

Indian Accounting Association

Subject: Management Accounting

Topic: Financial Statement Analysis and Forecasting



By:

Dr. Sakti Ranjan Dash

Assistant Professor

P.G. Department of Commerce

Berhampur University

Email: shaktiranjan.srd@gmail.com

IAA Membership No.: BH-102

Dr. Maheswar Sethi

Assistant Professor

P.G. Department of Commerce

Berhampur University

Email: maheswar.sethi1989@gmail.com

IAA Membership No.: BH-66

September 2025

Preface

In today's fast-changing and data-driven business world, financial statements have evolved beyond mere compliance documents into powerful tools for strategic decision-making. Whether one is a student aspiring to enter the world of finance, an entrepreneur planning for sustainable business growth, or a manager responsible for steering an organization's future, understanding the financial language of business is an indispensable skill. This study material on **Financial Statement Analysis and Forecasting (FSAF)** has been carefully designed to bridge the gap between academic learning and real-world financial analysis.

When properly analysed, financial statements provide crucial insights into a company's operational efficiency, profitability, liquidity, solvency, and long-term sustainability. However, numbers alone don't tell the complete story. They require critical interpretation, contextual understanding, and a keen analytical decoding of what lies beneath the surface, for which **Financial Statement Analysis** becomes not just important, but essential. Financial analysis transforms raw numbers into meaningful narratives that help stakeholders for informed financial decisions.

The uniqueness of this e-content lies in its **practical orientation, case-based approach, and innovative self-study tools**. Beyond theoretical explanations, the material introduces learners to real corporate financials, industry comparisons, forecasting methods, and modern analytical tools like DuPont Analysis and predictive forecasting. Case studies of well-known Indian and global companies have been included to provide context and demonstrate how financial analysis is performed in practice. Self-assessment exercises, illustrative examples, and visual aids like infographics have been added to facilitate deeper understanding.

This resource stands apart because of its adaptability to diverse learners, whether you are a student pursuing Commerce, Accounting, MBA, or a professional or entrepreneur aiming to sharpen your financial skills. The content is structured step-by-step, gradually building from fundamental concepts to advanced analytical techniques.

We hope this material will empower learners not just to **read** financial statements but to **interpret, question, and utilize** them for better academic success, professional competence, and strategic thinking. As businesses increasingly demand financial literacy from all stakeholders, not just accountants or finance managers, this knowledge will be a critical asset in one's academic, professional, and entrepreneurial journey.

Let this study material guide you in unlocking the stories behind the numbers.

-Authors

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Financial Statement Analysis and Forecasting

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Module 1: Understanding Financial Statements

“Financial statements are the language through which business communicates to stakeholders.”

1.1 Introduction to Financial Statements

Accounting is often described as the **language of business**, as it is the medium through which business communicates with its stakeholders. It provides various information via financial statements, offering an organised, systematic, and standardised way to convey a company's financial health to stakeholders. Just as a doctor uses diagnostic reports to assess a patient's health, financial experts rely on financial statements to evaluate and diagnose the financial condition of a business.

Financial statements are the foundation for informed decision-making by the investors, creditors, managers, analysts, and regulators. They provide answers to key questions:

- Is the business **profitable**?
- How much does it **own** and **owe**?
- Does it add **value** to the owners?
- Can it honour its **short-term obligations**?
- What is the pattern of **cash flows**?

Without understanding financial statements, analysis is incomplete, and financial decisions are prone to futility.

1.2 Objectives of Financial Statements

- To present a **true and fair view** of the company's financial position and performance.
- To assist stakeholders in making **rational economic decisions**.
- To provide **standardised, comparable, and reliable** information on:
 - Assets, Liabilities, and Equity
 - Income and Expenses
 - Cash Inflows and Outflows
- To ensure **compliance with legal and regulatory frameworks**.

1.3 Components of Financial Statements

Financial Statements typically comprise the following mandatory components:

- Balance Sheet (Statement of Financial Position)
- Income Statement (Statement of Profit & Loss)
- Cash Flow Statement (Exempt for some private companies)
- Statement of Changes in Equity (For companies under Ind AS)
- Notes to Accounts and Disclosures

1.3.1 Balance Sheet (Statement of Financial Position)

It shows a company's financial position at a specific date, detailing **assets**, **liabilities**, and **equity**.

Component	Meaning	Example
Assets	What the company <i>owns</i>	Cash, Inventory, Buildings
Liabilities	What the company <i>owes</i>	Creditors, Loans
Equity	Owners' claim on assets (Residual interest)	Capital, Reserves & Surplus

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Basic Equation: Assets = Liabilities + Equity

Example (ABC Ltd. FY24 Extract):

- Assets: ₹1,50,000 Cr
- Liabilities: ₹30,000 Cr
- Equity: ₹1,20,000 Cr

1.3.2 Income Statement (Statement of Profit & Loss)

It reports a company's **revenues, expenses,** and **profits/losses** over a specific accounting period, indicating its financial performance.

Component	Meaning	Example
Revenue	Income from main operations	Product sales, service fees, subscription income for the period
COGS	Direct costs	Raw materials, direct labor, factory consumables tied to units sold.
Gross Profit	Revenue – COGS	Revenue ₹1,000 – COGS ₹600 = ₹400 gross profit for the period
Operating Expenses	Salaries, marketing, rent, etc.	Salaries, marketing, rent, utilities, admin expenses
Operating Profit	Earnings before interest and taxes (EBIT)	Example: Gross profit ₹400 – operating expenses ₹250 = ₹150 EBIT
Net Profit	Final earnings after interest and taxes	EBIT ₹150 – interest ₹20 – tax ₹35 = ₹95 net profit

Example (XYZ Ltd. FY24):

Revenue: ₹2,25,000 Cr → Net Profit: ₹42,000 Cr → Net Profit Margin = 18.7% (Net Profit/Revenue)

1.3.3 Cash Flow Statement

It provides information about **cash inflows and outflows** from **operating, investing,** and **financing** activities during a period. The entire cash flow is divided into:

- i. **Operating Activities** → Day-to-day operations
- ii. **Investing Activities** → Purchase/sale of assets
- iii. **Financing Activities** → Raising/repayment of capital and rents thereon.

Example (Tata Steel Ltd. for the year 2023-24)

Cash Flow from operating activities: 27,328.27 Cr.

Cash Flow from investing activities: (15,557.89) Cr.

Cash Flow from financing activities: (8417.51) Cr.

Positive cash from operations of ₹27,328.27 crore supported liquidity, while heavy investing outflows of ₹15,557.89 crore reflected expansionary capex, and financing outflows of ₹8,417.51 crore indicated net repayments and distributions, resulting in an overall deployment of cash toward growth and capital structure management.

1.3.4 Statement of Changes in Equity (SOCE)

It shows **changes in shareholders' equity** during a period, including profits retained, dividends, and the issue of shares.

It is mandatory under **Ind AS** to show:

- Opening and closing balances of equity
- Changes due to profit, dividends, share issues

Example: Growth in retained earnings reflecting consistent profits.

1.3.5 Notes to Accounts & Disclosures

Supplementary details explaining **accounting policies, assumptions, and specific items** in the financial statements, ensuring transparency. It provides information such as:

- Accounting policies
- Contingent liabilities
- Related party transactions
- Explanations for adjustments

Example: Disclosure of change in the depreciation method.

1.4 Regulatory Framework of Financial Statements

1.4.1 Companies Act, 2013

Schedule III of the Companies Act 2013, prescribes the **format and components of financial statements** for companies in India. It has **three divisions**:

- **Division I** for companies following **Accounting Standards (AS)**
- **Division II** for companies following **Indian Accounting Standards (Ind AS)**
- **Division III** for NBFCs following Ind AS

1.4.2 Indian Accounting Standards (Ind AS)

Ind AS are India's IFRS-converged accounting standards that provide a uniform framework for recognition, measurement, presentation, and disclosure, making financial statements more transparent, comparable, and reliable across periods and entities. They are central to how balance sheets, profit & loss statements, cash flows, and notes are prepared and presented, improving investor confidence, cross-border comparability, and stakeholder decision-usefulness. The list of Ind As is as follows:

Ind ASs	Title
Ind AS 1	Presentation of Financial Statements
Ind AS 2	Inventories
Ind AS 7	Statement of Cash Flows
Ind AS 8	Accounting Policies, Changes in Accounting Estimates and Errors
Ind AS 10	Events after the Reporting Period
Ind AS 11	Construction Contracts (superseded by Ind AS 115 for revenue)
Ind AS 12	Income Taxes
Ind AS 16	Property, Plant and Equipment
Ind AS 17	Leases (superseded by Ind AS 116)

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Ind ASs	Title
Ind AS 18	Revenue (superseded by Ind AS 115)
Ind AS 19	Employee Benefits
Ind AS 20	Accounting for Government Grants and Disclosure of Government Assistance
Ind AS 21	The Effects of Changes in Foreign Exchange Rates
Ind AS 23	Borrowing Costs
Ind AS 24	Related Party Disclosures
Ind AS 27	Separate Financial Statements
Ind AS 28	Investments in Associates and Joint Ventures
Ind AS 29	Financial Reporting in Hyperinflationary Economies
Ind AS 32	Financial Instruments: Presentation
Ind AS 33	Earnings per Share
Ind AS 34	Interim Financial Reporting
Ind AS 36	Impairment of Assets
Ind AS 37	Provisions, Contingent Liabilities and Contingent Assets
Ind AS 38	Intangible Assets
Ind AS 40	Investment Property
Ind AS 41	Agriculture
Ind AS 101	First-time Adoption of Indian Accounting Standards
Ind AS 102	Share-based Payment
Ind AS 103	Business Combinations
Ind AS 104	Insurance Contracts
Ind AS 105	Non-current Assets Held for Sale and Discontinued Operations
Ind AS 106	Exploration for and Evaluation of Mineral Resources
Ind AS 107	Financial Instruments: Disclosures
Ind AS 108	Operating Segments
Ind AS 109	Financial Instruments
Ind AS 110	Consolidated Financial Statements
Ind AS 111	Joint Arrangements
Ind AS 112	Disclosure of Interests in Other Entities
Ind AS 113	Fair Value Measurement
Ind AS 114	Regulatory Deferral Accounts
Ind AS 115	Revenue from Contracts with Customers
Ind AS 116	Leases
Ind AS 117	Insurance Contracts (check current MCA effective date for reporting)

1.4.3 SEBI (LODR) Regulations, 2015

The Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations ensure transparency and accountability of listed companies. They require quarterly financial reporting, disclosures of related-party transactions, corporate governance practices, auditor reports, and annual filings to protect investor interests.

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1.4.4 IFRS (Global Framework)

International Financial Reporting Standards (IFRS) provide a globally accepted framework for financial reporting. India's Ind AS is aligned with IFRS to make financial statements comparable internationally. For instance, companies like Infosys prepare accounts under Ind AS and reconcile with IFRS for global stakeholders.

1.5 Types of Financial Statement Users

User	Matter of Interest
Investors	Returns, dividends, growth
Creditors	Liquidity and solvency
Management	Resource allocation and performance
Regulators	Tax compliance and transparency
Analysts	Company valuation, peer comparison
Government	Fiscal policy impact, taxation receipts, compliance with laws and public interest obligations
Employees	Job security, wage/bonus prospects, pension funding, long-term viability
Society	ESG impact, environmental footprint, community welfare, and economic contribution

1.6 Limitations of Financial Statements

- i. **Historical in nature** → Focused on past events.
- ii. **Non-financial data ignored** → Like employee morale, environmental impact.
- iii. **Estimates involved** → Depreciation, provision for doubtful debts.
- iv. **Creative Accounting risk** → Window dressing of results.

