



BUSINESS ANALYTICS

GROUP T

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INTRODUCTION AND COMPANY PROFILE

Introduction

The telecommunications sector is made up of companies that facilitate communication on a global scale, using various means such as phone networks, internet, airwaves, and cables. “These companies build and maintain the infrastructure that enables the transmission of data (such as text, voice, audio, or video) to any location around the world” (*DOS, 2023*). Beers states, “the most prominent companies in the sector are telephone operators (wired and wireless), satellite companies, cable companies, and internet service providers” (*Beers, 2023*). “The Internet has continuously evolved since its beginnings in the late 1960s, becoming the largest globally recognized communication system with advancements in technology, capacity, availability, and size” (*Mueller, 2014*). Information is transported via packets without differentiating between individual application characteristics over manifold access and core network technologies. Classical telecommunication networks initially transport voice over circuit-switched networks before adapting packet transport to the underlying network to increase overall network performance (*Bertin, Crespi and Magedanz, 2013*).

Company Profiles

Airtel Africa Plc and its subsidiaries, as stated in Yahoo Finance, offers telecommunications and mobile money services in Nigeria, East Africa, and Francophone Africa (*Yahoo Finance, 2023*). They provide prepaid and postpaid wireless voice, international roaming, and fixed-line telephone services, as well as data communication services for 2G, 3G, and 4G networks. Airtel Africa also offers mobile money services, including digital wallet payment systems, microloans, savings, and international money transfers. The company provides messaging, value-added, enterprise, and infrastructure-sharing services and support services. Additionally, it is involved in investment activities. Yahoo Finance states “the company was established in 2018 and is headquartered in London, United Kingdom. Airtel Africa Plc is a subsidiary of Airtel Africa Mauritius Limited” (*Yahoo Finance, 2023*).

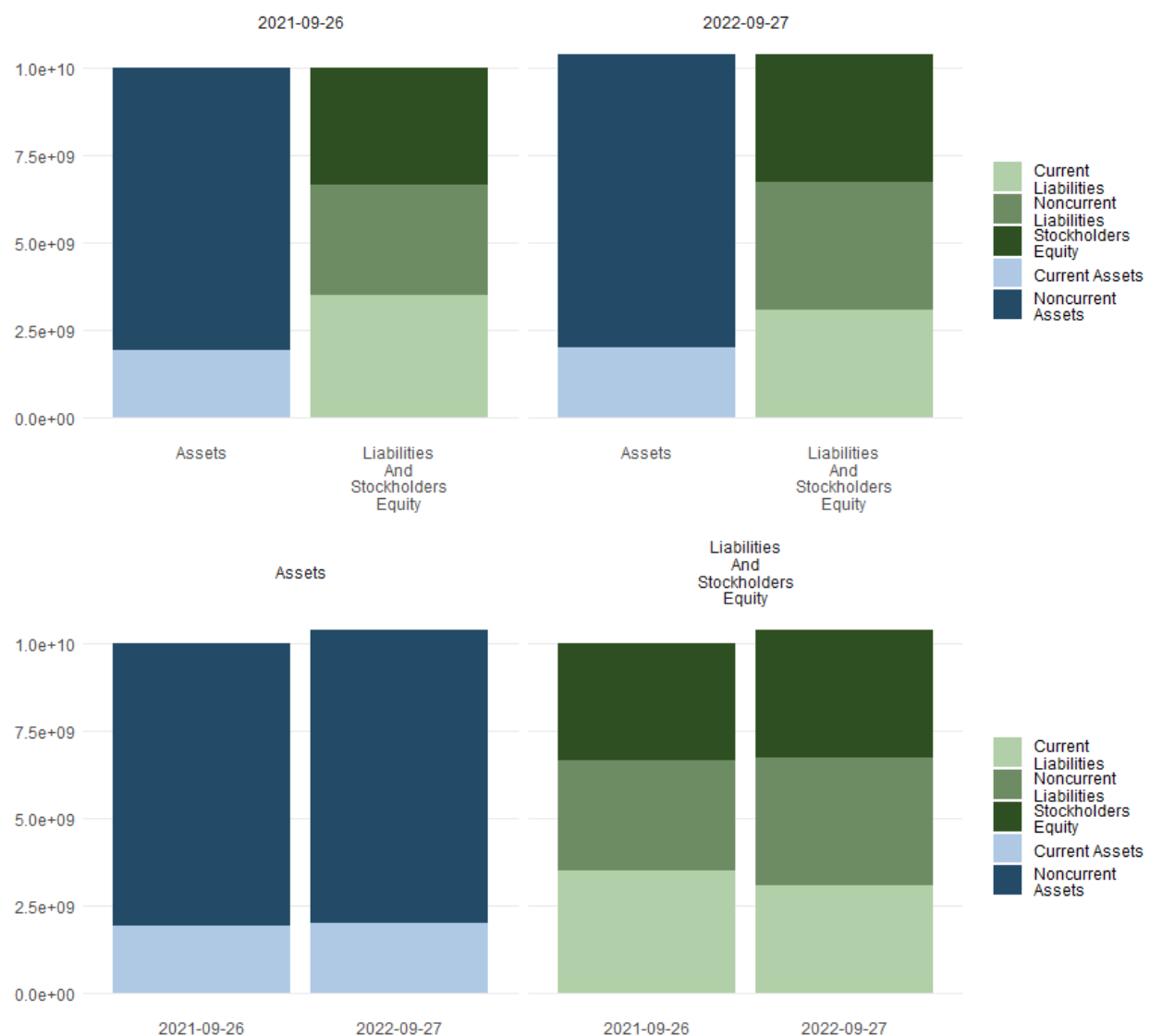


Figure 1: Assets and Liabilities for Airtel Africa



Figure 2: Revenue and Expenses for Airtel Africa

Figures 1 and 2 demonstrate that Airtel Africa is in good financial health, with positive trends in profitability, liquidity, and operational efficiency. The growth in total assets has improved liquidity, while the increase in net income, positive operating income, and gross profit trend reflects a well-managed and thriving business. However, it is worth noting that the decrease in cash and the increase in long-term debt require attention, as they can affect the company's financial flexibility.

Vodafone Group PLC is a multinational telecommunications company in several countries worldwide". The company offers various services, including voice, messaging, data, and fixed-line solutions to consumers and enterprise customers. Vodafone is known for its high-quality network coverage, innovative products, and exceptional customer service (*Yahoo Finance, 2023*).

Their mobile connectivity services include end-to-end services for mobile voice and data, messaging, device management, BYOx, and telecoms management. Additionally, they provide fixed line connectivity services such as fixed voice and data, broadband, software-defined networks, managed WAN, LAN, Ethernet, and satellite. They also offer financial services and business and merchant services (*Yahoo Finance, 2023*).

Vodafone provides consumers with Internet of Things (IoT) propositions, security and insurance products, mobile services, logistics, fleet management, and innovative metering services. They offer digital services like mobile application development, multi-access edge computing, worker insights, AI assistance, drone detection, visual inspection, mixed reality, and the Vodafone Analytics platform. They also provide traditional IT hosting services such as colocation, managed hosting, security, hosting infrastructure, and flexible computing for the government (*Yahoo Finance, 2023*).

In addition, Vodafone offers integrated business communication services, fixed mobile convergence services, carrier services, and IoT devices comprising managed tablets and integrated terminals. Further, they offer digital cloud-based television platforms, a multi-cloud platform for Vodafone Business, and productivity solutions. Additionally, they provide M-Pesa, an African mobile money platform for financial services and payments (*Yahoo Finance, 2023*).

Vodafone serves customers in various industries, including manufacturing, retail, automotive, banking, healthcare, smart cities, agriculture, transport, and energy management. They offer their products and services through both digital and physical channels. The company is headquartered in Newbury, United Kingdom, and was founded in 1984 (*Yahoo Finance, 2023*).



Figure 3: Assets and Liabilities for Vodafone Group

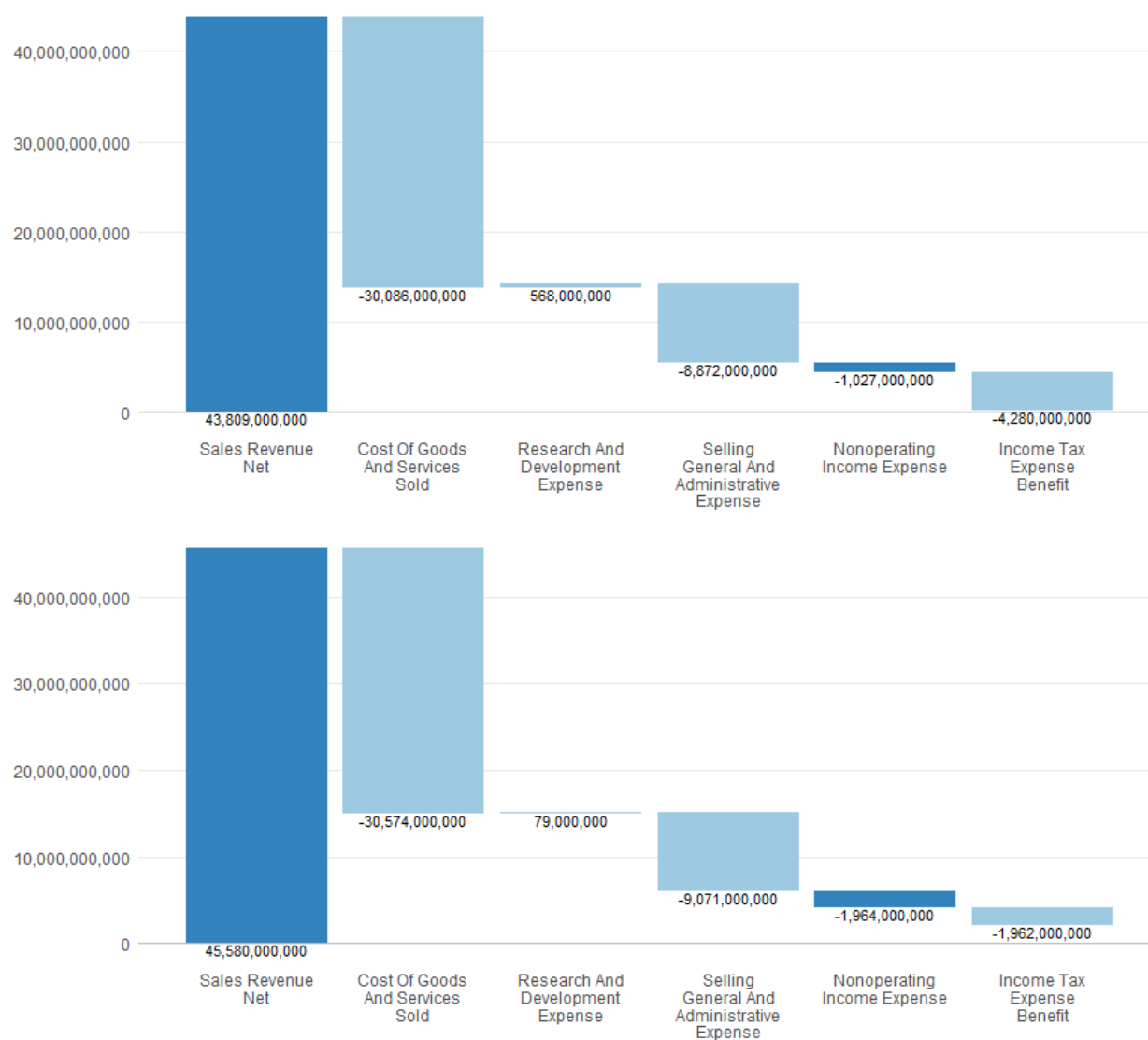


Figure 4: Revenues and Expenses for Vodafone Group

Figures 3 and 4 depicted above indicate that an analysis of Vodafone Group's financial statements shows a positive financial health and performance. The rise in net income, operating income, and gross profit suggests that the company's profitability and operational efficiency have improved. Although total assets and stockholders' equity have slightly declined, the company's ability to manage liabilities and generate higher profits indicates a robust financial position.

