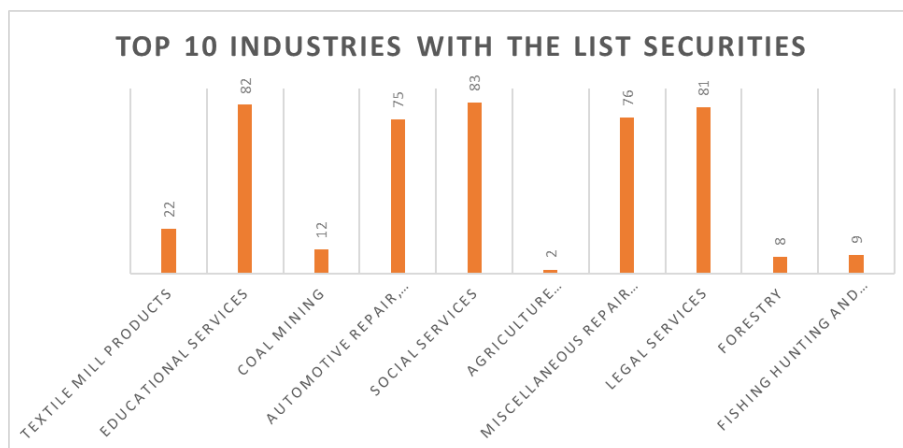


Fig 2. Top 10 industries with the list securities, Source; (Author, from Excel)

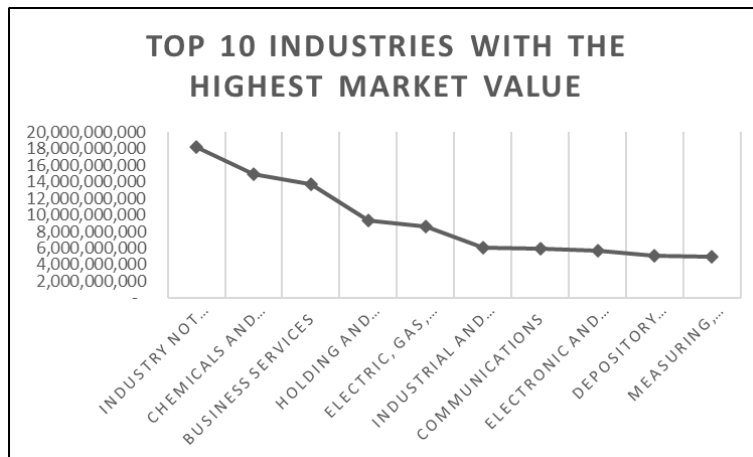


Fig 3. Top 10 industries with the highest market value, Source; (Author, from Excel)

Huge amounts are also represented by the 'Business Services' and 'Holding and Other Investment Offices' sectors, with market values of \$13.74 billion and \$9.35 billion, respectively. Normally, such pools of investments offer diverse types of services that keep transforming in light of diverse market requirements, thus balancing the risk from sector-specific trends. On the other hand, the 'Forestry', 'Fishing, Hunting and Trapping', and 'Miscellaneous Repair Services' industries represent the least investments. Those could be due to either the minimal scale in those industries or the strategic decision of the bank to reduce its exposure in those sectors due to their higher volatility or lower returns.

This investment diversity is at the heart of strategy at Deutsche Bank to strike a balance in the portfolio between high-value and emerging sectors in a bid to maximise returns while hedging against downtrends in a single sector. In fact, the sectors of chemicals, business services, and technology-related industries are part of the global trends in economic activity moving toward digitalisation and toward more sustainable answers, and the bank has positioned itself to derive benefits from growth in those areas.

3.4 DB AG's Portfolio Composition Analysis

DB AG's Portfolio Composition	
Total No. of Securities	3832
Total Shares	2371534436
Total Avg Share Price	424619
Total Portfolio Allocation	99.18253144
Total Portfolio Value (\$K)	196020500
Top Security by Value (\$K)	5.54188618
Bottom Security by Value (\$K)	0

Fig 4. DB AG's Portfolio Composition, Source; (Author, from Excel)

The structure of the portfolio held by Deutsche Bank AG over the observed period presents an informative picture of the scale and its value distribution over the vast array of investments. The portfolio consists of 3,832 securities that may be taken to encompass assets of various classes. Taken together, these 3,832 securities represent the vast asset base, reflecting the broad investment strategy of Deutsche Bank with the maximum extent to maximise the coverage and minimise the risks. This makes up some 2.37 billion shares, underpinning the claim of massive market involvement that the bank maintains. Further, the high share value, amounting to approximately \$424,619 on average, underlines the high value of selected securities that represent a mix of both high-value individual investments and broad-based market positions.

Financially, the total value of the portfolio under discussion is about \$196.02 billion, attesting to the vast financial footprint of Deutsche Bank on the global market. This value is nearly entirely allocated, with the portfolio allocation amounting to 99.18%, and, thus, indicates efficient capital deployment with idle resources minimised. On the other hand, the difference between the top and bottom securities by value, where the top security holds a value of approximately \$5.54 million compared to several that bottom at zero, demonstrates the variance that exists in investment returns within the portfolio. Such a range demonstrates strategic acceptance of varied investment returns—from high performers to potentially speculative positions that have yet to yield returns or have depreciated in value.

Such depth in composition also means that it leverages a robust investment strategy on the part of the entity, with an ability to capitalise on high-yield as well as high-risk opportunities. The very fact that zero-valued securities appear on the books may imply investment in distressed assets, early-stage companies, or other high-risk strategies that have not yet materialised into financial gain, although they may have long-term growth or strategic value. This configuration guarantees that as the bank enjoys its stable, high-value investments, it also seeds potential future growth areas. It maintains a balance in the approach to asset management and investment diversification. This strategic mix keeps Deutsche Bank not just safe from the latest market volatility but also in a great position to maximise a range of market conditions and opportunities.

3.4.1 Portfolio Allocation by Security

Deutsche Bank AG's portfolio showcases a dynamic approach to investment, adjusting allocations significantly to optimise returns and mitigate risks.

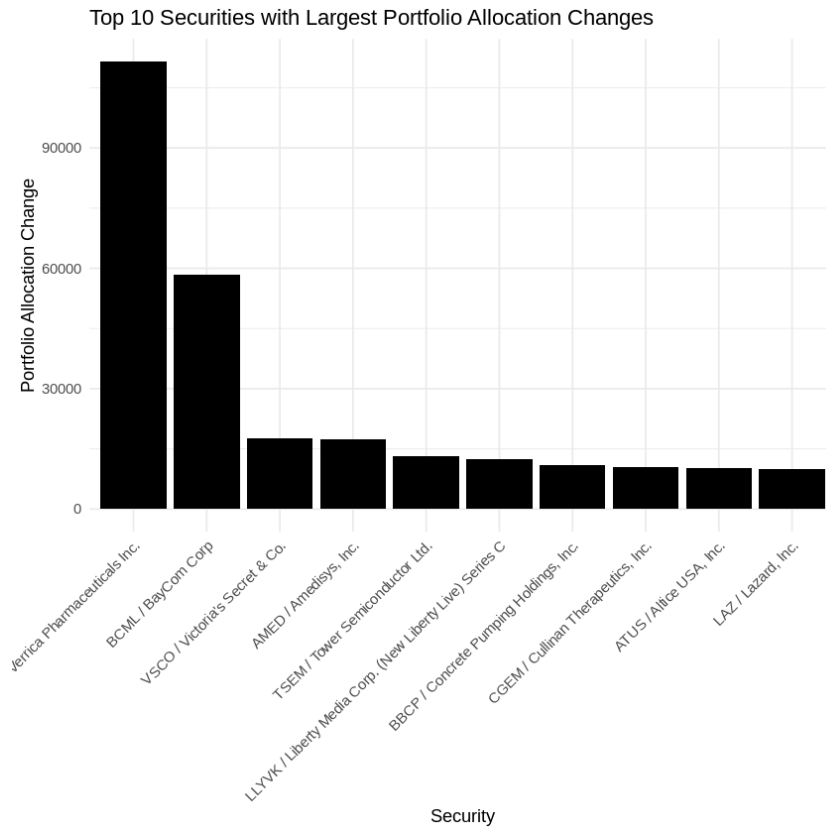


Fig 5. Top 10 securities with the largest change in portfolio allocation, Source; (Author, from R)

The "Top 10 Securities with Largest Portfolio Allocation Changes" graph strongly visualises these drastic changes. For example, Verrica Pharmaceuticals Inc. reports an astonishing increase in its portfolio allocation, having increased by 111,576.15% to a new share of the portfolio of 0.0003195. That is a tremendous increase, and it shows strategic optimism, most probably based on major trends taking place within the pharmaceutical industry or on specific corporate events that are expected to add substantial value to the stock. On the other hand, both BayCom Corp and Victoria's Secret & Co. registered increases of 58,486.42% and 17,743.88%, respectively. These increases could only be influenced by some good financial results or by good market conditions at the time, considering the sectors in which they operate.

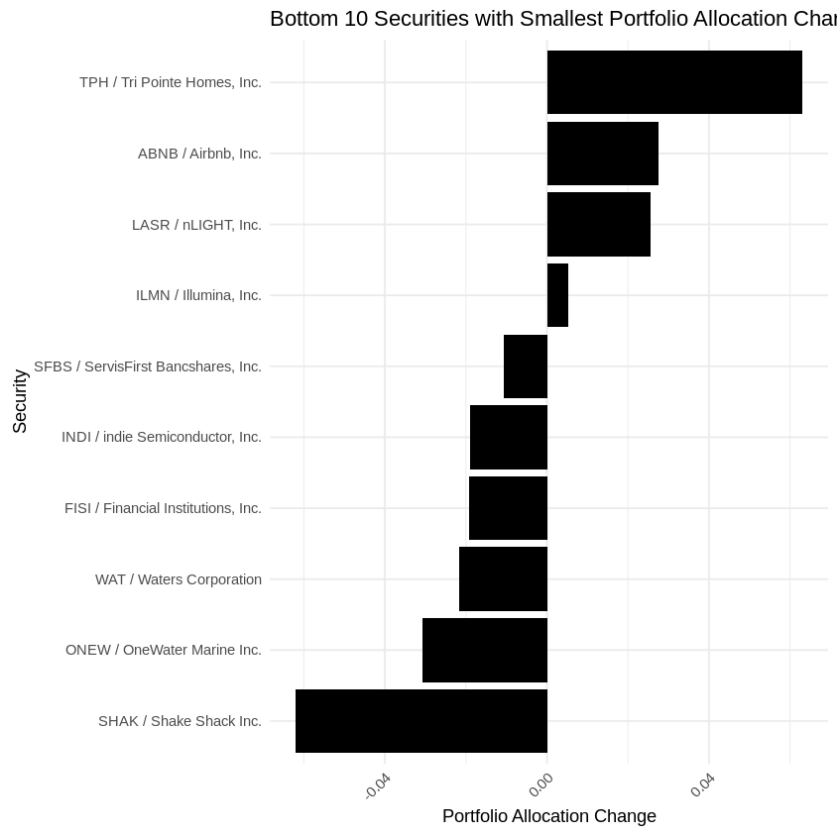


Fig 6. Bottom 10 securities with the largest change in portfolio allocation, Source; (Author, from R)

Conversely, the "Bottom 10 Securities with Smallest Portfolio Allocation Changes" suggests a more cautious or moderate approach taken to the rest of the portfolio. For instance, the securities of companies like Airbnb Inc. and Shake Shack Inc. had their portfolio allocations change considerably less, with Airbnb's even increasing by 0.0276415% and Shake Shack's decreasing by 0.0620906%. Changes of such magnitude serve as indicators of a hold strategy where waiting for the market to show defined trends or corporate action would be a typical response. This, in turn, could be part of its own form of risk management as undertaken by Deutsche Bank, thereby assuring that the bank can be flexible when moving forward with future market change, without significant commitments to positions that might otherwise not be in the interest of its long-term strategic goals.

It is such portfolio changes that assume the meaning of the strategic choices on the part of the bank. Verrica Pharmaceuticals' average cost basis per share was under \$1.00, with the bulk of their positions showing very large jumps in portfolio allocation, suggesting very profitable bets. When contrasted with these small changes in firms like Airbnb, whose average share was \$136.00, the contrast is much more of a strategic approach that might be seen as balanced between high performance and speculative gain. Rather, the cost basis versus portfolio for these firms shows careful balance in the deployment of capital to ensure that investments would be both prudent and possibly profitable.

The implications of these strategic allocation changes are profound. It underpins not only the proactive management style of Deutsche Bank but also its power to capitalise on emergent opportunities. The position of the bank ensures that it benefits from future potential gains through increased allocations in such potentially high-growth entities as Verrica Pharmaceuticals. Then, the cautious approach to the other stocks of Airbnb and Shake Shack

shows that it positions its portfolio in a manner that checks against any volatility or underperformance in security, effectively positioning it for effective risk management. Such prudence in the selection and addition of more securities to the portfolio ensures that the investor maintains diversity that can insulate the portfolio from the vagaries of the market and capitalizes on new opportunities that may arise across the different classes of assets.