Example: Inflated profits in the **Satyam Scam** (2009).

1.7 Self-Assessment Questions

- a) State the fundamental accounting equation of the balance sheet.
- b) What are the three sections of a cash flow statement?
- c) Name the standard dealing with revenue recognition in Ind AS.
- d) Give an example of a contingent liability disclosure.
- e) What role does SEBI play in financial reporting?

Answers:

- a) Assets = Liabilities + Equity
- b) Operating, Investing, Financing
- c) Ind AS 115
- d) Pending lawsuit
- e) Mandates disclosures for listed companies through **SEBI (LODR)**

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Financial Statement Analysis and Forecasting

1.8: Annexure

Financial Statements of TATA Steel Ltd.

TATA

STATEMENT OF PROFIT AND LOSS

for the year ended March 31, 2024

				(₹ crore)
	Note	Page	Year ended March 31, 2024	Year ended March 31, 2023
I Revenue from operations	24	F93	1,40,987.43	1,42,913.32
II Other income	25	F94	3,122.91	2,530.44
III Total income			1,44,110.34	1,45,443.76
IV Expenses:				
(a) Cost of materials consumed			48,018.48	59,948.72
(b) Purchases of stock-in-trade			9,702.30	7,424.21
(c) Changes in inventories of finished and semi-finished goods, stock-in-trade and work-in-progress	26	F94	369.85	(1,329.69)
(d) Employee benefits expense	27	F95	7,402.31	7,220.74
(e) Finance costs	28	F95	4,178.61	3,974.63
(f) Depreciation and amortisation expense	29	F95	5,969.79	5,956.32
(g) Other expenses	30	F96	46,648.71	42,463.89
			1,22,290.05	1,25,658.82
Less: Expenditure (other than finance cost) transferred to capital account			987.54	1,085.23
Total expenses			1,21,302.51	1,24,573.59
V Profit before exceptional items and tax (III-IV)			22,807.83	20,870.17
VI Exceptional items:	31	F97		
(a) Profit/(loss) on sale of non-current investments			-	338.56
(b) Provision for impairment of investments/doubtful loans and advances/ other financial assets (net)			(12,971.36)	(1,056.39)
(c) Provision for impairment of non-current assets (net)			(178.91)	-
(d) Employee separation compensation			(98.83)	(91.94)
(e) Restructuring and other provisions			(404.67)	(1.69)
(f) Gain/(loss) on non-current investments classified as fair value through profit and loss (net)			18.09	30.99
Total exceptional items			(13,635.68)	(780.47)
VII Profit before tax (V+VI)			9,172.15	20,089.70
VIII Tax expense:	9	F67		
(a) Current tax			4,954.21	4,918.39
(b) Deferred tax			(589.46)	486.06
Total tax expense			4,364.75	5,404.45
IX Profit for the year (VII-VIII)			4,807.40	14,685.25
X Other comprehensive income				
A (i) Items that will not be reclassified subsequently to profit and loss				
(a) Remeasurement gain/(loss) on post-employment defined benefit plans			(210.12)	266.82
(b) Fair value changes of investments in equity shares			1,005.34	(193.59)
(ii) Income tax on items that will not be reclassified subsequently to profit and loss			(60.16)	(44.31)
B (i) Items that will be reclassified subsequently to profit and loss				
(a) Fair value changes of cash flow hedges			(58.83)	79.78
(ii) Income tax on items that will be reclassified subsequently to profit and loss			15.14	(20.12)
Total other comprehensive income for the year			691.37	88.58
XI Total comprehensive income for the year (IX+X)			5,498.77	14,773.83
XII Earnings per share	32	F98		
Basic (₹)			3.85	11.76
Diluted (₹)			3.85	11.76
Notes forming part of the standalone financial statements	1 - 50			

In terms of our report attached

For and on behalf of the Board of Directors

For Price Waterhouse & Co Chartered Accountants LLP
Firm Registration Number: 304026E/E-300009

sd/-
N. Chandrasekaran
Chairman
DIN: 00121863

sd/-
Noel Naval Tata
Vice-Chairman
DIN: 00024713

sd/-
Deepak Kapoor
Independent Director
DIN: 00162957

sd/-
Farida Khambata
Independent Director
DIN: 06954123

sd/-
V. K. Sharma
Independent Director
DIN: 02449088

sd/-
Subramanian Vivek
Partner
Membership Number 100332

sd/-
Bharti Gupta Ramola
Independent
Director
DIN: 00356188

sd/-
Shekhar C. Mande
Independent
Director
DIN: 10083454

sd/-
T. V. Narendran
Chief Executive Officer
& Managing Director
DIN: 03083605

sd/-
Koushik Chatterjee
Executive Director
& Chief Financial Officer
DIN: 00004989

sd/-
Parvathesam Kanchinadham
Company Secretary &
Chief Legal Officer
(Corporate & Compliance)
ACS: 15921

Mumbai, May 29, 2024

Indian Accounting Association

Financial Statement Analysis and Forecasting

TATA STEEL | Financial Statements

BALANCE SHEET

as at March 31, 2024

	Note	Page	As at March 31, 2024	As at March 31, 2023
(₹ crore)				
Assets				
I Non-current assets				
(a) Property, plant and equipment	3	F44	90,806.74	90,276.86
(b) Capital work-in-progress	3	F44	27,196.47	21,653.81
(c) Right-of-use assets	4	F49	5,648.94	5,900.23
(d) Goodwill			12.66	12.66
(e) Other intangible assets	5	F52	967.80	1,233.10
(f) Intangible assets under development	5	F52	532.59	514.96
(g) Financial assets				
(i) Investments	6	F54	65,498.27	39,467.38
(ii) Loans	7	F64	8,604.38	32,574.10
(iii) Derivative assets			265.81	403.40
(iv) Other financial assets	8	F66	1,633.61	2,299.51
(h) Non-current tax assets (net)			4,684.71	4,291.02
(i) Other assets	10	F69	3,016.94	3,487.76
Total non-current assets			2,08,868.92	2,02,114.79
II Current assets				
(a) Inventories	11	F70	24,547.20	25,420.36
(b) Financial assets				
(i) Investments	6	F54	500.35	2,968.25
(ii) Trade receivables	12	F70	1,606.14	2,561.79
(iii) Cash and cash equivalents	13	F72	4,541.47	1,185.60
(iv) Other balances with banks	14	F72	1,413.21	1,664.35
(v) Loans	7	F64	140.82	1,925.71
(vi) Derivative assets			83.41	84.13
(vii) Other financial assets	8	F66	892.74	958.78
(c) Other assets	10	F69	3,039.80	3,746.59
Total current assets			36,765.14	40,515.56
III Assets held for sale			-	65.38
Total assets			2,45,634.06	2,42,695.73
Equity and liabilities				
IV Equity				
(a) Equity share capital	15	F73	1,248.60	1,222.40
(b) Other equity	16	F77	1,36,445.05	1,35,386.48
Total equity			1,37,693.65	1,36,608.88
V Non-current liabilities				
(a) Financial liabilities				
(i) Borrowings	17	F81	36,715.91	31,568.81
(ii) Lease liabilities			3,353.82	3,871.86
(iii) Other financial liabilities	18	F88	1,363.32	1,757.01
(b) Provisions	19	F89	2,704.59	2,658.95
(c) Retirement benefit obligations	20	F90	2,389.69	2,051.61
(d) Deferred income	21	F90	279.11	0.35
(e) Deferred tax liabilities (net)	9	F67	8,016.77	8,508.33
(f) Other liabilities	22	F91	2,476.80	3,878.50
Total non-current liabilities			57,300.01	54,295.42
VI Current liabilities				
(a) Financial liabilities				
(i) Borrowings	17	F81	3,841.52	7,298.12
(ii) Lease liabilities			667.85	565.57
(iii) Trade payables	23	F92		
(a) Total outstanding dues of micro and small enterprises			935.84	911.16
(b) Total outstanding dues of creditors other than micro and small enterprises			21,126.62	19,444.60
(iv) Derivative liabilities			10.22	68.51
(v) Other financial liabilities	18	F88	6,670.06	6,149.20
(b) Provisions	19	F89	1,146.42	1,968.15
(c) Retirement benefit obligations	20	F90	115.74	145.82
(d) Deferred income	21	F90	55.44	84.61
(e) Current tax liabilities (net)			1,928.13	1,703.91
(f) Other liabilities	22	F91	14,142.56	13,451.78
Total current liabilities			50,640.40	51,791.43
Total equity and liabilities			2,45,634.06	2,42,695.73

Notes forming part of the standalone financial statements

1 - 50

In terms of our report attached

For and on behalf of the Board of Directors

For Price Waterhouse & Co Chartered Accountants LLP
Firm Registration Number: 304026/E-300009

sd/-
N. Chandrasekaran
Chairman
DIN: 00121863

sd/-
Noel Naval Tata
Vice-Chairman
DIN: 00024713

sd/-
Deepak Kapoor
Independent Director
DIN: 00162957

sd/-
Farida Khambata
Independent Director
DIN: 06954123

sd/-
V. K. Sharma
Independent Director
DIN: 02449088

sd/-
Subramanian Vivek
Partner
Membership Number 100332

sd/-
Bharti Gupta Ramola
Independent
Director
DIN: 00356188

sd/-
Shekhar C. Mande
Independent
Director
DIN: 10083454

sd/-
T.V. Narendran
Chief Executive Officer
& Managing Director
DIN: 03083605

sd/-
Koushik Chatterjee
Executive Director
& Chief Financial Officer
DIN: 00004989

sd/-
Parvathesam Kanchinadham
Company Secretary &
Chief Legal Officer
(Corporate & Compliance)
ACS: 15921

Mumbai, May 29, 2024

Source: 117th Year Integrated Report & Annual Accounts 2023-24 of TATA Steel Ltd.