AIM OF THE REPORT

This report is a group assignment that aims to comprehensively analyse the financial statements and market data of two prominent companies in the telecommunication sector, namely Airtel Africa and Vodafone Group. The analysis involves comparing the reporting years 2021 and 2022.

The report's structure is as follows: it begins with the company profiles section, which provides detailed information about the two companies' services, subsidiaries, and financial health. Both companies' financial health and performance are analysed using various financial ratios and horizontal and vertical analyses of critical metrics. The primary source of information for the analysis is **Yahoo Finance**.

R-studio software will be used to carry out various analyses. The study covers horizontal and vertical analysis and ratio analysis, which includes liquidity, profitability, efficiency, solvency, financial gearing and operational aspects. The subsequent section focuses on market data analysis, which introduces the Capital Asset Pricing Model (CAPM) and its relevance in understanding the relationship between systematic and expected return assets, particularly stocks. The report emphasizes the importance of CAPM in determining market equilibrium under risk conditions. To summarise, the report provides a comprehensive analysis of the telecommunication sector, covering detailed company profiles, financial health assessments, an in-depth analysis of financial statements and ratios for Airtel Africa and Vodafone Group, and market data analysis that introduces the CAPM model, offering a broader understanding of the companies' positioning in the market.

Airtel Africa (AAF.L)
(Currency in USD and all numbers in thousands)
Income Statement from Yahoo Finance

Breakdown	TTM	3/30/2023	3/30/2022	3/30/2021	3/30/2020
Total Revenue	5,313,000	5,255,000	4,714,000	3,908,000	3,422,000
Operating Revenue	5,313,000	5,255,000	4,714,000	3,908,000	3,422,000
Cost of Revenue	1,954,000	1,678,000	1,468,000	1,268,000	1,193,000
Gross Profit	3,359,000	3,577,000	3,246,000	2,640,000	2,229,000
Operating Expense	1,577,000	1,806,000	1,706,000	1,514,000	1,330,000
Selling General and Administrative	252,000	243,000	224,000	187,000	148,000
General & Administrative Expense	-	-	-	-	32,000
Selling & Marketing Expense	252,000	243,000	224,000	187,000	148,000
Other Operating Expenses	194,000	471,000	451,000	382,000	333,000
Operating Income	1,782,000	1,771,000	1,540,000	1,126,000	899,000
Net Non Operating Interest Income Expense	-430,000	-723,000	-422,000	-423,000	-373,000
Interest Income Non Operating	35,000	29,000	19,000	9,000	67,000
Interest Expense Non Operating	413,000	752,000	441,000	432,000	440,000
Total Other Finance Cost	-	52,000	38,000	25,000	31,000
Pretax Income	530,000	1,034,000	1,224,000	697,000	598,000
Tax Provision	123,000	284,000	469,000	282,000	190,000
Net Income Common Stockholders	312,000	663,000	631,000	339,000	370,000
Net Income	312,000	663,000	631,000	339,000	370,000
Net Income Including Non-Controlling Interests	407,000	750,000	755,000	415,000	408,000
Net Income Continuous Operations	407,000	750,000	755,000	415,000	408,000
Minority Interests	-95,000	-87,000	-124,000	-76,000	-38,000
Otherunder Preferred Stock Dividend	0	0	0	0	0
Diluted NI Available to Com Stockholders	312,000	663,000	631,000	339,000	370,000
Basic EPS	0.08	0.18	0.17	0.09	0.1
Diluted EPS	0.08	0.18	0.17	0.09	0.1
Basic Average Shares	3,750,597	3,751,666	3,754,180	3,757,550	3,585,635
Diluted Average Shares	3,752,589	3,756,868	3,760,109	3,759,122	3,586,678
Total Operating Income as Reported	1,770,000	1,757,000	1,535,000	1,119,000	-901,000
Total Expenses	3,531,000	3,484,000	3,174,000	2,782,000	2,523,000
Net Income from Continuing & Discontinued Operation	312,000	663,000	631,000	339,000	370,000
Normalized Income	381,881	671,568	634,085	344,670	368,635
Interest Income	35,000	29,000	19,000	9,000	67,000
Interest Expense	413,000	752,000	441,000	432,000	440,000
Net Interest Income	-430,000	-723,000	-422,000	-423,000	-373,000
EBIT	943,000	1,786,000	1,665,000	1,129,000	1,038,000
EBITDA	1,795,000	2,604,000	2,409,000	1,810,000	1,670,000

Reconciled Cost of Revenue	1,954,000	1,678,000	1,468,000	1,268,000	1,193,000
Reconciled Depreciation	852,000	818,000	744,000	681,000	632,000
Net Income from Continuing Operation Net Minority Interest	312,000	663,000	631,000	339,000	370,000
Total Unusual Items Excluding Goodwill	-91,000	-14,000	-5,000	-7,000	2,000
Total Unusual Items	-91,000	-14,000	-5,000	-7,000	2,000
Normalized EBITDA	1,886,000	2,618,000	2,414,000	1,817,000	1,668,000
Tax Rate for Calcs	0	0	0	0	0
Tax Effect of Unusual Items	-21,119	-5,432	-1,915	-1,330	635.4515

Airtel Africa (AAF.L)
(Currency in USD and all numbers in thousands)
Balance Sheet from Yahoo Finance

Breakdown	3/30/2023	3/30/2022	3/30/2021	3/30/2020
Total Assets	11,166,000	10,364,000	9,992,000	9,325,000
Current Assets	1,898,000	1,997,000	1,905,000	1,671,000
Cash, Cash Equivalents & Short Term Investments	845,000	982,000	1,136,000	1,076,000
Cash And Cash Equivalents	586,000	638,000	813,000	1,010,000
Cash	313,000	357,000	523,000	174,000
Cash Equivalents	273,000	281,000	290,000	836,000
Other Short Term Investments	259,000	344,000	323,000	66,000
Inventory	15,000	3,000	7,000	3,000
Prepaid Assets	94,000	133,000	94,000	101,000
Restricted Cash	630,000	671,000	465,000	301,000
Assets Held for Sale Current	-	0	31,000	-
Hedging Assets Current	4,000	3,000	6,000	10,000
Other Current Assets	259,000	215,000	147,000	149,000
Total non-current assets	9,268,000	8,367,000	8,087,000	7,654,000
Net PPE	3,941,000	3,512,000	3,031,000	2,730,000
Gross PPE	5,228,000	5,307,000	4,728,000	4,176,000
Properties	0	0	0	0
Land And Improvements	25,000	26,000	27,000	26,000
Buildings And Improvements	92,000	96,000	96,000	97,000
Machinery Furniture Equipment	3,402,000	3,887,000	3,640,000	3,155,000
Other Properties	1,497,000	1,109,000	799,000	639,000
Construction in Progress	212,000	189,000	166,000	259,000
Accumulated Depreciation	-1,287,000	-1,795,000	-1,697,000	-1,446,000
Goodwill And Other Intangible Assets	4,728,000	4,461,000	4,570,000	4,429,000
Goodwill	3,516,000	3,827,000	3,835,000	3,943,000

Other Intangible Assets	1,212,000	634,000	735,000	486,000
Financial Assets	9,000	3,000	6,000	0
Non Current Prepaid Assets	151,000	123,000	8,000	7,000
Other Non Current Assets	214,000	134,000	112,000	112,000
Total Liabilities Net Minority Interest	7,358,000	6,715,000	6,639,000	6,044,000
Current Liabilities	3,572,000	3,073,000	3,504,000	2,488,000
Current Provisions	83,000	69,000	65,000	70,000
Current Debt And Capital Lease Obligation	1,339,000	1,109,000	1,708,000	863,000
Current Debt	944,000	786,000	1,468,000	664,000
Current Capital Lease Obligation	395,000	323,000	240,000	199,000
Other Current Liabilities	193,000	176,000	151,000	115,000
Total Non Current Liabilities Net Minority Interest	3,786,000	3,642,000	3,135,000	3,556,000
Long Term Provisions	21,000	20,000	25,000	23,000
Long Term Debt And Capital Lease Obligation	2,885,000	2,823,000	2,908,000	3,416,000
Long Term Debt	1,233,000	1,486,000	1,871,000	2,446,000
Long Term Capital Lease Obligation	1,652,000	1,337,000	1,037,000	970,000
Tradeand Other Payables Non Current	-	5,000	11,000	9,000
Derivative Product Liabilities	612,000	579,000	6,000	4,000
Other Non Current Liabilities	13,000	18,000	24,000	29,000
Total Equity Gross Minority Interest	3,808,000	3,649,000	3,353,000	3,281,000
Stockholders' Equity	3,635,000	3,502,000	3,405,000	3,388,000
Capital Stock	1,879,000	1,879,000	1,879,000	3,420,000
Common Stock	1,879,000	1,879,000	1,879,000	3,420,000
Additional Paid in Capital	-	-	-	0
Retained Earnings	-	3,436,000	2,975,000	2,805,000
Other Equity Interest	1,541,000	1,541,000	1,541,000	1,541,000
Minority Interest	173,000	147,000	-52,000	-107,000
Total Capitalization	4,868,000	4,988,000	5,276,000	5,834,000
Common Stock Equity	3,635,000	3,502,000	3,405,000	3,388,000
Capital Lease Obligations	2,047,000	1,660,000	1,277,000	1,169,000
Net Tangible Assets	-1,093,000	-959,000	-1,165,000	-1,041,000
Working Capital	-1,674,000	-1,076,000	-1,599,000	-817,000
Invested Capital	5,812,000	5,774,000	6,744,000	6,498,000
Tangible Book Value	-1,093,000	-959,000	-1,165,000	-1,041,000
Total Debt	4,224,000	3,932,000	4,616,000	4,279,000
Net Debt	1,591,000	1,634,000	2,526,000	2,100,000
Share Issued	3,758,152	3,758,152	3,758,152	3,758,152
Ordinary Shares Number	3,750,825	3,758,152	3,754,452	3,758,152
Treasury Shares Number	7,326	-	3,700	-

Vodafone Group PLC (VOD.L)
(Currency in EUR and all numbers in thousands)
Income Statement from Yahoo Finance

Breakdown	TTM	3/30/2023	3/30/2022	3/30/2021	3/30/2020
Total Revenue	45,706,000	45,706,000	45,580,000	43,809,000	44,974,000
Operating Revenue	45,706,000	45,706,000	45,580,000	43,809,000	44,974,000
Cost of Revenue	30,850,000	30,850,000	30,574,000	30,086,000	30,682,000
Gross Profit	14,856,000	14,856,000	15,006,000	13,723,000	14,292,000
Operating Expense	323,000	323,000	8,992,000	8,304,000	5,343,000
Selling General and Administrative	9,421,000	9,421,000	9,071,000	8,872,000	9,624,000
General & Administrative Expense	6,092,000	6,092,000	5,713,000	5,350,000	5,810,000
Selling & Marketing Expense	3,329,000	3,329,000	3,358,000	3,522,000	3,814,000
Other Operating Expenses	-9,098,000	-9,098,000	-79,000	-568,000	-4,281,000
Operating Income	14,533,000	14,533,000	6,014,000	5,419,000	8,949,000
Net Non Operating Interest Income Expense	-2,016,000	-1,728,000	-1,964,000	-1,027,000	-3,549,000
Interest Income Non Operating	248,000	561,000	428,000	485,000	248,000
Interest Expense Non Operating	2,577,000	1,728,000	1,964,000	1,027,000	3,549,000
Pretax Income	12,816,000	12,816,000	3,954,000	4,400,000	795,000
Tax Provision	481,000	481,000	1,330,000	3,864,000	1,250,000
Net Income Common Stockholders	11,838,000	11,838,000	2,088,000	112,000	-920,000
Net Income	11,838,000	11,838,000	2,088,000	112,000	-920,000
Net Income Including Non-Controlling Interests	12,335,000	12,335,000	2,624,000	536,000	-455,000
Net Income Continuous Operations	12,335,000	12,335,000	2,624,000	536,000	-455,000
Net Income Discontinuous Operations	0	-	-	0	0
Minority Interests	-497,000	-497,000	-536,000	-424,000	-465,000
Otherunder Preferred Stock Dividend	0	0	0	0	0
Diluted NI Available to Com Stockholders	11,838,000	11,838,000	2,088,000	112,000	-920,000
Basic EPS	0.43	0.43	0.08	0	-0.03
Diluted EPS	0.43	0.43	0.08	0	-0.03
Basic Average Shares	27,680,000	27,680,000	29,012,000	29,592,000	29,422,000
Diluted Average Shares	27,775,000	27,775,000	29,109,000	29,592,000	29,422,000
Total Operating Income as Reported	14,296,000	14,296,000	5,664,000	5,097,000	4,099,000
Rent Expense Supplemental	0	-	-	0	0
Total Expenses	31,173,000	31,173,000	39,566,000	38,390,000	36,025,000
Net Income from Continuing & Discontinued Operation	11,838,000	11,838,000	2,088,000	112,000	-920,000
Normalized Income	12,040,982	12,482,540	2,460,504	649,840	2,516,715
Interest Income	248,000	561,000	428,000	485,000	248,000
Interest Expense	2,577,000	1,728,000	1,964,000	1,027,000	3,549,000

