Excel for Finance and Accounting

Learn how to optimize Excel formulas and functions for financial analysis

Suraj Kumar Lohani

bpb

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www.bpbonline.com

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Dedicated to

My beloved wife:

Shikha

&

My Son ***Eshansh***

About the Author

Suraj Kumar Lohani, the author of Excel for Finance and Accounting, is a seasoned finance and accounting professional with over 18 years of industry experience. He has worked in a variety of roles in both finance and accounting, from audit and assurance to financial analysis and management accounting.

Suraj Kumar Lohani's expertise lies in financial reporting, forecasting, and analysis, and he has extensive experience using Microsoft Excel to manage complex data and perform detailed financial modeling. He holds a Master's degree in Accounting and Finance from Symbiosis and has completed various professional certifications.

As an author, Suraj Kumar Lohani is passionate about sharing his knowledge and expertise with other professionals in the industry. He has designed Excel for Finance and Accounting to provide readers with a comprehensive guide to Excel that is both accessible and informative.

Suraj Kumar Lohani is dedicated to helping finance and accounting professionals enhance their technical skills and stay up-to-date with industry trends, and he hopes that Excel for Finance and Accounting will be a valuable resource for professionals in the field.

About the Reviewer

Prawesthi Testyaningrum is a tech startup enthusiast who concerns about education and youth empowerment. She is currently on her 8th year of experience in Finance & Accounting industry, started her first career as an Internal Auditor and her latest career as a Finance, Accounting & Tax Manager in one of the biggest conglomerate company in Indonesia. Throughout her career, she uses excel extensively on day to day basis including the cloud based one. Besides that, she also on her phase to get an Accounting Doctoral Degree to emphasize her passion in Finance & Education.

Lean procedures and automation without neglecting the SOP is the key in her career journey she always emphasizes. Thus, paperless data and excel automation are a must in her team. It makes her passionate in becoming the reviewer of this book, in the hope that it would be beneficial to the target readers.

Acknowledgement

Acknowledging the support and contributions of those who have helped bring a book to fruition is a vital component of the publication process. With that in mind, I would like to express my heartfelt gratitude to all those who have been involved in the creation of Excel for Finance and Accounting.

To begin, I want to extend my deepest appreciation to my wife Shikha and my son Eshansh, as their encouragement and belief in my abilities have been instrumental in keeping me motivated throughout the writing process. I also want to thank my editor, for their guidance and feedback, which has helped me to shape this book into its final form.

Additionally, I would like to express my appreciation to the team at BPB Publications, whose assistance has been invaluable in bringing this book to publication. I am also grateful to my colleagues in the finance and accounting industry, whose expertise and experiences have helped to shape the content of this book.

Lastly, I would like to thank the readers of this book for their support and engagement. It is my sincere hope that Excel for Finance and Accounting provides you with the knowledge and skills necessary to excel in your careers. Thank you all for your invaluable contributions.

Preface

In today's world, finance and accounting professionals are expected to possess a wide range of skills, from technical proficiency to critical thinking and problem-solving abilities. Among these skills, proficiency in Microsoft Excel is one of the most critical. Excel is a versatile tool that can help professionals in finance and accounting manage complex data, analyze financial information, and make informed business decisions.

This book, Excel for Finance and Accounting, has been written with the goal of providing a comprehensive and accessible guide to Excel for professionals in the finance and accounting industries. Whether you are a seasoned professional or just starting in your career, this book will help you to master Excel's capabilities and apply them to real-world financial and accounting scenarios.

The book covers a broad range of topics, from the basics of Excel to advanced functions and formulas, financial modeling, data visualization, and more. Each chapter includes practical examples and exercises that will help you to apply your new skills and knowledge to real-world scenarios.

I hope that this book will serve as a valuable resource for finance and accounting professionals looking to improve their Excel skills and enhance their ability to analyze financial information, make informed business decisions, and succeed in their careers.

Thank you for choosing Excel for Finance and Accounting.

Chapter 1: Getting Started with Advance Excel - Excel for Finance and Accounting starts with an introduction to Excel and its advanced features and functions. This chapter is designed to provide a comprehensive overview of Excel and its usage in Accounting and Finance.

Chapter 2: Preparing Financial Statements Smartly- Focuses on preparing Financial Statements smartly. This chapter covers the basics of financial statements, including types of financial statements, structure, and components. Additionally, readers will learn about equity and private equity.

Chapter 3: Calculating and Projecting Various Financial Ratios- Delves into financial ratio analysis. The chapter covers the importance of financial ratios in

identifying the financial health of a business. It includes an introduction to financial ratios and their types.

Chapter 4: Modeling Working Capital- Teaches readers about Working Capital Management. The chapter covers how to manage working capital efficiently and the consequences of mismanagement.

Chapter 5: Preparing Business Valuation Modeling- Dedicated to Business Valuation Modelling. The chapter teaches readers how to evaluate a business using different scenarios.

Chapter 6: Financial Modeling and Cash Flow Modeling- Covers Financial Modelling and Cash Flow Modelling. The chapter teaches readers different types of financial modelling and the step-by-step calculation of financial modelling and cash flow statements in Excel.

Chapter 7: Preparing Different Budgets With Analysis- Teaches readers how to prepare different budgets with analysis. This chapter covers operating and capital budgets in Excel.

Chapter 8: Capital Budgeting and Leverage Buyout Modeling- Focuses on Leverage Buyout Modelling and discounted cash flow. The chapter covers leverage and its meaning in Accounting and Finance.

Chapter 9: Dashboards With Excel- Concludes the book by teaching readers how to design business dashboards step-by-step.

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Chapter 1
Getting Started with Advance Excel

Introduction

Excel is the one on the most powerful spreadsheets program and is frequently used by finance professionals. Advanced Excel training focuses on several critical skills that can be utilized and can add value to almost any position in a company. We benefit from advanced Excel training in many ways, from adding value to learning better tools to improve productivity.

After completing this chapter, you will become a proficient user and be able to work with various functions of Excel and use pivot tables, visualizations, and other advanced features. You will become one of the top Excel users.

Structure

In this chapter, we will discuss the following topics:

- Table and Its Uses
- Conditional Formatting
- Custom Number Formatting
- What if Analysis

- Advance Functions
- Lookup Functions
- Advance Features
- Dynamic Ranges
- Pivot Table and Chart
- Macros

Objectives

To deep dive into Excel in accounting and finance, we need to start from scratch. First, we will learn what Excel is and how we can use it. Then, we will look at various advanced features and functions. We will understand how to create equations that can allow us to provide more data on company functions, such as workflow, project efficiency, financial projections, and budgets, and even inventory levels and usage.

Excel Table and Its Uses

Excel Table is a table that commands the conversion of a list of data into a formatted Excel Table. We can use tables for many features, such as sorting and filtering, and to help us organize and view our data. We can use an Excel Table as a database to unlock additional Excel properties. An Excel Table can be handy and make Excel sheets easier to use. *Figure 1.1* is an example of a table:

	A	B	C	D	E
1	Student Roll N	Student Nam	Marks	Grade	Result
2	1	Matthew Wells	56	C+	Pass
3	2	Marie Howell	72	B+	Pass
4	3	Henry Gardner	67	B	Pass
5	4	Ann Ward	43	C	Fail
6	5	Michelle Evans	85	A	Pass
7	6	Patrick Gordon	30	E	Fail
8	7	Ralph Gilbert	92	A+	Pass
9	8	Phillip Hawkins	76	B+	Pass
10	9	Eugene Snyder	48	C	Pass
11	10	Kathleen Wagner	37	D	Fail

Figure 1.1: *Table Format in Excel*

As shown in the previous figure, Excel has its default template format of a table with blue banded rows, but we can change it as per our requirement. To do this, select any cell of the current Table, and a Table Design Tab will appear in the ribbon by default.

We can change the format from Table Design Tab from Table Styles, as shown in *Figure 1.2*:

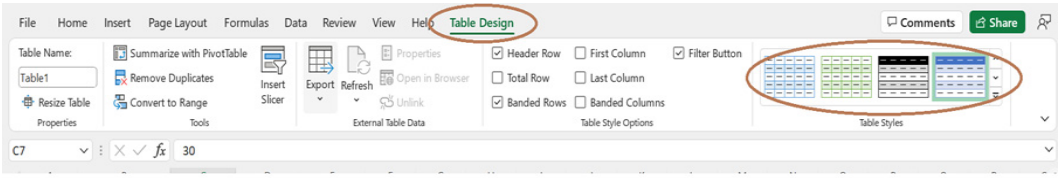


Figure 1.2: *Tab Style Path*

We can also create our custom Table Designs, for which we need to follow these steps:

1. Go to Table Styles and click on the right-most popup, as shown in *Figure 1.3*:

Figure 1.3: *Popup to click on in Table Styles Group*

2. Then, select New Table Style, as shown in *Figure 1.4*:

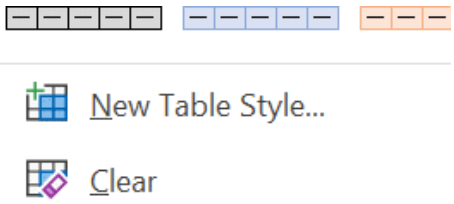


Figure 1.4: *Click on Clear to clear the formatting*

3. To clear the table formatting, click on Clear as shown in *Figure 1.4*.

Now we will learn to create a table in an Excel spreadsheet.

Select a set of data, go to the Insert tab, click on table or use the shortcut *Ctrl + T*, as shown in *Figure 1.5*:

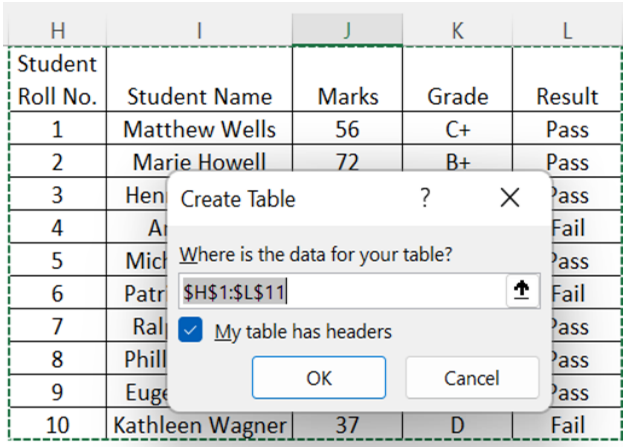


Figure 1.5: *Inserting a table*

Advantages of Excel Table

Tables headers remain visible even when we scroll down the sheet/table.

Filters are automatically available in a table, so we don't need to add separate filters.

Every Excel Table column has its name range. It makes Excel Data dynamic, as shown in *Figure 1.6*:

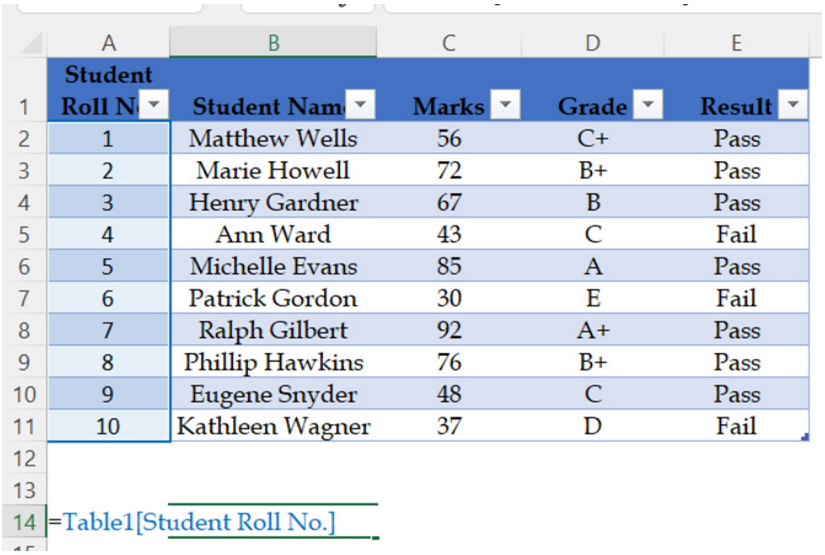


Figure 1.6: *Table Name Range*

Tables have different options, as shown in *Figure 1.7*:

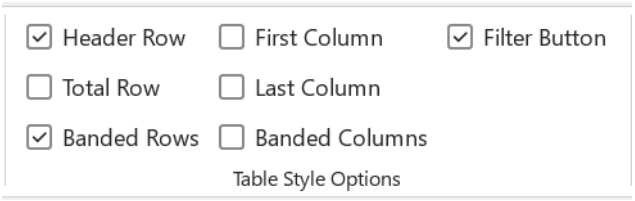


Figure 1.7: *Different Table Styles Options*

- **Header Row**: It displays the header of a table. If a header row is unchecked, the header of the table will disappear.
- **Total Row**: It displays the subtotal function with different parameters.
- **Banded Row/Column**: They display alternate row or column shading, respectively.
- **First column/last column**: They are the special display formatting for the first and the last columns of the table.
- **Filter Button:** The filter will disappear when the Filter button is unchecked.

Now, we will learn to name an Excel table.

Select a table and go to the table design and then to Properties. Table1 will display by default for the first table of the Workbook; you can rename it:

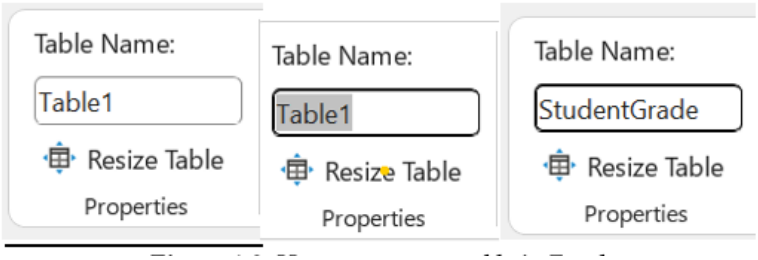


Figure 1.8: *How to rename a table in Excel*

Select Table1 and rename it, as shown in *Figure 1.8*.