The portfolio security allocations analysis of Deutsche Bank AG shows a bank that is highly strategic in the management of its investments where there are massive shifts in allocations to tap any growth opportunities and cautious adjustments to check against any risks. The detailed financial metrics and movements in positions underscore the agility of the bank in the volatile investment world to get maximum profit while limiting its exposure to risks. Essentially, strategic financial management broadens the options and enhances the capacities of the bank to be able to earn substantial returns as well as be able to react to evolving market trends.

3.5 Key Performance Metrics

3.5.1 Portfolio Allocation

Analysing Deutsche Bank AG's investment portfolio reveals a nuanced strategy aimed at balancing risk and optimising returns, evident from the detailed scrutiny of various financial metrics plotted in the given graphs.

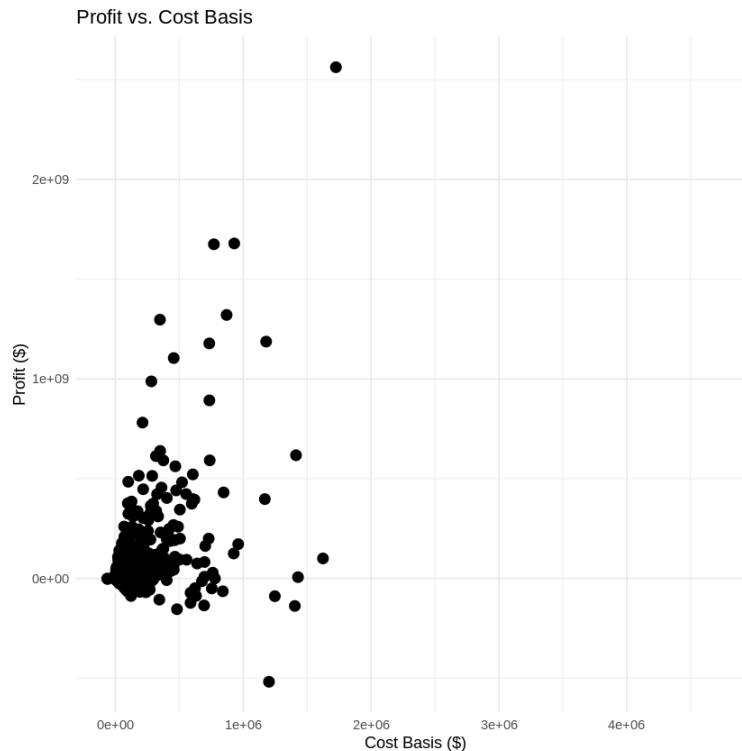


Fig 7. Distribution of profit vs cost basis across securities, Source; (Author, from R)

The "Profit vs. Cost Basis" graph has a very wide dispersion of investments, with most of the plotted points clustering around lower cost bases, and showing relatively modest profits. This

clustering would indicate a conservative investment strategy, with the focus being on less risky securities that require less capital outlay. The graph, however, indicates some outliers, which make it evident that Deutsche Bank had made investments that required substantially more capital, over \$3 million in a few cases, and that paid off substantially more profits, in some cases well above \$2 billion. These data points mean that the bank had the ability to make high-stakes investments, and these fewer but highly profitable stakes contribute more to the overall profitability of the portfolio.

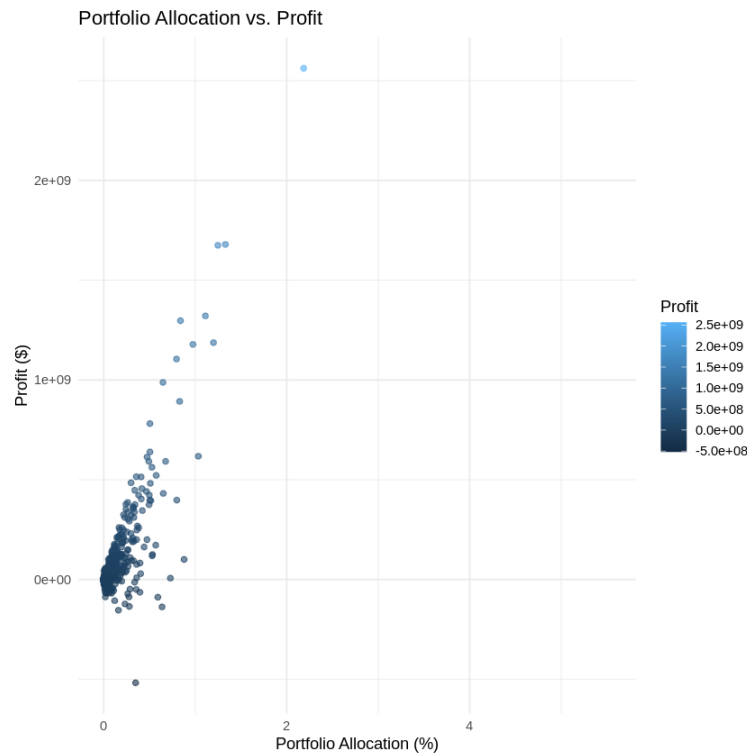


Fig 8. Distribution of portfolio allocation vs profit across securities, Source; (Author, from R)

For the “Portfolio Allocation vs. Profit” graph, there is a clear curve with securities with minimal to moderate allocations (typically below 4%) contributing to the overall profit more than securities with bigger allocations. This indicates the fact that the most profitable investments of Deutsche Bank are not simply those with the biggest value in the portfolio, a strategic consideration of utmost importance. Thus, it shows an intentional diversification strategy where the bank isn't overly dependent on one investment but rather disperses its risks over a broader foundation. Remarkably, one specific investment with just over a 2% portfolio allocation brings in nearly \$2.5 billion in profit, underscoring the effectiveness of the bank’s investment selection and timing. This strategy of moderate but targeted investment in high-yield securities seems to be a cornerstone of Deutsche Bank’s approach to achieving significant returns while managing exposure to potential losses.

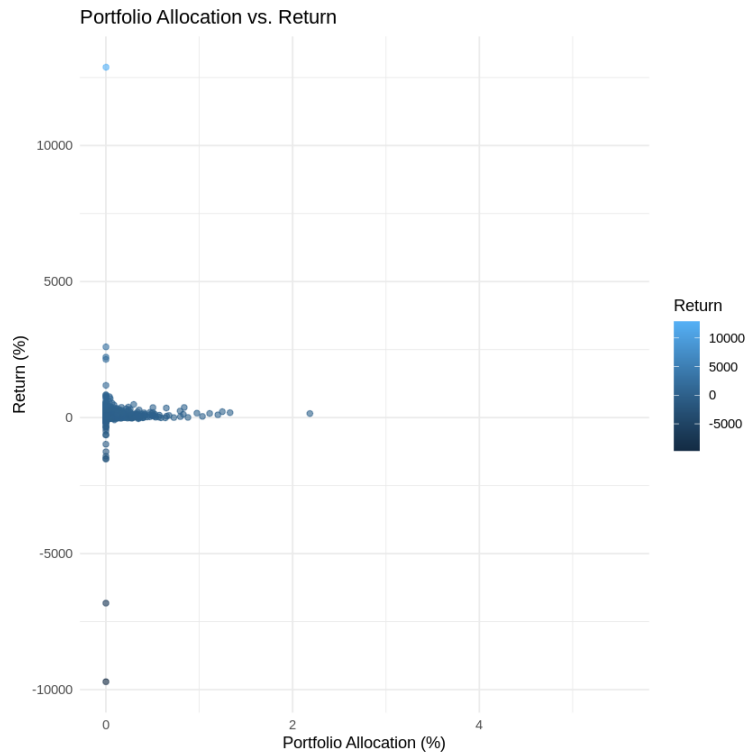


Fig 9. Distribution of portfolio allocation vs return across securities, Source; (Author, from R)

The graph "Portfolio Allocation vs. Return" tells a little more about the bank's risk-return profile than that. Most of the investments are concentrated around the 0% return bar, which states that a major part of the portfolio is very close to the average market—a characteristic of the market average, and it is typical of foundational investments that are supposed to give a flat, steady, if not spectacular, return. It is an indication of the underlying risk management, with extreme values in both directions. Some securities can offer returns as low as -5000%, while some go as high as 10000%, an indication of the fact that some people really take high-risk bets and fail or really high-risk bets and succeed. The mean variance is typical of some complex strategy, which allocates some percentage of the portfolio to high-risk opportunities capable of both outstanding gains and enormous losses, thus balancing high risk with potentially high rewards across the entire portfolio.

These insights into the investment dynamics of Deutsche Bank present a sophisticated style of asset management, in which calculated decisions are made in order to balance the cost basis of each investment with its expected return. This indicates a sophisticated understanding of market dynamics and the estimation of risks in the strategic deployment of capital across investment thresholds, from safe low-yield stocks to high-return but risky bets. It gives the overall impression that, while the bank structures a solid foundation of stable investments, it is open to engaging in more speculative ventures when the potential for high returns justifies the associated risks.

3.5.2 Return Distribution Across Securities

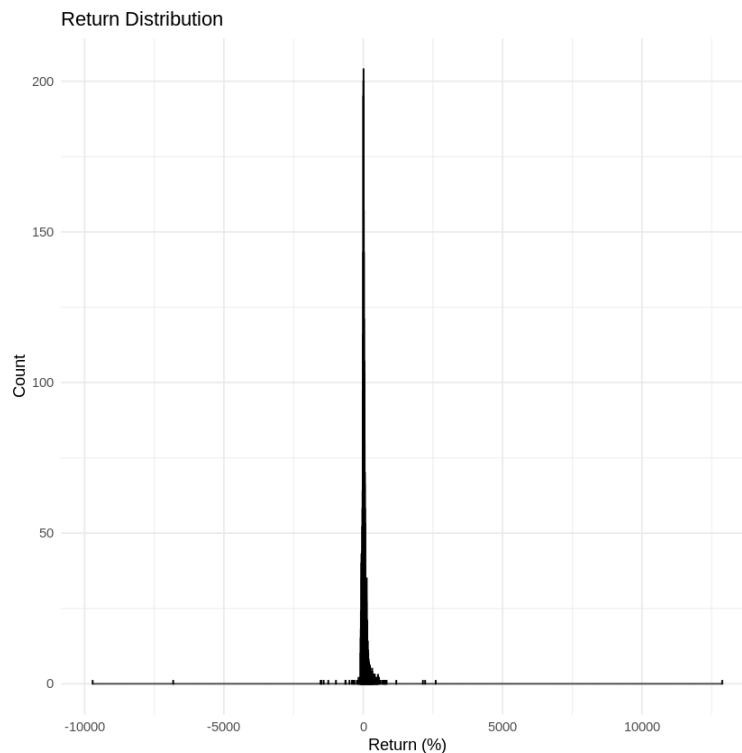


Fig 10. Return distribution across securities, Source; (Author, from R)

The "Return Distribution" graph for the Deutsche Bank AG investment portfolio is quite evocative with respect to the returns across various securities. This indicates the major concentration around zero, and in simple words, it means that a large number of investments are churning out returns close to the market average. The cluster close to the zero mark shows the conservative style of investment the bank practices, wherein a large percentage of the portfolio is vested in steady, low-risk investments that directly track the performance of the market. On the other hand, the number of cases with extreme positive and negative returns is also demonstrated by the graph. This indicates that a few numbers of high-risk, high-return investments are also present in the portfolio. Since the presence of outliers can be seen in the graph and they are less in number, it implies that the Deutsche Bank has a balanced mix of conservative strategies with some high-stake placements and bets that would either return huge gains or huge losses.

The return distribution is extremely leptokurtic, which is found in the high peak at the center and the fat tails on both ends of the spectrum. The implication, therefore, is that there is a high probability of getting more returns that are significantly different from the average benchmark, which is quite unlikely in most cases in the market. Such a return would indicate that while a major percentage of the bank's investments are made to deliver returns around the benchmark indices, there are going to be a few notables where the bank has either managed to perform well or very badly. Extreme values, especially in the negative domain, could reflect either certain market conditions or the formulation of decisions that resulted in huge losses. On the other hand, the extremely positive values represent the opposite: these are the positions where the bank has managed to post exceptional gains; thus, the high-reward strategies have been effective in these cases. It is this risk-return profile that is indicative of the sophisticated asset management strategy used by Deutsche Bank. It is the balance between the usual market-

following investments and those that are calculated high-potential ventures to provide the greatest possible overall portfolio performance.