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Financial Statement Analysis and Forecasting

TATA STEEL | Financial Statements

STATEMENT OF CASH FLOWS

for the year ended March 31, 2024

	Year ended March 31, 2024	Year ended March 31, 2023
(₹ crore)		
(A) Cash flows from operating activities:		
Profit before tax	9,172.15	20,089.70
Adjustments for:		
Depreciation and amortisation expense	5,969.79	5,956.32
Dividend Income	(313.21)	(201.93)
(Gain)/loss on sale of property, plant and equipment including intangible assets (net of loss on assets scrapped/written off)	(850.90)	66.16
Exceptional (income)/expenses	13,635.68	780.47
(Gain)/loss on cancellation of forwards, swaps and options	(151.34)	(13.63)
Interest income and income from current investments	(1,951.81)	(2,048.20)
Finance costs	4,178.61	3,974.63
Foreign exchange (gain)/loss	(348.03)	(2,544.78)
Other non-cash items	59.36	(55.36)
	20,228.15	5,913.68
Operating profit before changes in non-current/current assets and liabilities	29,400.30	26,003.38
Adjustments for:		
Non-current/current financial and other assets	1,947.37	(672.19)
Inventories	901.07	(1,972.02)
Non-current/current financial and other liabilities/provisions	124.90	(4,845.28)
	2,973.34	(7,489.49)
Cash generated from operations	32,373.64	18,513.89
Income taxes paid (net of refund)	(5,045.37)	(5,008.14)
Net cash from/(used in) operating activities	27,328.27	13,505.75
(B) Cash flows from investing activities:		
Purchase of capital assets	(10,426.00)	(9,067.96)
Sale of capital assets	220.95	31.82
Purchase of investments in subsidiaries	(684.41)	(12,686.82)
Purchase of other non-current investments	(0.01)	(314.00)
Purchase of Business Undertaking	-	(130.00)
Sale of investments in subsidiaries	-	1,112.42
(Purchase)/sale of current investments (net)	2,667.49	5,761.42
Loans given	(8,765.53)	(560.15)
Repayment of loans given	754.73	714.65
Principal receipts under sublease	0.48	-
Fixed/restricted deposits with banks (placed)/realised (net)	148.29	(139.49)
Interest received	212.91	281.98
Dividend received from subsidiaries	116.05	146.15
Dividend received from associates and joint ventures	163.27	32.16
Dividend received from others	33.89	23.62
Net cash from/(used in) investing activities	(15,557.89)	(14,794.20)
(C) Cash flows from financing activities:		
Proceeds from issue of equity shares (net of issue expenses)	-	1.37
Proceeds from long term borrowings (net of issue expenses)	9,696.09	16,628.55
Repayment of long term borrowings	(7,143.01)	(2,904.30)
Proceeds/(repayments) of short term borrowings (net)	(1,003.50)	(8,109.16)
Payment of lease obligations	(602.98)	(514.31)
Amount received/(paid) on utilisation/cancellation of derivatives	151.34	1.18
Interest paid	(5,098.45)	(4,028.27)
Dividend paid	(4,414.00)	(6,267.84)
Net cash from/(used in) financing activities	(8,414.51)	(5,192.78)
Net increase/(decrease) in cash and cash equivalents	3,355.87	(6,481.23)
Opening cash and cash equivalents (refer note 13, page F72)	1,185.60	7,666.83
Closing cash and cash equivalents (refer note 13, page F72)	4,541.47	1,185.60

- (i) Significant non-cash movements in borrowings and advances during the year include:
- amortisation/effective interest rate adjustments of upfront fees and other adjustments ₹89.94 crore (2022-23: ₹30.19 crore).
 - exchange loss on borrowings ₹50.93 crore (2022-23: ₹277.74 crore).
 - adjustments to lease obligations, increase ₹121.33 crore (2022-23: ₹452.65 crore).
 - conversion of loan given to a subsidiary into equity investment ₹34,168.90 crore (2022-23: Nil).
- (ii) (Gain)/loss on sale of property, plant and equipment includes a non-cash gain of ₹903.40 crore (2022-23: Nil) on de-recognition of assets pursuant to a long-term arrangement.

Source: 117th Year Integrated Report & Annual Accounts 2023-24 of TATA Steel Ltd.

Module 2: Techniques of Financial Statement Analysis (FSA)

“Analysis transforms numbers into actionable insights.”

2.1 Introduction to Financial Statement Analysis

Financial Statement Analysis (FSA) is the systematic study of financial statements to assess a company's performance, financial strength, risks, and future prospects. It converts raw financial data into useful intelligence for stakeholders.

2.2 Why Conduct Financial Statement Analysis?

Purpose	Description
Performance Evaluation	Measures operational success and managerial efficiency
Risk Identification	Detects financial risks before they materialize
Forecasting	Supports financial planning and forecasting
Decision-Making	Informs strategic investments, credit decisions, and growth

2.3 Objectives of Financial Statement Analysis

The primary objective is not merely to look at numbers but to **interpret what those numbers reveal** about the business's operations, risks, growth potential, and long-term viability. Through analysis, stakeholders, including **investors, creditors, management, regulators, and analysts**, become able to:

- **Assess profitability** and how efficiently the company generates returns on its investments.
- **Measure liquidity** to ensure that the business can meet its short-term obligations.
- **Evaluate solvency** for long-term financial security and risk of default.
- **Analyse operational efficiency** to detect how well resources are being utilized.
- **Determine market perception** and valuation by connecting internal performance with investor confidence.
- **Understand cash flow movements** to judge operational strength and financing capacity.
- **Estimate financial stability** by predicting risks of financial distress or insolvency.

These objectives help in turning **raw financial data** into meaningful information, supporting both **strategic decision-making** and **external reporting requirements**.

To make these objectives more actionable, the following table links each objective with its techniques and real-world examples.

Objective	What It Evaluates	Techniques/Tools Used
Profitability	Profitability potential	DuPont Analysis, Vertical Analysis, Profitability Ratios
Liquidity	Short-term payment ability	Current Ratio, Quick Ratio, Cash Ratio
Solvency	Long-term financial health	Debt-to-Equity Ratio, Interest Coverage Ratio
Efficiency	Operational productivity	Horizontal Analysis, Turnover Ratios
Market Position	Investor perception and valuation	EPS, DPS, P/E Ratio, Market Capitalization

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Objective	What It Evaluates	Techniques/Tools Used
Financial Movement	Cash flow and financial flexibility	Cash Flow Analysis, Fund Flow Analysis
Financial Stability	Risk of potential financial distress	Altman Z-Score

So, in a nutshell, we can summarise the objective of FSA in the following manner.

- Assess profitability, liquidity, solvency, and efficiency
- Decision-making support for investors, creditors, and management
- Performance comparison: intra-firm and inter-firm

2.4 Key Techniques of FSA

Technique	Description
Horizontal Analysis	Compares figures across periods to analyze growth patterns
Vertical Analysis	Expresses each item as a % of the base figure (Sales or Total Assets)
Ratio Analysis	Uses relationships between figures to analyze performance and health
Comparative Statements	Side-by-side view of multiple years' financials
Cash Flow Analysis	Tracks inflows and outflows from operations, investing, and financing
DuPont Analysis	Breaks down ROE into Profitability, Efficiency, and Leverage components
Altman Z-Score	Predicts bankruptcy probability based on financial metrics

2.5 Detailed Techniques of Financial Statement Analysis

2.5.1 Horizontal Analysis

Meaning:

Horizontal analysis, also known as **Trend Analysis**, examines financial data across two or more periods to observe changes over time. It provides valuable insight into **growth trends**, helps highlight **inconsistencies**, and tracks **financial progress**.

Purpose:

- To evaluate **financial growth or decline** over time.
- Useful in identifying **patterns, seasonal variations, or anomalies**.
- Enables comparison of **business performance** year-over-year or across periods.

Steps to Use:

- Select a **base year** for comparison.
- Calculate **absolute change** = Current Year - Base Year.
- Calculate **percentage change** = (Absolute Change ÷ Base Year) × 100.
- Analyze and interpret the data to **understand trends or detect irregularities**.

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Example and interpretation:

Example: Horizontal Analysis of Income Statement of TATA Steel (₹ crore)

Particulars	FY 2023	FY 2024	Change (₹)	% Change
Revenue from Operations	1,42,913.32	1,40,987.43	-1,925.89	-1.35%
Other Income	2,530.44	3,122.91	592.47	23.42%
Total Income	1,45,443.76	1,44,110.34	-1,333.42	-0.92%
Total Expenses	1,24,573.59	1,21,302.51	-3,271.08	-2.63%
Profit Before Tax	20,870.17	9,172.15	-11,698.02	-56.04%
Profit for the Year	14,685.25	4,807.40	-9,877.85	-67.25%

Interpretation of the Horizontal Analysis of Income Statement of TATA Steel (₹ crore):

- **Revenue from Operations** decreased slightly by **₹1,925.89 crore (-1.35%)**, suggesting relatively stable sales, possibly reflecting **industry conditions or commodity pricing pressure**.
- **Other Income** increased by **₹592.47 crore (+23.42%)**, likely due to **better returns on investments, interest, or dividends received**.
- **Total Income** dropped by **₹1,333.42 crore (-0.92%)**, indicating that despite an increase in other income, the decline in core operations led to a marginal overall reduction in total income.
- **Total Expenses** decreased by **₹3,271.08 crore (-2.63%)**, a positive sign suggesting **cost-control measures** or reduced input costs.
- **Profit Before Tax (PBT)** declined sharply by **₹11,698.02 crore (-56.04%)**, reflecting the **impact of exceptional expenses or impairment losses**.
- **Profit for the Year (PAT)** fell drastically by **₹9,877.85 crore (-67.25%)**, highlighting a **significant reduction in profitability** primarily because of **one-time extraordinary items like impairment charges** reported during the year.

Summary Insight:

- Operational revenues remained relatively stable.
- Profitability plunged primarily **due to exceptional items, not core business failure**.
- Financial analysis shows **underlying strength in operations but weakened net earnings because of one-off expenses**.

Advantages:

- Highlights trends and growth patterns.
- Useful for identifying sudden deviations.
- Easy to compute and interpret.

Drawbacks:

- Distorted by inflation if not adjusted.
- Misleading for new/irregular businesses.
- Negative-to-positive changes are hard to interpret as %.

2.5.2 Vertical Analysis (Common-Size Statements)

Meaning:

Vertical analysis expresses each item in a financial statement as a percentage of a base figure, typically total sales for income statements and total assets for balance sheets. This facilitates easy comparison between periods or with other companies, regardless of absolute size.

Purpose:

- To understand the **relative size** of components in relation to totals.
- Helps in comparing companies of **different sizes**.
- Highlights **cost structure** and **profitability margins** clearly.

Steps to Use:

- Choose the **base figure** (Total Sales or Total Assets).
- Divide each financial item by this base.
- Multiply by 100 to express as a percentage.
- Compare across periods or with peers to derive insight.

Example and interpretation:

Example: Vertical Analysis of Income Statement (₹ crore)

Particulars	FY 2024 ₹	% of Total Income
Revenue from Operations	1,40,987.43	97.83%
Other Income	3,122.91	2.17%
Total Income	1,44,110.34	100%
Total Expenses	1,21,302.51	84.16%
Profit Before Tax	9,172.15	6.37%
Profit After Tax	4,807.40	3.34%

Interpretation: Thin PAT margin of 3.34% caused by exceptional items.

Advantages:

- Facilitates comparison between companies of different sizes.
- Clear insight into cost structure.
- Highlights profit margins and financial efficiency.

Drawbacks:

- Fails to show trends over time.
- One-time expenses may distort the percentages.

2.5.3 Ratio Analysis

Meaning:

Ratio Analysis involves computing various financial ratios using figures from the financial statements to assess a company's performance in key areas like profitability, liquidity, solvency, and efficiency. Ratio analysis has been discussed in detail in a separate chapter.

Purpose:

- To evaluate financial health in a comprehensive manner.
- Helps in inter-firm and intra-firm comparison.
- Enables decision-making for investors, creditors, and management.

Common Types of Ratios:

Category	Example Ratios
Liquidity	Current Ratio, Quick Ratio
Profitability	Net Profit Margin, Return on Assets (ROA)
Solvency	Debt-Equity Ratio, Interest Coverage Ratio
Efficiency	Inventory Turnover, Receivables Turnover
Market-based	Earnings per Share (EPS), P/E Ratio

Steps to Use:

- Identify the relevant ratio for your analysis purpose.
- Use the formula to compute the ratio.
- Interpret by comparing with industry benchmarks or historical values.

Example and interpretation:

Example: Current Ratio = 1.8, Quick Ratio = 1.2, Net Profit Margin = 8%, ROA = 9%, ROE = 15%, Debt-to-Equity = 0.6, Interest Coverage = 5.

Interpretation: Liquidity appears adequate (CR > 1, QR > 1), profitability is moderate with efficient asset use (ROA) and healthy shareholder returns (ROE), leverage is manageable (D/E below 1) with comfortable debt-servicing capacity (ICR well above 2), indicating balanced growth with controlled risk.