Conditional Formatting

Conditional formatting allows us to automatically apply formatting, such as colors, icons, and data bars. It takes your Excel sheet's layout and design options to the next level. It makes our spreadsheet look fantastic, lets us make sense of our data, and spot essential cues in the blink of an eye.

It works like an "if this, then that" statement.

Every conditional formatting rule is made up of three parts:

- **Range**: We start by selecting the cells to which the rule will apply. This might be just a selection of rows, columns, or an entire workbook.
- **Condition**: This is the "if" part of the if/then clause. We can choose from various options, including formulas.
- **Formatting**: This is the "then" part of the if/then clause. Excel has a default styling for every condition, but we can also customize it.

Follow the given steps to apply conditional formatting in a range of cells or a table:

1. Select the range and go to Home tab – Style Group – Conditional Formatting, as shown in *Figure 1.9*:

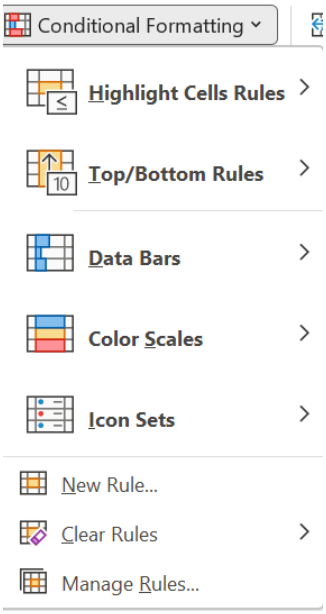


Figure 1.9: *Conditional Formatting*

2. Select a conditional formatting category, as shown in the previous figure:
    a) **Highlight Cells Rules:** Focus on general analysis. Default conditions include Greater Than, Less Than, Between, Equal To, Text That Contains, Date Occurring and Duplicate Values.
    b) **Top/Bottom Rules:** Focus on the high and low values in the worksheet. Default conditions include Top 10 Items; Top 10%; Bottom 10 Items; Bottom 10%; Above Average; Following Average.

c) **Data Bars:** Colored bars that appear in the cells. The longer the bar, the higher the value in that cell.

d) **Color Scales:** Cells are shaded with different color gradients, depending on the relative value of each cell compared to other cells in the range.

e) **Icon Sets:** Different shaped or colored icons appear in cells, based on each cell's value.

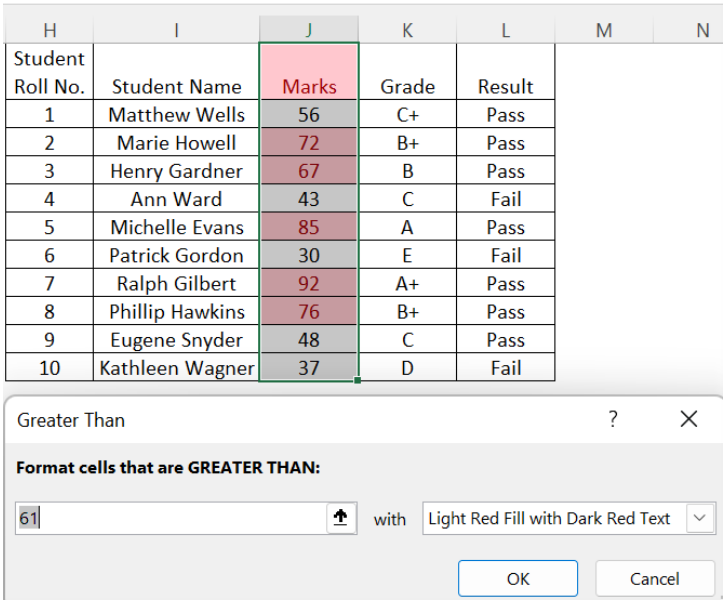


Figure 1.10: *Condition whatever we want*

3. As shown in *Figure 1.10*, we must follow the steps to complete conditional formatting. Select Cells to apply conditional formatting I.

   As shown in *Figure 1.10*, select the Marks column.

Apply Conditional Formatting.

We type 61 in our example.

Define Criteria and Get Format Cells

Select Criteria as shown in figure 1.10

Custom Number Formatting

Custom Number Format controls the execution of numerical values in a spreadsheet. This feature enables various kinds of formatting that can be applied to the data, especially numbers. It is used to perform many formatting on numbers automatically,

and it is totally different from Conditional Formatting. We will learn this with the help of an example.

To apply custom number formatting formatting on a range of cells or a table.

Select the range and Go to Home Tab | Number Group | Dialog Launcher -Select from Dialog Box – Custom (shortcut CTRL + 1), as shown in *Figure 1.11:*

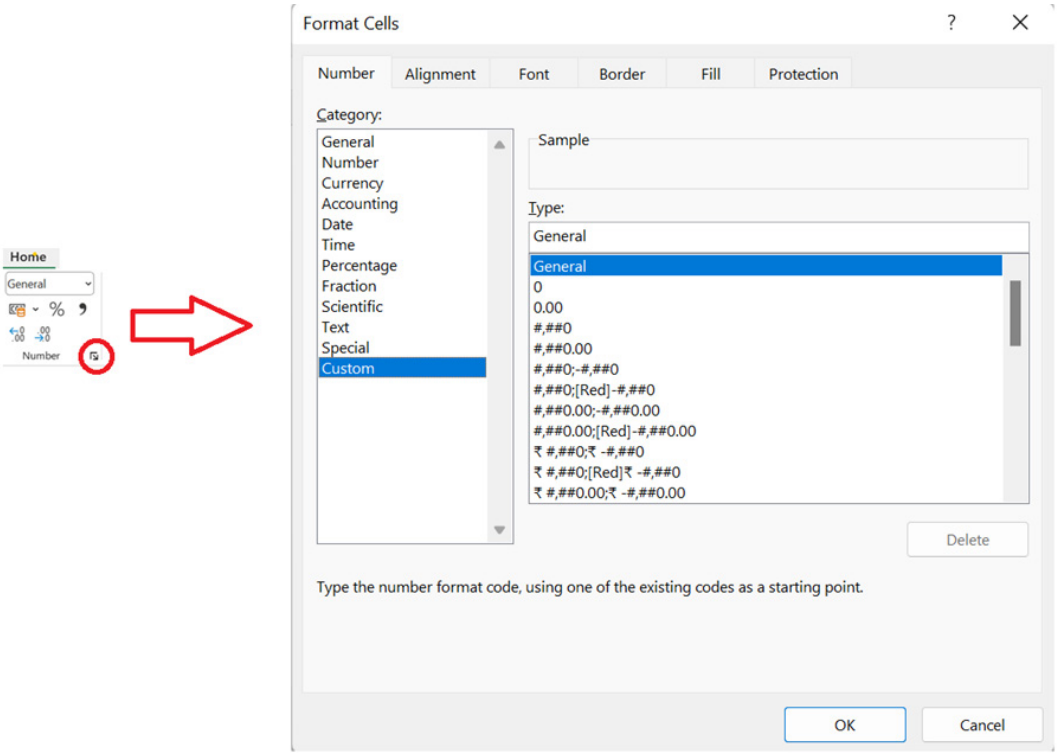


Figure 1.11: *Custom Formatting Dialog Box*

4 Parts of a Number Format Rule

There are four types of custom format" positive, negative, zero and text with the use of ;;;

There are four parts or sections to a ***Custom Number Format*** rule. The first section is required, while the other three are optional. Each section is divided with a semicolon (;) in this order [POSITIVE; NEGATIVE;ZEROS;TEXT]. Here's what each part of the number format rule represents:

- If the number is **positive,** then do this…
- If the number is **negative,** then do this…
- If the number equals **zero,** then do this…

- If the value is **not a number,** then do this…

  Example: [#,##0.00;#,##0.00;"-";[Red}@

In the previous example:

- #,##0.00 before the first semicolon means the number in the cell will display decimal places and thousands separator in case of positive numbers (If the value is 1000, it will display 1,000.00).
- #,##0.00 before the second semicolon means the number in the cell will display 2 decimal places and thousands separator in case of negative numbers (if the value is -1000, it will display -1,000.00).
- "-" before the third semicolon means the number in the cell will display – in case number is zero (if the value is 0, it will display -).
- [Red]@ in the last section means the cell value is text, and the font will be displayed in red.

Display text without converting cell to text format

If we type text along with numeric values in a cell, Excel automatically converts that cell to a text format, making it unusable for formulas and other mathematical calculations. If we want a specific text displayed next to a number without changing the number to text format, we may want to consider adding the text value to the number code.

For example, as shown in *Figure 1.12*, to add the text **"Kgs"**, we would use the following code: **General Kgs**

```
#,### "Kgs"
```

Figure 1.12: *To Add Text in a Number*

Use *, as shown in *Figure 1.13*, to give space between number and custom format text:

```
-03     Your
```

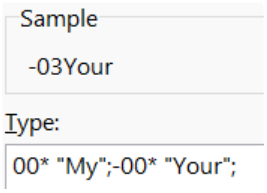


Figure 1.13: *To Add Space Between Number and Custom Format Text*

If we want to show the blank cell instead of Value Zero, we need to add a custom format, as shown in *Table 1.1*:

Actual Value	Custom Value	Remark
0		blank cell instead of zero

Table 1.1: *Blank cell instead of zero*

We need to add the formatting shown in *Figure 1.14*:

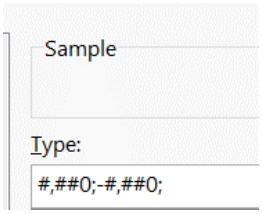


Figure 1.14: *Custom Number formatting for blank cell for zero value cell*

If we want to show the text instead of numeric values, we need to add a custom format, as shown in *Table 1.2*:

Actual	Custom Value	Remark
-10	Negative Value	Cell Value is Negative
5	Positive Value	Cell Value is Positive
0	Zero Value	Cell Value is Zero

Table 1.2: *Text instead of Numbers*

To apply this custom format, we need to type as shown in *Figure 1.15:*

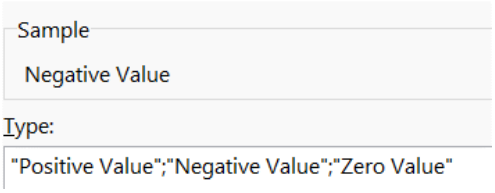


***Figure 1.15**: To Add Text instead of Numbers*

Shortcuts For Number Formats

There are shortcuts available to apply formatting instantly, as listed in *Table 1.3*:

Shortcut Key	Description
Ctrl + Shift + ~	Applies general formatting to the selected cells
Ctrl + Shift + $	Applies currency formatting to the selected cells
Ctrl + Shift + %	Applies percentage for formatting to the selected cells
Ctrl + Shift + ^	Applies scientific formatting to the selected cells
Ctrl + Shift + #	Applies date formatting to the selected cells
Ctrl + Shift + @	Applies time format to the selected cells

***Table 1.3:** Shortcuts for Number formatting in Excel*

What if Analysis

What-If Analysis is the process of changing the values in cells to see how those changes will affect the outcome of formulas on the worksheet. By using What-If Analysis tools in Excel, we can use several different sets of values in one or more formulas to explore the various results.

Excel has three types of What if Analysis features:

- Goal Seek
- Scenario Manager
- Data Table

Goal Seek

Goal Seek is the most common What if Analysis tool in MS Excel. It is a problem-solving approach that involves identifying and obtaining the desired outcome or

solutionby changing an assumption that drives it. If we know the result we want from a formula, we can use **Goal Seek** in **Excel**:

	A	B
1	**Student**	**Marks**
2	Math	76
3	English	87
4	Science	95
5	Hindi	91
6	Social Study	
7	Total	349

Figure 1.16: *Marks for Subjects for goal seek*

In *Figure 1.16*, B7 calculates the sum of all subjects' marks. The marks for Social Study are the input in cell B6. In this example, we are considering Total Marks as 440. Now, the Goal Seek is required to know the result of sum(B2:B6) in cell B7. After this, we will get the Marks of Social Study in B6. Following are the steps:

1. On the Data tab, in the Forecast group, click on **What-If Analysis** and then on **Goal Seek**:

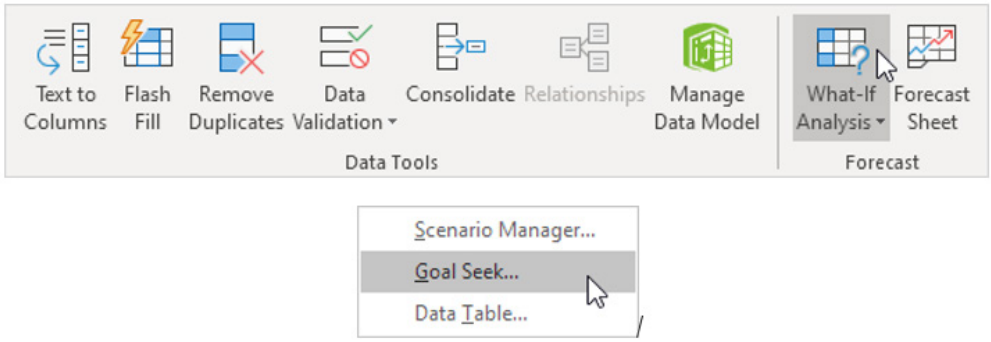


Figure 1.17: *Path for Goal Seek*

2. The Goal Seek dialog box appears.
3. Select cell B7. Click in the 'To value' box and type 440.
5. Click in the 'By changing cell' box and select cell B6.