Net Interest Income	-2,016,000	-1,728,000	-1,964,000	-1,027,000	-3,549,000
EBIT	15,393,000	14,544,000	5,918,000	5,427,000	4,344,000
EBITDA	29,011,000	14,544,000	5,918,000	5,427,000	18,518,000
Reconciled Cost of Revenue	30,850,000	30,850,000	30,574,000	30,086,000	30,682,000
Reconciled Depreciation	13,618,000	13,618,000	13,845,000	14,101,000	14,174,000
Net Income from Continuing Operation Net Minority Interest	11,838,000	11,838,000	2,088,000	112,000	-920,000
Total Unusual Items Excluding Goodwill	-211,000	-670,000	-561,000	-664,000	-2,345,000
Total Unusual Items	-211,000	-670,000	-561,000	-664,000	-660,000
Normalized EBITDA	29,222,000	15,214,000	6,479,000	6,091,000	19,178,000
Tax Rate for Calcs	0	0	0	0	0
Tax Effect of Unusual Items	-8,018	-25,460	-188,496	-126,160	-593,285

Vodafone Group PLC (VOD.L)
(Currency in EUR and all numbers in thousands)
Balance Sheet from Yahoo Finance

Breakdown	3/30/2023	3/30/2022	3/30/2021	3/30/2020
Total Assets	155,521,000	153,953,000	155,063,000	168,168,000
Current Assets	30,662,000	28,537,000	28,270,000	34,251,000
Cash, Cash Equivalents & Short Term Investments	18,722,000	15,427,000	14,980,000	20,373,000
Cash And Cash Equivalents	11,705,000	7,496,000	5,821,000	13,284,000
Cash	3,924,000	2,220,000	2,705,000	1,947,000
Cash Equivalents	7,781,000	5,276,000	3,116,000	2,202,000
Other Short Term Investments	7,017,000	7,931,000	9,159,000	7,089,000
Inventory	956,000	836,000	676,000	585,000
Prepaid Assets	835,000	872,000	1,082,000	859,000
Restricted Cash	239,000	698,000	4,848,000	1,460,000
Current Deferred Assets	1,471,000	1,403,000	1,364,000	1,293,000
Assets Held for Sale Current	-	959,000	1,257,000	1,607,000
Hedging Assets Current	482,000	410,000	239,000	752,000
Total non-current assets	124,859,000	125,416,000	126,793,000	133,917,000
Net PPE	37,992,000	40,804,000	41,243,000	39,197,000
Gross PPE	88,555,000	93,682,000	90,862,000	87,631,000
Properties	1,997,000	2,346,000	2,315,000	2,201,000
Machinery Furniture Equipment	74,460,000	79,320,000	75,974,000	70,022,000
Other Properties	12,098,000	12,016,000	12,573,000	15,408,000
Accumulated Depreciation	-50,563,000	-52,878,000	-49,619,000	-48,434,000
Goodwill And Other Intangible Assets	47,207,000	53,244,000	53,549,000	53,523,000
Goodwill	27,615,000	31,884,000	31,731,000	31,271,000

Other Intangible Assets	19,592,000	21,360,000	21,818,000	22,252,000
Financial Assets	5,642,000	4,216,000	2,912,000	8,424,000
Non Current Deferred Assets	690,000	630,000	580,000	583,000
Non Current Deferred Taxes Assets	19,316,000	19,089,000	21,569,000	23,606,000
Non Current Prepaid Assets	296,000	231,000	247,000	212,000
Defined Pension Benefit	329,000	555,000	60,000	590,000
Total Liabilities Net Minority Interest	91,038,000	96,976,000	97,247,000	105,543,000
Current Liabilities	34,584,000	33,647,000	28,711,000	33,507,000
Current Provisions	674,000	667,000	892,000	1,024,000
Current Debt And Capital Lease Obligation	14,721,000	11,961,000	8,488,000	11,826,000
Current Debt	6,789,000	6,318,000	4,403,000	11,826,000
Current Capital Lease Obligation	3,046,000	2,729,000	3,123,000	2,986,000
Total Non Current Liabilities Net Minority Interest	56,454,000	63,329,000	68,536,000	72,036,000
Long Term Provisions	1,572,000	1,881,000	1,747,000	1,474,000
Long Term Debt And Capital Lease Obligation	51,669,000	58,131,000	59,272,000	62,892,000
Long Term Debt	41,351,000	48,321,000	49,363,000	62,892,000
Long Term Capital Lease Obligation	10,318,000	9,810,000	9,909,000	9,077,000
Trade and Other Payables Non Current	2,184,000	2,516,000	4,909,000	5,189,000
Non Current Accrued Expenses	48,000	28,000	47,000	60,000
Derivative Product Liabilities	1,116,000	1,506,000	3,919,000	4,177,000
Total Equity Gross Minority Interest	64,483,000	56,977,000	57,816,000	62,625,000
Stockholders' Equity	63,399,000	54,687,000	55,804,000	61,410,000
Capital Stock	4,797,000	4,797,000	4,797,000	4,797,000
Common Stock	4,797,000	4,797,000	4,797,000	4,797,000
Additional Paid in Capital	149,145,000	149,018,000	150,812,000	152,629,000
Retained Earnings	-113,086,000	-122,118,000	-121,587,000	-120,349,000
Treasury Stock	7,719,000	7,278,000	6,172,000	7,802,000
Minority Interest	1,084,000	2,290,000	2,012,000	1,215,000
Total Capitalization	63,399,000	54,687,000	55,804,000	61,410,000
Common Stock Equity	63,399,000	54,687,000	55,804,000	61,410,000
Capital Lease Obligations	13,364,000	12,539,000	13,032,000	12,063,000
Net Tangible Assets	16,192,000	1,443,000	2,255,000	7,887,000
Working Capital	-3,922,000	-5,110,000	-441,000	744,000
Invested Capital	63,399,000	54,687,000	55,804,000	61,410,000
Tangible Book Value	16,192,000	1,443,000	2,255,000	7,887,000
Total Debt	66,390,000	70,092,000	67,760,000	74,718,000
Net Debt	36,435,000	47,143,000	49,686,000	61,434,000
Share Issued	28,818,256	28,817,628	28,816,836	28,815,915
Ordinary Shares Number	26,992,565	28,370,051	28,224,193	26,772,165
Treasury Shares Number	1,825,691	447,577	592,642	2,043,750

ANALYSIS OF FINANCIAL STATEMENTS

Horizontal and Vertical Analysis

Horizontal or trend analysis involves comparing financial information over multiple reporting periods, while vertical analysis entails listing line items as a percentage of another item on a financial statement (*Bragg, 2023*). Vertical analysis helps stakeholders assess the relative proportion of different financial statement items within a single period, making it easier to identify trends, patterns, and areas of concern. However, horizontal analysis helps stakeholders understand how a company's financial performance evolves over several periods. It reveals whether specific line items are increasing or decreasing and by what percentage (*Frm, 2023*). Investors and analysts can use horizontal analysis to understand a company's financial performance for several years. It helps them identify trends and growth patterns and evaluate the changes in different items over time. This information can then be used to make projections about the company's future performance (*Tuovila, 2023*). Vertical analysis does not compare the two periods directly; instead, it breaks down each period separately to compare the percentage changes and to determine why they may have changed (*FutureLearn, 2022*).

Analyzing the income statement and balance sheet from 2021 to 2022 for Airtel Africa and Vodafone Group can give a complete picture of operational results and reveal information about the company's financial performance and growth trends.

$$\text{➤ Horizontal Analysis (\%)} = \frac{\text{Horizontal Variation}}{\text{Base Year Amount}} \times 100$$

$$\text{➤ Vertical Analysis (Income Statement)} = \frac{\text{Income Statement Item}}{\text{Total Sales}} \times 100$$

$$\text{➤ Vertical Analysis (Balance Sheet)} = \frac{\text{Balance Sheet Item}}{\text{Total Assets (Liabilities)}} \times 100$$

AIRTEL AFRICA						
HORIZONTAL AND VERTICAL ANALYSIS						
item	27/09/2022	26/09/2021	Horizontal Variation	Variation %	Vertical 2022	Vertical 2021
Assets =	10364.00	9992.00	372.00	3.72	100.00000000	100.000000
+ AssetsCurrent =	1997.00	1905.00	92.00	4.83	19.268622154	19.065250
+ CashAndCashEquivalentsAtCarryingValue	982.00	1136.00	-154.00	-13.56	9.475106137	11.369100
+ AvailableForSaleSecuritiesCurrent	0.00	0.00	0.00	NaN	0.000000000	0.000000
+ AccountsReceivableNetCurrent	0.00	0.00	0.00	NaN	0.000000000	0.000000
+ InventoryNet	3.00	7.00	-4.00	-57.14	0.028946353	0.070056
+ DeferredTaxAssetsNetCurrent	0.00	0.00	0.00	NaN	0.000000000	0.000000
+ NontradeReceivablesCurrent	0.00	0.00	0.00	NaN	0.000000000	0.000000
+ OtherAssetsCurrent	1012.00	762.00	250.00	32.81	9.764569664	7.626101
+ AvailableForSaleSecuritiesNoncurrent	0.00	0.00	0.00	NaN	0.000000000	0.000000
+ PropertyPlantAndEquipmentNet	3512.00	3031.00	481.00	15.87	33.886530297	30.334270
+ Goodwill	3827.00	3835.00	-8.00	-0.21	36.925897337	38.380700
+ IntangibleAssetsNetExcludingGoodwill	634.00	735.00	-101.00	-13.74	6.117329217	7.355885
+ OtherAssetsNoncurrent	394.00	486.00	-92.00	-18.93	3.801620996	4.863891
LiabilitiesAndStockholdersEquity =	10364.00	9992.00	372.00	3.72	100.00000000	100.000000
+ Liabilities =	6715.00	6639.00	76.00	1.14	64.791586260	66.443150
+ LiabilitiesCurrent =	3073.00	3504.00	-431.00	-12.3	29.650714010	35.068050
+ AccountsPayableCurrent	404.00	366.00	38.00	10.38	3.898108838	3.662930
+ AccruedLiabilitiesCurrent	2507.00	3003.00	-496.00	-16.52	24.189502123	30.054040
+ DeferredRevenueCurrent	162.00	135.00	27.00	20.00	1.563103049	1.351081