3.6 Share Dynamics

3.6.1 Share change

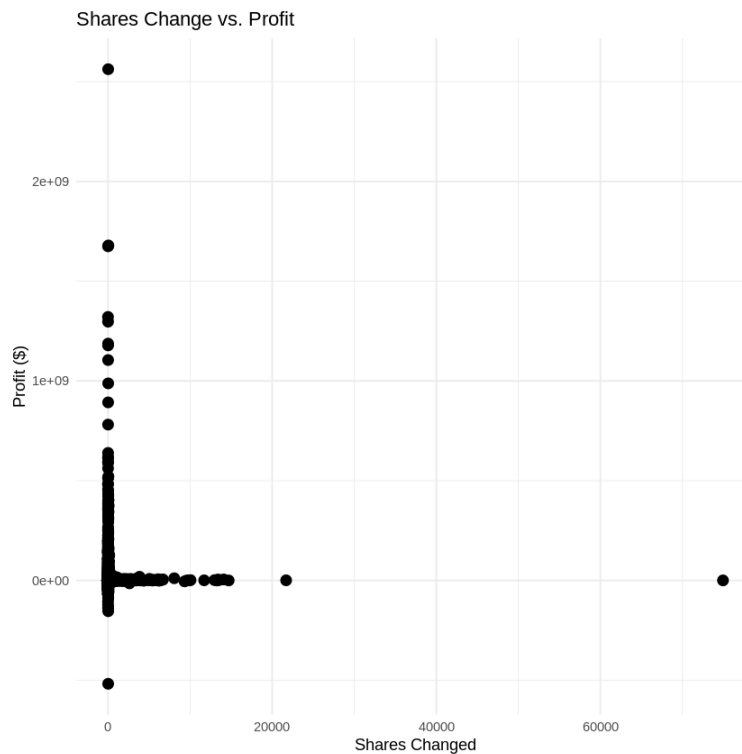


Fig 11. Share change vs profit distribution across securities, Source; (Author, from R)

The graph of "Shares Change vs. Profit" of the portfolio with Deutsche Bank AG shows the dynamics of share change of the portfolio and profit from such changes. It depicts the way in which adjustments of the portfolio affect financial outcomes. Most of the data points bunch around smaller changes in shares with modest profits, indicating that most of the transactions involve minor tweaking of shares rather than a major buy or sell. This means that there is an incremental trading strategy: Deutsche Bank is managing its risk by avoiding sizeable changes in position sizes, thereby resulting in stability in investment outcomes. Quite a few outliers are also there, in which, either a great number of shares were bought or sold, resulting in good profits. Some have extended to as high as \$2 billion. Such cases actually bring out probable scenarios where the bank maximised the movements in markets or probable information that helped in taking huge transactions resulting in high returns.

The other, even more outlying, values would further demonstrate that this is more likely the result of strategic decisions, not simply the routine rebalancing of its portfolio. Examples include large changes in shares driving high profits corresponding to strategic entries and exits in response to expected market shifts and corporate events, such as mergers, acquisitions, or divestitures. This strategy speaks to the agility of Deutsche Bank in manoeuvring market

dynamics—huge risks are taken selectively and calculatedly, manifesting in huge profit margins. The bulk of transactions, though at smaller profits, supports the conservative strategy aimed at the preservation of capital and constant gain accrual that underlies a risk-averse investment philosophy. This will be the combination of strategies: careful trading for most investments with the occasional aggressive move to maximise the performance of the portfolio while mitigating the innate risks that market exposure poses.

3.6.2 Share Dynamics

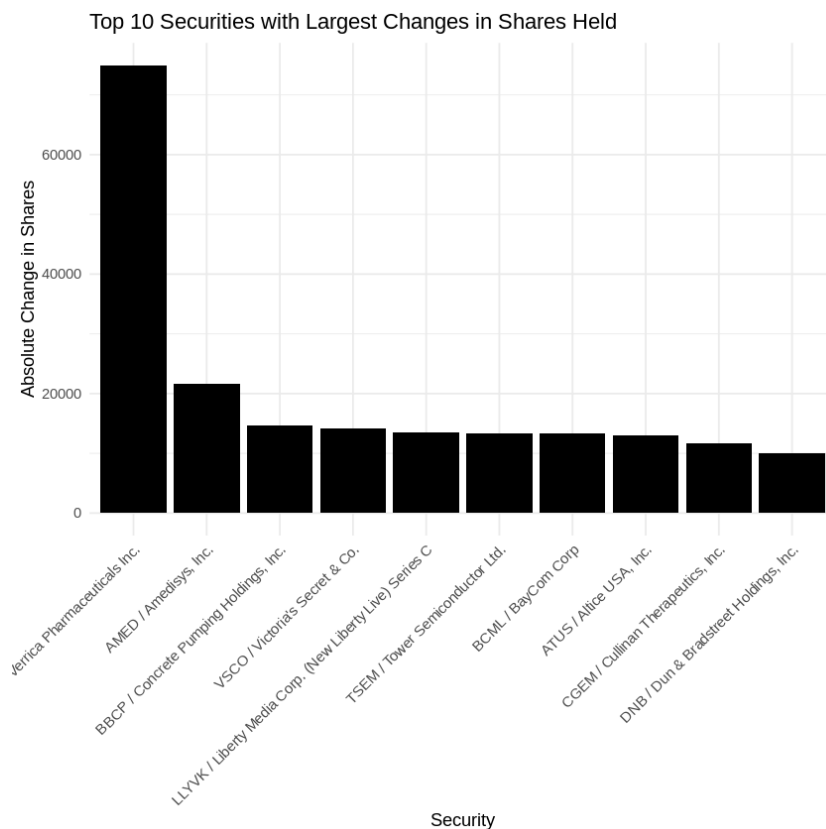


Fig 12. Top 10 securities with the largest change in shares held, Source; (Author, from R)

The dynamics of share changes across Deutsche Bank AG's portfolio reveal profound insights into the bank's investment strategies and their outcomes. In the top 10 securities with the largest changes in shares held, Verrica Pharmaceuticals Inc. stands out with a remarkable increase in shares by 74,945.61, which correlates with a significant profit of \$283,792 and an extraordinary profit rate of 80.71%. This suggests a highly successful investment decision, likely driven by favourable market conditions or positive developments within the pharmaceutical industry. Another notable example is Amedisys, Inc., which saw an increase of 21,706.75 shares, yielding a profit of \$738,947. Such substantial changes in shareholding and corresponding returns highlight Deutsche Bank's proactive approach to adjusting its portfolio in response to market opportunities or in anticipation of future gains.

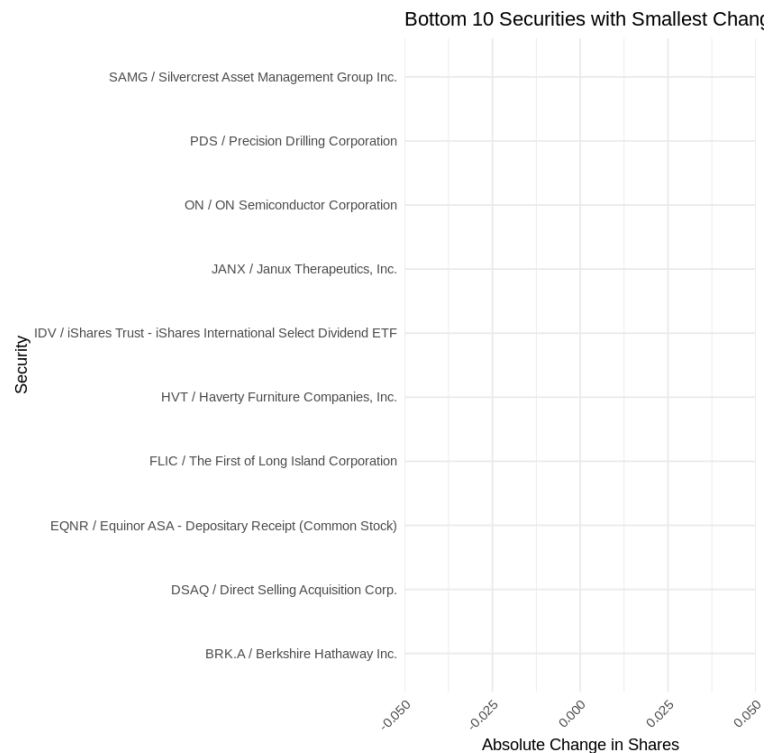


Fig 13. Bottom 10 securities with the smallest change in shares held, Source; (Author, from R)

Contrastingly, the table of the bottom 10 securities with the smallest changes in shares held points to a hold or minimal change strategy. For example, Berkshire Hathaway Inc. shows that the share difference is zero, so investment is on a holding pattern, though in value and profits, it may move up and down. This could be indicative of a long-term investment strategy, not willing to cash in on short-term gains and, therefore, more interested in the stability of the investment than immediate financial results. Similarly, the number of shares held with Equinor ASA and iShares International Select Dividend ETF remains the same, which indicates a similar holding strategy in industries or funds that are known to give dividends regularly or are not considerably volatile. These small differences in shares could be indicative of a strategy that maintains a stable core in the portfolio but searches for growth in the more volatile investments, as above. This only shows that Deutsche Bank has a balanced investment philosophy: aggressive and conservative. On the one hand, the banking giant can capitalise on aggressive movements, through which high returns are possible, in being very aggressive in increasing its shares. On the other, it sets itself very strong on the ground, holding still more stable or strategic investments that, in turn, produce stability for the whole portfolio in a volatile market. That dual strategy allows Deutsche Bank to manage its risks effectively while aggressively pursuing growth. It is thus a means through which this bank can ensure profitability and the appropriate return on investment from decisions made dynamically in line with the results of performance and forecasts for the market, attesting to a high level of understanding of market behaviour and portfolio management. Not only would these strategies protect the portfolio from undue market volatility, but it will enable the portfolio to cash in on high-gain opportunities, maximising overall financial performance and supporting growth in the long term.

3.6.3 Correlation Analysis Between Allocation Changes, Profit, and Return

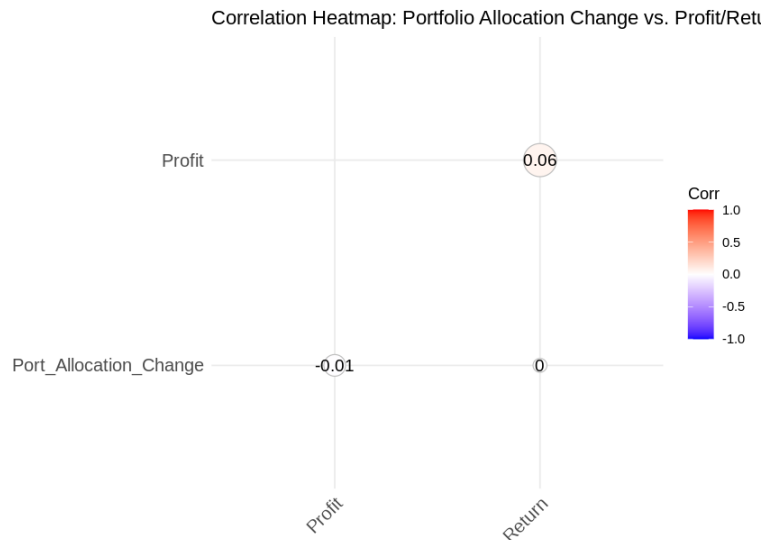


Fig 14. Correlation heatmap for portfolio allocation change vs profit/return, Source: (Author, from R)

The correlation heatmap gives a contextual visualisation of the patterns between changes in portfolio allocation, profits, and returns within Deutsche Bank AG's investment portfolio. Particularly, the heatmap shows extremely low correlation coefficients, which means that there are little linear relationships. The interrelation between portfolio allocation change and profit is almost zero at -0.01, implying that the shifting of the bank's portfolio allocation does not guarantee profit results consistently. Along the same lines, the relationship between return and portfolio allocation adjustment change is also very low at 0.00, which points out that movements in portfolio allocations do not give a definite indication of the returns on investments.

This weak relation between portfolio adjustments and profit maximisation might mean that the bank's strategic approach of portfolio allocation is not so much based on seeking immediate profit or direct return but could be due to other strategic concerns like risk management, sector diversification, or long-term financial planning. The weak relationship between profit and return (0.06). Finally, this implies that the profitability of investments is not the main determinant for the return percentages since market conditions, external economic factors, and the risk associated with specific securities also come into play. This analysis shows that Deutsche Bank's portfolio is most likely controlled with the help of an elaborate model that is not based solely on mere profit-seeking or reactionary allocation changes but a more comprehensive approach to asset management, taking into account the relationships between the variables and long-term results.