6. Click on OK, as shown in *Figure 1.18*:

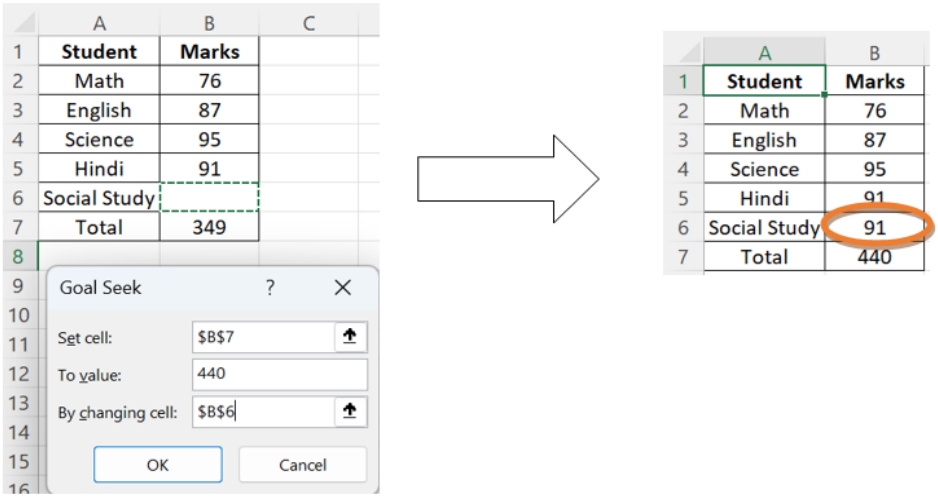


Figure 1.18: *Steps to get the desired result*

We will have our desired result of 91.

We can use Goal Seek for most formulas in Excel.

We will learn about Data Table and Scenario Manager in the later part of this book.

Advance Functions

Advanced Excel Functions refer to the features and functions of Microsoft Excel that help users perform complex calculations, data analysis, and much more. We will use the most common advanced functions in our journey of learning Excel for Accounting and Finance. Here's the list:

- Sumif and Sumifs.
- Count and Average Functions.
- Date Functions.

Lookup Functions are part of advance functions, so we will learn about them in the next section of this chapter.

Sumif and Sumifs

Both functions are used to sum a range with a related condition. To differentiate, the SUMIF function allows for imposing a single condition on our data, while the 'SUMIFS' function allows for setting multiple conditions.

The basic syntax of SUMIF and SUMIFS functions is as follows:

```
=SUMIF(range, criteria, [sum_range])
```

```
=SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2], [criteria2],…)
```

	A	B	C	D
1	**Zone**	**Sales Person**	**Item Name**	**Pcs**
2	Delhi	Vishal	TV	4
3	Noida	Ritesh	AC	3
4	Noida	Rahul	TV	5
5	Ghaziabad	Ritesh	AC	10
6	Ghaziabad	Ritesh	Fridge	1
7	Delhi	Rahul	Fridge	5
8	Noida	Vishal	TV	7
9	Ghaziabad	Pankaj	AC	12
10	Delhi	Rahul	AC	9
11	Noida	Vishal	AC	8
12	Ghaziabad	Pankaj	TV	3
13	Noida	Rahul	Fridge	7
14	Delhi	Pankaj	TV	3
15	Noida	Vishal	Fridge	9
16	Gurugram	Ritesh	AC	6

Figure 1.19: *Table for Sumif and Sumifs Functions*

Here, we have some salespersons' name, their selling products, and total pieces.

We are going to find the total pieces sold by Vishal:

=SUMIF(B2:B16,"Vishal",D2:D16)

We will get 28.

Now, we are going to find the total number of TVs sold by Vishal in Delhi Zone:

=SUMIFS(D2:D16,B2:B16,"Vishal",C2:C16,"TV",A2:A16,"Delhi")

We will get 4.

Count and Average Functions

We will learn about the Count and Average functions in Excel.

	A	B	C	D
1	**Channel**	**Product**	**Date**	**Sales Value**
2	Website	Shirt blue	08-01-2018	200
3	Store	Shirt white	08-01-2018	250
4	Affiliate site	Pants Blue	11-01-2018	300
5	Store	Shirt blue	10-02-2018	260
6				
7	Affiliate site	Shirt yellow	10-02-2018	270
8	Website	Shirt blue	20-12-2017	280
9	Store	Pants Blue	01-11-2017	100
10	Store	Shirt blue	01-11-2017	500

F	G	H	I
Requirment	**Formula Name**	**Result**	**Formula**
COUNT THE NUMRIC	COUNT	16	=COUNT($A$2:$D$10)
COUNT ALL	COUNTA	32	=COUNTA($A$2:$D$10)
COUNT WITH SINGLE CONDITION	COUNTIF	4	=COUNTIF($A$2:$D$10,"shirt blue")
COUNT THE BLANK	COUNTBLANK	4	=COUNTBLANK($A$2:$D$10)
COUNT WITH MULTIPLE CONDITIONS	COUNTIFS	3	=COUNTIFS(A2:A10,"store",B2:B10,"*blue")
AVERAGE OF ALL PRODUCTS	AVERAGE	270	=AVERAGE(D2:D10)
AVERAGE WITH SINGLE CONDITION	AVERAGEIF	310	=AVERAGEIF(B2:B10,"Shirt blue",D2:D10)
AVERAGE WITH MULTIPLE CONDITIONS	AVERAGEIFS	240	=AVERAGEIFS(D2:D10,A2:A10,"Website",B2:B10,"Shirt blue")

***Figure 1.20**: Various Functions of Count and Average*

Time Functions

Time functions are very useful for finance and accounting professionals. All projections and estimations depend on time for finance and accounting professionals. As shown in *Figure 1.21*, we will learn the following time and date functions, and their uses:

- EDATE
- EOMONTH
- WEEKNUM
- YEARFRAC

	A	B	C	D	E	F
1	**Date 1**	**Date 2**	**Requirment**	**ormula Nam**	**Result**	**Formula**
2	05-03-2021	19-09-2014	To Increase Months in a date	EDATE	05-08-2021	=EDATE($A$2,5)
3			To Decrease Months in a date	EDATE	05-10-2020	=EDATE($A$2,-5)
4			To Find of End of the Month for given date	EOMONTH	31-03-2021	=EOMONTH($A$2,0)
5			To Increase Months of End of the Month for given datee	EOMONTH	31-05-2021	=EOMONTH($A$2,2)
6			To Decrease Months of End of the Month for given date	EOMONTH	31-01-2021	=EOMONTH($A$2,-2)
7			To get the particular number of the week at a particular date.	WEEKNUM	10	=WEEKNUM($A$2)
8			To get the fraction of the year when two dates are supplied.	YEARFRAC	6.461111111	=YEARFRAC($A$2,$B$2)

***Figure 1.21**: Time Functions*

Lookup Functions

Use LOOKUP, one of the **lookup and reference functions**, when we need to look in a single row or column and find a value from the same position in a second row or column. There are various functions in this category, but we will focus only on the most useful ones:

- VLOOKUP
- HLOOKUP
- INDEX-MATCH (INDEX-MATCH-MATCH)
- XLOOKUP

VLOOKUP and HLOOKUP

The HLOOKUP and VLOOKUP functions are the functions of Lookup category. These functions look for a specific value in the first row (HLOOKUP - (h)orizontal) or column (VLOOKUP - (v)ertical) of a table and return any value from the same column (HLOOKUP) or row (VLOOKUP).

In the following example, For VLOOKUP, we are using the Student Name field in the Student Dataset to find the Student Database to return the Student Name linked to the Dataset.

A VLOOKUP will be used if the Students' Names are in a column.

Formula =VLOOKUP (value to look up, table area, column number)

For HLOOKUP, we are using the Subjects field in the Student Dataset to find the Student Database to return the Subject linked to the Dataset.

An HLOOKUP will be used if the Subjects are in a row.

Formula =HLOOKUP (value to look up, table area, row number)

Figure 1.22 is the sample table for Lookup functions:

	A	B	C	D	E	F
1	**Student Name**	**Rahul Singh**	**Sachin Sharma**	**Pankaj Madan**	**Rakesh Giri**	**Gikita Sharma**
2	**Accounts**	96	99	68	89	69
3	**Math**	97	70	73	61	89
4	**Business Study**	95	85	85	88	70
5	**Economics**	68	61	64	73	74
6	**English**	72	90	87	86	87
7	**Total**	**428**	**405**	**377**	**397**	**389**

Figure 1.22: *Table for* Vlookup *and Hlookup Functions*

In *Figure 1.23*, we can see the Economics result for all students:

10	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gikita Sharma
11	Economics	68	61	61	64	73

***Figure 1.23**: Vlookup Formula*

=VLOOKUP($A$11,$A$1:$F$7,2,FALSE) = 68

This is the argument for Rahul Singh, who earned 68 marks in Economics.

Sachin Sharma's name is displayed on column no 3 (C1) of the databases, so Sachin Sharma got 61.

The only difference in all HLOOKUP Functions is the column number.

The argument of the formula is Column No. of a Dataset.

	H	I	J
	Student Name	Sachin Sharma	Formula
	Accounts	99	=HLOOKUP($I$1,$A$1:$F$6,2,0)
	Math	70	=HLOOKUP(I$1,$A$1:$F$6,3,0)
	Business Study	85	=HLOOKUP(I$1,$A$1:$F$6,4,0)
	Economics	61	=HLOOKUP(I$1,$A$1:$F$6,5,0)
	English	90	=HLOOKUP(I$1,$A$1:$F$6,6,0)
	Total	405	=SUM(I2:I6)

***Figure 1.24:** Hlookup Formula*

In *Figure 1.24*, we can see that we have Sachin Sharma's result for all subjects.

As per the figure, we can see in the formula column that only the third argument is different in each formula as we need to define the row number this time, for HLOOKUP.

Index - Match

INDEX and MATCH are more advanced lookups. This is because they are incredibly flexible: we can do horizontal and vertical lookups, 2-way lookups, left lookups, case-sensitive lookups, and even lookups based on multiple criteria. INDEX – MATCH is the best substitute for VLOOKUP and HLOOKUP.

First, we will learn Index and Match Functions separately for better understanding, and then we will merge both.

Index

INDEX retrieves the value at a given location in a range as per the following example. The out for the following figure is taken from *Figure 1.22*. Refer to the following figure:

Student Name	Pankaj Madan
Business Study	64

=INDEX($A$1:$F$7,5,4)

***Figure 1.25**: Index Formula*

In the previous example, we want to see the marks earned in Business Study by Pankaj Madan.

As per the previous formula, 5 is the row number (Business Study), and 4 is the column number (Pankaj Madan).

The result is 64.

Match

The MATCH function is designed to find the position of an item in a range.

Business Study	3

=MATCH($D$11,$A$2:$A$7)

***Figure 1.26:** Match Formula*

Figure 1.26 shows that Business Study is on the third position of the range A2:A7.

Now, we will combine INDEX-MATCH.

	Student Name	Pankaj Madan
18		
19	Accounts	68
20	Math	87
21	Business Study	85
22	Economics	64
23	English	87

Formula
=INDEX($A$2:$F$7,MATCH($A19,$A$2:$A$6),4)
=INDEX($A$2:$F$7,MATCH($A20,$A$2:$A$6),4)
=INDEX($A$2:$F$7,MATCH($A21,$A$2:$A$6),4)
=INDEX($A$2:$F$7,MATCH($A22,$A$2:$A$6),4)
=INDEX($A$2:$F$7,MATCH($A23,$A$2:$A$6),4)

***Figure 1.27:** Index – Match Formula*

In *Figure 1.27*, we got the Student – Pankaj Madan (Column No. 4 as per table), and we defined the rows by the match formula.

The formula is Insert INDEX and select the array. After that, we defined the Match function for a row.

Now, we will go one step further to use INDEX-MATCH-MATCH (Double Match).

As we can see in the previous example, we manually typed 4 to get Pankaj Madan's result. We will use another Match function to define columns as well.

26	Student Name	Gitika Sharma
27	Accounts	69
28	Math	89
29	Business Study	70
30	Economics	74
31	English	87

Formula
=INDEX($A$2:$F$7,MATCH($A27,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))
=INDEX($A$2:$F$7,MATCH($A28,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))
=INDEX($A$2:$F$7,MATCH($A29,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))
=INDEX($A$2:$F$7,MATCH($A30,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))
=INDEX($A$2:$F$7,MATCH($A31,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))

Figure 1.28: *Index Match Match Formula Vertical Mode*

In *Figure 1.28*, we can see that we got the result of Student – Gitika Sharma in vertical mode.

25						
26	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gitika Sharma
27	Business Study	95	85	85	88	70
28	Formula					
29	=INDEX($A$2:$F$7,MATCH($A27,$A$2:$A$6,0),MATCH(B$26,$A$1:$F$1,0))					
30						

Figure 1.29: *Index Match Match Formula Horizontal Mode*

In *Figure 1.29*, we can see that we got the result of Business Study for all students in horizontal mode.

The formula is the same in both cases (vertical and horizontal).

XLOOKUP (For Excel 365 Users only)

=XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

32	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gitika Sharma
33	Accounts	96	99	68	89	69
34	Formula					
35	=XLOOKUP(B$32,$B$1:$F$1,$B$2:$F$2)					

Figure 1.30: *Xlookup Formula*

We want to get all students' results for Accounts. As per *Figure 1.30*, we got the result of Accounts by students.

Advance Features

In the process of learning Excel, we have reached the next level: Advance Features. These are popular among Excel users as they save time and avoid repetitive work.

Drop-down List

Drop-down lists in Excel are helpful if you want to be sure that users select an item from a list instead of typing their values.