+ CommercialPaper	0.00	0.00	0.00	NaN	0.000000 000	0.000000
+ DeferredRevenueNoncurrent	0.00	0.00	0.00	NaN	0.000000 000	0.000000
+ LongTermDebt	1486.00	1871.00	-385.00	-20.58	14.33809 3400	18.72498 0
+ OtherLiabilitiesNoncurrent	2156.00	1264.00	892.00	70.57	20.80277 8850	12.65012 0
+ CommitmentsAndContingencie s	0.00	0.00	0.00	NaN	0.000000 000	0.000000
+ StockholdersEquity =	3649.00	3353.00	296.00	8.83	35.20841 3740	33.55685 0
+ CommonStockValue	1879.00	1879.00	0.00	0.00	18.13006 5612	18.80504 0
+ RetainedEarningsAccumulated Deficit	3436.00	2975.00	461.00	15.50	33.15322 2694	29.77382 0
+ AccumulatedOtherComprehens iveIncomeLossNetOfTax	- 1666.15	- 1500.95	-165.20	11.01	- 16.07629 2937	- 15.02150 0
+ CommonStocksIncludingAdditi onalPaidInCapital	0.15	-0.05	0.20	-382.69	0.001418 371	- 0.000520

Item	27/09 /2022	26/09/ 2021	Horizontal Variation	Variation %	Vertical 2022	Vertical 2021
NetIncomeLoss =	631	339	292	86.14	13.385660	8.674514
+ IncomeLossFromContinuingOperationsBefore.. . =	1118	703	415	59.03	23.716589	17.988741
+ OperatingIncomeLoss =	1540	1126	414	36.77	32.668647	28.812692
+ GrossProfit =	3246	2640	606	22.95	68.858719	67.553736
+ SalesRevenueNet	4714	3908	806	20.62	100.00000 0	100.000000
- CostOfGoodsAndServicesSold	1468	1268	200	15.77	31.141281	32.446264
- OperatingExpenses =	1706	1514	192	12.68	36.190072	38.741044
+ ResearchAndDevelopmentExpense	1482	1327	155	11.68	31.438269	33.955988
+ SellingGeneralAndAdministrativeExpense	224	187	37	19.79	4.751803	4.785056
+ NonoperatingIncomeExpense	-422	-423	1	-0.24	-8.952058	-10.823951
- IncomeTaxExpenseBenefit	487	364	123	33.79	10.220929	9.314227

VODAFONE GROUP						
HORIZONTAL AND VERTICAL ANALYSIS						
item	27/09/2022	26/09/2021	Horizontal Variation	Variation %	Vertical 2022	Vertical 2021
Assets =	153953	155063	-1110	-0.72	100.000000	100.000000
+ AssetsCurrent =	28537	28270	267	0.94	18.536177	18.231300
+ CashAndCashEquivalentsAtCarrying Value	15427	14980	447	2.98	10.020591	9.660590
+ AvailableForSaleSecuritiesCurrent	0	0	0	NaN	0.000000	0.000000
+ AccountsReceivableNetCurrent	0	0	0	NaN	0.000000	0.000000
+ InventoryNet	836	676	160	23.67	0.543023	0.435952
+ DeferredTaxAssetsNetCurrent	0	0	0	NaN	0.000000	0.000000
+ NontradeReceivablesCurrent	0	0	0	NaN	0.000000	0.000000
+ OtherAssetsCurrent	12274	12614	-340	-2.70	7.972563	8.134758
+ AvailableForSaleSecuritiesNoncurrent	0	0	0	NaN	0.000000	0.000000
+ PropertyPlantAndEquipmentNet	40804	41243	-439	-1.06	26.504193	26.597577
+ Goodwill	31884	31731	153	0.48	20.710217	20.463296
+ IntangibleAssetsNetExcludingGoodwill	21360	21818	-458	-2.10	13.874364	14.070410
+ OtherAssetsNoncurrent	31368	32001	-633	-1.98	20.375050	20.637418
LiabilitiesAndStockholdersEquity =	153953	155063	-1110	-0.72	100.000000	100.000000
+ Liabilities =	96976	97247	-271	-0.28	62.990653	62.714510
+ LiabilitiesCurrent =	33647	28711	4936	17.19	21.855371	18.515700
+ AccountsPayableCurrent	19661	18070	1591	8.80	12.770781	11.653328

+ AccruedLiabilitiesCurrent	11961	8488	3473	40.92	7.769254	5.473904
+ DeferredRevenueCurrent	2025	2153	-128	-5.95	1.315337	1.388468
+ CommercialPaper	0	0	0	NaN	0.000000	0.000000
+ DeferredRevenueNoncurrent	2516	4909	-2393	-48.75	1.634265	3.165810
+ LongTermDebt	58131	59272	-1141	-1.93	37.758926	38.224464
+ OtherLiabilitiesNoncurrent	2682	4355	-1673	-38.42	1.742090	2.808536
+ CommitmentsAndContingencies	0	0	0	NaN	0.000000	0.000000
+ StockholdersEquity =	56977	57816	-839	-1.45	37.009347	37.285490
+ CommonStockValue	4797	4797	0	0.00	3.115886	3.093581
+ RetainedEarningsAccumulatedDeficit	-122118	-121587	-531	0.44	-79.321611	-78.411355
+ AccumulatedOtherComprehensiveIncomeLossNetOfTax	25280	23794	1486	6.25	16.420596	15.344731
+ CommonStocksIncludingAdditionalPaidInCapital	149018	150812	-1794	-1.19	96.794476	97.258534

item	27/09 /2022	26/09 /2021	Horizontal Variation	Variation %	Vertical 2022	Vertical 2021
NetIncomeLoss =	2088	112	1976	1764.29	4.5809566	0.2556552
+ IncomeLossFromContinuingOperationsBefore... =	4050	4392	-342	-7.79	8.8854761	10.0253373
+ OperatingIncomeLoss =	6014	5419	595	10.98	13.1943835	12.3696044
+ GrossProfit =	15006	13723	1283	9.35	32.9223344	31.3246137
+ SalesRevenueNet	45580	43809	1771	4.04	100.0000000	100.0000000
- CostOfGoodsAndServicesSold	30574	30086	488	1.62	67.0776656	68.6753863
- OperatingExpenses =	8992	8304	688	8.29	19.7279509	18.9550092
+ ResearchAndDevelopmentExpense	-79	-568	489	-86.09	-0.1733216	-1.2965372
+ SellingGeneralAndAdministrativeExpense	9071	8872	199	2.24	19.9012725	20.2515465
+ NonoperatingIncomeExpense	-1964	-1027	-937	91.24	-4.3089074	-2.3442672
- IncomeTaxExpenseBenefit	1962	4280	-2318	-54.16	4.3045195	9.769682

Ratio Analysis

To effectively compare Airtel Africa and Vodafone Group, it is necessary to perform a financial ratio analysis. *Takeuchi* states, "It is the technique of comparing the relationship (or ratio) between two or more items of financial data from a company's financial statements" (*Takeuchi, 2021*).

LIQUIDITY

Liquidity analysis evaluates a company's ability to meet its immediate debt obligations from its current assets.

➤ **Current ratio** = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1997000000}{3073000000} \approx 0.65$	$\frac{1905000000}{3504000000} \approx 0.54$	$\frac{28537000000}{33647000000} \approx 0.85$	$\frac{28270000000}{28711000000} \approx 0.98$
0.65:1	0.54:1	0.85:1	0.98:1

Airtel Africa's current ratio has improved in 2022 compared to 2021. A current ratio above 1 is considered a good sign for a company's short-term financial health, indicating that it has more current assets than current liabilities. On the other hand, Vodafone Group's current ratio has decreased from 2021 to 2022, which may suggest that the company's ability to cover its short-term liabilities with its current assets has decreased in 2022 compared to 2021. Even though a ratio above 1 is still desirable in this case, the decrease in the ratio can indicate lower short-term financial stability.

$$\text{➤ Quick ratio} = \frac{\text{Quick Assts}}{\text{Current Liabilities}} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1997000000 - 3000000}{3073000000}$	$\frac{1905000000 - 7000000}{3504000000}$	$\frac{28537000000 - 836000000}{33647000000}$	$\frac{28270000000 - 676000000}{28711000000}$
0.65:1	0.54:1	0.82:1	0.96:1

It can be observed that the quick ratio of Airtel Africa has improved from 2021 to 2022. This indicates that the company now has a better ability to cover its short-term liabilities with liquid assets. On the other hand, the quick ratio of Vodafone Group has decreased from 2021 to 2022, which suggests that the company's ability to cover its short-term obligations has reduced.

PROFITABILITY

$$\text{➤ Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Average Total Assets}} \times 100$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{631000000}{10178000000} \times 100$	$\frac{339000000}{10178000000} \times 100$	$\frac{2088000000}{154508000000} \times 100$	$\frac{112000000}{154508000000} \times 100$
6.2 %	3.3 %	1.4 %	0.07 %

The ROA has improved for both Airtel Africa and Vodafone Group from 2021 to 2022, indicating that they generate more profit relative to their total assets.

➤ **Gross Profit Margin** = $\frac{\text{Gross Profit}}{\text{Sales Revenue}} \times 100$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{3246000000}{4714000000} \times 100$	$\frac{2640000000}{3908000000} \times 100$	$\frac{15006000000}{45580000000} \times 100$	$\frac{13723000000}{43809000000} \times 100$
69%	68%	33%	31%

Airtel Africa had a higher Gross Profit Margin than Vodafone Group in both 2021 and 2022. This suggests that Airtel Africa is more effective in managing its production costs relative to its revenue compared to Vodafone Group.

➤ **Net Profit Margin** = $\frac{\text{Net Income}}{\text{Sales Revenue}} \times 100$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{631000000}{4714000000} \times 100$	$\frac{339000000}{3908000000} \times 100$	$\frac{2088000000}{45580000000} \times 100$	$\frac{112000000}{43809000000} \times 100$
13.38%	8.68%	4.58%	0.26%

Both companies experienced an increase in Net Profit Margin from 2021 to 2022, showing improved efficiency in managing costs and generating profits relative to their revenue.

➤ **Return on Equity (ROE)** = $\frac{\text{Net Income}}{\text{Average Shareholders Equity}} \times 100$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{631000000}{3501000000} \times 100$	$\frac{339000000}{3501000000} \times 100$	$\frac{2088000000}{57396500000} \times 100$	$\frac{112000000}{57396500000} \times 100$
18 %	9.7 %	3.6 %	0.2 %

Both companies have shown an increase in ROE from 2021 to 2022, indicating improved profitability in relation to shareholders' equity over the period.

➤ **Operating Profit Margin** = $\frac{\text{Operating Income}}{\text{Sales Revenue}} \times 100$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1540000000}{4714000000} \times 100$	$\frac{1126000000}{3908000000} \times 100$	$\frac{6014000000}{45580000000} \times 100$	$\frac{5419000000}{43809000000} \times 100$
33 %	29 %	13.2 %	12.4 %

Both companies demonstrated an increase in their operating profit margin between 2021 and 2022, which indicates an improvement in their ability to generate profits from their operations relative to their revenues.

EFFICIENCY

➤ **Inventory Turnover** = $\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1468000000}{5000000}$	$\frac{1268000000}{5000000}$	$\frac{30574000000}{756000000}$	$\frac{30086000000}{756000000}$
293.6	253.6	40.4	39.8

Airtel Africa had a higher inventory turnover ratio than Vodafone Group in 2021 and 2022. This suggests that Airtel Africa is managing its inventory more efficiently, selling and replacing it more frequently than Vodafone Group.

$$\text{➤ Fixed Assets Turnover} = \frac{\text{Total Revenue}}{\text{Average Fixed Assets}}$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{4714000000}{8227000000}$	$\frac{3908000000}{8227000000}$	$\frac{45580000000}{126104500000}$	$\frac{43809000000}{126104500000}$
0.57	0.48	0.36	0.35

Both companies have shown an improvement in this ratio, with Airtel Africa experiencing a more significant increase. A higher fixed assets ratio indicates better efficiency in utilizing fixed assets to generate revenue.

$$\text{➤ Total Assets Turnover} = \frac{\text{Total Revenue}}{\text{Average Total Assets}}$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{4714000000}{10178000000}$	$\frac{3908000000}{10178000000}$	$\frac{45580000000}{154508000000}$	$\frac{43809000000}{154508000000}$
0.46	0.38	0.295	0.284

Airtel Africa has demonstrated a significant improvement in total asset turnover, indicating better utilization of assets to generate revenue. Meanwhile, Vodafone Group has maintained a relatively stable total asset turnover.