3.7 Top/Bottom Performers

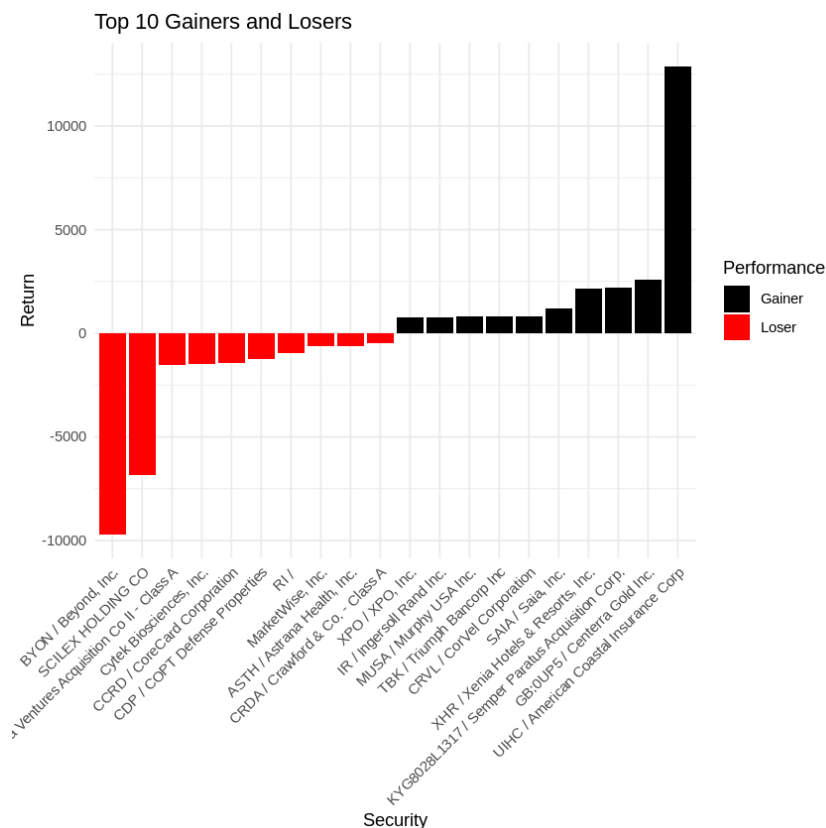


Fig 15. Top and bottom-performing securities, Source; (Author, from R)

The chart of "Top 10 Gainers and Losers" clearly illustrates the discrepancy between investment outcomes in the portfolio of Deutsche Bank AG, with underlined strong financial markets noted as high-risk and high-reward. One is presented with UHC (UnitedHealthcare) and XYG02B12315713, which are identifiers for a certain asset, giving phenomenally high returns, with UHC topping the list at almost 10,000. Such realisations will mark an investment as being extremely successful and are likely to be using unique market opportunities that existed or corporate performances and strategic business decisions of strong firms. Such massive positive returns are a clear sign of good asset selection and timing, which clearly has to be in line with general market trends or the growth specifically in that sector.

However, the chart on the left shows the brutal reality of risks that companies like BEYONDID Inc. and SCIXETRONIC SA have to face when their losses run into thousands, plunging below -10,000. This kind of outcome can be realised due to bad market conditions, bad strategy decisions by the companies, or bad economic times that might be realised by the sectors in which these firms are operating. It is important to understand that the existence of such extremely negative returns points to the tasks and difficult decisions that are routine for those managing investments, where even the best of investments can turn sour to result in extreme losses.

Having such extreme performers in the Deutsche Bank portfolio would underline the nature of complex investment strategies within a globalised market. This clearly indicates that the bank can handle a diversified portfolio which, despite such high fluctuations, focuses on achieving

overall returns from a mix of winning and losing investments. This strategic balance thus enables the bank to capitalise on its outperformers and therefore, in a way, gain high returns to recoup losses from the underperforming assets to retain a resilient portfolio, capitalising on market fluctuations to exploit emerging opportunities. Such a strategy is necessary for long-term investment stability and growth, which allows Deutsche Bank to have the capacity to maneuver in the cycle of financial markets while striving to achieve superior aggregated returns.

3.8 Deutsche Bank's Top 3 Increased Securities This Quarter

This section focuses on the analysis of the securities of three tech behemoths: Amazon, Microsoft, and Meta. All these companies strongly and broadly impact market trends globally. It seeks to deconstruct the dynamics of investment and financial metrics behind such companies, thereby giving a clear view of share volume changes, value variations, and price movements. This part of the report is an interesting view of the behaviour that these securities have adopted in the market and, consequently, how investors can benefit from using this insight to make decisions based on both current and historical performances. The analysis will be based on information sourced from the latest filings and financial records for the previous fiscal quarter. The datasets contain immense information regarding the details of transactions for each individual security, such as the average price paid for the security and how many shares have been purchased, including the previous and current share quantities, and the financial implication in terms of the outcome from such holdings as profit or cost of investment.

Such detailed datasets would make room for an analysis of a wide array of trends over the reporting period, including shifts in investor behaviour and developments in market valuation. What makes the analysis of Amazon, Microsoft, and Meta so important is the magnitude of their weight not only in technology and investment portfolios but also in the impact they have on broader strategies of investments globally. Understanding the financial footprints of such companies helps investors and financial analysts mould their positions in order to maximise their returns and, at the same time, reduce their exposure to risk in the ever-changing investment landscape.

3.8.1 Analysis of Share Volume Changes

The share volume analysis for Amazon, Microsoft, and Meta during the reporting period showed different patterns, reflecting each company's strategic changes and market responses.

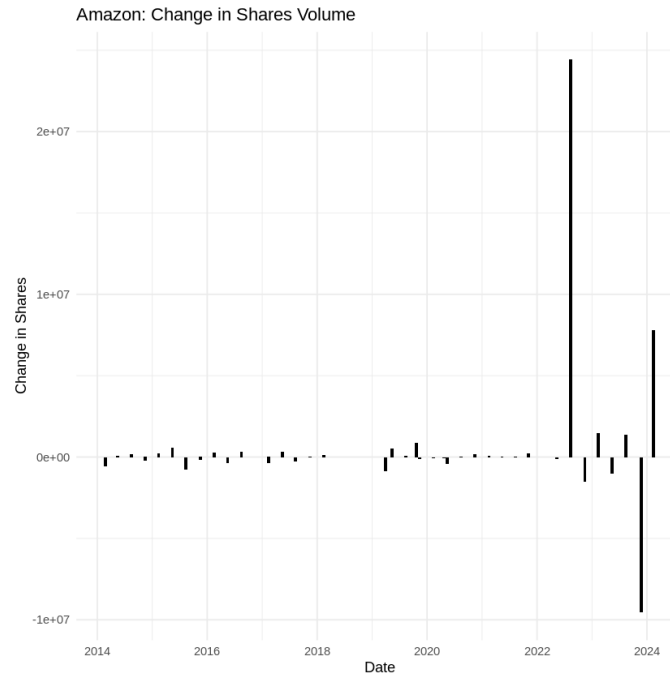


Fig 16. Changes in share volume for Amazon, Source; (Author, from R)

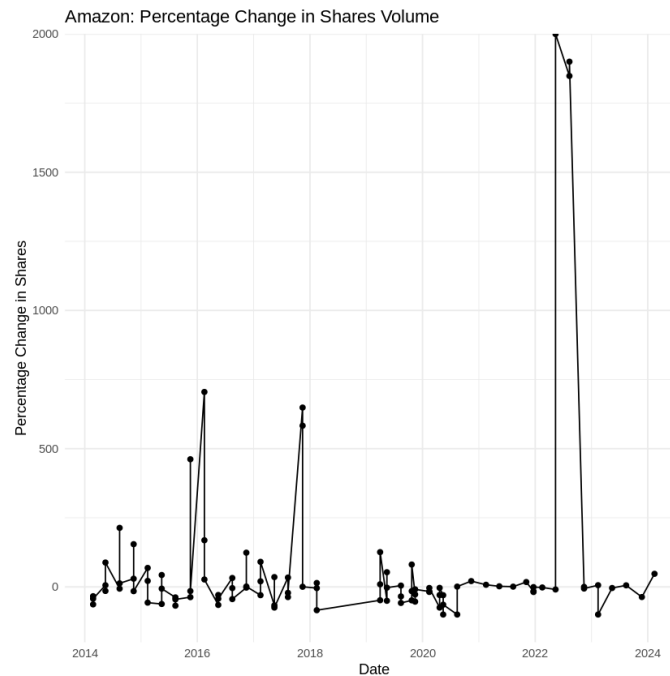


Fig 17. Percentage change in share volume for Amazon, Source; (Author, from R)

For Amazon, the chart shows a significant increase in share volume change of around 20 million in 2024, when shares jumped about 20 million. This notable rise shows high buying

activity, which can be considered a sign of either good market news or Amazon's strong financial results announcement.

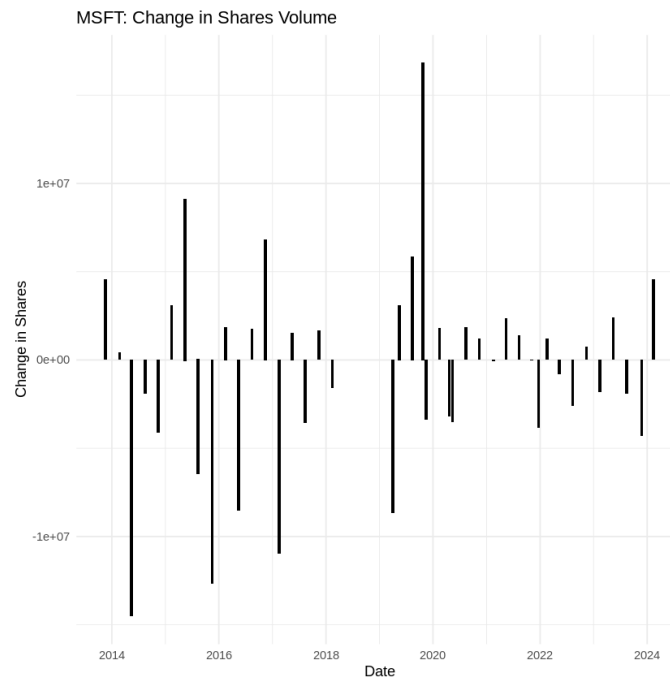


Fig 18. Changes in share volume for Microsoft, Source; (Author, from R)

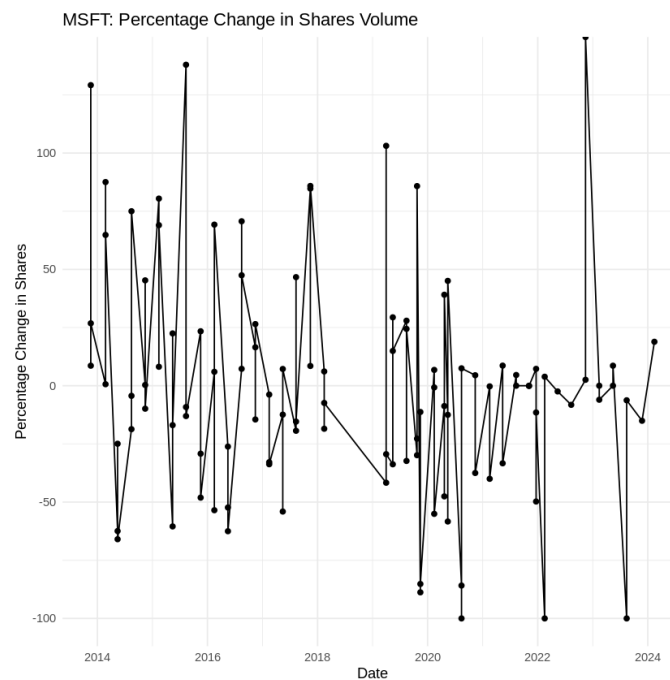


Fig 19. Percentage change in shares volume for Microsoft, Source; (Author, from R)

Microsoft presents an uneven variation in the prices of the shares with multiple ups and downs throughout the whole period. In 2024 there was a big surge, up to about 10 million additional shares. This demonstrates either investors' belief in Microsoft's growth approach or reaction to new product launches or expansion into new markets.

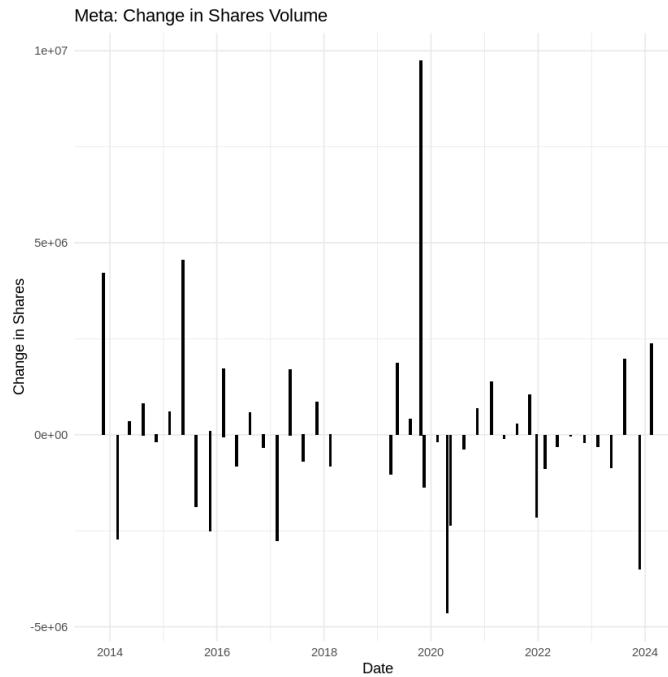


Fig 20. Changes in share volume for Meta, Source; (Author, from R)

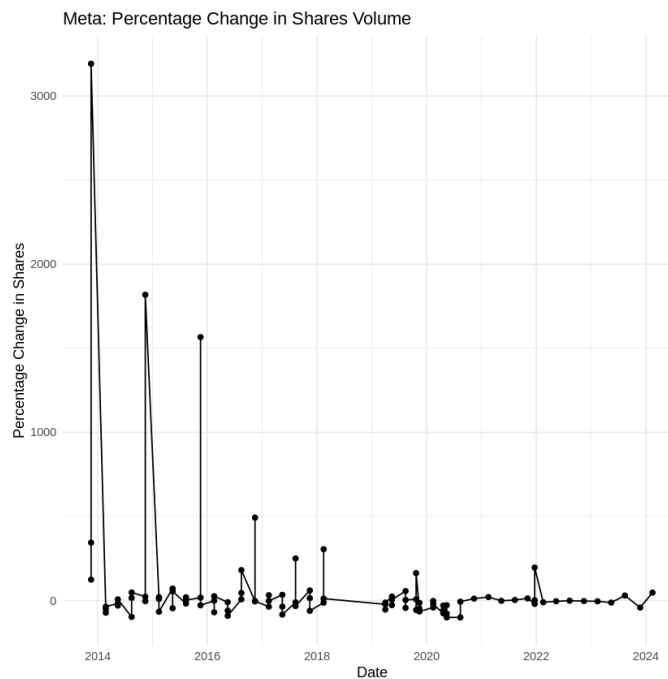


Fig 21. Percentage change in share volume for Meta, Source; (Author, from R)

The figures from Meta are even more dramatic as it showcased a record number of shares, almost 10 million, within 2022. This could be attributed to certain strategic moves on the part of the corporate world or conditions of the market, particularly that of social media companies. Such developments are present in the form of traded shares of any company that is associated with Meta.