Advantages:

- Offers multidimensional financial insights.
- Easy to interpret with industry standards.
- Enables strategic planning and corrective actions.

Drawbacks:

- Ignores qualitative aspects.
- Can be manipulated through accounting choices.
- Ratios are historical in nature and may not reflect future trends.

2.5.4 Comparative Financial Statements

Meaning:

These statements present financial data for multiple periods side-by-side, making it easier to observe changes over time and compare key metrics across years.

Purpose:

- To identify financial trends and fluctuations.
- Facilitates year-over-year comparison and financial forecasting.

Steps to Use:

- Select comparable periods (e.g., FY 2023 vs FY 2024) and align accounting policies/classifications.
- Place line items side-by-side and compute each item's absolute change and percentage change.
- Highlight material variances and link them to drivers (volume/price mix, cost inflation, FX, one-offs).
- Cross-check with notes/MD&A for explanations; validate consistency with cash flows and key ratios.
- Draw insights on trends (**growth, margin, working capital**) and **implications for forecast/valuation**.

Example and interpretation:

Example:

Particulars	FY 2023	FY 2024	Change (₹)
Total Income	1,45,443.76	1,44,110.34	-1,333.42
Total Expenses	1,24,573.59	1,21,302.51	-3,271.08
Profit Before Tax	20,870.17	9,172.15	-11,698.02

Interpretation

- **Total Income** decreased by ₹1,333.42 crore (**-0.92%**), indicating a slight decline in operational revenues. This could be due to softer demand, pricing pressure, or reduced sales volumes.
- **Total Expenses** fell by ₹3,271.08 crore (**-2.63%**), suggesting successful cost containment or reduced raw material prices.
- **Profit Before Tax (PBT)** plunged by ₹11,698.02 crore (**-56.04%**), a sharp decline that outweighs the benefit of reduced expenses. This could be due to extraordinary losses, impairments, or lower operational efficiency.

While revenue and expenses moved slightly, the profitability was **severely impacted**. The drastic fall in PBT points to **non-operational or one-time costs** that require further scrutiny. This example highlights how comparative analysis can uncover key performance deviations over time.

Advantages:

- Simplifies financial trend detection.
- Suitable for stakeholder presentations and reports.
- Enhances transparency and clarity.

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Drawbacks:

- Lacks depth if not combined with ratio or vertical analysis.
- May be misleading if inflation is not adjusted.

2.5.5 Cash Flow Analysis

Meaning:

Cash Flow Analysis studies the movement of cash into and out of a company under three main activities: Operating, Investing, and Financing.

Purpose:

- To assess liquidity and operational efficiency.
- Understand sources and uses of funds.
- Evaluate the firm's sustainability and solvency.

Classification of Cash Flows:

- **Operating Activities:** Cash from core business operations.
- **Investing Activities:** Cash used in or generated from asset purchases/sales.
- **Financing Activities:** Cash raised via equity, debt, or paid as dividends.

Steps to Use:

- Classify cash flows into Operating, Investing, and Financing; reconcile the opening to the closing cash.
- Evaluate operating cash flow quality: compare CFO to EBITDA/net profit; adjust for working capital swings.
- Assess investing flows: identify maintenance vs growth capex, acquisitions/disposals, and R&D capitalization.
- Review financing flows: examine debt drawdowns/repayments, interest/dividends/buybacks, and equity raises.
- Derive free cash flow ($FCF = CFO - \text{maintenance capex}$) and test coverage of dividends/debt service.
- Compare multi-year patterns and benchmark peers to judge sustainability, flexibility, and risk of funding gaps.

Example and interpretation:

Example: Cash Flow Statement Summary of ABC Ltd.

Cash Flow Component	FY 2024 (₹ Cr)	Nature
Cash Flow from Operating Activities (CFO)	12,500	Positive (Inflow>Outflow)
Cash Flow from Investing Activities (CFI)	-7,200	Negative (Outflow>Inflow)
Cash Flow from Financing Activities (CFF)	-4,000	Negative (Outflow>Inflow)
Net Cash Flow	+1,300	Positive (Inflow>Outflow)

Interpretation

- **Operating Activities (₹12,500 Cr)**
 - A strong **positive CFO** indicates that the company's core business operations are generating healthy cash.
 - This is a sign of **sustainable business performance**.
 - It also means the company is not relying on external borrowing or asset sales to fund its operations.

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- **Investing Activities (₹–7,200 Cr)**
 - Negative CFI is expected and generally **good** if it reflects investment in capital assets (e.g., new plants, R&D, or capacity expansion).
 - It indicates **growth-oriented spending**, not financial distress.
 - However, consistently high outflows without matching returns may signal poor capital allocation.
- **Financing Activities (₹–4,000 Cr)**
 - Outflows in financing typically result from **repayment of loans** or **dividend payments**.
 - If paired with strong operating cash flow, it shows the company is **reducing debt** or **returning value to shareholders**—both positive signs.
- **Net Cash Flow (₹1,300 Cr)**
 - A positive net cash flow after all activities means the company is **generating surplus liquidity**, which can be used for further investment, reserves, or reducing liabilities.

Relevance of Cash Flow Analysis:

Key Use	Explanation
Assessing Liquidity	Helps evaluate if the firm can meet short-term obligations without raising external funds.
Understanding Quality of Earnings	A profitable firm with negative CFO may indicate accrual-based profit manipulation .
Evaluating Investment Policy	Shows how aggressively the firm is investing for future growth.
Assessing Financial Policy	Reveals whether the firm is reliant on debt or internal accruals for financing.
Risk Management	Regular monitoring helps detect early signs of stress (e.g., positive net income but negative CFO).

The cash flow statement can be used to determine the life cycle stage of a firm as per Dickinson (2011).

Firm Life Cycle Stages as per Dickinson (2011)								
	Introduction	Growth	Mature	Shake-out	Shake-out	Shake-out	Decline	Decline
CFOA	-	+	+	-	+	+	-	-
CFIA	-	-	-	-	+	+	+	+
CFFA	+	+	-	-	+	-	+	-

Note: CFOA: Cash Flow Operating Activities, CFIA: Cash Flow Investing Activities, CFFA: Cash Flow Financing Activities.

So, by observing the cash flow pattern, one can determine the firm's life cycle stages. The above example of the cash flow statement summary of ABC Ltd. shows that the firm is in the mature stage.

Advantages:

- Focuses on actual cash movement (not accrual-based).
- Aids in evaluating liquidity and capital needs.

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- Critical for investment and credit decisions.

Drawbacks:

- One-time inflows/outflows may distort view.
- Does not indicate profitability directly.

2.5.6 DuPont Analysis

Meaning:

DuPont Analysis is a strategic framework that decomposes **Return on Equity (ROE)** into its **three core components—Profitability, Efficiency, and Leverage**. It allows analysts to **understand *how* and *why* a firm generates returns for equity shareholders**, going far beyond surface-level ratio analysis.

The method originated from the **DuPont Corporation** in the 1920s and has since become a cornerstone of corporate financial analysis.

DuPont Formula:

$$\text{ROE} = (\text{Net Profit Margin}) \times (\text{Asset Turnover}) \times (\text{Equity Multiplier})$$

Where:

- **Net Profit Margin (Profitability)** = Net Profit ÷ Revenue
- **Asset Turnover (Efficiency)** = Revenue ÷ Total Assets
- **Equity Multiplier (Leverage)** = Total Assets ÷ Shareholders' Equity

Purpose and Analytical Relevance:

Objective	Description
Decomposing ROE	Understand whether high ROE is due to strong margins, efficient asset use, or high leverage.
Strategic Benchmarking	Compare firms with similar ROEs but different risk and efficiency profiles.
Detecting Hidden Weaknesses	A high ROE due to excessive leverage may be unsustainable.
Capital Allocation Insights	Assess how well management uses capital across operations, investments, and financing.

Steps to use:

- Gather inputs from audited statements: net profit (or net income), revenue, average total assets, and average shareholders' equity for the analysis period.
- Compute the three components:
 - Net Profit Margin = Net Profit ÷ Revenue.
 - Asset Turnover = Revenue ÷ Average Total Assets.
 - Equity Multiplier = Average Total Assets ÷ Average Shareholders' Equity.
- Calculate ROE using the DuPont identity: $\text{ROE} = \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier}$.

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Example: DuPont Analysis for ABC Steel Ltd. (FY 2024)

Component	Value
Net Profit Margin	3.34% (Net Profit ÷ Revenue)
Asset Turnover	0.85 (Revenue ÷ Total Assets)
Equity Multiplier	2.1 (Total Assets ÷ Equity)

ROE = $3.34\% \times 0.85 \times 2.1 = 5.96\%$

Interpretation:

- **Low Net Profit Margin (3.34%):** Profitability is thin, likely impacted by exceptional or non-recurring charges.
- **Moderate Asset Turnover (0.85):** Indicates that for every ₹1 in assets, the company is generating ₹0.85 in revenue — typical for capital-intensive sectors like steel.
- **High Equity Multiplier (2.1):** The company is using significant leverage (debt or liabilities) to finance assets, which boosts ROE but **increases financial risk**.

Insight: The 5.96% ROE is not purely a result of operational excellence; it's **heavily supported by leverage**, which may be risky in volatile industry conditions.

Example: Firm A vs. Firm B (Same ROE, Different Composition)

Metric	Firm A	Firm B
Net Profit Margin	14.0%	5.0%
Asset Turnover	0.75	1.4
Equity Multiplier	2.0	3.0
ROE Calculation	$14.0\% \times 0.75 \times 2.0 = 21.0\%$	$5.0\% \times 1.4 \times 3.0 = 21.0\%$

Analysis & Interpretation

Firm A: Profitability-Driven

- **Strength** lies in **profit margin (14%)** — it retains more from each ₹ of sales.
- **Moderate efficiency** (Asset Turnover = 0.75) — common in services or IP-based firms.
- **Low to moderate leverage** (Equity Multiplier = 2.0) — indicates controlled financial risk.

◆ **Operationally strong, resilient, and sustainable.**

◆ Lower exposure to interest rate risk.

◆ Easier to withstand external shocks (e.g., COVID-19, input price hikes).

Firm B: Leverage-Driven

- **Low Net Profit Margin (5%)** — points to tight margins or cost pressures.
 - **High Asset Turnover (1.4)** — indicates efficient use of assets (e.g., retail, logistics).
 - **High Leverage (Equity Multiplier = 3.0)** — ROE is **artificially elevated** via debt.
- **Dependent on financial engineering rather than internal profitability.**
- **Risk of earnings volatility** in downturns.
- **Debt servicing pressures** if interest rates rise or cash flows tighten.

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Efficiency & Sustainability Comparison

Criteria	Firm A	Firm B
ROE	21.0%	21.0%
Profit Margin (↑ better)	High (14%)	Low (5%)
Asset Turnover (↑ better)	Moderate (0.75)	High (1.4)
Leverage (↓ better)	Moderate (2.0)	High (3.0)
Efficiency Driver	Profitability	Asset use + debt
Risk Level	Low	High
Long-Term Sustainability	High	Conditional (risk-prone)

Conclusion: Who is More Efficient and Sustainable?

- **Firm A** is **sustainably profitable**, achieves its ROE through internal strength (margins), and has moderate leverage, **preferred for long-term investors**.
- **Firm B**, although operationally efficient in asset use, achieves the same ROE through **high debt, riskier and less resilient** in adverse conditions.