Create a Drop-down List

To create a drop-down list in Excel, we execute the following steps:

1. Select the cell where we want to create a drop-down list.
2. On the Data tab, in the Data Tools group, click on Data Validation. Refer to the following figure:

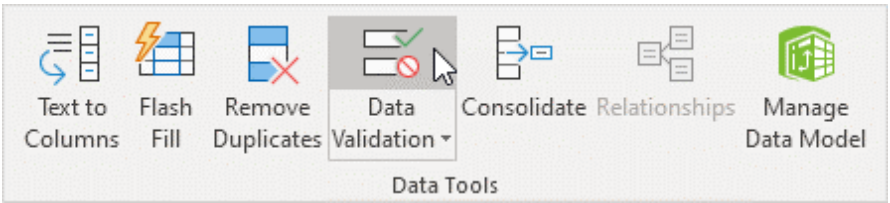


Figure 1.31: *Path for Data Validation*

3. The 'Data Validation' dialog box appears.
4. In the Allow box, click List.
5. Click in the Source box and select the range A2:A6 (First Method) or type all values (Second Method) with a comma (,) in the Source box.

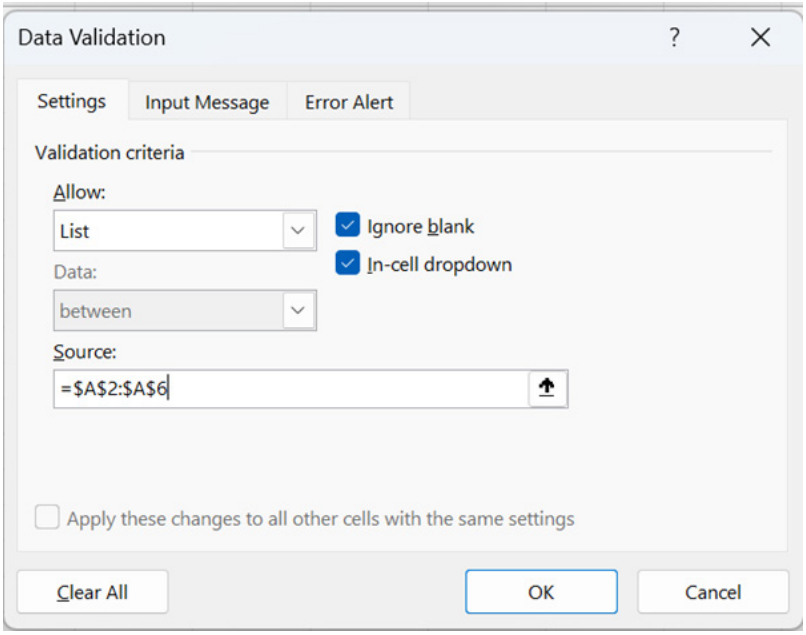


Figure 1.32: *Data Validation Dialog Box*

Second Method

We also can add text manually to create a dropdown in Source, as shown in *Figure 1.33*:

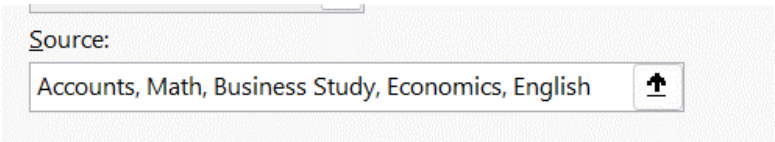


Figure 1.33: *Subjects Added Manually to create drop down list*

Click on OK.

The result is as shown in the following figure:

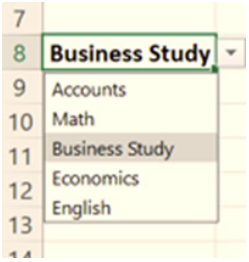


Figure 1.34: *Drop-Down List in Excel*

We recommend the first method for the drop-down list.

Trace Dependents and Trace Precedents of Formula

An Excel spreadsheet sometimes contains multiple formulas, and understanding the relationship between the cells would be difficult in the absence of the Trace Precedents and Trace Dependents features of Excel.

To see the cells that are dependent on the active cell, follow the given steps:

1. Open the worksheet and locate the active cell.
2. Select the cell you want to analyze.
3. Go to **Formulas** tab > **Formula Auditing** > **Trace Dependents**.

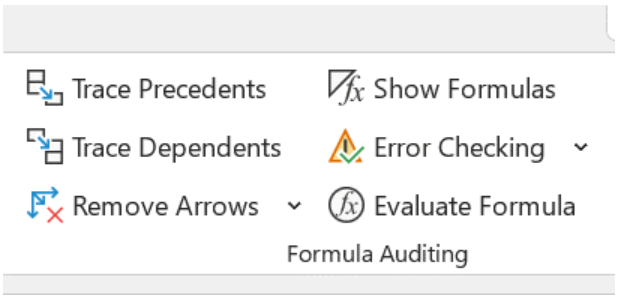


Figure 1.35: *Trace Dependents and Trace Precedents Path*

4. Click on the Trace Dependents button to see the cells affected by the active cell. It will show a blue arrow that links the active cell and the other cells related to the selected cell. Refer to the following figure:

	A	B	C	D	E	F
1	**Student Name**	**Rahul Singh**	**Sachin Sharma**	**Pankaj Madan**	**Rakesh Giri**	**Gitika Sharma**
2	**Accounts**	96	99	68	89	69
3	**Math**	97	70	73	61	89
4	**Business Study**	95	85	85	88	70
5	**Economics**	68	61	64	73	74
6	**English**	72	90	87	86	87
7	**Total**	**428**	**405**	**377**	**397**	**389**
8						
9	**Student Name**	**Pankaj Madan**				
10	**Accounts**	68	=INDEX($A$2:$F$7,MATCH($A10,$A$2:$A$6),4)			
11	**Math**	87				
12	**Business Study**	85				
13	**Economics**	64				
14	**English**	87				
15						

Figure 1.36: *Arrows for Trace Dependents*

As we can see in *Figure 1.36*, arrows defined the relationship between dependents.

The same procedure is for Trace Precedents. Click on Trace Precedents, to see the arrows as shown in *Figure 1.37*:

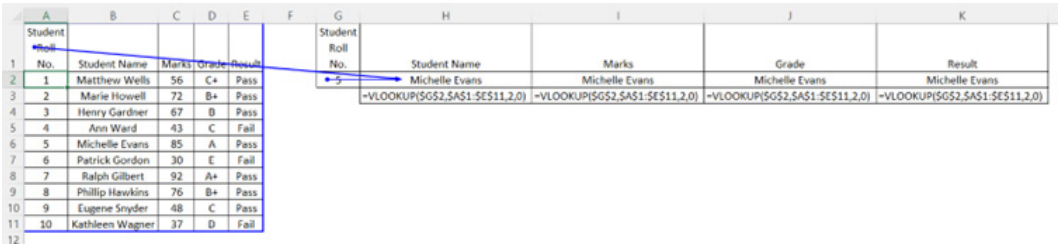


Figure 1.37: *Arrows for Trace Dependents*

As we can see in *Figure 1.37*, arrows defined the relationship between precedents.

To remove the blue arrow, click on remove arrows.

Group-Ungroup

To group data in a list in Excel, we need to follow certain steps:

1. Select the rows or columns you wish to group.
2. On the **Data** tab, in the **Outline** group, click on the **Group** command.

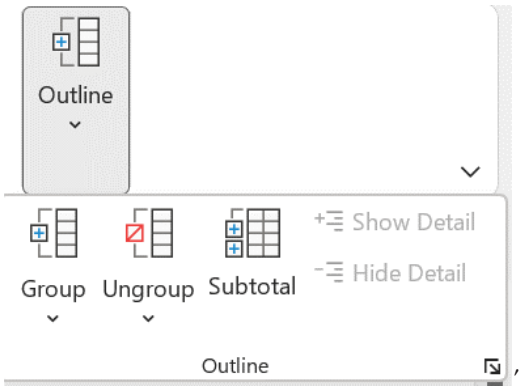


Figure 1.38: *Path for* Group *and Ungroup*

3. Select the rows to group.

	A	B	C	D	E	F
1	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gitika Sharma
2	Accounts	96	99	68	89	69
3	Math	97	70	73	61	89
4	Business Study	95	85	85	88	70
5	Economics	68	61	64	73	74
6	English	72	90	87	86	87
7	Total	428	405	377	397	389

***Figure 1.39**: Group Created*

4. When we click on circled button, we get the following result:

	A	B	C	D	E	F
1	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gitika Sharma
7	Total	428	405	377	397	389

***Figure 1.40:** Hiding the rows by group button*

When we ungroup the same by clicking the + button, it will come to a standard display.

	A	B	C	D	E	F
1	Student Name	Rahul Singh	Sachin Sharma	Pankaj Madan	Rakesh Giri	Gitika Sharma
2	Accounts	96	99	68	89	69
3	Math	97	70	73	61	89
4	Business Study	95	85	85	88	70
5	Economics	68	61	64	73	74
6	English	72	90	87	86	87
7	Total	428	405	377	397	389

***Figure 1.41:** To Ungroup the cell for standard*

Shift+Alt+Right arrow is the shortcut to group rows or columns. Shift+Alt+Left arrow is the shortcut to ungroup. Again, the trick here is to select entire rows or columns that you want to group/ungroup the first arrow.

Dynamic Ranges

Dynamic ranges, also known as dynamic defined ranges, are used in Microsoft Excel to create rolling over ranges that can be easily updated as the underlying data changes. These ranges are particularly useful for working with frequently updated or changed data and are commonly used in conjunction with the INDEX function. Once a dynamic range has been defined by assigning it a name, it can be used for a

variety of calculations under various functions, providing flexibility and efficiency in data analysis.Dynamic Range with the Index Function

Formula

With counting everything

=$A$2:INDEX($A:$A,COUNTA($A:$A))

Example

	A	B	C	D	E	F	G
1		Particular	Apr	May	Jun	Jul	
2	Add	Sale	10,00,000	10,50,000	9,45,000	9,97,500	
3	Add	Other Income	70,000	73,500	66,150	69,825	
4	Less	Purchase	6,50,000	6,82,500	6,14,250	6,48,375	
5	Less	Direct Expenses	1,00,000	1,05,000	94,500	99,750	
6	Less	Indiriect Expenses	1,25,000	1,31,250	1,18,125	1,24,688	
7	Final Output	Profit	1,95,000	2,04,750	1,84,275	1,94,512	
8							
9							
10		Particular	Amount	Formula			
11		Total Profit After Each Months	7,78,537	=SUM($C$7:INDEX($7:$7,COUNTA($7:$7)))			
12		Average Profit After Each Month	1,94,634	=AVERAGE($C$7:INDEX($7:$7,COUNTA($7:$7)))			

Figure 1.42: *Dynamic Ranges as shown in formula*

Now, we are adding August to the table. Check the result once it's done:

	A	B	C	D	E	F	G
1		Particular	Apr	May	Jun	Jul	Aug
2	Add	Sale	10,00,000	10,50,000	9,45,000	9,97,500	11,00,000
3	Add	Other Income	70,000	73,500	66,150	69,825	77,000
4	Less	Purchase	6,50,000	6,82,500	6,14,250	6,48,375	7,15,000
5	Less	Direct Expenses	1,00,000	1,05,000	94,500	99,750	1,10,000
6	Less	Indiriect Expenses	1,25,000	1,31,250	1,18,125	1,24,688	1,37,500
7	Final Output	Profit	1,95,000	2,04,750	1,84,275	1,94,512	2,14,500
8							
9							
10		Particular	Amount	Formula			
11		Total Profit After Each Months	9,93,037	=SUM($C$7:INDEX($7:$7,COUNTA($7:$7)))			
12		Average Profit After Each Month	1,98,607	=AVERAGE($C$7:INDEX($7:$7,COUNTA($7:$7)))			
13							

Figure 1.43: *Dynamic Range with extended Range*

It calculates sum and average automatically, without changing the formula.

Moving Average

While working in accounting and finance, the term moving average or rolling average is common for us. So, Excel has an inbuild calculation feature for moving average/rolling average.

For this, we need to activate the Analysis Toolpak feature from add-ins:

1. Click on the **File** tab, Options, and the **Add-Ins** category.
2. In the **Add-Ins** box, check the **Analysis ToolPak** check box and click on **OK**.