Amazon graphs show a continuous increase in recent years that could indicate either investors' interests have increased or strategic activities that have been done in the corporate sector, which

have driven the purchase of shares. These fluctuations are seen most obviously in the charts for Microsoft, and they are more volatile than those of Amazon, which may imply both a mixture of investor reactions to macro conditions and the company's development. Meta's graphs present a graphical representation that has a dramatic spike, which shows the changes in share volume, thus indicating what can be tumultuous market sentiment around social media and tech regulatory issues.

The premium share volume among tech companies may indicate an increase in market sentiment and particular investor actions, due to both macroeconomic factors and company-related headlines. The rise in Amazon's share volume would signal that investors are bullish about the company's ongoing expansion, strength in the market, and continued dominance. The varying share volumes of Microsoft may show ambiguous investors' views on the corporation's competitive status and innovative output, while the extreme shifts in Meta's share volumes are an indication of the stock's high sensitivity towards regulatory news, privacy issues and global digital policy. This alteration demonstrates not only the financial statements and the strategic aims of the firms but also the movements in the tech industry and the investors' requirements. In this example, large increases in share volume are often timed with shareholder announcements, earnings surprises or favourable market conditions, while decreases in activity might be due to unfavourable events such as negative regulatory announcements or competitive pressures. In fact, this change in holdings shares, which are represented by the shares of Amazon, Microsoft, and Meta, should be studied in the spectrum of financial mathematics using many complex formulas related to market dynamics and investor behaviour. Another essential idea is the Demand Elasticity for shares, which, in a nutshell, stands for the responsiveness of the volume of stocks an investor will buy to the price change. This is calculated using the formula

$$Elasticity = \frac{\Delta Q/Q}{\Delta P/P}$$

Where;

ΔQ – Change in quantity

Q – Initial quantity

ΔP – Change in price

P – Initial price

Adopting this formula allows us to find out whether the share volumes are elastic or inelastic with respect to the prices or affected by other factors.

Furthermore, the study of share volume fluctuations can be integrated with the notions of liquidity and market depth. Liquidity means how easy it is to buy or sell an asset in the market without causing its price to drop. Usually, the market liquidity is measured by the Amihud Illiquidity ratio which is computed as the daily price change to one dollar of volume,

$$Illiquidity = \frac{\Delta P}{V * P}$$

Where, V – trading volume

A high value of this ratio implies low liquidity, and thus, even small transactions have the potential to cause significant price shifts. Sudden surges in trading volumes might explain Meta's highly volatile pricing. These values are crucially needed by investors who are trying to estimate the risk of large position movements in these highly liquid securities.

To extend these notions across a broader financial framework, the Autoregressive Conditional Heteroskedasticity model can be used in order to examine the volatility of stock returns that depend on past price changes, which are usually reflected through trading volumes. The ARCH model is represented by the formula;

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2$$

Where, σ_t^2 is the conditional variance (representing volatility) and ϵ_{t-1}^2 is the lagged error term from a mean equation. It helps in understanding how previous price changes impact current volatility, linking it to observed changes in trading volume. This becomes especially important for stocks like Microsoft, which show a correlation between times of high price volatility and major trade volume peaks.

Such a powerful financial tool is, therefore, very important in building up knowledge regarding stock market behaviour, especially for big-time companies such as Amazon, Microsoft, and Meta, where the traders' activities are watched closely by many people. Such data-rich analysis not only supports investment decisions but also helps predict market trends based on past evidence.

3.8.2 Analysis of Percentage Changes

In the financial analysis of share volume changes, the percentage change is a crucial metric that provides insights into the relative magnitude of changes within a given period. Percentage changes were calculated using the formula:

$$\frac{\text{Current Value} - \text{Previous Value}}{\text{Previous Value}} * 100\%$$

This calculation gives a normalised measure of how much a variable, such as share volume or market value, has changed relative to its previous state, thus enabling a clear comparison over time or across different securities.

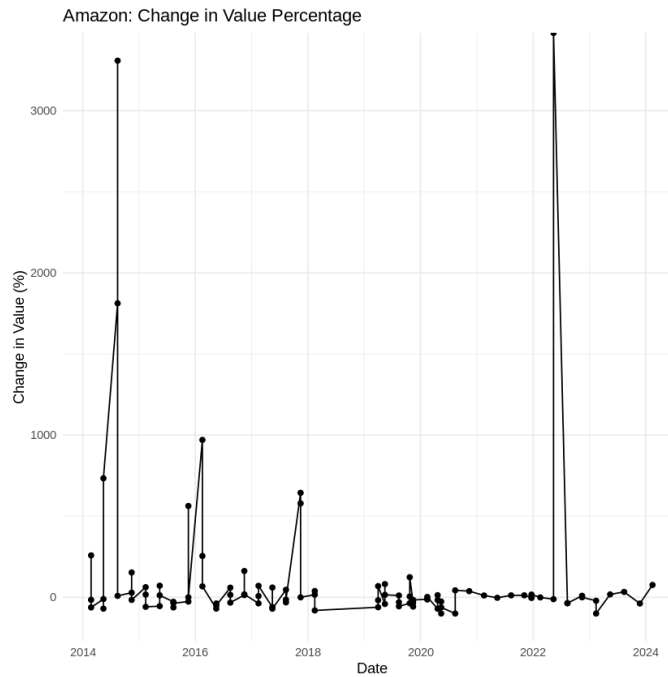


Fig 22. Change in value percentage for Amazon, Source; (Author, from R)

For Amazon, the graph reflects the percentage change spikes in value, with the highs moving toward 3,000% in early 2014 and another major peak in 2024. Chances are, very high points of price appreciation are governed by very positive market sentiments, strong earnings reports, or important corporate announcements that boost investor confidence and demand for Amazon shares. Such steep increases within a short period may be important material moves in generating very high returns on investment but may concomitantly increase volatility and risk across the investment portfolio.

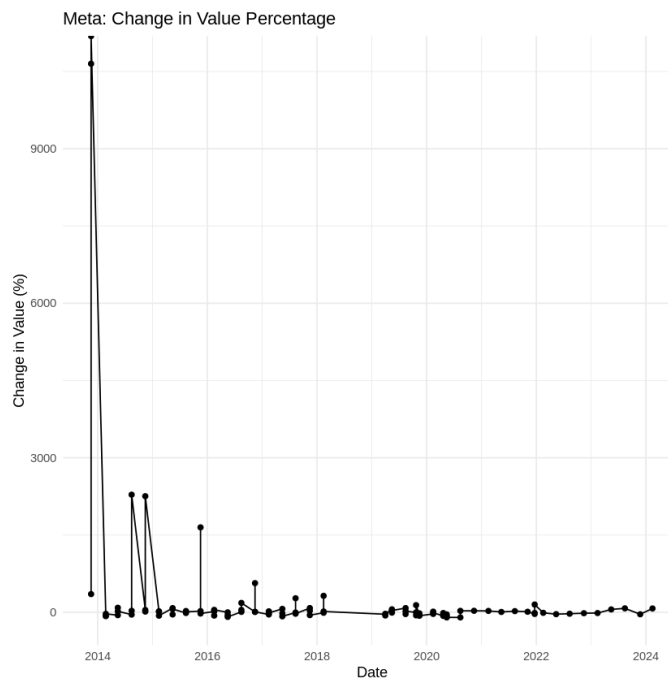


Fig 23. Change in value percentage for Meta, Source; (Author, from R)

Meta, on the other hand, exhibits an even more dramatic initial spike that exceeds 9000% in early 2014, reflecting an extraordinary increase in the value of its shares, potentially due to critical product launches or pivotal market expansion news. However, subsequent fluctuations are less pronounced yet still notable, suggesting a stabilisation in market perception but with occasional peaks that imply ongoing investor responsiveness to company developments or external market conditions.

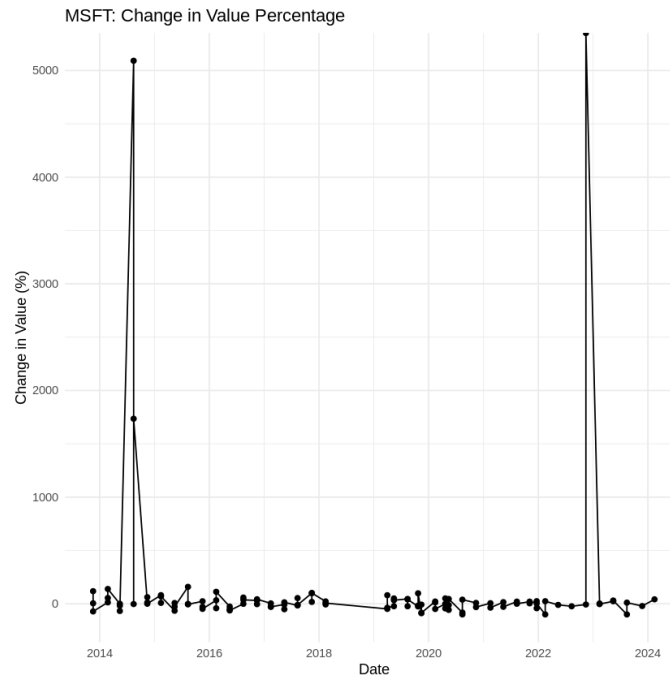


Fig 24. Change in value percentage for Microsoft, Source; (Author, from R)

Microsoft reveals a pattern of more regulation that, while still significant, has developed many peaks and valleys much less extreme than the Amazon or Meta examples shown above. The Microsoft percentage change value has high points that occur approximately every two years, suggesting a cyclic pattern that may be associated with product release cycles, strategic corporate developments, or external economic factors which may be affecting its market valuation. The 2024 high point, like that for Amazon above, suggests a recent event or series of events which have brought about a sharp increase in the company's market valuation. All of these have deep implications for portfolio performance. To the extent investors hold stocks like these, high peaks represent the opportunity for significant capital gains, especially if buying and selling decisions (the latter at least) can be timed to take advantage of such dramatic increases. The volatility implied by such dramatic changes presents significant risks, of course, as such dramatic increases can quickly be reversed by similarly dramatic declines. So, investment decisions need to be situated within the broader strategic context of the investment strategy, risk tolerance, and the conditions of the market in order to optimise portfolio outcomes. From that perspective, such analysis is helpful not only to tactical decision-making but also to strategic asset allocation as balances high potential returns against the risks associated with the investment. Finally, in financial analysis, the percentage change within variables like stock values or volumes is the cornerstone of current measures of market sentiment and company performance over time. The formula for percentage change calculates percentage changes and captures the relative increase or decrease in a financial variable, represented in a normalised measure that is so crucial to comparing different stocks or as an assessment of changes over multiple periods. For instance, large spikes in percentage

circulation changes of Amazon and Meta can be represented by Exponential Moving Averages, which will filter out data and show longer-term trends. The EMA is calculated using the formula:

$$EMA_{today} = (Value_{today} * K) + (EMA_{yesterday} * (1 - K))$$

where k is the smoothing factor derived from the number of days.

Another important implication is the use of logarithmic returns, which normalises returns for a multiplicative process, thus making the return metrics suitable for analyses over time. Logarithmic returns are computed as:

$$\ln\left(\frac{Current\ Price}{Previous\ Price}\right)$$

providing a continuous measure of returns that adjusts for compounding effects and is particularly useful when assessing returns over longer periods or across different scales of value changes. This method helps in understanding the influence of price fluctuations on investment decisions by putting emphasis on the fact that sharp increases in the value of stocks could affect the risk-return profile of a portfolio.