Alternative (5-Step) DuPont Version (*for deeper insights*)

Some analysts break ROE into five components to further dissect tax and interest impacts:

$$\text{ROE} = \text{Tax Burden} \times \text{Interest Burden} \times \text{EBIT Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier}$$

Where:

- Tax Burden = Net Profit ÷ EBT
- Interest Burden = EBT ÷ EBIT
- EBIT Margin = EBIT ÷ Revenue

This allows you to evaluate **operating efficiency**, **interest management**, and **tax strategy** individually.

Advantages

Strength	Explanation
Dissects performance	Identifies precise drivers behind ROE - operational, asset-based, or leverage-driven.
Cross-firm comparison	Normalizes ROE decomposition across industries and sizes.
Performance monitoring	Reveals shifts in strategy (e.g., margin compression, aggressive leverage use).

Limitations:

Limitation	Explanation
Complex for new learners	Requires understanding of multiple ratios and financial statements.
Leverage can mask weakness.	High ROE may falsely appear attractive if driven by excessive debt.
Influenced by accounting policy	Different depreciation, revenue recognition, or impairment methods can skew margins or asset turnover.

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Summary View:

Component	Driver	Implications for ROE
Net Profit Margin	Operational Efficiency	Higher margins increase ROE
Asset Turnover	Asset Utilization	Better asset usage increases ROE
Equity Multiplier	Financial Leverage	More leverage boosts ROE, but raises risk

2.5.7 Altman Z-Score

Meaning:

Altman Z-Score is a predictive model for assessing the likelihood of corporate bankruptcy based on several weighted financial ratios. It was developed by Edward Altman in 1968 and remains widely used in credit risk analysis, financial due diligence, and investment decisions.

Purpose:

- To **quantify the risk of business failure or bankruptcy** using a formula.
- To enable stakeholders such as **investors, creditors, and management** to gauge financial health in advance.
- Useful as an **early-warning signal** for potential financial distress in organizations.

Significance in Financial Analysis:

- Combines elements of **profitability, leverage, liquidity, solvency, and activity ratios** into one metric.
- Especially valuable for **lenders, investors, rating agencies, and strategic managers** in risk evaluation.

Altman Z-Score is a predictive model for assessing the likelihood of corporate bankruptcy based on several weighted financial ratios.

Steps to Use:

- Calculate relevant financial ratios (Working Capital/Assets, Retained Earnings/Assets, etc.).
- Apply the Altman formula appropriate for the industry.
- Interpret the resulting score using standard benchmarks.

Formula for Manufacturing Companies:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

- $X1 = \text{Working Capital} \div \text{Total Assets}$
- $X2 = \text{Retained Earnings} \div \text{Total Assets}$
- $X3 = \text{EBIT} \div \text{Total Assets}$
- $X4 = \text{Market Value of Equity} \div \text{Total Liabilities}$
- $X5 = \text{Sales} \div \text{Total Assets}$

Formula for Non-Manufacturing Companies:

$$Z = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$$

- $X1 = \text{Working Capital} \div \text{Total Assets}$
- $X2 = \text{Retained Earnings} \div \text{Total Assets}$
- $X3 = \text{EBIT} \div \text{Total Assets}$
- $X4 = \text{Book Value of Equity} \div \text{Total Liabilities}$

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Interpretation Range:

- $Z > 2.99 \rightarrow$ Safe Zone
- $1.81 < Z < 2.99 \rightarrow$ Grey Zone
- $Z < 1.81 \rightarrow$ Distress Zone

Example:

- If the $Z = 2.8 \rightarrow$ **Grey Zone** $\rightarrow$ requires further monitoring but is reasonably stable for a capital-intensive manufacturing giant.

This formula is widely used by banks, analysts, and credit rating agencies.

Advantages:

- Predictive, early-warning tool for financial distress.
- Useful for lenders and investors.
- Versatile across sectors with adjusted models.

Drawbacks:

- Requires accurate and current data.
- Grey zone interpretation may be ambiguous.
- May not factor sector-specific risks sufficiently.

Summary Table: Key FSA Techniques

Technique	Key Focus	Best Use Case
Horizontal Analysis	Trend over time	Year-over-year growth comparison
Vertical Analysis	Component as % of total	Peer or size-independent comparison
Ratio Analysis	Financial health via ratios	Holistic performance benchmarking
Comparative Statements	Multi-period comparisons	Financial disclosure and trend visualization
Cash Flow Analysis	Cash inflow/outflow breakdown	Liquidity and sustainability assessment
DuPont Analysis	ROE decomposition	Identify drivers of shareholder returns
Altman Z-Score	Bankruptcy prediction	Risk screening and credit analysis

2.6 Self-Assessment Questions

- a) Name two techniques that make line items comparable across firms of different sizes?
- b) Which statement and section best reveal core cash generation from operations?
- c) What three components does DuPont Analysis use to decompose ROE?
- d) Which tool compares multi-year figures side-by-side to show absolute and percentage changes?
- e) What does the Altman Z-Score primarily assess in FSA?

Answers:

- a) Vertical (common-size) analysis; Ratio analysis
- b) Cash flow statement — Operating activities (CFO)
- c) $\text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier}$
- d) Comparative financial statements (horizontal/trend analysis)
- e) Probability of financial distress or bankruptcy risk

Module 3: Ratio Analysis

“Ratio analysis transforms scattered numbers into structured meaning.”

3.1 Introduction to Ratio Analysis

Ratio Analysis is a powerful quantitative technique used to evaluate various aspects of a firm’s financial performance and position by interpreting relationships between financial statement figures. It enables stakeholders to assess profitability, efficiency, liquidity, solvency, and market valuation.

3.2 Purpose of Ratio Analysis

- To interpret complex financial data in a simplified form.
- To identify strengths and weaknesses of a business.
- To facilitate comparison across time, industry, and competitors.
- To aid in decision-making for investors, lenders, and managers.

3.3 Types of Ratios

Ratio analysis is typically categorized into the following five groups:

- Profitability Ratio
- Liquidity Ratio
- Efficiency Ratio
- Solvency Ratio
- Marketability Ratio
-

3.3.1 Understanding Ratio Analysis Through Human Health Analogy

Financial statements often feel abstract to students. But imagine if a company were a living human being – wouldn’t we want to check its **blood, heart, digestion, brain, and appearance** to assess overall health?

Just like doctors run multiple tests to diagnose human health, financial analysts use **ratios** to evaluate a company’s well-being. Each category of ratio serves a **unique diagnostic purpose**, much like different medical checkups.

This analogy helps demystify financial ratios by mapping them to health indicators- making the concepts intuitive, relatable, and memorable.

Ratio Category	Human Health Analogy	What It Tells Us
Liquidity Ratios	Blood Tests	Assess short-term health — does the company have enough working capital to function daily, like checking blood sugar or oxygen levels?
Efficiency (Activity) Ratios	Digestive & Metabolic Health	Measures how well resources are processed and turned into output — like a body’s metabolism.

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Ratio Category	Human Health Analogy	What It Tells Us
Profitability Ratios	Mental Health & Brain Function	Reflects how well all systems (revenues, costs, resources) come together to create value — overall business intelligence.
Solvency (Leverage) Ratios	Chronic Illness Risk (e.g., Diabetes or Heart Disease)	Diagnoses long-term risks — e.g., debt levels, financial stress — even if current performance looks fine.
Market Valuation Ratios	Genetic Testing & Skin Symptoms	Looks at how the external world evaluates the company, which can sometimes detect underlying risks or value shifts before they appear in the financials. Like genetic tests or skin issues that point to deeper problems the body hasn't shown yet.

So, “A financially healthy company, like a healthy human, must have good circulation, strong digestion, mental balance, internal stability, and external fitness.” A single ratio doesn't reveal everything - just like a single test doesn't determine your overall health.

For a better understanding all such ratios are detailed below.

3.3.2 Profitability Ratios

These ratios measure the ability of a firm to generate profits from its operations.

Ratio	Formula	Interpretation
Gross Profit Margin	Gross Profit / Net Sales	Indicates the efficiency of production and pricing.
Net Profit Margin	Net Profit / Net Sales	Reflects overall profitability after all expenses.
Return on Assets (ROA)	Net Profit / Total Assets	Measures how efficiently assets generate profit.
Return on Equity (ROE)	Net Profit / Shareholders' Equity	Evaluates profitability for shareholders.

3.3.3 Liquidity Ratios

These ratios assess a firm's ability to meet short-term obligations.

Ratio	Formula	Interpretation
Current Ratio	Current Assets / Current Liabilities	Indicates short-term financial health.
Quick Ratio	(Current Assets - Inventory) / Current Liabilities	Measures liquidity without relying on inventory.

3.3.4 Efficiency (Activity) Ratios

These ratios examine how effectively a firm utilizes its resources.

Ratio	Formula	Interpretation
Inventory Turnover	Cost of Goods Sold / Average Inventory	Shows how quickly inventory is sold.

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Ratio	Formula	Interpretation
Debtors Turnover	Net Credit Sales / Average Receivables	Indicates collection efficiency.
Total Asset Turnover	Net Sales / Total Assets	Measures overall asset efficiency.

3.3.5 Solvency (Leverage) Ratios

These ratios evaluate a firm's ability to meet long-term debts.

Ratio	Formula	Interpretation
Debt to Equity Ratio	Total Debt / Shareholders' Equity	Indicates the balance between debt and equity.
Interest Coverage Ratio	EBIT / Interest Expense	Measures ability to service interest payments.

3.3.6 Market Valuation Ratios

These are used by investors to assess the attractiveness of a firm's stock.

Ratio	Formula	Interpretation
Earnings Per Share (EPS)	Net Profit / No. of Outstanding Shares	Indicates earnings attributable to each share.
Price to Earnings Ratio (P/E)	Market Price per Share / EPS	Reflects market expectations and valuation.
Dividend Yield	Dividend per Share / Market Price per Share	Shows return in the form of dividends.

3.4 Steps in Ratio Analysis

- i. Selection of relevant ratios based on objective.
- ii. Calculation using standardised financial data.
- iii. Comparison with:
 - a. Industry averages
 - b. Historical performance
 - c. Competitors
- iv. Interpretation of results to draw insights.
- v. Decision-making based on findings.

3.5 Advantages of Ratio Analysis

- Simplifies complex financial statements.
- Highlights trends and patterns.
- Supports internal and external benchmarking.
- Aids strategic decision-making and forecasting.

3.6 Limitations of Ratio Analysis

- Based on historical data, not future-oriented.
- Can be distorted by accounting policies.
- Ignores qualitative factors (e.g., brand value).

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- Comparability issues due to differing business models.

Example: Ratio Analysis of ABC Ltd.

Particulars	FY 2023 (₹ Cr)	FY 2024 (₹ Cr)
Net Sales	5,000	5,500
Gross Profit	2,000	2,200
Net Profit	700	715
Current Assets	1,800	2,100
Inventory	600	700
Current Liabilities	900	1,000
Total Assets	4,000	4,500
Shareholders' Equity	2,000	2,200
Total Debt	1,200	1,300
EBIT	1,000	1,050
Interest Expense	200	210

Selected Ratios for FY 2024:

- **Gross Profit Margin** = $2,200 / 5,500 = 40\%$
- **Net Profit Margin** = $715 / 5,500 = 13\%$
- **Current Ratio** = $2,100 / 1,000 = 2.1$
- **Quick Ratio** = $(2,100 - 700) / 1,000 = 1.4$
- **ROA** = $715 / 4,500 = 15.89\%$
- **ROE** = $715 / 2,200 = 32.5\%$
- **Debt to Equity** = $1,300 / 2,200 = 0.59$
- **Interest Coverage** = $1,050 / 210 = 5.0$

Interpretation: ABC Ltd. is a profitable, liquid, and moderately leveraged company. Its high ROE is driven by a solid profit margin and effective asset use, while liquidity ratios suggest good short-term financial health.