SOLVENCY

➤ **Debt to Assets Ratio** = $\frac{\text{Liabilities}}{\text{Total Assets}}$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{6715000000}{10364000000}$	$\frac{6639000000}{9992000000}$	$\frac{96976000000}{153953000000}$	$\frac{97247000000}{155063000000}$
0.65	0.66	0.63	0.63

There was a slight decrease in the ratio for Airtel Africa between 2021 and 2022, indicating an improvement in financial leverage. The ratio remained stable for Vodafone Group during both years, indicating consistent financial leverage.

➤ **Debt to Equity Ratio** = $\frac{\text{Liabilities}}{\text{Stockholders Equity}}$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{6715000000}{3649000000}$	$\frac{6639000000}{3353000000}$	$\frac{96976000000}{56977000000}$	$\frac{97247000000}{57816000000}$
1.84	1.98	1.7	1.68

Airtel Africa has displayed a favorable trend with a decrease in its debt-to-equity ratio from 2021 to 2022. This could be observed as a positive sign as it indicates a lower dependence on debt for financing. On the other hand, Vodafone Group's ratio stayed relatively stable, indicating a steady financial structure, although there was a slight increase.

$$\text{Interest Coverage Ratio} = \frac{EBIT}{\text{Interest Expense}}$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1665000000}{441000000}$	$\frac{1129000000}{432000000}$	$\frac{5918000000}{1964000000}$	$\frac{5427000000}{1027000000}$
3.77	2.61	3.01	5.28

A higher interest coverage ratio is considered favourable as it indicates that a company has more income to cover its interest payments. However, if the interest coverage ratio declines, it raises concerns about the company's ability to meet its interest obligations in the future. In 2022, both Airtel Africa and Vodafone Group have moderate interest coverage ratios. Airtel Africa improved from 2021, while Vodafone Group experienced a decrease.

FINANCIAL GEARING

$$\text{Gearing Ratio} = \frac{\text{Long-term (non-current) liabilities}}{\text{Total Assets} \div \text{Share capital} + \text{Reserves} + \text{Long-term (non-current) liabilities}} \times 100$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{3642000000 \times 100}{3649000000 + 3642000000}$	$\frac{3135000000 \times 100}{3353000000 + 3135000000}$	$\frac{63329000000 \times 100}{56977000000 + 63329000000}$	$\frac{68536000000 \times 100}{57816000000 + 68536000000}$
49.95 %	48.32 %	52.64 %	54.24 %

The ratio for Airtel Africa slightly decreased from 2021 to 2022, indicating a slight improvement in the contribution of long-term lenders to the long-term capital structure of the business. On the other hand, the ratio decreased for Vodafone Group from 2021 to 2022, indicating a reduction in the contribution of long-term lenders to the long-term capital structure of the business.

INVESTMENT

➤ **Earnings per Share (EPS)** =
$$\frac{\text{Net Income}}{\text{Weighted Average Shares Outstanding}}$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{631000000}{3754180000}$	$\frac{339000000}{3757550000}$	$\frac{2088000000}{29012000000}$	$\frac{112000000}{29592000000}$
0.168	0.09	0.07	0.004

Both Airtel Africa and Vodafone Group saw an increase in earnings per share from 2021 to 2022. This can be seen as a positive indicator of enhanced profitability on a per-share basis for both companies during this time period.

OPERATIONAL

➤ **Operating Ratio** =
$$\frac{\text{Operating Expenses}}{\text{Nets Sales}} \times 100$$

Airtel Africa		Vodafone Group	
2022	2021	2022	2021
$\frac{1706000000}{4714000000}$	$\frac{1514000000}{3908000000}$	$\frac{8992000000}{45580000000}$	$\frac{8304000000}{43809000000}$
36%	39%	19.7%	19%

There was a decrease in operating ratio for Airtel Africa from 2021 to 2022, indicating improved operational efficiency. However, there was an increase in operating ratio for Vodafone Group from 2021 to 2022, indicating a slight decrease in operational efficiency.

RATIO ANALYSIS	Airtel Africa		Vodafone Group	
	2022	2021	2022	2021
LIQUIDITY				
Current Ratio	0.65	0.54	0.85	0.98
Quick Ratio	0.65	0.54	0.82	0.96
PROFITABILITY				
Return on Assets (ROA)	6.2 %	3.3 %	1.4 %	0.07 %
Gross Profit Margin	69 %	68 %	33 %	31 %
Net Profit Margin	13.38 %	8.68 %	4.58 %	0.26 %
Return on Equity (ROE)	18 %	9.7 %	3.6 %	0.2 %
Operating Profit Margin	33 %	29 %	13.2 %	12.4 %
EFFICIENCY				
Inventory Turnover	293.6	253.6	40.4	39.8
Fixed Assets Turnover	0.57	0.48	0.36	0.35
Total Assets Turnover	0.46	0.38	0.295	0.294
INVESTMENT				
Earnings per Share (EPS)	0.168	0.09	0.07	0.004
FINANCIAL GEARING				
Gearing Ratio	49.95 %	48.32 %	52.64 %	52.24 %
SOLVENCY				
Debt to Assets Ratio	0.65	0.66	0.63	0.63
Debt to Equity Ratio	1.84	1.98	1.7	1.68
Interest Coverage Ratio	3.77	2.61	3.01	5.28
OPERATIONAL				
Operating Ratio	36 %	39 %	19.7 %	19 %

ANALYSIS OF MARKET DATA

The Capital Asset Pricing Model (CAPM) was initially developed by Sharpe (1964) and Lintner (1965), which received a Nobel Prize in 1990 (*Bailey, 2023*). He expanded upon earlier research on risk preferences by Harry Markowitz to develop a novel theory of Capital Asset Prices, a theory of market equilibrium in situations involving risk. "The capital Asset Pricing Model (CAPM) describes the relationship between systematic risk, or the general perils of investing, and expected return for assets, particularly stocks" (*Bailey, 2023*). The Capital Asset Pricing Model (CAPM) explains the relationship between an asset's expected return, specifically stocks, and its systematic risk or the general risks associated with investing (*Kenton, 2023*). It is a widely accepted model that connects the anticipated return of an asset, the risk-free rate, and the asset's systematic risk. It presents a structure for calculating the rate of return for an investment considering the time value of money and the risk associated with the asset. The CAPM formula is as follows:

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f]$$

Where:

- $E(R_i)$ = expected return
- R_f = risk-free rate of interest.
- β_i = beta (volatility – this estimates risk)
- $E(R_m)$ = expected return on the market portfolio.
- $E(R_m) - R_f$ = Market risk premium or the price per unit risk.

The Capital Asset Pricing Model (CAPM) is a valuation model that helps estimate the expected return on an investment. It does so by adding the risk-free rate to the product of the investment's beta or risk and the expected return of the market and subtracting the risk-free rate from the result. The difference between the two rates is known as the market risk premium.

However, it is important to note that the model has some limitations. Its assumptions are often idealistic, and beta coefficients can be unpredictable and change over time. It is also important to remember that beta only reflects systemic risk, not total risk. Despite these shortcomings, the CAPM remains popular for valuing securities (*Tamplin, 2023*).

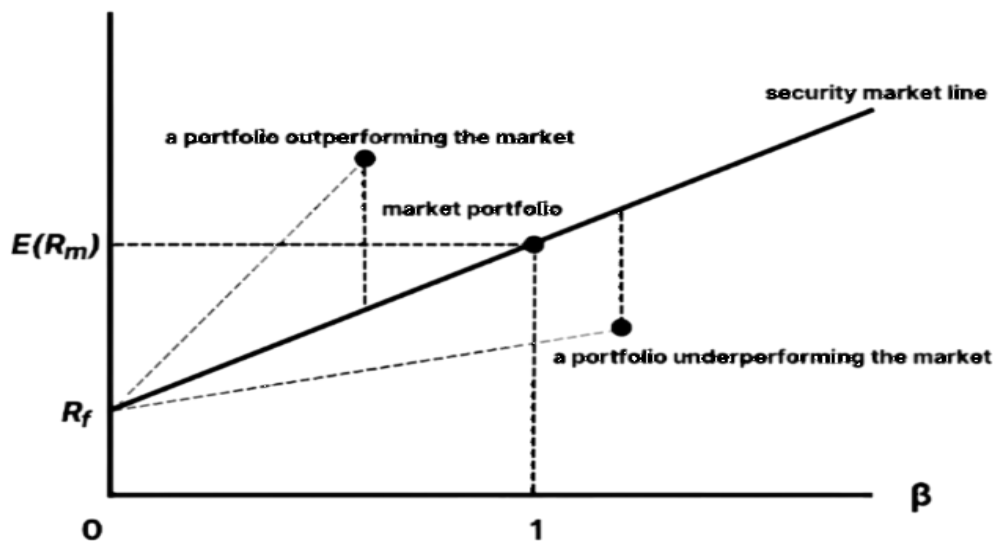


Figure 5: Capital Asset Pricing Model (CAPM)

The Security Market Line (SML) is a graphical representation of the Capital Asset Pricing Model (CAPM). It helps determine whether an investment product will provide a favourable expected return compared to its level of risk. Kenton states, "The Security Market Line (SML) is a useful tool for determining whether a security offers a favourable expected return based on its level of risk. When security is plotted on the SML chart, it is considered undervalued if it appears above the line because it offers a greater return against its inherent risk". On the other hand, if the security plots below the SML, it is considered overvalued because the expected return does not outweigh the inherent risk. (*Kenton, 2022*). As per the Capital Asset Pricing Model (CAPM), if the level of risk increases, the expected return should also increase proportionately. If a security shows a higher return in comparison to the additional risk incurred, it is considered a buying opportunity. However, like all valuation models, CAPM has its limitations due to its idealistic assumptions.

For instance, Beta coefficients are unpredictable and change over time, and they only reflect systemic risk rather than total risk. Despite these limitations, CAPM remains a popular model for valuing securities (*Tamplin, 2023*). The CAPM formula evaluates whether a stock is fairly valued by comparing its risk and the time value of money with its expected return.

Ticker	Stock	Estimated Returns	Betas	Weights
AAF.L	Airtel Africa PLC	0.14	0.83	0.028
CPG.L	Compass Group PLC	0.00	1.08	0.017
AZN.L	AstraZeneca PLC	0.04	0.54	0.106
BP.L	BP PLC	0.02	1.20	0.091
CRH.L	CRH PLC	0.07	1.15	0.040
HSBA.L	HSBC Holdings PLC	0.02	1.03	0.006
ULVR.L	Unilever PLC	- 0.01	0.47	0.331
GSK.L	GlaxoSmithKline PLC	0.00	0.63	0.138
VOD.L	Vodafone Group PLC	- 0.05	0.88	0.001
SHEL.L	Royal Dutch Shell PLC (Shell)	0.08	1.12	0.001
DGE.L	Diageo PLC	0.02	0.91	0.040
RIO.L	Rio Tinto Group	0.05	0.97	0.008
PRU.L	Prudential PLC	- 0.03	1.42	0.002
GLEN.L	Glencore PLC	0.12	1.24	0.020
REL.L	RELX PLC	0.07	0.79	0.004
LLOY.L	Lloyds Banking Group PLC	0.03	1.23	0.002
RR.L	Rolls-Royce Holdings PLC	0.00	1.27	0.014
WG.L	Wood Group PLC	- 0.07	1.11	0.000
NG.L	National Grid PLC	0.01	0.56	0.150
ISF.L	iShares PLC	0.03	1.00	

Airtel Africa (AAF.L) is expected to provide a return above the risk-free rate, with a positive expected return of 0.14. It has a beta of 0.83, which means it is less volatile than the market (beta < 1), suggesting a moderate level of risk. On the graph, Airtel Africa's position will be above the security market line.