The concept of volatility clustering can be integrated into the system of financial theory using the GARCH model. The GARCH model, particularly effective in financial series that exhibit time-varying volatility, is given by;

$$\sigma_t^2 = \omega + \alpha\epsilon_{t-1}^2 + \beta\sigma_{t-1}^2$$

Where; σ_t^2 is the conditional variance (volatility), ω , α , and β are parameters, and ϵ_{t-1}^2 are lagged error terms. The model enables the dynamics modeling of volatility based on the changes in stock value. Volatility modelling helps investors forecast future volatility based on past percentage changes in value and adjust their portfolio strategies accordingly. These innovative financial tools improve the grasp of market intricacies and strengthen predictability, both of which are of the utmost importance for an investment strategy in a shifting economy.

3.8.3 Analysis of Value Changes

Bar charts reflecting the net market value for Amazon, Meta, and Microsoft provide a great demonstration of their financial dynamics over the past ten years. Each peak or low implies a large variation in the investors' valuation process where it reflects the underlying business activity or the overall market conditions.

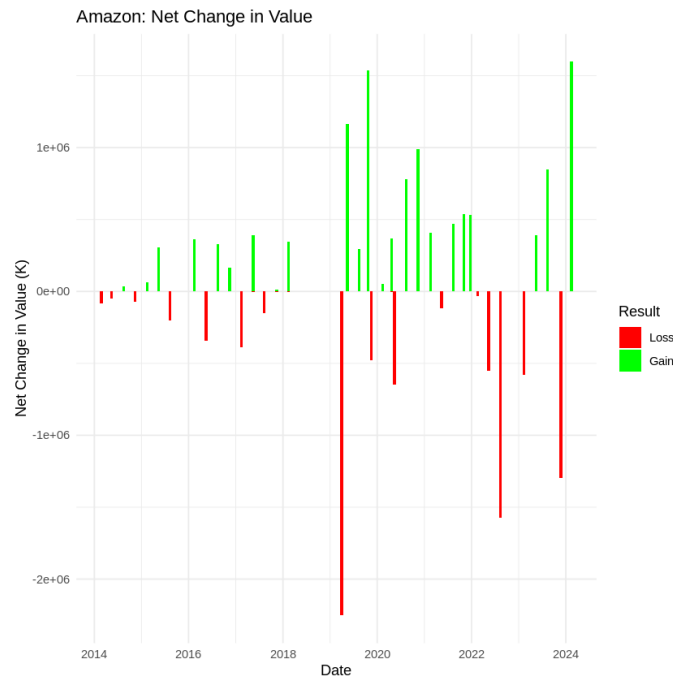


Fig 25. The net change in value for Amazon security, Source; (Author, from R)

In Amazon's case, the data represented cycles of huge gains and losses, where the most obvious upward spikes were in the positive territory in the years 2020 and 2024. These accomplishments probably have to do with when Amazon got into new markets and bonus points for furthering logistic and cloud computing advancements, which investors buy into at these times. Conversely, the significant red bars, signifying losses, can be tied to systemic economic downturns or perhaps even negative press and regulatory headwinds that typically influence most large technology companies. Each event, whether it leads to a gain or loss, offers insights into how investor sentiment is changed over time through external and internal factors and, in turn, the market value.

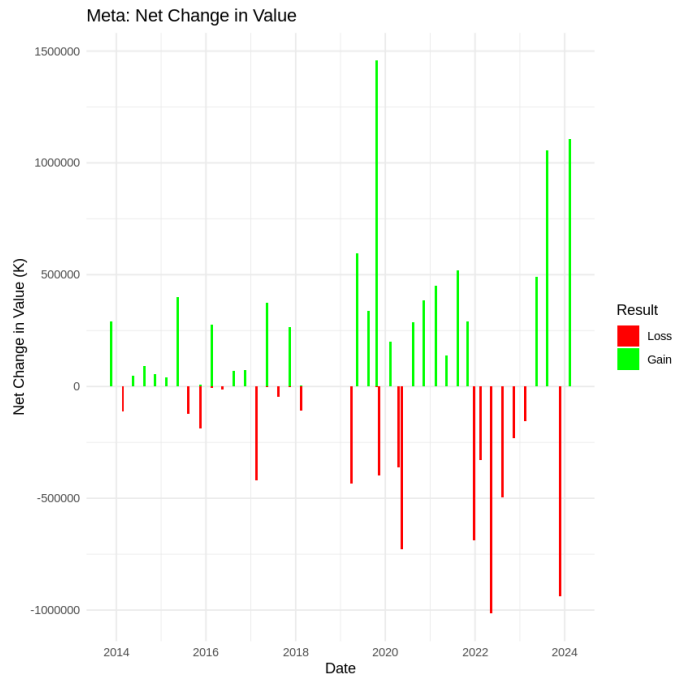


Fig 26. The net change in value for Meta security, Source; (Author, from R)

Meta's chart displays a high degree of volatility as extreme surges and reversals are evident through the years. The first years exhibit high fluctuations in price, probably showing growth spikes linked with the times following its IPO and further rapid growth in the number of users and advertising opportunities. But the drastic reductions, specifically around 2018 and after, might represent a wide range of privacy problems and regulatory issues which likely lowered investor confidence for a period of time. Such volatility illustrates the social media bigwigs like Meta being influenced by the public feedback as well as the regulatory systems, which in turn results in huge market fluctuations.

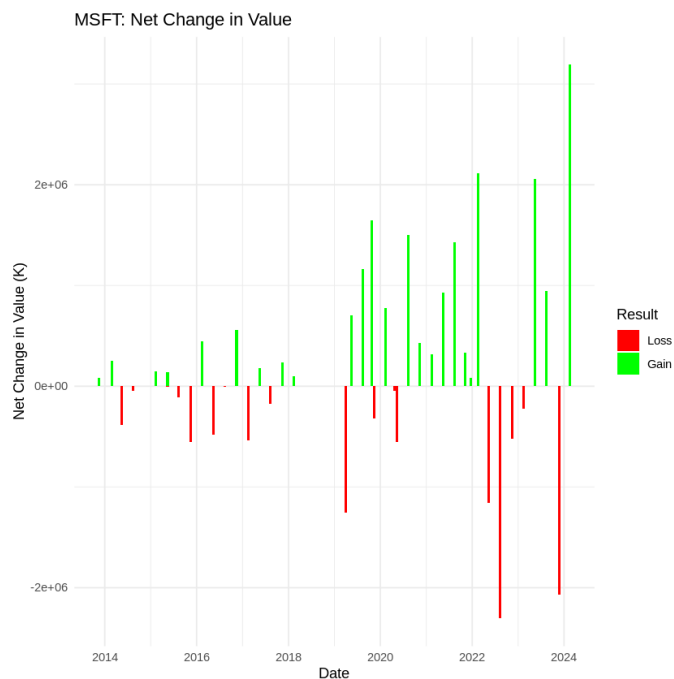


Fig 27. The net change in value for Microsoft security, Source; (Author, from R)

Microsoft's graph depicts a pattern of overall stability interrupted by dramatic advances which are more evident in recent years. Such benefits may be ascribed to the successful transformation of Microsoft to cloud services and the consistent growth of its enterprise software solutions. Unlike Amazon and Meta, Microsoft shows less substantial losses, which could be due to its diversified portfolio and stable leadership that usually reassures investors during times of volatility in the markets.

Besides the common feature that all three are vulnerable to overall market shifts, their respective reasons for the peaks and dips differ considerably based on corporate strategy, specific industry position, and external economic determinants. For investors, comprehension of these trends is critical for them to make well-calculated investment decisions regarding buying or selling shares. In terms of strategic decisions, the data can be used by companies to realign their strategies with investor expectations to have a realistic market value.

In the financial analysis of the net change in the market value of companies such as Amazon, Meta, and Microsoft, mathematical formulas and models would give an understanding of the financial data. This method involves the use of the delta-normal technique to estimate the probability of the loss of value of a risky asset or portfolio through a given confidence interval for a defined period of time. The VaR can be estimated using the formula:

$$\mathbf{VaR} = \mathbf{Z} \times \sigma \times \sqrt{t}$$

, where Z is the Z -score from the normal distribution corresponding to the desired confidence level, σ is the standard deviation of the asset's returns, and t is the time horizon. This data is vital in figuring out the magnitude of such declines in the market capitalisation that is seen in the supplied charts and this assists the investors in calculating the worst-case scenario losses.

In addition, regression analysis can be used to discover the factors that affect the change in these values and to reveal the relationship between these factors and the company's market value. The linear regression model is given by;

$$\mathbf{Y} = \beta_0 + \beta_1 X_1 + \epsilon$$

where Y represents the net change in value, X_1 could be a variable representing market conditions or company-specific events, and β values are the coefficients showing how much impact each unit change in X has on Y . This model allows for the isolation of the effect of individual variables by adjusting for others, which leads to a clearer picture of the drivers of these companies' value changes.

Cumulative returns can also be illustrated through the annexation of geometrically linked periodic returns, which is particularly useful in drawing long-term performance ramifications from the net changes. The formula;

$$(1 + rt) = \prod_{i=1}^t (1 + ri)$$

Where, rt is the total return over period t , and ri is the return in each sub-period i , facilitates the analysis of how initial changes in market value compound over time. This analysis is particularly relevant to investors, shareholders and other stakeholders to see how past performance may affect future value and to guide strategic investments and business decisions for the future based on historical data trends.

3.8.4 Analysis of Investment Cost and Profit

The cost and profit analysis of Amazon, Microsoft, and Meta reveals insights into the profitability and effectiveness of these investments. The method of calculating these metrics entails finding out the cost basis which is the number of shares purchased multiplied by the average price paid per share. This is the total amount incurred to purchase the shares. The realisation of the profit or loss is done by comparing the current price of the shares, which is obtained by multiplying the number of shares by the current market price, with the cost basis.

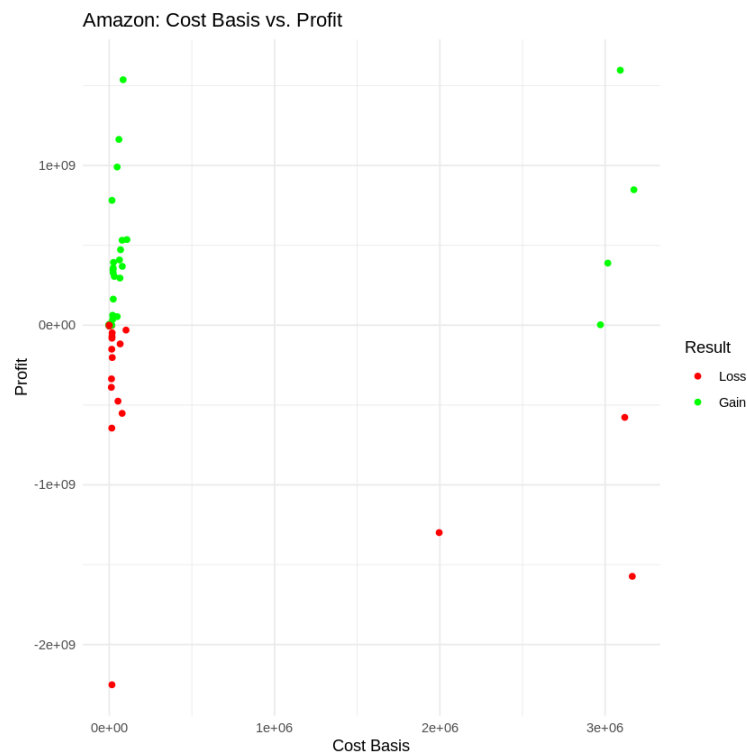


Fig 28. Distribution of cost basis vs profit across Amazon, Source; (Author, from R)

The results suggest great differences in the profitability of various Amazon investments. A scatter plot of cost basis versus profit is just a big, mishmash of red and green, with many more green than red. The red dots generally represent losses, the sizes of which go into the billion-dollar range. For instance, one of the most profitable investments is represented by a \$1 billion cost basis compared to about a \$1.5 billion profit. It is still a lot of profit, but it is also seen how a loss amount of more than \$2 billion can be proven to be such a risky and volatile investment in Amazon. This really just goes to show how important it is to make careful decisions with market timing when dealing with such large fluctuation tech companies like Amazon.