3.7 Self-Assessment Questions

- Define Gross Profit Margin (formula).
- What does the Current Ratio measure (and formula)?
- Give the formula for Return on Equity (ROE).
- Which ratio assesses interest-servicing capacity (and formula)?
- Name two market valuation ratios commonly used by investors.

Answers

- Gross Profit Margin = $\text{Gross Profit} \div \text{Net Sales}$
- Short-term liquidity; Current Ratio = $\text{Current Assets} \div \text{Current Liabilities}$
- ROE = $\text{Net Profit} \div \text{Shareholders' Equity}$
- Interest Coverage Ratio = $\text{EBIT} \div \text{Interest Expense}$
- P/E Ratio; Dividend Yield

Module 4: Introduction to Financial Planning

“A well-made plan transforms uncertainty into preparedness.”

4.1 Introduction to Financial Planning

Financial planning is **estimating the amount of funds** required by an organization and **determining the sources** from which the funds will be obtained. It involves **designing financial policies** concerning **procurement, investment, and the administration of funds**.

Example: Before launching a new product, a company estimates how much capital it will require for production, marketing, and distribution.

4.2 Objectives of Financial Planning

- To ensure the **availability of sufficient funds** whenever required.
- To ensure that funds are acquired at the **minimum possible cost**.
- To ensure **adequate return to shareholders**.
- Help in avoiding business **shocks and surprises**.

Now, let's understand the objectives of financial planning through an example.

Example: Financial Planning for ABC Electronics Ltd. (A Consumer Electronics Manufacturer)

Objective 1: Ensure the availability of sufficient funds whenever required

- **Scenario:** ABC Electronics plans to launch a new product line of smart home appliances.
- **Action:** Through effective financial planning, the company secures a ₹50 crore credit line from a bank *before* the launch, ensuring that there are **no cash shortages** during production and marketing phases.
- **Result:** Smooth execution of the launch plan without disruptions due to lack of funds.

Objective 2: Ensure that funds are acquired at the minimum possible cost.

- **Scenario:** Instead of opting for high-interest short-term loans, ABC Electronics chooses to **issue corporate bonds** at 7% interest because of good credit ratings.
- **Result:** The company saves significantly on interest expenses compared to bank loans at 11%, thus **reducing the cost of capital**.

Objective 3: Ensure adequate return to shareholders

- **Scenario:** ABC Electronics forecasts profits over the next three years and plans for **dividend distribution** of ₹5 per share along with reinvestment for expansion.
- **Result:** Shareholders receive regular dividends, boosting **investor confidence** and sustaining the market value of the company's stock.

Objective 4: Help in avoiding business shocks and surprises

- **Scenario:** By conducting **risk analysis** during planning, ABC prepares for possible supply chain disruptions by **maintaining a reserve fund**.
- **Result:** When raw material prices unexpectedly rise due to geopolitical tensions, the company **avoids a crisis** by using its reserve fund, ensuring continuous production and delivery.

4.3 Importance of Financial Planning

- Guides the organization in financial decision-making.
- Helps in optimum utilization of available resources.
- Avoids over-capitalization and under-capitalization.
- Helps in long-term strategic goals.

Example: Importance of Financial Planning — XYZ Pharmaceuticals Ltd.

Scenario:

XYZ Pharmaceuticals Ltd., a medium-sized pharmaceutical company, is planning to expand into the vaccine manufacturing sector, which requires large capital investments, regulatory approvals, and long-term commitment.

How Financial Planning Helps:

Aspect of Importance	Illustration in This Example	Result
Guides the organization in financial decision-making	The company prepares a 5-year financial plan outlining projected costs for R&D, production, marketing, and approvals.	Enables structured decisions on borrowing, partnerships, and spending.
Helps in optimum utilization of available resources	By analyzing the plan, XYZ identifies that it can reuse part of its existing laboratory facilities for vaccine R&D.	Saves ₹10 crore of capital expenditure → better resource use .
Avoids over-capitalization and under-capitalization	Through accurate projections, XYZ realizes that a ₹100 crore investment is sufficient , avoiding raising unnecessary funds.	Prevents idle funds (over-capitalization) and ensures no fund shortage .
Helps in long-term strategic goals	The vaccine initiative aligns with the company's vision of becoming a leader in preventive healthcare by 2030.	Provides a clear growth roadmap with financial backing.

So, by **engaging in** robust financial planning, XYZ Pharmaceuticals **successfully:**

- Makes better decisions,
- Uses its resources more efficiently,
- Avoids both surplus and shortage of funds,
- Aligns its financial strategy with its **long-term business goals**.

4.4 Steps in Financial Planning

- Assessing Current Financial Position
- Determining Financial Goals
- Forecasting Financial Needs
- Formulating Financial Strategies
- Implementing the Plan
- Monitoring and Reviewing

A **brief explanation of each step** is given below.

Assessing Current Financial Position: It means analysis of what the organization **owns (assets)**, **owes (liabilities)**, and its **profitability & cash flows** to understand its present financial strength.

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Determining Financial Goals: It deals with **setting a clear financial objectives for the future: short, medium, and long-term—like expansion, debt reduction, launching new products, etc.**

Example:

ABC Ltd. wants to **launch a new manufacturing unit** needing ₹250 lakh within the next 2 years.

Forecasting Financial Needs: It means estimating **how much finance will be required** to meet the goals, considering expected sales, costs, inflation, and risks.

Example:

Total financial need for new project = ₹250 lakh → ₹180 lakh fixed capital + ₹70 lakh working capital.

Formulating Financial Strategies: In this step, the firm needs to decide **how to arrange the required funds** (e.g., equity, loans, internal profits) and **how to utilize them** effectively.

Example:

ABC Ltd. plans to fund the project with ₹100 lakh from retained earnings, ₹100 lakh through a term loan, and ₹50 lakh by issuing new shares.

Implementing the Plan: **This step involves putting the plan into action, raising funds, purchasing assets, and starting project work.**

Example:

ABC Ltd. buys land and machinery, recruits staff, and begins construction of the new manufacturing unit.

Monitoring and Reviewing: It involves continuously tracking progress, comparing actual performance with plans, and making necessary corrections.

Example:

After 6 months, cost overruns are identified → ABC Ltd. negotiates better supply contracts and controls overheads to stay within budget.

4.5 Characteristics of a Good Financial Plan

- **Flexibility to Adapt to Future Changes**

A good financial plan should allow adjustments based on changing market conditions, business growth, or unforeseen events.

- **Proper Allocation of Risk and Return**

It should balance risk and return, ensuring risky investments have potential rewards while safeguarding essential operations.

- **Understandable and Practical**

The plan should be clear, easy to follow, and realistic, avoiding unnecessary complexity so that it can be effectively implemented.

4.6 Self-Assessment Questions

- a) Which ratio measures a firm's short-term financial health?
- b) What does ROE stand for?
- c) Which ratio indicates the debt burden in comparison to equity?
- d) P/E ratio is classified under which category of ratios?
- e) Quick ratio excludes which current asset from calculation?

Answer

- a) Current Ratio
- b) Return on Equity
- c) Debt-to-Equity Ratio
- d) Market Valuation Ratios
- e) Inventory

Module 5: Forecasting of Financial Performance

“Forecasting connects present realities with future possibilities.”

5.1 Introduction to Forecasting of Financial Performance

Forecasting is all about predicting future financial events based on historical data and analytical techniques. Various methods of forecasting is detailed below.

5.2 Percentage of Sales Method

The **Percentage of Sales Method** is a financial forecasting technique that estimates future financial needs by assuming that certain balance sheet and income statement items (like assets, liabilities, and expenses) change proportionally with sales. It is widely used for preparing projected financial statements.

5.2.1 Steps to Apply Percentage of Sales Method

- **Collect historical financial data** (Sales, assets, liabilities, expenses).
- **Calculate the percentage of each variable relative to sales.**
- **Forecast sales for the future period.**
- **Apply the historical percentages to the forecasted sales** to estimate corresponding values of assets, liabilities, and expenses.
- **Estimate Additional Funds Needed (AFN)** by comparing projected assets and liabilities.

Example

Historical Data of ABC Ltd. (₹ lakh)

Year	Sales	Fixed Assets	Inventory	Debtors	Creditors
2020	500	250	100	80	60
2021	550	260	110	88	66
2022	600	270	120	96	72
2023	660	280	132	105.6	79.2
2024	720	290	144	115.2	86.4

Percentage of Sales for Each Year:

Year	Fixed Assets %	Inventory %	Debtors %	Creditors %
2020	50.00%	20.00%	16.00%	12.00%
2021	47.27%	20.00%	16.00%	12.00%
2022	45.00%	20.00%	16.00%	12.00%
2023	42.42%	20.00%	16.00%	12.00%
2024	40.27%	20.00%	16.00%	12.00%
Average	44.19%	20.00%	16.00%	12.00%

Forecast for 2025 (Projected Sales = ₹800 lakh):

Item	Formula	Projected Value
Fixed Assets	₹800 × 44.19%	₹353.52 lakh
Inventory	₹800 × 20%	₹160 lakh
Debtors	₹800 × 16%	₹128 lakh
Creditors	₹800 × 12%	₹96 lakh

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Additional Funds Needed (AFN):

Total Projected Assets = ₹353.52 + ₹160 + ₹128 = ₹641.52 lakh

Projected Spontaneous Liabilities (Creditors) = ₹96 lakh

Equity + Retained Earnings (Assume) = ₹450 lakh

→ AFN = ₹641.52 lakh - (₹96 lakh + ₹450 lakh) = ₹95.52 lakh

→ An additional ₹95.52 lakh is required to support projected sales.

Advantages

- **Simple and quick** to apply.
- Useful for **short-term financial planning**.
- Helpful when historical relationships between sales and variables are stable.

Disadvantages

- Assumes **all variables change proportionally with sales**, which may not always be realistic.
- Ignores **step-fixed** costs like machinery purchases that increase in jumps.
- Doesn't account for **changes in operating efficiency or external factors**.

Excel Application

- Enter historical data in Excel columns.
- Use formulas to calculate **% of Sales** for each item.
- Input forecasted sales → Apply percentages → Generate projections automatically.
- Use **Excel functions like SUM, PRODUCT, and IF** for better automation.
- Create a chart or dashboard for visualization.

5.3 Trend Analysis

Trend Analysis is a method of financial forecasting that examines historical data over multiple periods to identify patterns, trends, or growth rates. It helps predict future performance based on past behaviour.

5.3.1. Steps to Apply Trend Analysis

- **Collect historical financial data for several periods.**
- **Choose the variable to forecast** (e.g., sales, expenses, profits).
- **Identify the pattern or trend** by calculating the annual growth rate or fitting a trend line.
- **Project future values** by applying the growth rate or using the trend equation.

Example

Historical Sales Data of XYZ Ltd. (₹ lakh):

Year	Sales
2020	500
2021	550
2022	600
2023	660
2024	720

Step 1: Calculate Compounded Annual Growth Rate (CAGR) for Sales:

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- Growth Rate (CAGR) = $[(\text{Final Year Sales} / \text{Initial Year Sales})^{(1/n)} - 1] \times 100$
- = $[(720 / 500)^{(1/4)} - 1] \times 100 = 9.52\%$

→ **Why n = 4?** → 5 years of data gives **4 intervals** between start and end.

Step 2: Projected Sales for 2025 = $₹720 \times (1 + 9.52\%) = ₹789.5$ lakh

- → “1” refers to **100% of current sales**.
- → **9.52%** is the calculated annual growth added to the base.