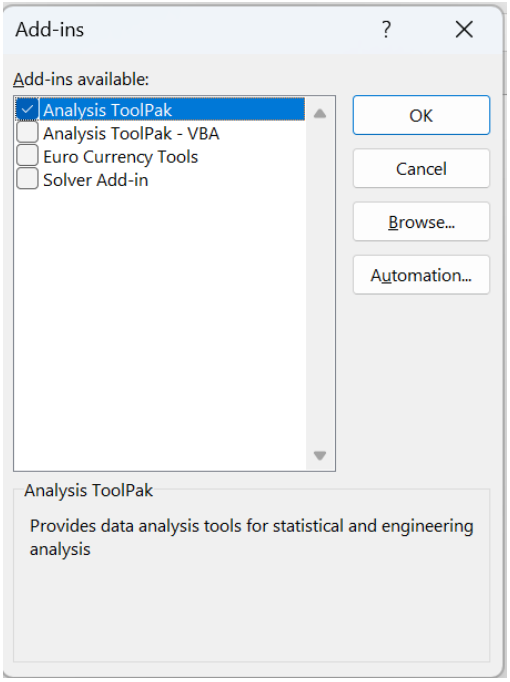


Figure 1.44: *To Activate the Analysis Toolpak*

3. Now Analysis Toolpak will display in Data Tab – Data Analysis.

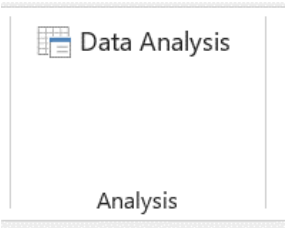


Figure 1.45: *Data Analysis Tab*

4. Now, click on Data Analysis.

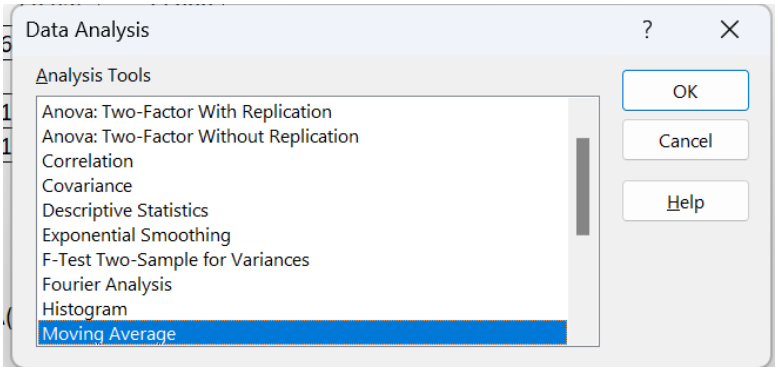


Figure 1.46: *Data Analysis Dialog Box*

5. A dialog box will appear, as shown in *Figure 1.46*.
6. Select Moving Average and then OK, as shown in *Figure 1.47*:

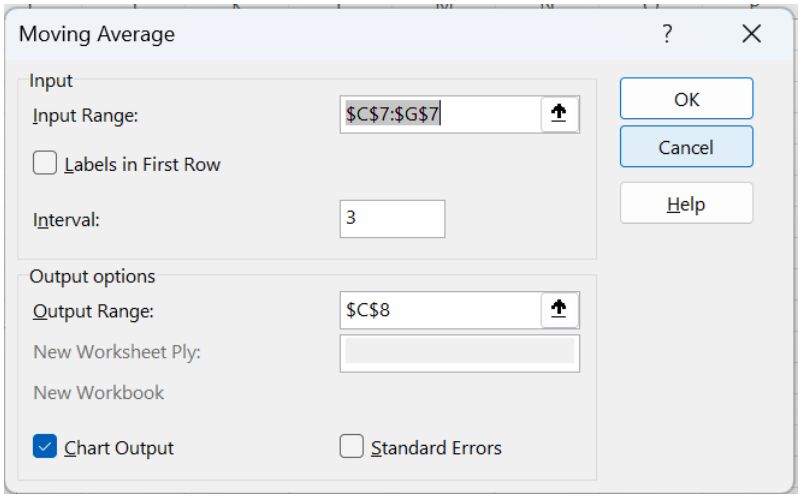


Figure 1.47: *Moving Average Dialog Box*

5. We will get the desired result with the default chart (that we can change as per our convenience) as shown in *Figure 1.48*:

	A	B	C	D	E	F	G
1		Particular	Apr	May	Jun	Jul	Aug
2	Add	Sale	10,00,000	10,50,000	9,45,000	9,97,500	11,00,000
3	Add	Other Income	70,000	73,500	66,150	69,825	77,000
4	Less	Purchase	6,50,000	6,82,500	6,14,250	6,48,375	7,15,000
5	Less	Direct Expenses	1,00,000	1,05,000	94,500	99,750	1,10,000
6	Less	Indiriect Expenses	1,25,000	1,31,250	1,18,125	1,24,688	1,37,500
7	Final Output	Profit	1,95,000	2,04,750	1,84,275	1,94,512	2,14,500
8			#N/A	#N/A	1,94,675	1,94,512	1,97,762

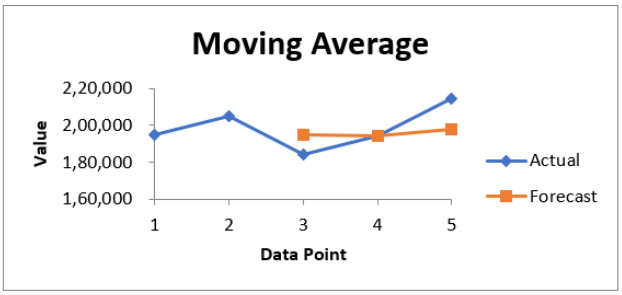


Figure 1.48: *Result of Moving Average*

Pivot Table

Pivot tables is the most potent tool of Microsoft Excel to analyze data. The best part about using a pivot table is that it calculates data quickly and efficiently. It summarizes the huge data table and the features of slicers, and the timeline is the add-on for the last 2-3 versions.

Inserting a Pivot Table

Pivot tables are an essential tool for analyzing large sets of data in Microsoft Excel. They allow you to quickly and easily summarize and analyze complex data sets, identify patterns, and gain insights into your data. In this article, we will guide you through the process of inserting a pivot table in Excel, step-by-step. Whether you're a beginner or an experienced Excel user, you'll find the instructions and tips in this article useful for creating powerful pivot tables that will help you make informed business decisions. We will do this with Car Sales Data as shown in *Figure 1.49:*

	A	B	C	D	E	F	G	H	I	J
1	Date	City	Car	Rate per Car	Buy Cost per Car	Other Expenses per Car	Profit per Car	Car Sold	Amount	Profit
2	01-01-2019	Banglore	Alto	4,90,000	3,43,000	62,000	85,000	1	4,90,000	85,000
3	01-01-2019	Bhopal	Alto	4,90,000	3,43,000	62,000	85,000	4	19,60,000	3,40,000
4	01-01-2019	Delhi	Alto	4,90,000	3,43,000	62,000	85,000	2	9,80,000	1,70,000
5	01-01-2019	Jhansi	Alto	4,90,000	3,43,000	62,000	85,000	4	19,60,000	3,40,000
6	01-01-2019	Banglore	Amaze	4,10,000	3,07,500	55,000	47,500	2	8,20,000	95,000
7	01-01-2019	Bhopal	Amaze	4,10,000	3,07,500	55,000	47,500	-	-	-
8	01-01-2019	Delhi	Amaze	4,10,000	3,07,500	55,000	47,500	2	8,20,000	95,000
9	01-01-2019	Jhansi	Amaze	4,10,000	3,07,500	55,000	47,500	-	-	-
10	01-01-2019	Banglore	Audi	54,20,000	37,94,000	4,55,000	11,71,000	4	2,16,80,000	46,84,000
11	01-01-2019	Bhopal	Audi	54,20,000	37,94,000	4,55,000	11,71,000	1	54,20,000	11,71,000
12	01-01-2019	Delhi	Audi	54,20,000	37,94,000	4,55,000	11,71,000	2	1,08,40,000	23,42,000
13	01-01-2019	Jhansi	Audi	54,20,000	37,94,000	4,55,000	11,71,000	1	54,20,000	11,71,000
14	01-01-2019	Banglore	Baleno	9,00,000	6,30,000	1,13,000	1,57,000	1	9,00,000	1,57,000
15	01-01-2019	Bhopal	Baleno	9,00,000	6,30,000	1,13,000	1,57,000	2	18,00,000	3,14,000
16	01-01-2019	Delhi	Baleno	9,00,000	6,30,000	1,13,000	1,57,000	4	36,00,000	6,28,000
17	01-01-2019	Jhansi	Baleno	9,00,000	6,30,000	1,13,000	1,57,000	-	-	-
18	01-01-2019	Banglore	BMW	40,70,000	28,49,000	4,56,000	7,65,000	3	1,22,10,000	22,95,000
19	01-01-2019	Bhopal	BMW	40,70,000	28,49,000	4,56,000	7,65,000	3	1,22,10,000	22,95,000
20	01-01-2019	Delhi	BMW	40,70,000	28,49,000	4,56,000	7,65,000	2	81,40,000	15,30,000
21	01-01-2019	Jhansi	BMW	40,70,000	28,49,000	4,56,000	7,65,000	3	1,22,10,000	22,95,000
22	01-01-2019	Banglore	Bolero	9,00,000	6,75,000	1,22,000	1,03,000	2	18,00,000	2,06,000
23	01-01-2019	Bhopal	Bolero	9,00,000	6,75,000	1,22,000	1,03,000	4	36,00,000	4,12,000
24	01-01-2019	Delhi	Bolero	9,00,000	6,75,000	1,22,000	1,03,000	1	9,00,000	1,03,000
25	01-01-2019	Jhansi	Bolero	9,00,000	6,75,000	1,22,000	1,03,000	2	18,00,000	2,06,000
26	01-01-2019	Banglore	Brezza	7,20,000	4,68,000	66,000	1,86,000	2	14,40,000	3,72,000
27	01-01-2019	Bhopal	Brezza	7,20,000	4,68,000	66,000	1,86,000	4	28,80,000	7,44,000

Figure 1.49: *Car Sales Data for Pivot Table*

Figure 1.49 shows the data of cars sales (for educational purposes) for Jan 19 to Dec 21 for a company in 4 different cities and 17 different cars.

Now, we need to analyze this with the help of a pivot table. So, first we need to insert a pivot table:

1. Select any cell/row/column of the table or range.
2. Click on the **Insert** Tab – Tables Group-**PivotTable**-From Table/Range.

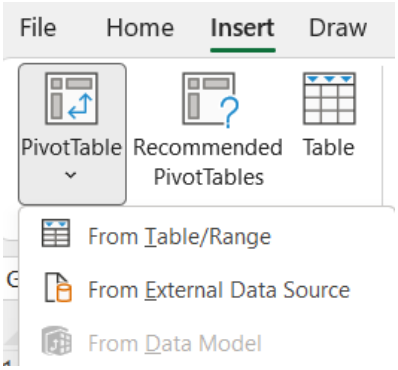


Figure 1.50: *Pivot Table Path*

After selecting From Table/Range, a pivot table from the selected table or range will display, as shown in *Figure 1.51*:

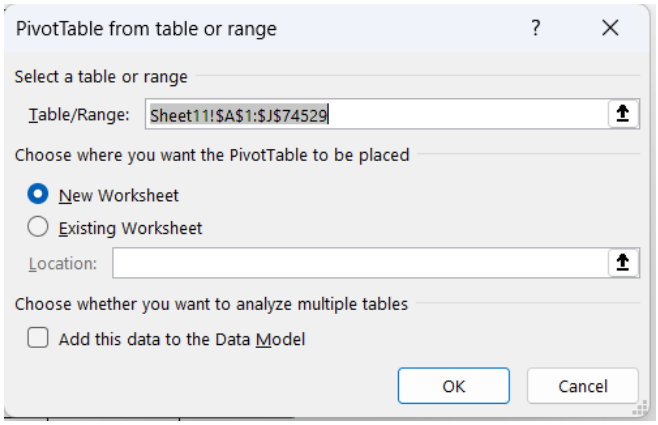


Figure 1.51: *Pivot Table Dialog Box*

3. We can change the range, but it is okay for now.

   It is recommended to select New Worksheet, but we can work on the pivot table on the Existing Worksheet as well. For now, we will go with New Worksheet.

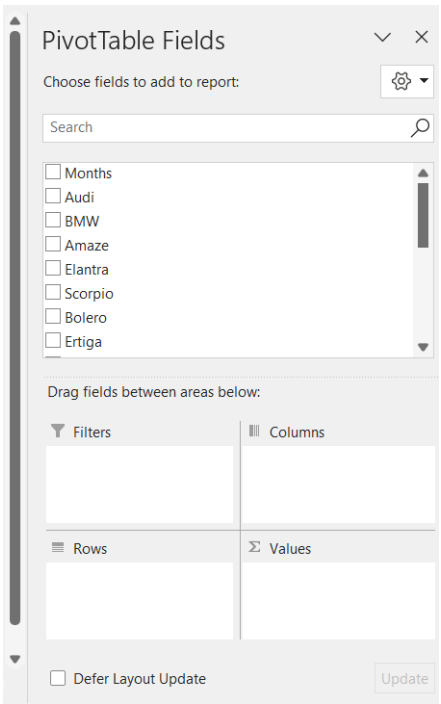


Figure 1.52: *Pivot Table Field Dialog Box*

4. Drag Months in Rows Columns, as shown in *Figure 1.53*:

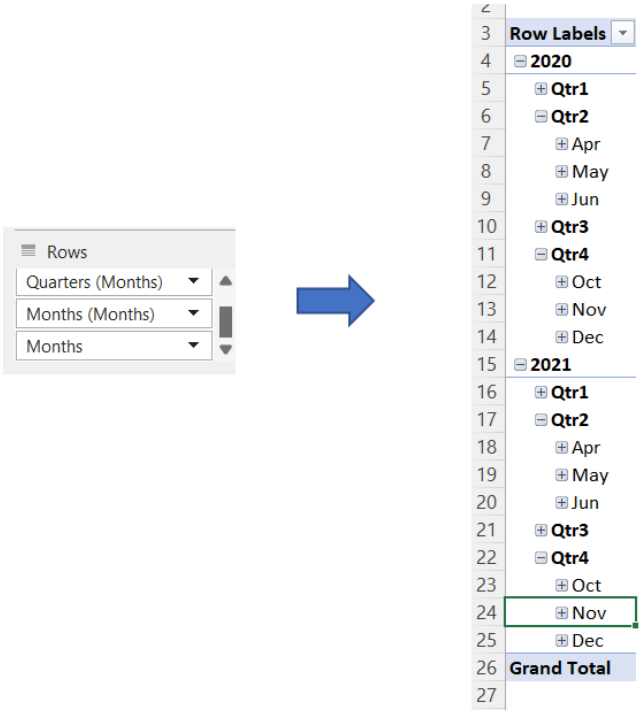


Figure 1.53: *Results for Selecting Months in Row Field of Pivot Table*

5. Drag different field, as shown in the following figure:

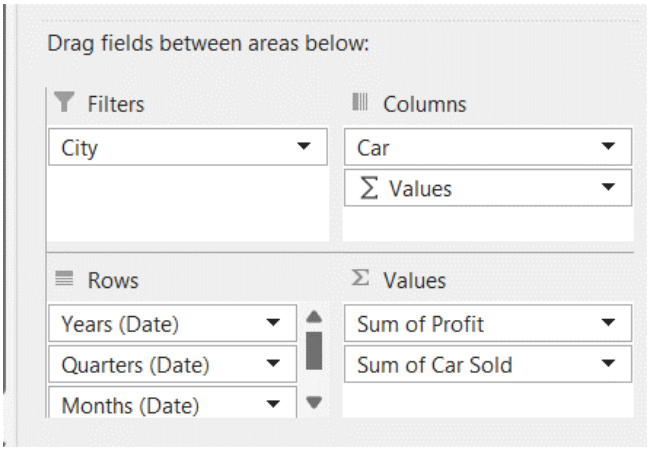


Figure 1.54: Drag *Different Field*

The pivot table will be displayed like this:

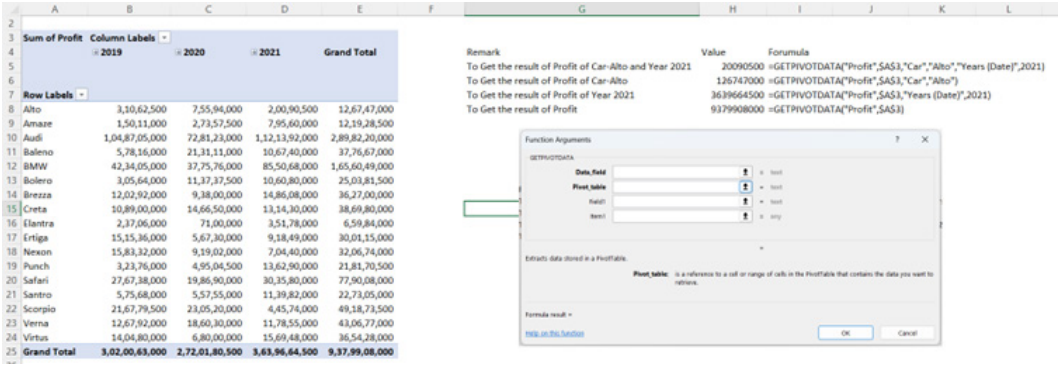
City	(All)											
	Column Labels											
	Alto		Amaze		Audi		Baleno		BMW		Bolero	
Row Labels	Sum of Profit	Sum of Car Sold	Sum of Profit	Sum of Car Sold	Sum of Profit	Sum of Car Sold	Sum of Profit	Sum of Car Sold	Sum of Profit	Sum of Car Sold	Sum of Profit	Sum of Car Sold
2019	250920000	2952	139935000	2946	3460305000	2955	454986000	2898	2220030000	2902	295198(	
2020	306075000	2915	219825000	2931	2449090000	2965	919776000	2948	2883324000	2892	394625(	
2021	186055000	2930	356490000	3060	3781728000	2918	552532000	2939	4209120000	2960	555916(	
Grand Total	743050000	8797	716250000	8937	9691123000	8838	1927294000	8785	9312474000	8754	1245739(	

Figure 1.55: *First Result of Pivot Table*

6. We can change fields as per requirements.

Getpivotdata

Getpivotdata gives us the desired result for a particular field(s). The function works only with a Pivot Table. Refer to the following figure:



Sum of Profit	Column Labels			
	2019	2020	2021	Grand Total
Row Labels				
Alto	3,10,62,500	7,55,94,000	2,00,90,500	12,67,47,000
Amaze	1,50,11,000	2,73,57,500	7,95,60,000	12,19,28,500
Audi	1,04,87,05,000	72,81,23,000	1,12,13,92,000	2,89,82,20,000
Baleno	5,78,16,000	21,31,11,000	10,67,40,000	37,76,67,000
BMW	42,34,05,000	37,75,76,000	85,50,68,000	1,65,60,49,000
Bolero	3,05,64,000	11,37,37,500	10,60,80,000	25,03,81,500
Brezza	12,02,92,000	9,38,00,000	14,86,08,000	36,27,00,000
Creta	10,89,00,000	14,66,50,000	13,14,30,000	38,69,80,000
Elantra	2,37,06,000	71,00,000	3,51,78,000	6,59,84,000
Ertiga	15,15,36,000	5,67,30,000	9,18,49,000	30,01,15,000
Nexon	15,83,32,000	9,19,02,000	7,04,40,000	32,06,74,000
Punch	3,23,76,000	4,95,04,500	13,62,90,000	21,81,70,500
Safari	27,67,38,000	19,86,90,000	30,35,80,000	77,90,08,000
Santro	5,75,68,000	5,57,55,000	11,39,82,000	22,73,05,000
Scorpio	21,67,79,500	23,05,20,000	4,45,74,000	49,18,73,500
Verna	12,67,92,000	18,60,30,000	11,78,55,000	43,06,77,000
Virtus	14,04,80,000	6,80,00,000	15,69,48,000	36,54,28,000
Grand Total	3,02,00,63,000	2,72,01,80,500	3,63,96,64,500	9,37,99,08,000

Figure 1.56: *Various Results of Getpivot Table*

As we can see in *Figure 1.56*, All results can be checked in Pivot Table as well.

Inserting a Slicer

We can use a slicer to know the exact data for an item/period and so on:

1. To insert Slicers, go to **PivotTable Analyze** – Filter Group – **Insert Slicer**.

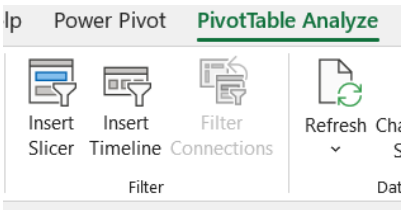


Figure 1.57: *Insert Slicer path*

2. Select whatever slicers you want to analyze.

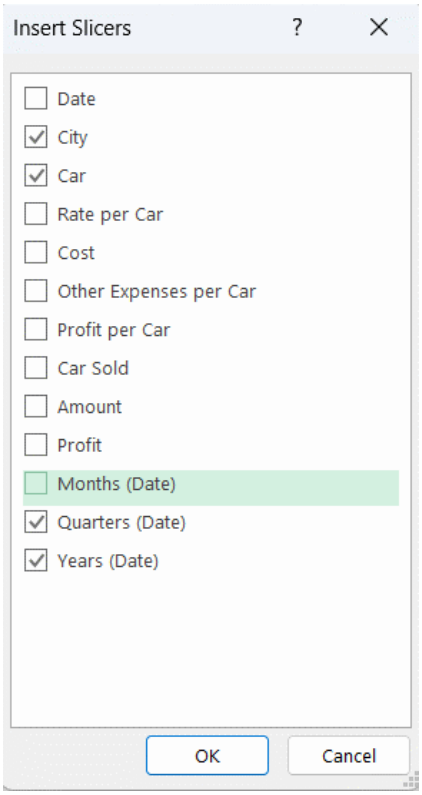


Figure 1.58: *Insert Slicer Dialog Box*

3. Slicer boxes will appear.

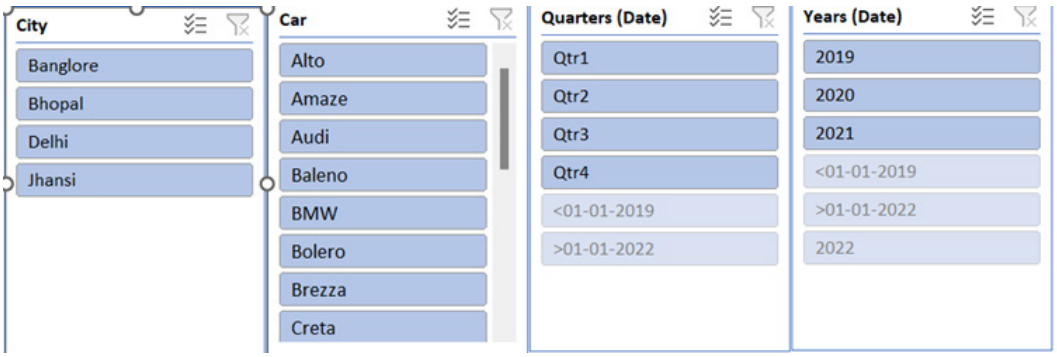


Figure 1.59: *Slicers we selected*

4.1. Now we can select the slicers whatever we want.

Let's take Bhopal from City Slicer, Car – Creta, Year 2020. The result will be 3,57,00,000/-, as shown in *Figure 1.60*). We can play with slicers much more.

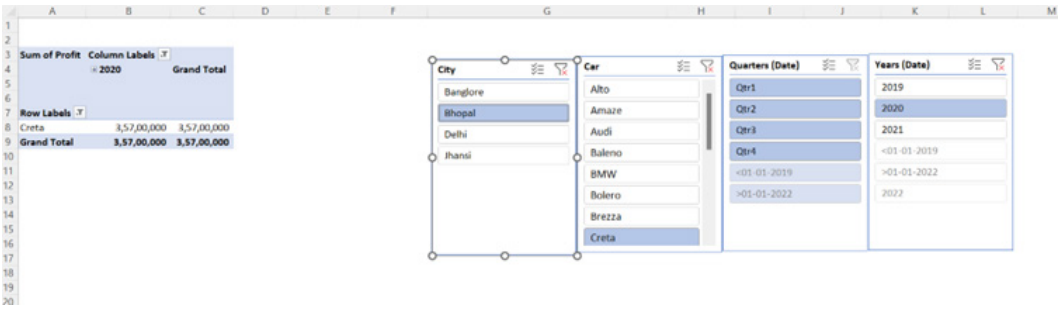


***Figure 1.60**: Slicer Result*

4.2. We can select multiple items at one go from different slicers. Like now, we want to select cities – Delhi, Jhansi, Car – BMW, Audi, Years – 2020, 2021. Refer to *Figure 1.61*.

To make multiple selections, use the *Ctrl* key and select using the mouse.

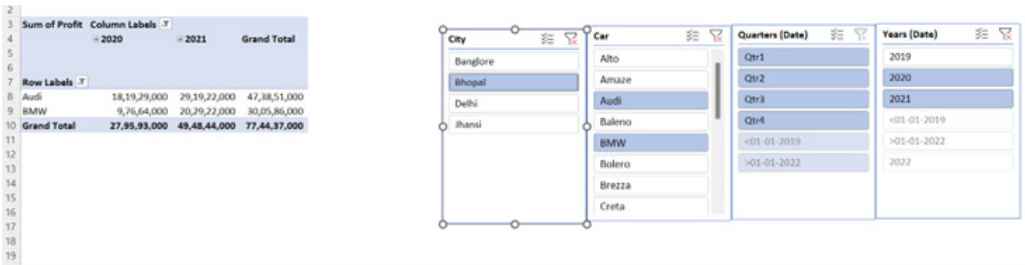


***Figure 1.61:** Multiple Slicer Result*

We can also use Pivot Charts for the same data, and the features of pivot charts are the same as those of Pivot Tables. Following is the default PivotChart; we can customize the chart features.

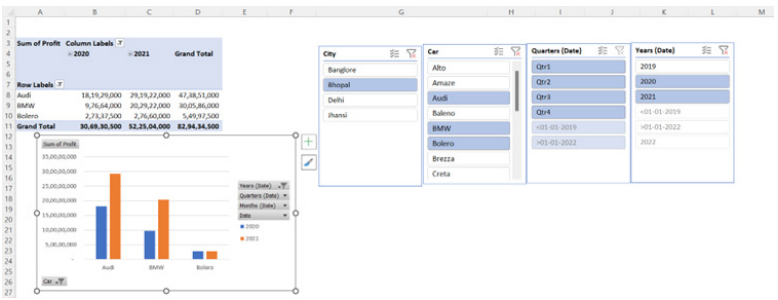


***Figure 1.62**: Pivot Chart*

Pivot tTable has the same options as a normal table in MS Excel in the Design tab.

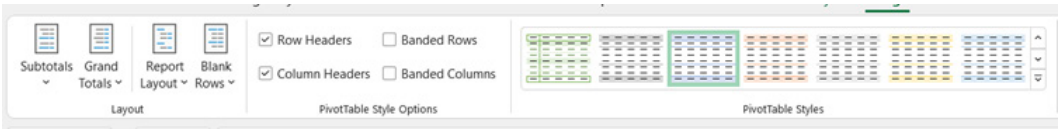


Figure 1.63: *Different Options in Pivot Table*

Note that we must refresh the Pivot Table after every change to/update in our data and/or data sources, as a PivotTable doesn't update automatically.

Macros

An Excel macro is an action or a set of steps that we can record, give a name, save, and run as many times as we want and whenever we want. Macros help us save time on repetitive tasks involved in data manipulation and reports that are to be done frequently.

When we record a macro, Excel stores it as VBA code, and we can view this code in the VBA editor. Macros are time savers for repetitive tasks.

1. To work on macros, we must turn on the hidden tab – Developer.
2. Right-click on the ribbon anywhere and select (click on) Customize the ribbon.