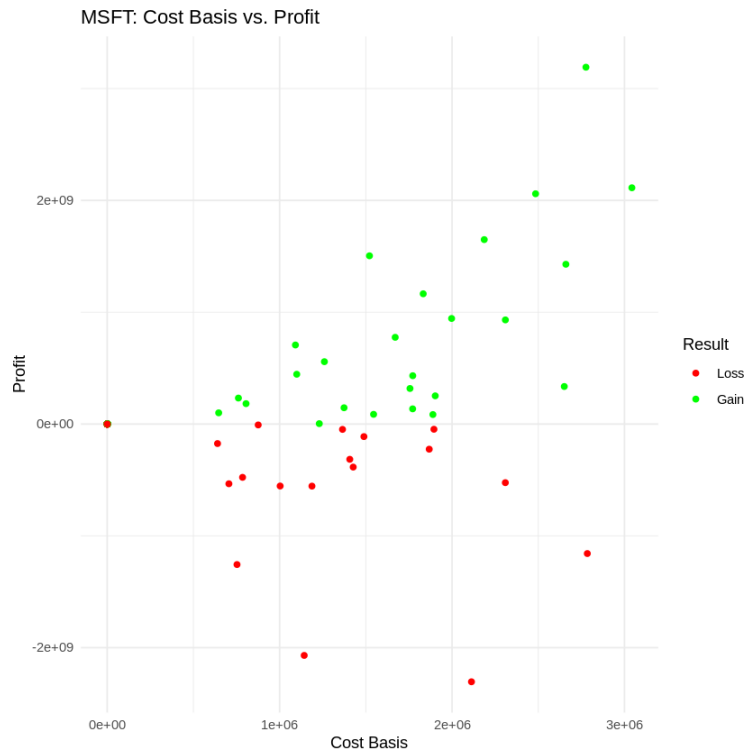


Fig 29. Distribution of cost basis vs profit across Microsoft, Source; (Author, from R)

The performance of investment in Microsoft is consistent in nature as opposed to Amazon. A case in point is this scatter plot, which shows that there are relatively few cases of extreme losses with more or less positive returns on average. Data analysis reveals that most investments in this investment performance have large cost bases that are usually, in most cases, more than \$1 million, and the corresponding profits often reflect a positive return. For instance, one of the investments has realised a profit of \$500 million on the cost basis of \$1 million, indicating the potential of Microsoft to yield high returns. An indication shows that an investor may have relatively a stable investment, very low volatility, and high chances of positive returns. The consistency in the performance of Microsoft investments indicates Microsoft's stronghold in the market and how the business strategies are effective in place.

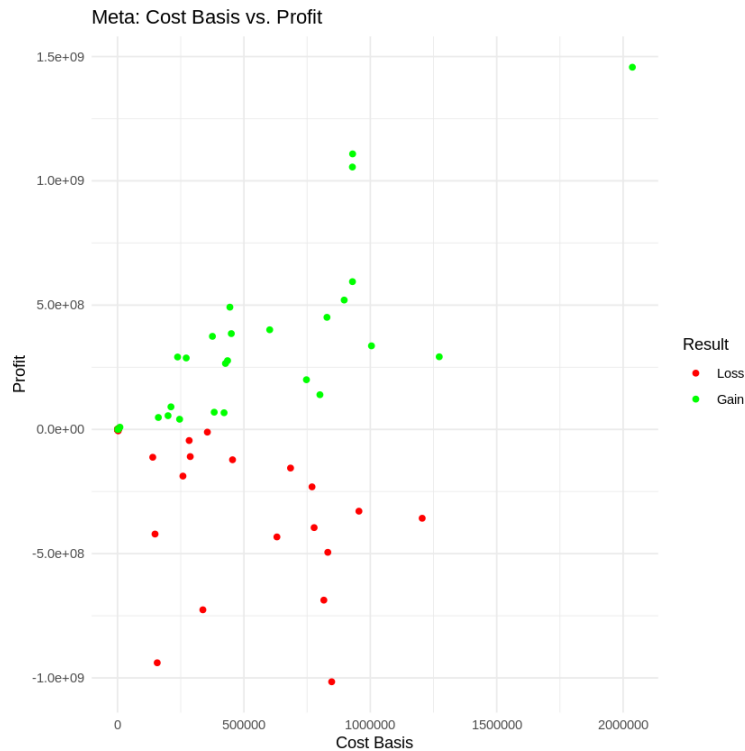


Fig 30. Distribution of cost basis vs profit across for Meta, Source; (Author, from R)

Meta's investment report has both positive and negative results. The chart is characterised by significant profits coupled with large losses that point to the turbulent and unforecastable nature of investing in social media and technology companies. As one example, Meta's investment in Meta, where the profit is \$1 billion against the cost basis of \$500 million, may mean a substantial return on investment. Nonetheless, there were certain investments which led to losses in excess of \$1 billion, demonstrating the actual risks. These data show the significance of thorough research and risk management executions when investing in companies with rapidly changing industries and markets.

The assessment of the efficiency of these investments based on costs and returns involves computing the return on investment (ROI) for each security. It is calculated by dividing the profit by the cost basis and multiplying it by 100 to show it as a percentage. Higher ROI values suggest more successful investments. The analysis shows that although both Amazon and Microsoft have experienced significant overall gains, Amazon's investments are highly volatile, with extreme gains and losses, unlike Microsoft, whose investments tend to generate more consistent and predictable returns showing that they provide a more efficient and less risky investment alternative.

Meta's investments have large variances, which go hand in hand with high reward potential but also with a high level of risk. Mixed outcomes shed light on the role of strategic choice and risk management in ensuring successful investments. Investors certainly need to pay attention to a number of factors, such as market conditions, company performance, and competitive situation, when deciding on the allocation of resources in order to achieve the best results.

3.8.5 Comparative Analysis

The respective differences and similarities can be detected within the performance and market behaviour of Amazon, Microsoft, and Meta in the technology sector. Amazon, with its huge e-commerce operations and cloud computing services, shows volumes of change in shares and markets that are highly volatile. It is due to an aggressive growth strategy with frequent acquisitions and entry into new markets. Big fluctuations in share volume and value then represent a situation of dynamic market response to innovative initiatives and competitive moves of a giant company. On the contrary, Microsoft has shown a comparatively stable investment profile, bringing consistent returns and fewer dramatic losses. That is explained by the diversified nature of its product portfolio, where its main dominants are enterprise software, cloud services, and gaming.

Stability in change of share volume and value appreciation of Microsoft displays a mature company with safe revenue streams and a strong market position. Aided by a focus on long-term growth through sustainable innovation, the relative company shows lower volatility, unlike Amazon and Meta. Meta, previously Facebook, shows unique market behaviour, which is affected by its social media and digital advertising. The performance of the company has reflected both the utmost highs and the lows, portraying the unpredictable nature of the advertising market and regulatory challenges. Huge fluctuations in share volume and value depict the dynamic nature of the investment performance of Meta Inc. In the context of a broader trajectory of growth in the tech industry, driven by increased digitalisation and demand for cloud services, it is sector-specific.

However, these companies face their own unique challenges within their respective industries. Amazon, being a gargantuan retailer, is thus very sensitive to both supply chain problems and evidence of more reticence by consumers to spend money. Microsoft is more vulnerable in the face of intense competition, given its large enterprise footprint and the need for continuous innovation in order to be highly competitive with software and cloud services. However, Meta is highly reliant on ad revenue, which opens it up to potential changes in consumer privacy regulation and user engagement. These inputs will help investors to understand the varied dynamics of these tech behemoths. The potential for high return in Amazon invites a high-risk factor and could work for investors who can sustain risks. Stability in the movement of Microsoft and its consistent performance make it a preferred stock among conservative investors to get steady returns. The high-growth potential coupled with volatility makes Meta the best case for investors who could be watchful against regulatory risks and market fluctuations. On the other hand, it provides a point to invest from which investors can make their decisions well, depending on their risk preference and investment goal.

Bibliography

- Abdullah, N. A. H., Halim, A., Ahmad, H., & Rus, R. M. (2008). Predicting corporate failure of Malaysia's listed companies: Comparing multiple discriminant analysis, logistic regression and the hazard model. *International research journal of finance and economics*, 15(2008), 201-217
- Agarwal, R., & Gort, M. (2002). Firm and product life cycles and firm survival. *American Economic Review*, 92(2), 184-190.
- Agustina, Yolanda Nofita, and Hery Suprayitno. "ANALYSIS of FINANCIAL STATEMENTS USING LIQUIDITY RATIO to MEASURE FINANCIAL PERFORMANCE in 2017-2019": *JOSAR (Journal of Students Academic Research)* 5, no. 2 (September 1, 2020): 32–39. <https://doi.org/10.35457/josar.v5i2.1144>.
- Al-Kassar, Talal A., and Jared S. Soileau. "Financial Performance Evaluation and Bankruptcy Prediction (Failure)1." *Arab Economic and Business Journal* 9, no. 2 (October 2014): 147–55. <https://doi.org/10.1016/j.aebj.2014.05.010>.
- Ayash, Brian, Robert P. Bartlett, and Annette B. Poulsen. "The Determinants of Buyout Returns: Does Transaction Strategy Matter?" *Journal of Corporate Finance* 46 (October 2017): 342–60. <https://doi.org/10.1016/j.jcorpfin.2017.07.006>.
- Badertscher, Brad, Sharon P. Katz, and Sonja O. Rego. "The Impact of Private Equity Ownership on Portfolio Firms' Corporate Tax Avoidance." *SSRN Electronic Journal*, 2011. <https://doi.org/10.2139/ssrn.1338282>.
- Baker, Colleen, Christine Cummings, and Julapa Jagtiani. "The Impacts of Financial Regulations: Solvency and Liquidity in the Post-Crisis Period." *Journal of Financial Regulation and Compliance* 25, no. 3 (July 10, 2017): 253–70. <https://doi.org/10.1108/jfrc-02-2017-0027>.
- Bertoni, Fabio, Massimo G. Colombo, and Luca Grilli. "Venture Capital Financing and the Growth of High-Tech Start-Ups: Disentangling Treatment from Selection Effects." *Research Policy* 40, no. 7 (September 2011): 1028–43. <https://doi.org/10.1016/j.respol.2011.03.008>.
- Bhabra, Gurmeet Singh. "Insider Ownership and Firm Value in New Zealand." *Journal of Multinational Financial Management* 17, no. 2 (2007): 142–54. <https://ideas.repec.org/a/eee/mulfin/v17y2007i2p142-154.html>.
- Blessing, Haldane, and Gryglewicz Sakouvogui. "Impact of Liquidity and Solvency Ratios on Financial Performance: A Comprehensive Analysis." *Indonesia Auditing Research Journal* 12, no. 3 (September 30, 2023): 102–15. <https://doi.org/10.35335/arj.v12i3.208>.
- Block, Joern, Christian Fisch, Silvio Vismara, and René Andres. "Private Equity Investment Criteria: An Experimental Conjoint Analysis of Venture Capital, Business Angels, and Family Offices." *Journal of Corporate Finance* 58 (May 2019). <https://doi.org/10.1016/j.jcorpfin.2019.05.009>.
- Boffo, and Patalano . "ESG Investing: Practices, Progress and Challenges." OECD, Paris, 2020. <https://www.oecd.org/finance/ESG-Investing-Practices-Progress-Challenges.pdf>.
- Bonacchi, Massimiliano, Antonio Marra, and Paul Zarowin. "Organizational Structure and Earnings Quality of Private and Public Firms." *Review of Accounting Studies* 24, no. 3 (June 28, 2019): 1066–1113. <https://doi.org/10.1007/s11142-019-09495-y>.

- Bouwens, Jan, Ties de Kok, and Arnt Verriest. "The Prevalence and Validity of EBITDA as a Performance Measure." *Comptabilite Controle Audit* 25, no. 1 (April 17, 2019): 55–105. <https://www.cairn.info/revue-comptabilite-controle-audit-2019-1-page-55.htm>.
- Brigham, Eugene, and Joel Houston. "Fundamentals of Financial Management Brigham Houston 12th Edition," 2012. http://uni.delf.pro/uploads/7/1/0/7/7107980/fundamentals_of_financial_management_-_brigham_houston_-_12th_edition.pdf.
- Brown, Greg, Bob Harris, Tim Jenkinson, Steve Kaplan, and David Robinson. "Private Equity: Accomplishments and Challenges." *Journal of Applied Corporate Finance* 32, no. 3 (August 20, 2020): 8–20. <https://doi.org/10.1111/jacf.12415>.
- Bruton, Garry D., Igor Filatotchev, Salim Chahine, and Mike Wright. "Governance, Ownership Structure, and Performance of IPO Firms: The Impact of Different Types of Private Equity Investors and Institutional Environments." *Strategic Management Journal*, 2009, n/a-n/a. <https://doi.org/10.1002/smj.822>.
- Buchner, Axel. "Risk Management for Private Equity Funds." Social Science Research Network. Rochester, NY, August 2, 2017. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3012551.
- Cassel, Johan. "What Is the Impact of Managerial Ownership on Firm Performance in Private Equity Portfolio Firms? *," 2020. https://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2021-Leeds/papers/EFMA%202020_stage-1301_question-Full%20Paper_id-434.pdf.
- Cheffins, Brian, and John Armour. "The Eclipse of Private Equity." *Delaware Journal of Corporate Law* 33 (2008): 1. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/decor33&div=6&id=&page=>.
- Dang, Thi, and Thuy. "Literature Review on Factors Affecting Financial Performance of Firms I." *International Journal of Business and Management Invention (IJBMI) ISSN* 12, no. 6 (2023): 181–88. <https://doi.org/10.35629/8028-1206181188>.
- DEMIRHAN, H.Gökçehan, and Waseem Anwar. "Factors Affecting the Financial Performance of the Firms during the Financial Crisis: Evidence from Turkey." *Ege Stratejik Araştırmalar Dergisi* 5, no. 2 (July 1, 2014): 65. <https://doi.org/10.18354/esam.70099>.
- Deutsche Bank. "Deutsche Bank Announces Launch of DB Investment Partners." Db.com, 2023. https://www.db.com/news/detail/20230912-deutsche-bank-announces-launch-of-db-investment-partners?language_id=1.
- . "Deutsche Bank Reports 2023 Profit before Tax of € 5.7 Billion and Announces € 1.6 Billion of Proposed Capital Distributions to Shareholders." Db.com, 2023. https://www.db.com/news/detail/20240201-full-year-results-2023?language_id=1.
- . "Deutsche Bank Reports Continued Delivery of Transformation in 2022 and Clear Targets for 2025." Db.com, 2022. https://www.db.com/news/detail/20230317-deutsche-bank-reports-continued-delivery-of-transformation-in-2022-and-clear-targets-for-2025?language_id=1#:~:text=The%20CET1%20capital%20ratio%20was.
- . "F R a M E W O R K E X T E R N a L R E v I E W," 2024. <https://www.db.com/files/documents/csr/sustainability/SPO-ISS-Sustainable-Finance-Framework-January-2024.pdf>.
- . "History of Deutsche Bank." www.db.com, n.d. <https://www.db.com/who-we-are/history/history-of-deutsche-bank>.
- Dominicus Priyarsono, Raden Racmadi Gustrian, Charles R Vorst, Heri Supriyadi, A. Yulian, and Y Munawar. "Risk Management in Private Companies and Public Sector