On the other hand, Vodafone Group (VOD.L) has a negative expected return of -0.05, indicating a potential lower return compared to the risk-free rate. With a beta of 0.88, it is less volatile than the market but more so than Airtel Africa. Vodafone Group's position on the graph will be below the security market line. iShares (ISF.L) represents the market and has a beta of 1.00. Its expected return will be the same as the market return. The graph shows that iShares' position will align with the security market line.

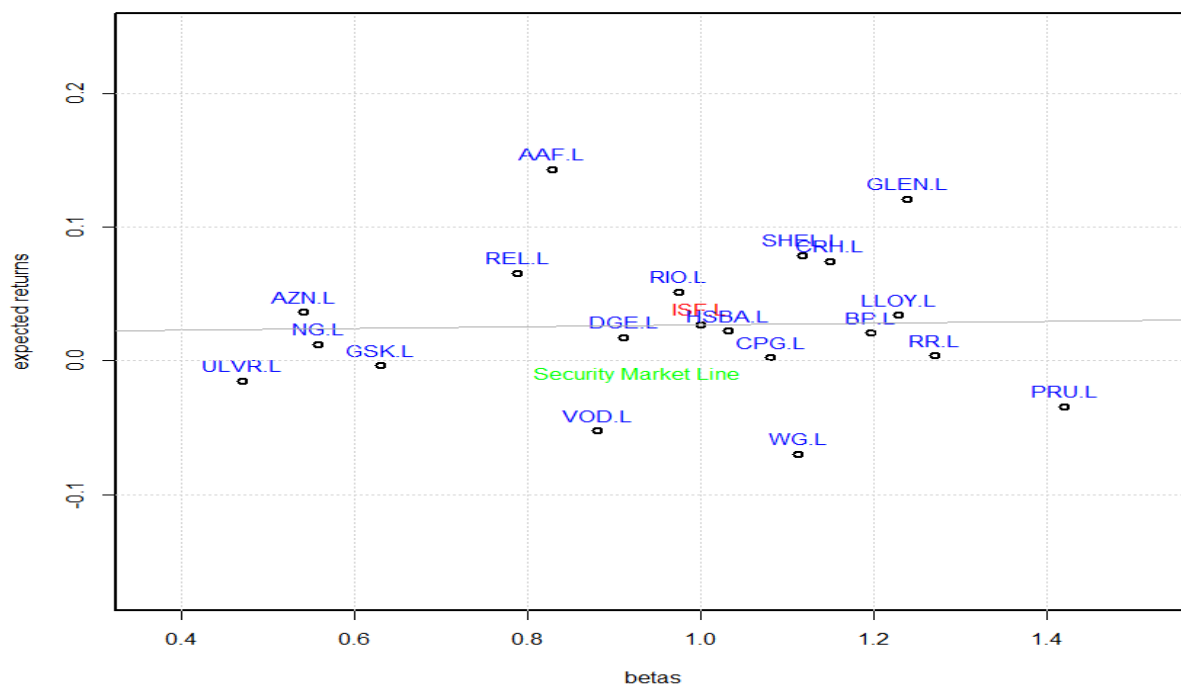


Figure 6: CAPM FOR SOME UKSTOCKS

In **Figure 6**, we can see that the security market line has an upward and positive slope trajectory. To determine if Airtel Africa and Vodafone Group shares are overpriced or underpriced, we can use the Capital Asset Pricing Model (CAPM).

The CAPM results show that AAF.L is above the SML and VOD.L is below the market line. This means that AAF.L is undervalued or underpriced, while VOD.L is overvalued or overpriced. AAF.L offers slightly higher returns with a lower beta, which means a lower expected risk. On the other hand, VOD.L has a higher beta than AAF.L, which means it has slightly higher risk. The ISF.L represents the market with an expected return equal to the market return. Both stocks have a beta smaller than one, making them both not very risky for investors. Based on the CAPM analysis, AAF.L represents a better investment opportunity compared to VOD.L as it is underpriced relative to the expected return. However, it's important to consider the level of risk involved, as high beta stocks generally come with risks. Opting to invest in AAF.L could be a better choice since VOD.L has a higher beta value. Additionally, the relationship between beta and expected return was further described as companies with higher beta having less market return, and less beta being related to higher market return. According to the relationship between beta and expected return, AAF.L has a higher potential to provide the expected return as it has a lower beta when compared to VOD.L.

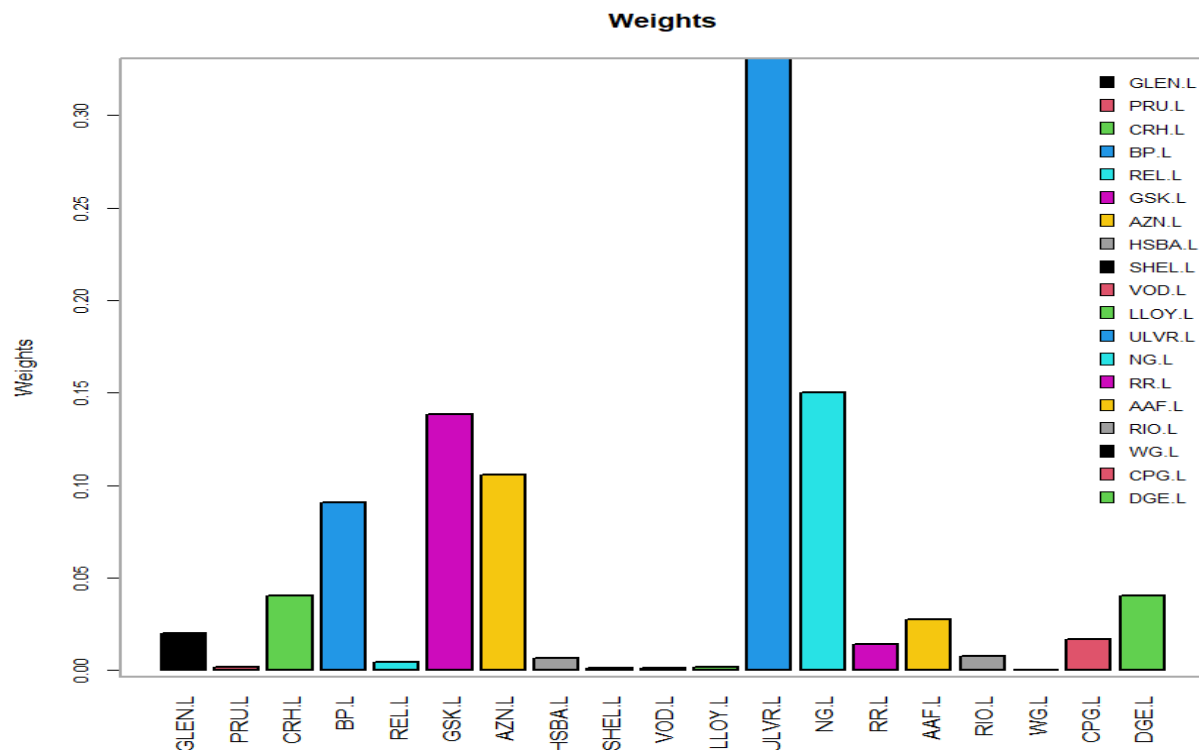


Figure 7: Portfolio Analytics Graph of UKSTOCKS



Figure 8: Cumulative Returns of UKSTOCKS

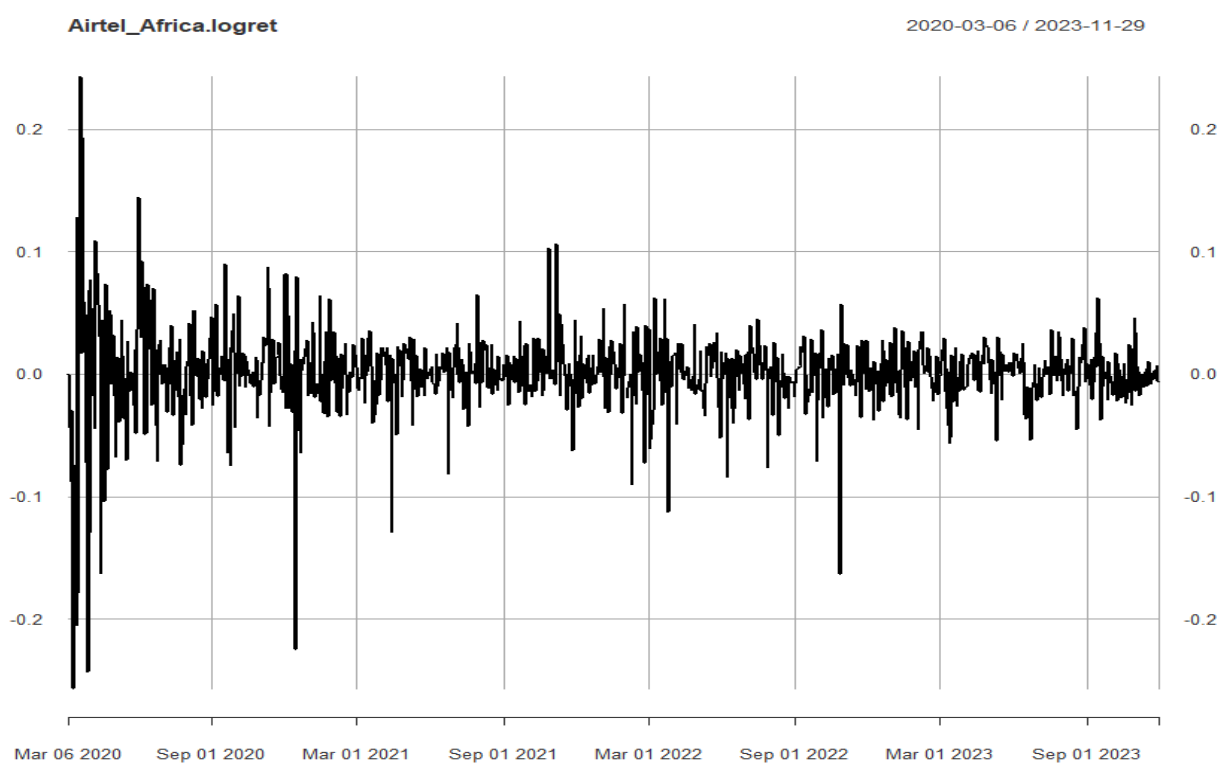


Figure 9: Log Return for Airtel Africa

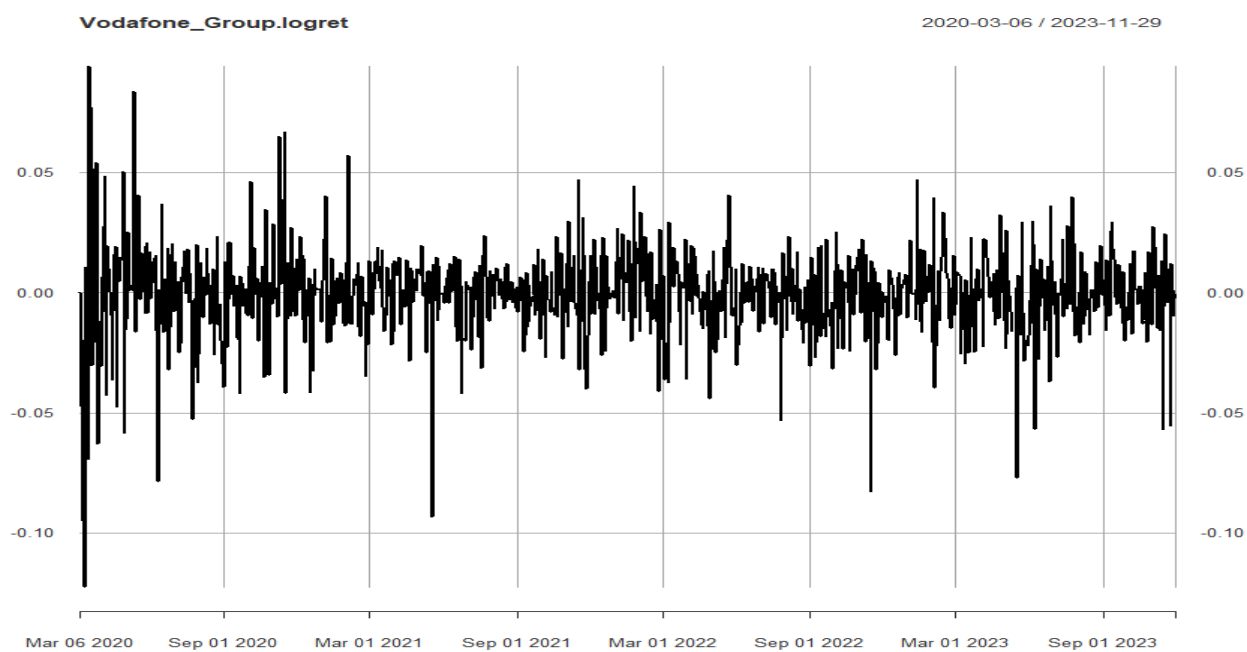


Figure 10: Log Return for Vodafone Group

Recommendations & Conclusion

The financial analysis of Airtel Africa (AAF.L) and Vodafone Group (VOD.L) involved a comprehensive analysis of their financial statements, ratio analysis, and an evaluation of market data using the Capital Asset Pricing Model (CAPM). The financial statement analysis revealed various information about the companies' financial performance, growth trends, and overall financial health. Airtel Africa has shown positive growth trends in its financial statements, with increased assets, net income and various margins. The company has efficiently managed its current and non-current assets, leading to improved ratios. However, Vodafone Group also exhibited growth but faced challenges in liquidity and a decrease in the current ratio.