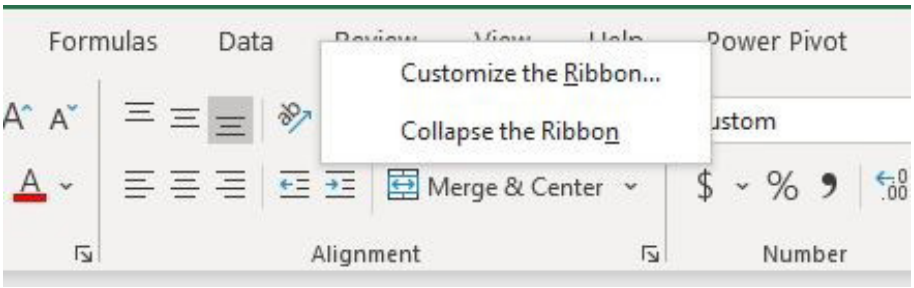


Figure 1.64: *To add Developer Tab*

3. Navigate to Customize the ribbon and place a check on the Developer checkbox.

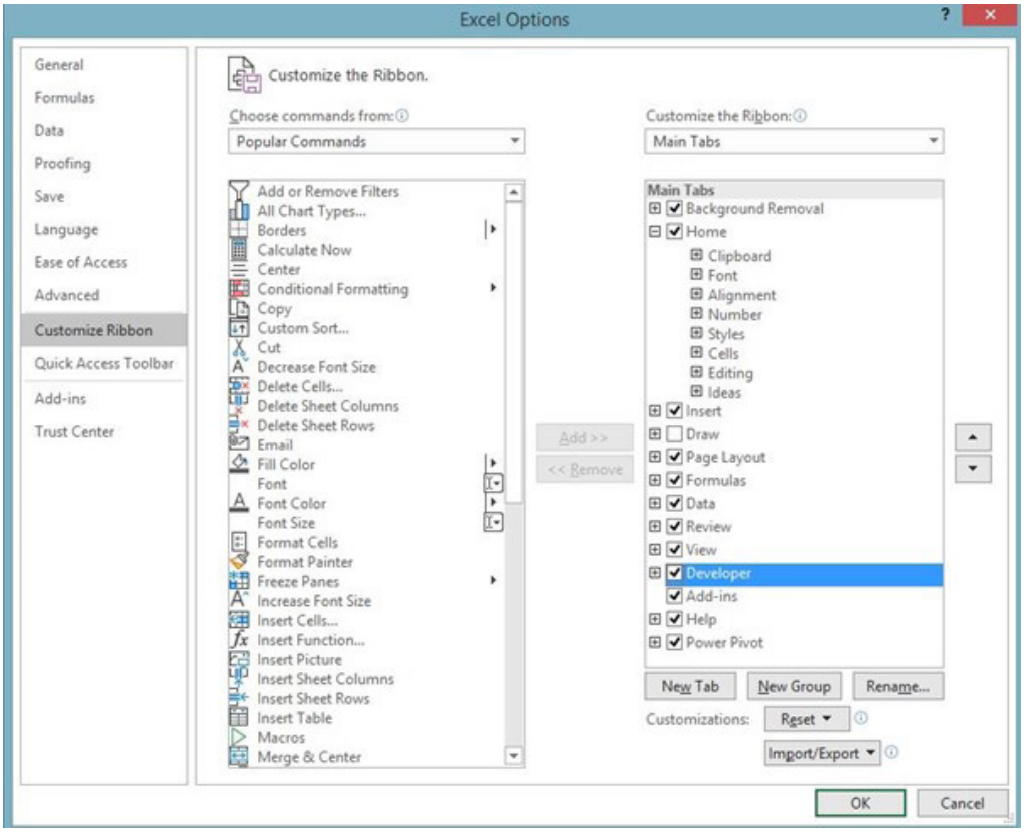


Figure 1.65: *Customize Ribbon Dialog Box*

Record a Macro

Now that we have the Developer tab on our ribbon, let's start recording our first macro in Excel. To record a macro, follow these steps:

1. On the Developer tab, go to the Code group and click Record Macro.

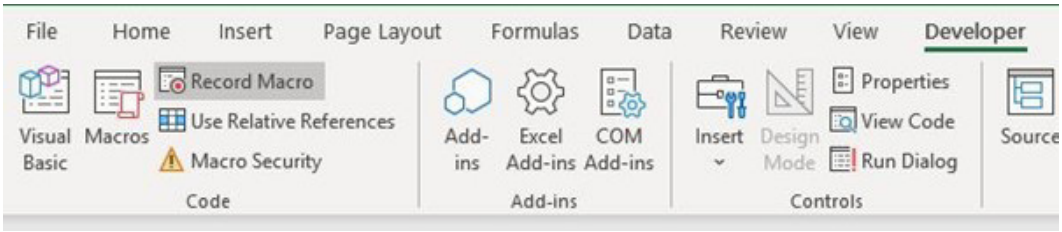


Figure 1.66: *Record Macro Path*

2. The Record Macro dialog box will appear. Give the macro a name and assign the shortcut that will activate the macro. Then, click on OK.

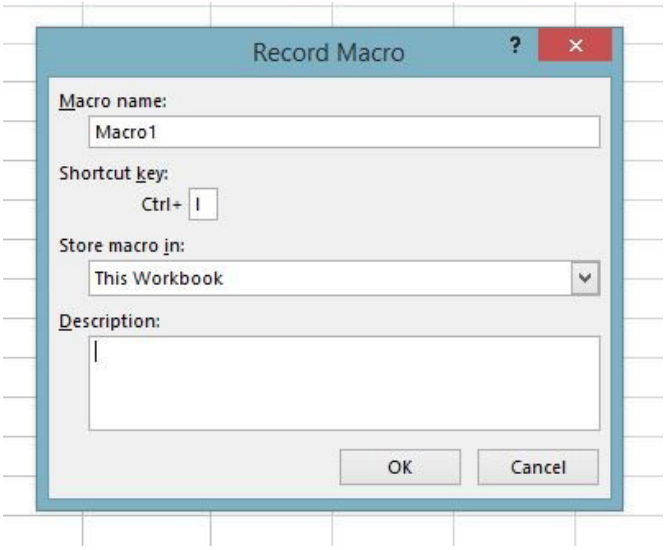


Figure 1.67: *Record Macro Dialog Box*

Note that every step we perform from now on will be recorded by the macro.

Create a header, as shown in *Figure 1.68*:

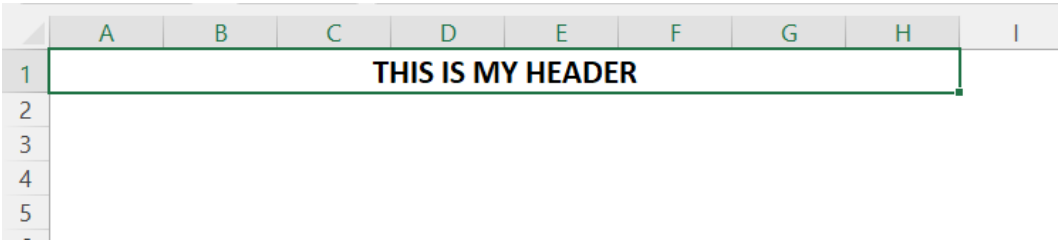


Figure 1.68: *Recording Macro*

43 Now Stop Recording.

4. Now, type *Ctrl + l*. We will get the same format in another sheet. The previous figure is only an example; we can record as long as we want. We can assign the macros in a button.

5. Insert a button from the control group.

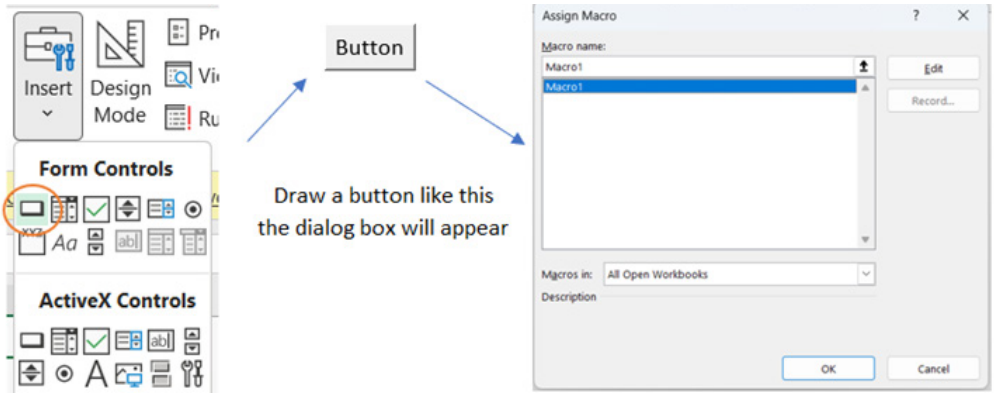


Figure 1.69: *Steps to Assign Macro*

6. Select the Macro Name from the list we want to assign, and then click on OK.
7. Now we can run the macro with just a click-on button. We can rename the button by right-clicking on it.
8. Click on a macro to delete, modify or run it in the Code Group of Developer.

Conclusion

Now that we have enough knowledge of Advance Excel, we will learn about a few more valuable features and functions in our journey of understanding accounting and finance. Now, we are ready to visualize, manipulate, and evaluate the data. We can do more efficient work, perform tasks quickly, and complete finance projects, allowing us to provide customers and clients or employee with better service and enabling us to be more productive.

In the next chapter, we will learn about financial statements and their structure and types. We will also study the components of balance sheet, income statement and cash flow statement. Moving on, we will look at a few useful financial terms.

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Chapter 2
Preparing Financial Statements Smartly

Introduction

Reading financial statements is a crucial skill for any accounting and finance professional, as they want to review one's financial health.

Now, we will learn what a financial statement is and get to know the types of financial statements, and their structure and components. We will also get familiarized with financial terms that will be used further. In the last section of this chapter, we will learn what equity and private equity are.

Structure

In this chapter, we will discuss the following topics:

- What is a Financial Statement?
    - Advantages and Disadvantages of Financial Statements
- Types of Financial Statements
    - Balance Sheet
    - Income Statement
    - Cash Flow Statement

- Balance Sheet
  - Equity and Liabilities
  - Shareholders' Fund
  - Share Capital
  - Reserve and Surplus
  - Non-Current Liabilities
  - Current Liabilities
  - Assets
  - Non-Current Assets
  - Current Assets
- Income Statement
  - Terms Related to Income Statement
- Cash Flow Statement
  - Operating Activities
  - Investment Activities
  - Financial Activities
- Depreciation and Amortization
- Accounting and Financial Terms
- Public Equity and Private Equity
  - Public Equity
  - Private Equity

Objectives

Before learning ratios, working capital, and financial modeling, we must learn how to study the financial statements. What are the components of a financial statement? What is the structure of a balance sheet, an income statement, and a cash flow statement? What are the financial terms we will use in our journey of learning to use Excel for Accounting and Finance?

Financial Statement

Financial statements are formal records of the financial activities and position of a business, person, or other entity. A financial statement is a collection of the financial information of a business, and it reveals the financial health of a business. In financial statements, businesses report both the individual line-by-line items and

the total amounts to provide a comprehensive view of their financial performance. The line-by-line items include various accounts and transactions, such as revenues, expenses, assets, and liabilities. These items are presented in a structured manner that allows readers to understand the company's financial position, operations, and cash flows. In addition to the detailed information, financial statements also include the total amounts or summary information, such as net income, total assets, and total liabilities, to give an overall picture of the company's financial health.Financial statements include true statements of the company's operational budget, assets, expenses, liabilities, earnings, and the net worth of liabilities and assets. Financial analysts, accountants, investors, and planners use these statements to enable decision-making expansions, future planning, fundraising, market launches, and such.

There are three important financial statements: balance sheet, income statement, and cash flow statement.

Each type of financial statement reports different types of information for a period (for example, month, quarter, or year). Using financial statements gives you insight into several areas of your business's financial health.

Here's the breakdown of what each financial summary reveals:

- **Income statement**: Business's profits and losses.
- **Balance sheet**: Business's assets, liabilities, and equity.
- **Cash flow statement**: Business's incoming and outgoing money.

Who needs the Financial Statements of a Business/Company?

The following persons / entities want to look at the financial statements of a business / company:

Investors: Investors want to know about the financial health of a business.

Banks and Lending Institutions: They want to know whether a company can repay loans.

Creditors: Creditors want confirmation before lending credit to a business.

Government: Governments want to derive information about the taxes to be collected from a business.

Employees: Employees of a company want to know how well the company is doing – salary, bonus, and increment.

Managers: Managers want to get information about the performance of a business.

Auditors: Auditors to give a report that is an independent opinion on the company's position.

Advantages and Disadvantages of Financial Statements

Financial statements have their own advantages or advantages and disadvantages. Let's look at them.

Advantages

Historical and Factual Perspective: A financial statement provides a historical and factual perspective.

Status of a company: It provides information about past performance and the company's current situation.

Business Operation: It helps one know the ability of a business to complete business transactions, make profit, and so on.

Loan Repayment: It helps creditors know whether a business can repay its debts/ loan or credit.

Growth: It helps track and analyze the development of a business with previous periods.

Disadvantages

Based on past data: Financial statements are based on past data.

Based on the pattern of the Market Data: Financial statements are based on the practice of the market data, which means we cannot compare a manufacturing company with a service provider or a showroom of laptops and mobiles with a company of book publishing.

Biased Information: Some of the information in financial statements is window dressing to attract investors, banks, and creditors.

Incomplete Information: We can't know a business's working style, management behavior, relationship with parties like investors, banks, creditors, and employees, and so on by looking at financial statements.

Types of Financial Statements

Now, we will discuss the parts of financial statements. There are three parts of financial statements; we will study these one by one:
The three major financial statement reports are as follows:

- Balance sheet
- Income statement
- Cash flow statement

Other than these, the statement of owner's equity is part of the financial statements. In addition, the notes are an integral part of the financial statements.

Balance Sheet

The balance sheet gives details of a company's assets, liabilities, and shareholders' equity for the end of a period, which is generally the end of the reporting period. The total of assets and liabilities are always equal, that is, the balance sheet always tallies.

Income Statement

The income statement defines a company's net profit or loss for a period, which can be monthly, quarterly, biannually, or annually. It reports the progress made by the company over a period. In addition, the income statement provides an overview of revenues, expenses, net income, and earnings per share.