- Organizations: A Preliminary Comparative Study.” *Jurnal Organisasi Dan Manajemen* 19, no. 1 (June 26, 2023): 256–72. <https://doi.org/10.33830/jom.v19i1.4126.2023>.
- Ewens, Michael, and Joan Farre-Mensa. “The Evolution of the Private Equity Market and the Decline in IPOs.” *SSRN Electronic Journal*, 2017. <https://doi.org/10.2139/ssrn.3017610>.
- Farah, Mariam Robleh, and Sitki Sönmezer. “The Effects of Private Equity on the Financial Performance of Firms.” *International Journal of Social Science and Human Research* 05, no. 08 (August 31, 2022). <https://doi.org/10.47191/ijsshr/v5-i8-68>.
- Fraidin, Stephen, and Meredith Foster. “The Evolution of Private Equity and the Change in General Partner Compensation Terms in the 1980s.” *Fordham Journal of Corporate and Financial Law* 24 (2018): 321. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/fjcf24&div=17&id=&page=>.
- Frontier Economics Ltd., “Exploring the Impact of Private Equity on Economic Growth in Europe,” 2013. https://www.investeurope.eu/media/1110/frontier_economics_report.pdf.
- Gilligan, John, and Mike Wright. *Private Equity Demystified: An Explanatory Guide*. Google Books. Oxford University Press, 2020. https://books.google.co.ke/books?hl=en&lr=&id=GocEEAAQBAJ&oi=fnd&pg=PP1&dq=History+and+evolution+of+private+equity&ots=iv7g4iR7le&sig=fzzByKn_smcG0K0SAQb8oa-3Wmw&redir_esc=y#v=onepage&q=History%20and%20evolution%20of%20private%20equity&f=false.
- Gondi, Suhas, and Zirui Song. “Potential Implications of Private Equity Investments in Health Care Delivery.” *JAMA* 321, no. 11 (March 19, 2019): 1047. <https://doi.org/10.1001/jama.2019.1077>.
- Hall, Thomas, Cesario Mateus, and Irina Bezhentseva Mateus. “What Determines Cash Holdings at Privately Held and Publicly Traded Firms? Evidence from 20 Emerging Markets.” *International Review of Financial Analysis* 33 (May 2014): 104–16. <https://doi.org/10.1016/j.irfa.2013.11.002>.
- Harris, Robert S., Tim Jenkinson, Steven N. Kaplan, and Ruediger Stucke. “Financial Intermediation in Private Equity: How Well Do Funds of Funds Perform?” *Journal of Financial Economics* 129, no. 2 (August 2018): 287–305. <https://doi.org/10.1016/j.jfineco.2018.04.013>.
- Huoponen, Tommi. “The Effect of Secondary Buyouts on Private Equity Fund Performance.” *Aaltodoc.aalto.fi*, November 8, 2017. <https://aaltodoc.aalto.fi/items/703d647f-01d6-4953-865c-39f1d18c54c5>.
- Hvide, H. K., & Møen, J. (2007). Liquidity constraints and entrepreneurial performance. FINANCIAL ECONOMICS, INDUSTRIAL ORGANIZATION, LABOUR ECONOMICS and PUBLIC POLICY, DISCUSSION PAPER SERIES, No. 6495
- Ibrahim Arpacı, Omer Aslan, and Mustafa Kevser. “Evaluating Short- and Long-Term Investment Strategies: Development and Validation of the Investment Strategies Scale (ISS).” *Financial Innovation (Heidelberg)* 10, no. 1 (February 19, 2024). <https://doi.org/10.1186/s40854-023-00573-4>.
- Islam, Md Aminul. “An Analysis of the Financial Performance of National Bank Limited Using Financial Ratio.” *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport* 2, no. 5 (January 23, 2014): 121–29. <https://doi.org/10.12691/jbe-2-5-3>.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.

- Kaserer, Christoph, and Rüdiger Stucke. "Performance of Private Equity." *Alternative Investments*, March 18, 2013, 323–44. <https://doi.org/10.1002/9781118656501.ch16>.
- Kingman, John. "Independent Review of the Financial Reporting Council," 2018. <https://assets.publishing.service.gov.uk/media/5c1bbe68ed915d7327b92162/frc-independent-review-final-report.pdf>.
- Knight, Rory, and Marc Bertoneche. *Financial Performance*. Google Books. Elsevier, 2000. https://books.google.co.ke/books?hl=en&lr=&id=TBiPUsf6jGoC&oi=fnd&pg=PP1&dq=Importance+of+Financial+Performance+Analysis&ots=-oQX5NevZ3&sig=PPN7I7VGEW2XHXR2dGTGRFb1kKM&redir_esc=y#v=onepage&q=Importance%20of%20Financial%20Performance%20Analysis&f=false.
- Lin, Y. R., & Fu, X. M. (2017). Does institutional ownership influence firm performance? Evidence from China. *International Review of Economics & Finance*, 49, 17-57.
- Loos, Nicolaus. *Value Creation in Leveraged Buyouts: Analysis of Factors Driving Private Equity Investment Performance*. Google Books. Springer Science & Business Media, 2007. <https://books.google.com/books?hl=en&lr=&id=GHeMY5F61icC&oi=fnd&pg=PR1&dq=Strategies+and+Performance+of+Private+Equity+Firms+-+LBO&ots=aYPZWjBXyZ&sig=MRDxzliVdizAqgibyZNDQe7kcy4>.
- Manigart, Sophie, and Mike Wright. "Reassessing the Relationships between Private Equity Investors and Their Portfolio Companies." *Small Business Economics* 40, no. 3 (October 30, 2011): 479–92. <https://doi.org/10.1007/s11187-011-9387-7>.
- Medeline Effendie, Jessica, Henny A. Manafe, and Stanis Man. "Analysis of the Effect of Liquidity Ratios, Solvency and Activity on the Financial Performance of the Company (Literature Review of Corporate Financial Management)." *Dinasti International Journal of Economics, Finance & Accounting* 3, no. 5 (December 13, 2022): 541–50. <https://doi.org/10.38035/dijefa.v3i5.1507>.
- Mishra, R., & Kapil, S. (2017). Effect of ownership structure and board structure on firm value: evidence from India. *Corporate Governance: The International Journal of Business in Society*.
- Myšková, Renáta , and Peter Hajek. "Comprehensive Assessment of Firm Financial Performance Using Financial Ratios and Linguistic Analysis of Annual Reports." *Journal of International Studies* 10, no. 4 (2017): 96–108. <https://www.ceeol.com/search/article-detail?id=607109>.
- Pandey, I. M. (2007). *Financial management* (9th ed.). New Delhi: Vikas Publishing House Ltd
- Pelozo, John. "The Challenge of Measuring Financial Impacts from Investments in Corporate Social Performance." *Journal of Management* 35, no. 6 (April 20, 2009): 1518–41. <https://doi.org/10.1177/0149206309335188>.
- Phillips, Michael, and Steven Anderson. "A BEHAVIORAL COMPARISON of FINANCIAL RATIOS for DIFFERENT SIZE PRIVATELY-HELD RETAIL and SERVICE BUSINESSES," 2009. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=e209a5fcdfe8cecdcdbad02e6b1e5e0dd4592a94>.
- Rozaimah Zainudin, Nurul Shahnaz Ahmad Mahdzan, Ee Shan Leong. (2018). Firm-specific internal determinants of profitability performance: an exploratory study of selected life insurance firms in Asia. *Journal of Asia Business Studies*, Vol.12 Issue: 4, pp.533- 550, <https://doi.org/10.1108/JABS-09-2016-0129>
- Schell, James M., Pamela Lawrence Endreny, and Kristine M. Koren. *Private Equity Funds: Business Structure and Operations*. Google Books. Law Journal Press, 2024. <https://books.google.co.ke/books?hl=en&lr=&id=9CXLWwVGDbQC&oi=fnd&pg=P>

A9&dq=components+of+private+equity+fund&ots=2utk6MImSQ&sig=d1CSS_pv9T
VwxJp7hI8JE1429c&redir_esc=y#v=onepage&q=components%20of%20private%2
0equity%20fund&f=false.

- Setiawan, Christopher Ari, and Tina Rosa. "The Analysis of the Effect of Return of Investment (ROI) on Stock Price and Financial Performance of a Company." *Journal of Accounting, Management, Economics, and Business (ANALYSIS)* 1, no. 1 (January 24, 2023): 20–29. <https://doi.org/10.56855/analysis.v1i1.177>.
- Setiawan, Danu Ade. "THE EFFECT of FINANCIAL LEVERAGE on DEBT REPAYMENT CAPACITY : EVIDENCE from LISTED SHIPPING COMPANY in INDONESIA." *Hasanuddin Economics and Business Review* 2, no. 2 (October 18, 2018): 113. <https://doi.org/10.26487/hebr.v2i2.1513>.
- Sharifi, F., and E. Taghipour. "Measuring Financial Performance Using New Liquidity Indices." *Management Science Letters* 4, no. 9 (2014): 2139–44. <https://m.growingscience.com/beta/msl/1717-measuring-financial-performance-using-new-liquidity-indices.html>.
- Simerly, R. L., & Li, M. (2000). Environmental dynamism, capital structure and performance: a theoretical integration and an empirical test. *Strategic management journal*, 21(1), 31-49
- Sørensen, J. B., & Stuart, T. E. (2000). Aging, obsolescence, and organizational innovation. *Administrative science quarterly*, 45(1), 81-112.
- Sorensen, Morten, Neng Wang, and Jinqiang Yang. "Valuing Private Equity." *SSRN Electronic Journal*, 2012. <https://doi.org/10.2139/ssrn.2180789>.
- Sulairman, M., Jili, A., & Sanda, A. U. (2001). Predicting corporate failure in Malaysia: An application of the Logit Model to financial ratio analysis. *Asian Journal of Management Journal*, 6(1), 99-118
- Taffler, R. J. "The Assessment of Company Solvency and Performance Using a Statistical Model." *Accounting and Business Research* 13, no. 52 (September 1983): 295–308. <https://doi.org/10.1080/00014788.1983.9729767>.
- Toms, Steven, Nick Wilson, and Mike Wright. "The Evolution of Private Equity: Corporate Restructuring in the UK, C.1945–2010." *Business History* 57, no. 5 (June 2, 2015): 736–68. <https://doi.org/10.1080/00076791.2014.977262>.
- Upneja, A., & Dalbor, M. C. (2001). An examination of capital structure in the restaurant industry. *International Journal of Contemporary Hospitality Management*.
- Wilson, Nick, Moshfique Uddin, and Mike Wright. "Exporting by Private Equity-Backed Portfolio Companies." *British Journal of Management*, November 23, 2021. <https://doi.org/10.1111/1467-8551.12566>.
- Wright, Mike. "Venture Capital and Private Equity: A Review and Synthesis." *Journal of Business Finance Accounting* 25, no. 5&6 (June 1998): 521–70. <https://doi.org/10.1111/1468-5957.00201>.
- Wright, Mike , Kevin Amess, Nick Bacon, and Donald Siegel. *The Routledge Companion to Management Buyouts*. Edited by Wright Mike, Amess Kevin, Bacon Nick, and Siegel Donald. Abingdon, Oxon ; New York, NY : Routledge, 2018.: Routledge, 2018. <https://doi.org/10.4324/9781315230597>.
- Yuqi, L. (2007). Determinants of Banks' Profitability and Its Implication on Risk Management Practices: Panel Evidence from the UK. The University of Nottingham