Why do we use CAGR here?

- **Avoids fluctuations:** Even if sales increased irregularly year by year, CAGR *smooths* it out.
- **Better for projections:** It gives a stable percentage to use for forecasting **future values**, like 2025 sales.
- **Common professional practice:** CAGR is used in financial reports, valuation, project analysis, etc.

Advantages

- Identifies long-term growth patterns.
- Useful for medium to long-term financial planning.
- Helps in recognizing consistent trends or seasonality.

Disadvantages

- Past trends may not continue in the future.
- Can be misleading if external factors (economic, technological) change drastically.
- Requires sufficient historical data for reliability.

Excel Application

- Enter historical data in Excel.
- Use the **TREND()** or **GROWTH()** functions to predict future values.
- Apply charts (line charts) to visualize trends.
- Use **LINEST()** function for more advanced linear trend equations.

Trend Analysis is a practical method for forecasting financial performance over time. By understanding historical patterns, organizations can make informed predictions about future financial conditions while being cautious of external changes that may impact those trends.

5.4 Regression Forecasting

Regression Forecasting is a statistical technique used to predict the value of a dependent variable (e.g., sales) based on one or more independent variables (e.g., advertising expenditure, market size). It helps establish a mathematical relationship between variables to project future outcomes.

5.4.1 Steps to Apply Regression Forecasting

- Collect historical data of the dependent variable and one or more independent variables.
- Plot the data to visually examine the relationship between variables.
- Apply regression analysis to find the regression equation ($Y = a + bX$), where:
 - Y = Dependent variable (e.g., Sales)
 - X = Independent variable (e.g., Advertising expenses)
 - a = Intercept (value of Y when $X = 0$)
 - b = Slope (change in Y for a one-unit change in X)
- Use the regression equation to forecast future values of Y by substituting expected values of X .

Example

Historical Data of XYZ Ltd. (₹ lakh):

Year	Advertising Expense (X)	Sales (Y)
2020	50	500
2021	60	550
2022	70	600
2023	80	660
2024	90	720

Step 1: Calculate the Regression Equation ($Y = a + bX$)

Using Excel or statistical software, we get:

→ $Y = 100 + 7X$

Step 2: Forecast Sales for Advertising Expense of ₹100 lakh in 2025:

→ **Projected Sales** = $100 + (7 \times 100) = \text{₹800 lakh}$

Why Use Regression Forecasting?

- Shows relationships: Helps understand how one variable influences another.
- Better planning: Useful for budgeting and strategic decision-making when changes in input variables are expected.
- Applicable in various scenarios: Forecasting sales based on advertising, production costs based on output, etc.

Advantages

- Can incorporate multiple variables (multiple regression) for better accuracy.
- Effective when strong relationships exist between variables.
- Provides a mathematical prediction model.

Disadvantages

- Requires statistical knowledge and proper data preparation.
- Assumes linear relationships unless specified otherwise.
- Can produce misleading results if key influencing factors are omitted.

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Excel Application

- Use the **=FORECAST.LINEAR(X, known_ys, known_xs)** function for simple linear regression forecasting.
- Apply **LINEST()** function to compute regression statistics.
- Utilize **scatter plots** with trend lines to visualize relationships.
- For multiple regression, use **Data Analysis ToolPak** → Regression.

Regression Forecasting is a powerful forecasting tool that links financial outcomes to influencing factors. By establishing statistical relationships, organizations can create data-driven projections and enhance decision-making accuracy in uncertain environments.

5.5 Moving Average Method

Moving Average is a time series forecasting technique that smooths out short-term fluctuations and highlights longer-term trends or cycles by averaging data points over a specified period. It is commonly used for financial forecasting, especially when data shows seasonal or irregular variations.

5.5.1 Steps to Apply Moving Average Method

- Collect historical data of the variable to be forecasted (e.g., sales, expenses).
- Select the number of periods for the moving average (e.g., 3-period, 4-period).
- Calculate the average of the selected number of periods.
- Slide the period forward by one time unit and repeat the averaging.
- Use the latest moving average to forecast the next period's value.

Example

Historical Sales Data of XYZ Ltd. (₹ lakh):

Year	Sales
2020	500
2021	550
2022	600
2023	660
2024	720

Apply **3-Year Moving Average**:

Year	Sales	3-Year Moving Average
2020	500	
2021	550	
2022	600	$(500 + 550 + 600) / 3 = 550.00$
2023	660	$(550 + 600 + 660) / 3 = 603.33$
2024	720	$(600 + 660 + 720) / 3 = 660.00$

► **Forecast for 2025 = ₹660 lakh** (Based on last calculated moving average)

Why Use Moving Average?

- Smoothens fluctuations: Useful when data has irregular or seasonal variations.
- Simple to calculate and understand.
- Highlights underlying trends in financial data.

Advantages

- Reduces noise from random short-term fluctuations.
- Easy to compute and interpret.
- Useful for short- to medium-term forecasting.

Disadvantages

- Lags behind actual trends, especially when using longer periods.
- Not effective for capturing sharp upward or downward trends.
- Selection of the number of periods can be subjective.

Excel Application

- Use **=AVERAGE(range)** to compute moving averages manually.
- For larger datasets, use **Data Analysis ToolPak** → **Moving Average** for automated calculations.
- Apply **line charts** with moving average lines for visualization.
- Use **=AVERAGE(OFFSET(...))** formula for dynamic moving averages.

Moving Average is a foundational forecasting tool that provides clarity in trends by smoothing volatile data. While it works best for data without sharp changes, combining it with other techniques can enhance forecasting accuracy.

5.6 Exponential Smoothing

Exponential Smoothing is a time series forecasting method that applies decreasing weights to past observations, giving more importance to recent data points. It is particularly useful for datasets with random fluctuations and no strong trend or seasonal pattern.

5.6.1 Steps to Apply Exponential Smoothing

- Collect historical data for the variable to forecast (e.g., sales, expenses).
- Choose a smoothing constant (α), where $0 < \alpha < 1$:
 - Lower α → Smoother forecasts (less responsive to recent changes)
 - Higher α → More sensitive to recent data changes
- Apply the formula:
 - **Forecast for Next Period = $\alpha \times (\text{Actual Value in Current Period}) + (1 - \alpha) \times (\text{Forecast for Current Period})$**
- Use the latest forecasted value for projecting future periods.

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Example

Historical Sales Data of XYZ Ltd. (₹ lakh):

Year	Sales
2020	500
2021	550
2022	600
2023	660
2024	720

Let's apply **Exponential Smoothing** with $\alpha = 0.3$ and assume **Initial Forecast (2020) = 500**.

Year	Sales	Forecast ($\alpha = 0.3$)
2020	500	500.00
2021	550	$0.3 \times 550 + 0.7 \times 500 = 515.00$
2022	600	$0.3 \times 600 + 0.7 \times 515 = 540.50$
2023	660	$0.3 \times 660 + 0.7 \times 540.5 = 576.35$
2024	720	$0.3 \times 720 + 0.7 \times 576.35 = 622.44$

► **Forecast for 2025 = ₹622.44 lakh**

Example: Retail Inventory Forecasting

A **supermarket chain** sells **bottled drinking water**. Sales vary weekly due to factors like:

- Sudden warm weather increases
- Small promotions or discounts
- Irregular consumer demand

To avoid **overstocking (leading to spoilage)** or **understocking (leading to lost sales)**, the store applies **Exponential Smoothing ($\alpha = 0.3$)** on weekly sales data.

- The method allows **recent weeks' data to influence the forecast more**, while still accounting for past patterns.

- The manager uses the **forecast to decide next week's order quantity**.

► **Result:** Better stock management, reduced costs, and satisfied customers.

This method is widely used in:

- Retail for perishable goods
- Hospitals for patient inflow forecasting
- Call centers for predicting call volumes
- Utilities for short-term electricity demand

Why Use Exponential Smoothing?

- Quick adjustments: Reacts faster to recent changes compared to Moving Average.
- Suitable for stable data with irregular short-term fluctuations.
- Flexible: Smoothing factor (α) can be adjusted based on the nature of the data.

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Advantages

- Places greater emphasis on recent data.
- Requires less historical data than moving averages.
- Easy to compute and implement in spreadsheets or software.

Disadvantages

- Not suitable for data with clear trends or seasonality unless modified (Double/Triple Exponential Smoothing).
- Choice of α can significantly affect accuracy.
- Initial forecast choice impacts early results.

Excel Application

- No direct built-in formula, but implement with:
 - **Forecast = $\alpha \times (\text{Actual}) + (1-\alpha) \times (\text{Previous Forecast})$**
 - Manually or using helper columns.
- For automated implementation:
 - Use **Data Analysis → Exponential Smoothing** (via ToolPak add-in).
- Use **charts** to visualize smoothing against actual values.
- Advanced users can use VBA or specialized software for optimized smoothing parameters.

Exponential Smoothing is a flexible forecasting tool, balancing responsiveness with stability. When applied properly, it provides reliable forecasts for datasets exhibiting random short-term variations without strong trends. Real-world applications, such as inventory planning in retail or workload planning in call centers, demonstrate its practical importance in decision-making.

5.7 Scenario Analysis

Scenario Analysis is a forecasting and decision-making technique that evaluates possible future events by considering different alternative outcomes (scenarios). It helps organizations assess the impact of **best-case**, **worst-case**, and **most likely case** scenarios on financial performance or project outcomes.

5.7.1 Steps to Apply Scenario Analysis

- Identify the key variable(s) to forecast (e.g., sales, profits, investment returns).
- Develop multiple scenarios based on different assumptions:
 - Best Case → Optimistic assumptions
 - Worst Case → Pessimistic assumptions
 - Most Likely Case → Realistic or expected outcome
- Estimate the outcomes under each scenario by adjusting key inputs (e.g., market growth, pricing, costs).
- Compare and analyze results to support decision-making.

Example

Forecasting Sales for XYZ Ltd. in 2025:

Scenario	Assumptions	Forecasted Sales (₹ lakh)
Best Case	Market expands by 20%	₹864 lakh
Most Likely Case	Market expands by 10%	₹792 lakh
Worst Case	Market contracts by 5%	₹684 lakh

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Calculation:

- **2024 Sales** = ₹720 lakh
- **Best Case** = ₹720 × 1.20 = ₹864 lakh
- **Most Likely** = ₹720 × 1.10 = ₹792 lakh
- **Worst Case** = ₹720 × 0.95 = ₹684 lakh

► The company can now prepare strategies for each case:

- Invest in marketing (Best Case)
- Maintain stable operations (Most Likely)
- Cost-cutting or price adjustments (Worst Case)

Example: New Product Launch

A **mobile phone manufacturer** plans to launch a new smartphone model.

- **Best Case Scenario** → New features highly demanded, high sales, strong profit margins
- **Most Likely Scenario** → Moderate market acceptance, steady sales
- **Worst Case Scenario** → Technological glitches, low customer interest, weak sales

By preparing for these scenarios, the company:

- Secures financing in advance
- Plans marketing budgets accordingly
- Designs contingency plans to mitigate risks

Why Use Scenario Analysis?

- Prepares for uncertainty: Offers structured planning for uncertain futures.
- Supports decision-making: Helps in evaluating risk-return trade-offs.
- Strategic tool: Used in budgeting, project planning, risk analysis, and investment appraisals.

Advantages

- Considers a wide range of possible outcomes.
- Facilitates risk management and proactive planning.
- Helps identify opportunities and threats.