Liquidity analysis indicated that Airtel Africa improved in current and quick ratios from 2021 to 2022, which suggests better short-term financial health. In contrast, Vodafone Group experienced a decrease in both ratios, raising concerns about its ability to cover short-term liabilities with current assets. Profitability ratios, including Return on Assets (ROA), Gross Profit Margin, Net Profit Margin, and Return on Equity (ROE), demonstrated positive trends for both companies from 2021 to 2022. Airtel Africa consistently outperformed Vodafone Group in Gross Profit Margin, indicating better efficiency in managing production costs. Efficiency ratios such as inventory turnover, fixed assets turnover, and total assets turnover showed that Airtel Africa was more efficient than Vodafone Group in managing inventory and generating revenue from fixed and total assets. Solvency ratios, including Debt Assets Ratio, Debt to Equity Ratio, and Interest Coverage Ratio, indicated that both companies maintained relatively stable financial structures. Airtel Africa showed a slight improvement in the Debt-to-Equity Ratio, while Vodafone Group experienced a decrease in the Interest Coverage Ratio. The financial gearing analysis revealed that Airtel Africa and Vodafone Group exhibited positive trends in their Gearing Ratios. Airtel Africa shows a decrease, indicating a slight improvement in long-term financial structure. The additional ratios, including the cost-to-income ratio and Altman Z-Score, provide further insights into the financial health and risk profiles of Airtel Africa and Vodafone Group.

The cost-to-income ratio compares operating expenses to operating income and reflects the efficiency of a company's operations. Airtel Africa showed an improvement in its cost-to-income ratio from 2021 to 2022, indicating increased efficiency. On the other hand, Vodafone Group experienced a slight increase, suggesting a potential concern about operational efficiency. The Altman Z-Score which measures a company's financial distress and bankruptcy risk. A score below 1.8 suggests a high risk of bankruptcy, while a score above 3.0 indicates financial stability. Airtel Africa shows an improvement in its Z score from 2021 to 2022, moving towards a more stable position. In contrast, Vodafone Group's Z score remains in the distressed range, indicating a higher risk of financial distress.

Financial ratio analysis has limitations. Takeuchi states, "It is quantitative rather than qualitative. It, therefore, does not address certain factors that can play a huge role in determining a company's prospects. For example, it cannot analyse the quality of their management. Although financial ratio analysis can be hugely useful, it only tells part of the story" (*Takeuchi, 2021*).

Moreover, financial ratio is based on certain assumptions and their idealistic nature may not capture all aspects of a company's prospect. The market data analysis used the Capital Asset Pricing Model (CAPM) to assess the expected returns and betas of Airtel Africa and Vodafone Group compared to other listed companies. The security market line (SML) assessed whether the stocks were undervalued or overvalued based on their expected returns and inherent risk. Airtel Africa displayed a positive estimated return, while Vodafone Group's was negative. Both companies had betas below 1, indicating lower volatility than the market.

Tamplin states, "Like all valuation models, CAPM has its limitations since some assumptions it uses are idealistic. For example, Beta coefficients are unpredictable, change over time, and only reflect systemic risk rather than total risk. Despite its shortcomings, this model is very popular for valuing securities" (*Tamplin, 2023*).

Considering the purpose of this report, which is to determine which of the companies is the best choice for investment, we can draw a conclusion that after a thorough analysis of both Airtel Africa (AAF.L) and Vodafone Group (VOD.L), incorporating financial statements analysis, ratio analysis, and market data analysis using the Capital Asset Pricing Model (CAPM).

Based on the analysis, the recommendation is to consider Airtel Africa (AAF.L) as the more favourable investment option than Vodafone Group. The company has demonstrated robust financial performance, efficient asset management, and improved ratios across various categories. Vodafone Group, on the other hand, faces concerns in liquidity and a slight decrease in financial ratios. Additionally, the CAPM analysis indicates positive estimated returns for Airtel Africa compared to Vodafone Group. Airtel Africa appears to be a more favourable investment option based on the overall analysis. Airtel Africa consistently improved across various financial metrics, indicating better financial health, operational efficiency, and market performance than Vodafone Group. The liquidity, profitability, and stability indicators improve its favourable position. Vodafone Group faces concerns about liquidity, a slight decrease in financial ratios, and a higher risk of financial distress based on Altman's Z Score. However, there are also limitations of limited data sources as the analysis relied on data from Yahoo Finance, and the analysis's accuracy depends on the data source's reliability.

In conclusion, while financial ratios provide valuable insights into the performance and risk of companies, investors should consider a holistic approach, incorporating qualitative factors and staying updated on market conditions. Airtel Africa's positive trends across various metrics make it a more compelling investment choice than Vodafone Group. Still, investors should always be cautious and carefully research before making any investment decisions.

APPENDICES

List of aggregations to fit the Balance Sheet template

Assets = Assets Current + Assets Non-Current

Assets Current =

- + Cash and Cash Equivalent at Carrying Value (Cash and Cash Equivalents + Other short-term investment)
- + Available for Sale Securities Current
- + Account Receivable Net Current (Net receivables)
- + Inventory Net (Inventory)
- + Deferred Tax Assets Net Current
- + Nontrade Receivables Current
- + Other Assets Current (Other current assets)

Assets Non-Current =

- + Available for Sale Securities Non-Current
- + Property Plant and Equipment Net (Property plant and equipment)
- + Goodwill (Goodwill)
- + Intangible Assets Net Excluding Goodwill (Intangible Assets)
- + Other Assets Non-Current (Other long-term assets + Other non-current assets)

Liabilities and Stockholders' Equity = Liabilities + Stockholders' Equity

Liabilities =

- + Liabilities Non-Current (Accounts Payable Current (Accounts Payable) + Accrued Liabilities Current + Deferred Revenue Current + Commercial Paper)
- + Deferred Revenue Non-Current (Deferred revenues)
- + Long-Term Debt (Long-term debt)
- + Other Liabilities Non-Current (Other long-term liabilities + Other non-current liabilities)

Stockholders' Equity =

- + Common Stock Value (Common Stock)
- + Retained Earnings Accumulated Deficit (Retained earnings)
- + Accumulated Other Comprehensive Income Loss Net of Tax
- + Common Stocks Including Additional Paid in Capital

List of aggregations to fit the Income Statement template

Net Income Loss (Net Income) =

+ **Income Loss from Continuing Operations Before**

+ **Operating Income Loss** (Operating income or loss)

+ **Gross Profit** (Gross profit)

+ **Sales Revenue Net** (Total Revenue)

- **Cost of Goods and Services Sold** (Cost of Revenue)

- **Operating Expenses**

+ **Research and Development Expense**

+ **Selling General and Administrative Expense** (Selling General and
Administrative)

+ **Non-Operating Income Expense** (Net Interest Income)

- **Income Tax Expense Benefit** (Taxation)

Airtel Africa Aggregated Balance Sheet

AIRTEL AFRICA		
item	27/09/2022	26/09/2021
Assets =	10364000000	9992000000
+ AssetsCurrent =	1997000000	1905000000
+ CashAndCashEquivalentsAtCarryingValue	982000000	1136000000
+ AvailableForSaleSecuritiesCurrent	0	0
+ AccountsReivableNetCurrent	123000000	113000000
+ InventoryNet	3000000	7000000
+ DeferredTaxAssetsNetCurrent	0	0
+ NontradeReceivablesCurrent	0	0
+ OtherAssetsCurrent	889000000	649000000
+ AvailableForSaleSecuritiesNoncurrent	0	0
+ PropertyPlantAndEquipmentNet	3512000000	3031000000
+ Goodwill	3827000000	3835000000
+ IntangibleAssetsNetExcludingGoodwill	634000000	735000000
+ OtherAssetsNoncurrent	394000000	486000000
LiabilitiesAndStockholdersEquity =	10364000000	9992000000
+ Liabilities =	6715000000	6639000000
+ LiabilitiesCurrent =	3073000000	3504000000
+ AccountsPayableCurrent	404000000	366000000
+ AccruedLiabilitiesCurrent	2507000000	3003000000
+ DeferredRevenueCurrent	162000000	135000000
+ CommercialPaper	0	0
+ DeferredRevenueNoncurrent	0	0
+ LongTermDebt	1486000000	1871000000
+ OtherLiabilitiesNoncurrent	2156000000	1264000000
+ CommitmentsAndContingencies	0	0
+ StockholdersEquity =	3649000000	3353000000
+ CommonStockValue	1879000000	1879000000
+ RetainedEarningsAccumulatedDeficit	3436000000	2975000000
+ AccumulatedOtherComprehensiveIncomeLossNetOfTax	-1666147000	-1500948000
+ CommonStocksIncludingAdditionalPaidInCapital	147000	-52000

Vodafone Group Aggregated Balance Sheet

VODAFONE GROUP		
item	27/09/2022	26/09/2021
Assets =	153953000000	155063000000
+ AssetsCurrent =	28537000000	28270000000
+ CashAndCashEquivalentsAtCarryingValue	15427000000	14980000000
+ AvailableForSaleSecuritiesCurrent	0	0
+ AccountsReceivableNetCurrent	11019000000	10923000000
+ InventoryNet	836000000	676000000
+ DeferredTaxAssetsNetCurrent	0	0
+ NontradeReceivablesCurrent	0	0
+ OtherAssetsCurrent	1255000000	1691000000
+ AvailableForSaleSecuritiesNoncurrent	0	0
+ PropertyPlantAndEquipmentNet	40804000000	41243000000
+ Goodwill	31884000000	31731000000
+ IntangibleAssetsNetExcludingGoodwill	21360000000	21818000000
+ OtherAssetsNoncurrent	31368000000	32001000000
LiabilitiesAndStockholdersEquity =	153953000000	155063000000
+ Liabilities =	96976000000	97247000000
+ LiabilitiesCurrent =	33647000000	28711000000
+ AccountsPayableCurrent	19661000000	18070000000
+ AccruedLiabilitiesCurrent	11961000000	8488000000
+ DeferredRevenueCurrent	2025000000	2153000000
+ CommercialPaper	0	0
+ DeferredRevenueNoncurrent	2516000000	4909000000
+ LongTermDebt	58131000000	59272000000
+ OtherLiabilitiesNoncurrent	2682000000	4355000000
+ CommitmentsAndContingencies	0	0
+ StockholdersEquity =	56977000000	57816000000
+ CommonStockValue	4797000000	4797000000
	-	-
+ RetainedEarningsAccumulatedDeficit	122118000000	121587000000
+ AccumulatedOtherComprehensiveIncomeLossNetOfTax	25280000000	23794000000
+ CommonStocksIncludingAdditionalPaidInCapital	149018000000	150812000000

Airtel Africa and Vodafone Group Aggregated Income Statement

AIRTEL AFRICA		
item	27/09/2022	26/09/2021
NetIncomeLoss =	631000000	339000000
+ IncomeLossFromContinuingOperationsBefore... =	1118000000	703000000
+ OperatingIncomeLoss =	1540000000	1126000000
+ GrossProfit =	3246000000	2640000000
+ SalesRevenueNet	4714000000	3908000000
- CostOfGoodsAndServicesSold	1468000000	1268000000
- OperatingExpenses =	1706000000	1514000000
+ ResearchAndDevelopmentExpense	1482000000	1327000000
+ SellingGeneralAndAdministrativeExpense	224000000	187000000
+ NonoperatingIncomeExpense	-422000000	-423000000
- IncomeTaxExpenseBenefit	487000000	364000000

VODAFONE GROUP		
item	27/09/2022	26/09/2021
NetIncomeLoss =	2088000000	112000000
+ IncomeLossFromContinuingOperationsBefore... =	4050000000	4392000000
+ OperatingIncomeLoss =	6014000000	5419000000
+ GrossProfit =	15006000000	13723000000
+ SalesRevenueNet	45580000000	43809000000
- CostOfGoodsAndServicesSold	30574000000	30086000000
- OperatingExpenses =	8992000000	8304000000
+ ResearchAndDevelopmentExpense	-79000000	-568000000
+ SellingGeneralAndAdministrativeExpense	9071000000	8872000000
+ NonoperatingIncomeExpense	-1964000000	-1027000000
- IncomeTaxExpenseBenefit	1962000000	4280000000

Calculations of Two Additional Ratios

Cost-to-income ratio =	Airtel Africa		Vodafone Group	
	2022	2021	2022	2021
$\frac{\text{Operating expenses}}{\text{Operating income}} \times 100$	$\frac{1706000000}{1540000000}$	$\frac{1514000000}{1126000000}$	$\frac{8992000000}{6014000000}$	$\frac{8304000000}{5419000000}$
	111 %	134 %	150%	153 %

This ratio compares income and operating expenses to determine whether the company is profitable. A decreasing cost-to-income ratio over time reflects improved efficiency, while an increasing cost-to-income ratio reflects concerns about operational efficiency. (*Indeed Editorial Team, 2023*).

Altman's Z score $Z = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$	Airtel Africa		Vodafone Group	
	2022	2021	2022	2021
A = Working capital / total assets	- 0.12	- 0.19	- 0.04	- 0.003
B = retained earnings / total assets	0.42	0.42	- 1.11	-1.098
C = earnings before interest and tax / total assets	0.53	0.36	0.13	0.115
D = market value equity / total liabilities	0.32	0.31	0.36	0.357
E = sales / total assets	0.45	0.39	0.30	0.283
Z =	1.60	1.29	- 0.36	- 0.35

To summarize, there have been changes in the Z-Scores of Airtel Africa and Vodafone Group from 2021 to 2022. The Z-Score of Airtel Africa increased from 1.29 to 1.60 during this period, while Vodafone Group's Z-Score decreased from -0.35 to -0.36. A negative Z-Score indicates a higher risk of bankruptcy. If the Z-Score of a company falls below 1.8, it is likely to face bankruptcy. However, if a company's Z-Score is above 3, it is not likely to go bankrupt (*Kenton, 2022*).

REFLECTIVE REPORTS

10892938

This reflective report critically evaluates my contributions and learning experiences during my Business Analytics coursework with my team. In this coursework, I was responsible for analysing the financial statements and market data (CAPM) of the two companies, Airtel Africa and Vodafone Group. I carried out the horizontal and vertical analysis, ratio calculations, and the CAPM using R-studio software during the coursework. I created graphs and tables for the financial analysis and market data part using Excel and the R studio software. Since my background is a Bachelor's in Computer Science with no experience in Finance, I have learnt how to analyse data for different companies.

Throughout the coursework, I encountered both achievements and challenges. The achievement lies in successfully conducting a comprehensive financial analysis using various tools and techniques like the R-studio software. I gained valuable insights into interpreting financial statements, calculating ratios, and understanding market data. Applying CAPM to evaluate investment opportunities gave me a practical understanding of how financial models can guide decision-making in the business world. However, challenges were also part of the learning process. Understanding and interpreting financial ratios required a deep dive into accounting principles and financial concepts. Moreover, extracting relevant information from financial statements and applying it to real-world scenarios demanded a thorough understanding of the telecommunication industry and the broader economic context. Based on the analyses conducted, I evaluated the outcomes critically and provided a solid recommendation on which investment opportunity is considered the best option.

In terms of personal growth, this coursework significantly enhanced my analytical and critical thinking skills in interpreting financial data and drawing meaningful conclusions, a crucial skill for a student pursuing an MSc in Data Science and Business Analytics. Moving forward, I recognise areas for improvement, such as further refinement of financial modelling skills, especially using advanced statistical and machine learning techniques to enhance the depth of the analysis. The experiences gained during this coursework have significantly shaped my future career prospects.

As a student in the MSc in Data Science and Business Analytics program at the University of Plymouth, I now possess a solid foundation in financial analysis. This skill set is highly valuable in various industries. The ability to extract meaningful insights from data and apply them to decision-making processes positions me as a versatile professional ready to tackle complex business challenges. In conclusion, the financial analysis of Airtel Africa and Vodafone Group was a valuable learning experience that combined theoretical knowledge with practical application. The coursework equipped me with skills essential for a career in data science and business analytics, and the insights gained will undoubtedly contribute to my academic and professional journey.

10764009

The coursework provided an immersive learning experience, centering on the application of R-Studio, for the financial analysis of Vodafone Group and Airtel Africa during the financial years 2021 and 2022.

A significant portion of the coursework was dedicated to dissecting the financial complexity of Vodafone Group and Airtel Africa. The initial phase involved crafting comprehensive company profiles, where I meticulously gathered and analysed information about each company's financial health, market positioning, and strategic initiatives. These profiles served as the foundation for the subsequent financial analysis.

Applying theoretical concepts to real-world settings allowed me to make substantial contributions to the financial analyses of both firms. Utilizing R-STUDIO for analyses, such as ratio analysis, cost to income ratio and Altman Z-score provided significant insights into the financial performance of Vodafone Group and Airtel Africa. Visual aids like graphs and charts enhanced the communication impact of the analyses, ensuring a clear portrayal of significant conclusions.

Learning R was initially challenging but proved to be a rewarding experience. As someone with little expertise in software, grasping the essentials was tough initially. However, with the support of my group members and online resources, I overcame the learning curve and contributed meaningfully to the project. This experience underscored the value of continuous learning and adapting to new technology and techniques. The ability to use R-Studio for financial analysis stands out as a notable accomplishment, involving various analyses, including ratio analysis.

The coursework not only equipped me with technical expertise in R-Studio but also enhanced my analytical and problem-solving abilities, deepening my understanding of financial analysis. The practical application of R Studio to translate financial theories into code and extract useful insights from data reflects the coursework's practical aspect. Collaborative efforts within the group refined my communication and cooperation abilities, essential for effective collaboration in real-world circumstances.

In conclusion, the skills acquired through the financial analysis of Vodafone Group and Airtel Africa are poised to be instrumental in shaping my future career prospects. The hands-on experience in navigating financial complexities, coupled with effective communication of findings, positions me as a more knowledgeable expert in the field of financial analysis. This assignment not only strengthened my technical knowledge but also instilled confidence in dealing with varied financial challenges in real-world circumstances. I am grateful for the opportunity to participate in this coursework, recognizing that the skills and knowledge gained will be critical in shaping my path in the dynamic profession of business analysis.

10892109

In order to examine the financial analysis of Vodafone Group and Airtel Africa for the fiscal years 2021 and 2022. The aim of the study was to examine and evaluate various financial statements, calculate financial ratios, critically analyse share price data using the Capital Asset Pricing Model (CAPM), determine if the shares of the two companies are undervalued or overvalued, also to determine which company has the better investment opportunities, and provide recommendations.

My responsibility was creating the lists of aggregations that matched the templates for the income statement and balance sheet, as well as creating the combined income statements and balance sheets for Vodafone Group and Airtel Africa. In addition, I looked over the calculated ratios and did some analysis and interpretation. In addition, I contributed to the introduction, conclusion, and recommendations sections of the report's editing.

Upon contemplation of this experience, I came to recognise that collaborating in a group had its merits and demerits. On the merit side, it facilitates the exchange of information and skills, and tasks can be allocated among group members for optimal efficiency. Conversely, it may result in disputes and disagreements, consuming time and causing frustration.

I gained insights into the significance of achieving a shared objective through effective communication, teamwork, and adept time management. Moreover, I acquired valuable skills in financial analysis, particularly in utilising ratio analysis, CAPM, and the R Software for scrutinising financial reports and generating comprehensive reports. These newly acquired skills are poised to be beneficial for both my ongoing studies and future career endeavours. Additionally, the project afforded me the chance to apply the financial analysis techniques learned in the classroom to a real-world context. With this experience, I can now approach similar projects in the nearest future with heightened confidence.

Additionally, during the report-writing process, I recognised the importance of clear and concise writing. Articulating the Introduction and recommendations required a meticulous evaluation of language and organization. This experience served as a lesson in conveying complex ideas in a straightforward, direct and lucid manner.

The challenges encountered played a crucial role in fostering personal growth and resilience, while the accomplishments bolstered my confidence in my abilities. The acquired skills and knowledge are poised to be indispensable assets in shaping my future career prospects. I am sincerely grateful for the opportunity to have been part of this team, as the entire experience was truly enriching and rewarding.

10887206

This reflective report explores my thoughts and insight into the telecommunications industry, focusing on two prominent companies -Airtel and Vodafone. My observations and reflections are based on various aspects, such as market presence, customer service, technological innovations, and corporate strategies. The completion of the course work provided an opportunity to engage in different tasks (Research, Data collection, Financial Analysis, and R markdown); this helps to evaluate a company's financial strength with value in my future role. The cogitation report aims to discuss the specific contribution made, highlighting the skills acquired and reflecting on the overall experience.

The initial phase of the coursework involves thorough research of relevant frameworks to identify key concepts and methodologies that laid the foundation and company profile. Moreover, I worked on the company profiles of Airtel and Vodafone, including Table Content, Introduction and Analysis of the Financial statements. Additionally, I use R markdown to produce horizontal and vertical analyses of Airtel and Vodafone; the solvency, profitability, valuation, and liquidity ratios have been analysed in the financial reports of the two companies. To create simplified balance sheets and income statements and provide predictable performance so the outcome can be estimated as possible.

As the coursework progressed, I was glad to overcome various challenges that required innovative solutions, which helped me learn and develop my skills. Deadlines were a significant challenge, but I learned to regulate time by setting ground rules to meet the deadlines. Additionally, the coursework demanded critical analysis; I ensured the project stayed on track to overcome obstacles. It provided an opportunity to apply in a practical context to learn more strategies and skills and meet my future goals.

Throughout the coursework, collaboration with team members was essential, and effective written and verbal communication I played a crucial role in coordinating efforts, sharing findings, and ensuring everyone was aligned with the coursework in achieving common goals.

In conclusion, the coursework provided a holistic learning experience encompassing research, data analysis, problem-solving, R studio, and teamwork. Each task contributed to the development of specific skills, fostering a more comprehensive understanding of both theoretical and practical aspects. This reflective report has illuminated the significance of adaptability, resilience, and effective communication in navigating the complexities of a real-work project. The experience gained from this coursework will undoubtedly prove valuable in future endeavours, both academically and professionally.

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