Disadvantages

- Depends on the quality of assumptions.
- Can be subjective or overly simplistic.
- Time-consuming if many variables are involved.

Excel Application

- Create separate columns for each scenario and apply different formulas or assumptions.
- Use **Data Tables** for structured scenario models.
- **Scenario Manager (What-If Analysis → Scenario Manager)** allows defining and comparing multiple scenarios easily.
- Use **charts** to visually represent the range of possible outcomes.

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Scenario Analysis is an essential part of modern financial planning, helping managers and decision-makers prepare for uncertainty by modeling a range of potential outcomes. By visualizing best, worst, and most likely scenarios, organizations can develop robust strategies that are resilient to changing environments.

For a quick view, the summary table for all Forecasting Techniques is given below:

Technique	When to Use	Excel Tool / Formula
Percentage of Sales Method	• Forecasting expenses, profits, or assets as a % of projected sales • Useful for budgeting and financial planning	Manual with formulas: $\text{Sales} \times \%$ Can use Data Tables for multiple assumptions
Trend Analysis	• Long-term growth patterns• Predict future values from historical trends	=TREND(), =GROWTH(), =LINEST()
Regression Forecasting	• Forecasting based on relationships• E.g., sales vs advertising	=FORECAST.LINEAR(), =SLOPE(), =INTERCEPT()
Moving Average	• Smoothing short-term irregularities• No strong trends or seasonality	=AVERAGE(), Data Analysis → Moving Average
Exponential Smoothing	• Data with random short-term fluctuations• Recent data more relevant	Data Analysis → Exponential Smoothing or manual: $\alpha \times \text{Actual} + (1-\alpha) \times \text{Forecast}$
Scenario Analysis	• Planning for uncertain future outcomes• Strategic decision-making	What-If Analysis → Scenario Manager / Manual setup

Quick Guide: Which Method for Which Situation

Situation	Recommended Technique
Budget planning for next year	Percentage of Sales Method
Predicting future sales from past sales	Trend Analysis
Predicting sales based on advertising spend	Regression Forecasting
Dealing with fluctuating weekly/monthly sales	Moving Average
Retail stock forecasting (short term)	Exponential Smoothing
Evaluating optimistic and pessimistic forecasts	Scenario Analysis

5.8 Advanced Techniques

- **Break-Even Analysis (BEA):** Minimum output required to cover total costs.
 - **Sensitivity Analysis:** How sensitive results are to changes in assumptions.
 - **Simulation Models:** Used in complex risk analysis.
-

5.9 Self-Assessment Questions

- a) Which forecasting method assumes expenses, assets, and liabilities change in proportion to sales?
- b) CAGR is especially used in which forecasting technique?
- c) What is the regression equation format used in Regression Forecasting?
- d) In the Moving Average method, what is the purpose of taking averages?
- e) **Scenario Analysis generally considers how many cases?**

Answers

- a) Percentage of Sales Method
- b) Trend Analysis
- c) $Y = a + bX$
- d) To smooth out short-term fluctuations
- e) Three (Best, Worst, Most Likely)

Module 6: Estimating Financial Requirement

“Defining requirements is the bridge between vision and execution.”

6.1 Introduction to Estimation of Financial Requirement

It is the process of determining how much funding a business needs—covering start-up costs, working capital for day-to-day operations, and long-term investments—so that plans are feasible and adequately financed. It aligns projected activities with the capital needed, the timing of cash flows, and appropriate financing sources to avoid under- or over-capitalization.

6.2 Types of Financial Requirements

- a) **Fixed Capital Requirement:** Funds needed to acquire assets like plant, machinery, and infrastructure.
- b) **Working Capital Requirement:** Funds required for day-to-day operational expenses.

6.3 Factors Affecting Financial Requirements

- Nature of Business
- Size of Business
- Growth Stage
- Production Cycle
- Credit Terms

Let's understand these in detail:

6.3.1 Nature of Business

- **Definition:** Different types of businesses require different amounts of capital.
- **Explanation:**
 - **Manufacturing businesses** → High capital requirement (for machinery, equipment, raw materials).
 - **Trading businesses** → Moderate requirement (need inventory, warehouses).
 - **Service businesses** → Usually lower requirement (mostly salaries, office rent, software).

6.3.2 Size of Business

- **Definition:** The bigger the business, the more capital it needs.
- **Explanation:**
 - **Small businesses** → Limited operations → Lower financial needs.
 - **Large corporations** → Multiple plants, branches, departments → Higher financial needs.

6.3.3 Growth Stage of Business

- **Definition:** The stage of a business's lifecycle affects its capital requirements.
- **Explanation:**
 - **Startup/Introduction Stage** → Huge initial investments in R&D, marketing, assets.
 - **Growth Stage** → Requires expansion capital.
 - **Maturity Stage** → Stable, lower incremental funding.
 - **Decline Stage** → Capital needed mainly for restructuring or diversification.

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6.3.4 Production Cycle

- **Definition:** Time taken to convert raw materials into finished goods and sell them.
- **Explanation:**
 - **Long Production Cycle** → More funds tied up → Higher working capital requirement.
 - **Short Production Cycle** → Quick conversion → Lower working capital requirement.

6.3.5 Credit Terms

- **Definition:** The terms under which a business buys from suppliers and sells to customers.
- **Explanation:**
 - **Favorable credit terms (buy now, pay later)** → Lower working capital requirement.
 - **Extended credit to customers** → Increases need for working capital.

Example: GHI Textiles Ltd. (A Cotton Garment Manufacturer)

Business Profile:

- GHI Textiles manufactures cotton garments for domestic and export markets.
- Recently, the company is planning to **expand operations internationally**.

Let's see how each factor affects GHI's financial requirements:

Factor	Situation at GHI Textiles Ltd.	Impact on Financial Requirement
Nature of Business	Manufacturing sector : Needs machinery, warehouses, raw materials, labor.	High fixed & working capital required.
Size of Business	Medium-sized but expanding into export markets.	Capital is required for new plant setup, logistics, and marketing abroad.
Growth Stage	Moving from the growth to the expansion stage.	Heavy investment in product development, international branding, and certifications.
Production Cycle	Long production cycle (3-4 months) due to sourcing of cotton, weaving, and tailoring.	High working capital is needed to fund operations during the production cycle.
Credit Terms	- Buys raw cotton on 30 days' credit.- Gives 90 days credit to international buyers.	Mismatch increases working capital needed to bridge the gap between paying suppliers and receiving from customers.

Summary Table of the Example:

Factor	Outcome for GHI Textiles Ltd.
Nature of Business	High fixed + working capital for manufacturing operations.
Size of Business	Growing → Needs more funding for scaling globally.
Growth Stage	Expanding → High cash requirement for market development abroad.
Production Cycle	Long → More working capital needed to keep production flowing.
Credit Terms	Supplier credit is short, customer credit is long → Increases need for bridge financing .

Example:

- A similar situation is often seen in **Indian textile exporters** like **Raymond Ltd.** or **Arvind Mills**, where **export receivables** take 60-120 days, but supplier payments are due within 30 days, → **increases working capital needs**.

6.4 Methods of Estimating Financial Requirements

Estimating financial requirements is a critical part of financial planning. Once future sales, production, or expansion have been forecasted, it becomes necessary to estimate the **funds required** to support those projections. Several methods are commonly used depending on the nature of the business and the availability of data.

6.4.1 Projected Balance Sheet Method

The Projected Balance Sheet Method is a comprehensive approach that involves **preparing a pro forma (projected) balance sheet** based on expected operations for a future period. By comparing **projected assets** and **projected liabilities**, the financial requirement (or surplus) can be determined.

Steps to Apply:

- Forecast key financial items: sales, fixed assets, current assets, liabilities, reserves.
- Prepare a **pro forma balance sheet** for the future period.
- Calculate the difference:
 - **Excess of Assets over Liabilities = External Funding Requirement**
 - **Excess of Liabilities over Assets = Surplus or Excess Funds**

Example:

Particulars	₹ lakh
Projected Assets	1,500
Projected Liabilities & Equity	1,200
Funding Gap	300

► **₹300 lakh needed as external financing.**

Advantages:

- Comprehensive; considers all items.
- Accurate for long-term planning.

Disadvantages:

- Time-consuming; requires detailed projections.

6.4.2 Percentage of Sales Method

This is a **quick and practical approach** based on the historical relationship between **sales** and related financial variables (like inventory, receivables, working capital, etc.).

Steps to Apply:

- Analyze past financial statements to find stable relationships (e.g., Inventory = 20% of Sales).
- Forecast sales.
- Apply the percentage to estimate the requirement.

Example:

If Inventory historically = 20% of Sales, and projected sales = ₹1,000 lakh → Required Inventory = ₹200 lakh.

Advantages:

- Easy and quick to apply.
- Good for short-term forecasting.

Disadvantages:

- Assumes that the historical percentage will remain constant.
- Not suitable if significant changes are expected in business operations.

6.4.3 Regression Analysis

Regression Analysis estimates financial requirements by establishing a **statistical relationship between financial variables and sales**. This method provides greater accuracy when reliable historical data is available.

Steps to Apply:

- Perform a regression analysis using historical data.
Example equation: Working Capital (WC) = $20 + 0.25(\text{Sales})$
- Forecast sales.
- Substitute projected sales into the equation to estimate financial requirement.

Example:

Forecasted Sales = ₹100 lakh

→ $WC = 20 + 0.25(100) = ₹20 \text{ lakh} + ₹25 \text{ lakh} = ₹45 \text{ lakh}$

Advantages:

- Statistically sound.
- Reflects real relationships if sufficient data is available.

Disadvantages:

- Requires statistical knowledge and reliable historical data.
- More complex than Percentage of Sales Method.

6.4.4 Operating Cycle Approach

This method estimates **working capital requirements** by analyzing the **business's operating cycle**. The operating cycle represents the **time taken to convert resources into cash flows**.

Formula:

Operating Cycle = Inventory Holding Period + Receivables Period – Payables Period

► **Longer Operating Cycle → Higher Working Capital Requirement**

Steps to Apply:

- Calculate average Inventory Days, Receivables Days, and Payables Days.
- Determine the length of the operating cycle.
- Estimate the amount of working capital needed to cover the operating cycle.

Example:

Item	Days
Inventory Days	60
Receivables Days	30
Payables Days	20
Operating Cycle	70

If daily operating expenses = ₹2 lakh →

Working Capital Requirement = 70 × ₹2 lakh = ₹140 lakh

Advantages:

- Practical for operational planning.
- Directly related to business efficiency.

Disadvantages:

- Requires detailed operational data.
- Changes in credit terms or inventory policies can alter the requirement.

Summary Table of Methods

Method	Best Used For	Complexity
Projected Balance Sheet	Comprehensive planning	High
Percentage of Sales	Quick short-term estimation	Low
Regression Analysis	Accurate estimation with data	Medium to High
Operating Cycle Approach	Working capital estimation	Medium

6.5 Self-Assessment Questions

- a) Which type of capital is required for day-to-day operations?
- b) Name any two factors affecting financial requirements.
- c) In the Projected Balance Sheet Method, how is external funding requirement calculated?
- d) Which method estimates working capital by analyzing Inventory Days, Receivables Days, and Payables Days?
- e) If Inventory = 20% of Sales and projected Sales = ₹1,000 lakh, what will be the Inventory requirement (using Percentage of Sales Method)?

Answer

- a) Working Capital
- b) Nature of Business, Size of Business (any two)
- c) Excess of Assets over Liabilities = External Funding Requirement
- d) Operating Cycle Approach
- e) ₹200 lakh