Cash Flow Statement

The cash flow statement tells us how much cash the company generated from business and where it spent cash, i.e., where it came from and where it went. A cash flow statement provides the data of all inflows and outflows.
All three statements complement each other, and the financial statements are not complete if any of these is missed. We will study all three statements in detail in the following three sections.

Balance Sheet

The balance sheet displays the company's assets, liabilities, and shareholders' equity at a point in time.

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in `)

Particulars		As at 31.03.2016	As at 31.03.2015
I. EQUITY AND LIABILITIES			
1. Shareholder's funds			
(a) Share Capital		43,64,28,570	43,64,28,570
(b) Reserves and Surplus		31,11,79,085	29,46,90,305
		74,76,07,655	**73,11,18,875**
2. Non- current liabilities			
(a) Long-Term Borrowings		5,52,76,268	4,65,88,871
(b) Deferred Tax Liabilities (Net)		5,43,57,435	4,79,84,775
(c) Long Term Provisions		75,78,067	58,58,850
		11,72,11,770	**10,04,32,496**
3. Current Liabilities			
(a) Short Term Borrowings		49,11,35,902	47,02,72,485
(b) Trade Payables		21,06,96,656	75,20,16,578
(c) Other Current Liabilities		10,80,46,164	13,46,13,287
(d) Short Term Provisions		8,83,024	1,64,91,863
		81,07,61,746	**1,37,33,94,213**
	TOTAL	**1,67,55,81,171**	**2,20,49,45,584**
II. ASSETS			
1. Non-Current assets			
(a) Fixed Assets			
Tangible Assets		62,58,24,778	65,32,38,792
Capital work-in-progress		5,42,77,691	2,39,27,322
(b) Non Current Investments		91,84,400	91,84,400
(c) Long-Term Loans and Advances		5,13,47,212	5,48,11,695
		74,06,34,081	**74,11,62,209**
2. Current assets			
(a) Inventories		68,64,26,005	65,61,02,746
(b) Trade Receivables		13,91,40,782	71,28,04,280
(c) Cash and Bank Balance		3,03,30,135	2,04,78,590
(d) Short-term Loans and Advances		4,19,87,968	5,66,87,044
(e) Other Current Assets		3,70,62,200	1,77,10,715
		93,49,47,090	**1,46,37,83,375**
	TOTAL	**1,67,55,81,171**	**2,20,49,45,584**

Figure 2.1: *Balance Sheet Format with Numbers*

Figure 2.1 is the format and example of a balance sheet. It shows the balance sheet of ABC & XYZ Limited for the period ending 31st March 2016. It also has the figures for the period ending 31st March 2015 for comparison and reporting purposes.

A balance sheet is divided into two sections and further subsections.

- Equity and Liabilities
  - Shareholder's Funds
  - Non-Current Liabilities
  - Current Liabilities
- Assets
  - Non-Current Assets
  - Current Assets

According to Accounting rule, following is the equation of the Balance Sheet:
Assets = Equity + Liabilities

Or

Total Assets (Current + Non-Current) = Total Liabilities (Current + Non-Current) + Shareholders' Funds (Share Capital + Reserve and Surplus)

Equity and Liabilities

Equity: This is the value of the fund as capital introduced at the time of starting a business, and the shareholders also invest the funds while the company is in process or working.

Liabilities: They are existing debts and obligations. There are two types of liabilities: current liabilities and non-current liabilities. Current liabilities are those that must be paid in less than a year, and non-current liabilities are those that have to be paid after a year. Now, we will learn about all the sections and subsections of a balance sheet.

Shareholders' Fund

The amount of shareholders' funds yields an approximation of theoretically how much the shareholders would receive if a business were to liquidate after all the debts were paid off. Shareholders' funds is the owner's claim after subtracting total liabilities from total assets. If it is positive, the business has enough assets to pay all its liabilities; and if it is negative, the business doesn't have enough assets to pay all its liabilities. Reserves and surplus, and retained earnings are part of the shareholders'

funds. We can see the figures of the shareholders' funds on the liabilities side of a balance sheet, as shown in *Figure* 2.2:

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in ₹)

Particulars	As at 31.03.2016	As at 31.03.2015
I. EQUITY AND LIABILITIES		
1. Shareholder's funds		
(a) Share Capital	43,64,28,570	43,64,28,570
(b) Reserves and Surplus	31,11,79,085	29,46,90,305
	74,76,07,655	**73,11,18,875**

Figure 2.2: *Shareholder's Funds in Balance Sheet*

Example: Shareholders' Fund for Company ABC & XYZ Limited in *Figure 2.1*.

```
Shareholder's Equity = Total Assets – Total Liabilities
                     =  (74,06,34,081  +93,49,47,090)  –  (11,72,11,770
                        + 81,07,61,746)
                     =  74,76,07,655
```

As per the preceding equation, the shareholders' fund is positive, which it means the company can pay their liabilities easily.

The shareholders' fund divided into two components:

- Share capital
- Reserves and surplus

Share capital

Share capital is the amount invested by a company's shareholders for use in the business when a company is first incorporated, or the amount of money the companies raise from the issue of common shares of the company from public and private sources.

Let's take an example: Mr. Ram and Mr. Shyam started a business named ABC Infotech Limited (name taken only for educational purpose), and invested ₹10 crore each; the company's share capital will be ₹20 crore.

But now they want to expand their business and need ₹50 crore more, so they decide to launch an IPO in stock market. They issue 10 lakh shares of ₹500 face value.

In this process, they sold 9 lakh shares and raised ₹45 crore. So, in the balance sheet, the share capital will be ₹65 Crores (₹10 crore from each shareholder and ₹45 crore

from IPO). Now the general public who bought the Shares are also considered shareholders of the company in the percentage of the shares they bought.

We must remember that share capital will be calculated only from the issued value and how much company got at the time of IPO, not from the market value of shares.

Reserves and Surplus

Reserves are the funds earmarked for a specific purpose, which the company intends to use in future.

The surplus is where the profits of the company reside. This is one of the points where the balance sheet and the P&L statement interact. Dividends are paid out of the surplus.

During a financial year, a business has several unknown expenses, which are unexpected, so it must build reserves in order to be able to meet such expenses. Effectively, these reserves ensure that the company's financial position is not disturbed by the surfacing of any unexpected expenses. On the other hand, the surplus is the retained balance of the profit and loss account after the payment of dividends, tax provisioning, and such. Just like reserves, the surplus is also earmarked for various special-purpose expenses, such as the purchase of any assets, payment towards legal settlements, repayment of debts, and dividend payments.

In common finance terms, retained earnings are part of surplus. Retained earnings, also known as "earnings surplus", are reported in the balance sheet under shareholders' funds. Retained earnings represent the net earnings of a business that are not paid out as dividends. In simple terms, we can say that retained earnings are the balance on net profit, which is transferred to the balance sheet.

Retained earnings are typically used for future growth and operations of the business; they are reinvested into the business.

We will discuss equity and private equity in detail in the last section of this chapter.

Non-Current Liabilities

A non-current liability refers to the financial obligations in a company's balance sheet that are not expected to be paid within a year. Non-current liabilities are due in the long term.

Most businesses compare the amount of non-current liabilities with the cash flow to understand whether an organization has enough financial resources to meet its financial obligations over the long term. Most investors focus on short-term liquidity and the current liabilities amount; however, the long-term investors check

non-current liabilities to decide whether they should invest in the company. If the company's cash flow is high, it indicates that it can support more debt without liquidation.

Types of non-current liabilities:

- Debentures
- Long-term loans
- Bonds payable
- Deferred tax liabilities
- Long-term provisions

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
I. EQUITY AND LIABILITIES		
2. Non- current liabilities		
(a) Long-Term Borrowings	5,52,76,268	4,65,88,871
(b) Deferred Tax Liabilities (Net)	5,43,57,435	4,79,84,775
(c) Long Term Provisions	75,78,067	58,58,850
	11,72,11,770	**10,04,32,496**

Figure 2.3: *Non-Current Liabilities in Balance Sheet*

Figure 2.3 shows the format of non-current liabilities in a balance sheet.

Current Liabilities

Current liabilities are business obligations or debts due within a year or in the normal functioning cycle. Current liabilities determine how well a company can meet its short-term financial obligations. In simple terms, a company needs to generate enough revenue and cash in the short term to cover its current liabilities.
Types of current liabilities:

- Short-term borrowings – Accounts payable
- Trade payable
- Short-term provisions
- Other current liabilities

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
I. EQUITY AND LIABILITIES		
3. Current Liabilities		
(a) Short Term Borrowings	49,11,35,902	47,02,72,485
(b) Trade Payables	21,06,96,656	75,20,16,578
(c) Other Current Liabilities	10,80,46,164	13,46,13,287
(d) Short Term Provisions	8,83,024	1,64,91,863
	81,07,61,746	**1,37,33,94,213**

Figure 2.4: *Current Liabilities in Balance Sheet*

Figure 2.4 shows the format of current liabilities in a balance sheet.

Contingent Liabilities

These are not actual liabilities but may become actual liabilities depending on the occurrence of certain events. If such events do not occur, no liability is incurred. They are reported and recorded when we can estimate them in the value of money, and they are to be disclosed only in the footnote of a financial statement unless we can estimate them.

Assets

An asset is something that a company owns. There are two types of assets: current assets and non-current assets. Current assets are utilized within a year, and non-current assets are those that are used for more than a year.

Non-current assets

Non-current assets are a company's long-term investments that are not easily converted to cash or are not expected to bring in cash for the business within a financial year.

Non-current assets include tangible and non-tangible assets, which are capitalized. Their value is drawn down due to depreciation or amortization and allocated over the years for which the asset will be in use per their useful life. Companies purchase fixed assets intending to use them in the business since their benefits will last more than a year. The assets may be amortized or depreciated, depending on their type.

Tangible assets refer to assets with a physical form or property owned by a company and central to its core operations. The recorded value of a tangible asset is its original acquisition cost, less any accumulated depreciation.

However, not all physical assets are depreciated. Assets like land are held at a cost even though they tend to appreciate in value. Depreciation is a non-cash expense that reduces the value of an asset till its useful life.

Types of non-current assets:

- Fixed assets
  - o Tangible assets
  - o Work in progress
- Intangible assets
- Deferred tax assets
- Non-current investment
- Long-term loans and advances

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
II. ASSETS		
1. Non-Current assets		
(a) Fixed Assets		
Tangible Assets	62,58,24,778	65,32,38,792
Capital work-in-progress	5,42,77,691	2,39,27,322
(b) Non Current Investments	91,84,400	91,84,400
(c) Long-Term Loans and Advances	5,13,47,212	5,48,11,695
	74,06,34,081	**74,11,62,209**

Figure 2.5: *Non-Current Assets in Balance Sheet*

Figure 2.5 shows the format of non-current assets in a balance sheet.

Current Assets

Current assets can be explained as assets that are expected to last only for a year or less. They are expected to be consumed, sold, or converted into cash either within 1 year or within the operating cycle (we will learn about the operating cycle in *Chapter 4 , Modelling Working Capital*), whichever is longer. They are usually presented in order of liquidity on the balance sheet. The company needs cash for day-to-day operations, and current assets fulfill this requirement.

Types of current assets:

- Inventories
- Trade receivable

- Cash and bank balance
- Short-term loans and advances
- Other current assets

ABC & XYZ LIMITED
BALANCE SHEET AS AT MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
II. ASSETS		
2. Current assets		
(a) Inventories	68,64,26,005	65,61,02,746
(b) Trade Receivables	13,91,40,782	71,28,04,280
(c) Cash and Bank Balance	3,03,30,135	2,04,78,590
(d) Short-term Loans and Advances	4,19,87,968	5,66,87,044
(e) Other Current Assets	3,70,62,200	1,77,10,715
	93,49,47,090	**1,46,37,83,375**

Figure 2.6: *Current Assets in Balance Sheet*

Figure 2.6 shows the format of current assets in a balance sheet.

Income Statement

An income statement is a financial statement that shows a company's income and expenditures. It indicates whether a company is making a profit or loss for a given period and is also known as the Profit and Loss Statement. The profit or loss is determined by taking all revenues and subtracting all expenses from both operating and non-operating activities. The statement displays the company's revenue, costs, gross profit, selling and administrative expenses, other expenses and income, taxes paid, and net profit in a tabular and logical manner.

An income statement helps the company decide whether it can generate profit by increasing revenues, decreasing costs, or both. It also shows the effectiveness of the business's strategies at the beginning of a financial period. The business owners can refer to this document to see if the strategies have paid off. They can develop the best solutions to yield more profit based on their analysis.

The income statement needs the least amount of information, less than the other two statements (balance sheet and cash flow statement). So, instead, it provides the information to both the other statements.

It is divided into four (sometime three) parts:

- Revenue
- Expenses

- Tax expenses (some of the analysts and accountants consider expenses and tax expenses in the same category.)
- Net profit/loss, as shown in *Figure 2.7*:

ABC & XYZ LIMITED
STATEMENT OF PROFIT & LOSS FOR THE YEAR ENDED MARCH 31, 2016

(Amount in `)

Particulars	For the Year ended 31.03.2016	For the Year ended 31.03.2015
I. Revenue From Operations	1,99,66,97,549	1,88,56,44,512
II. Other Income	1,11,79,528	42,73,900
III. Total Revenue (I+II)	**2,00,78,77,077**	**1,88,99,18,412**
IV. Expenses		
Cost of materials consumed	93,84,99,810	78,88,10,561
Purchases of Stock in Trade	46,49,07,698	58,68,43,409
Changes in inventories of finished goods, work in progress and Stock-in- trade	(4,20,60,361)	(17,05,83,048)
Employee Benefits Expense	13,86,68,860	11,34,86,055
Finance Costs	6,70,31,015	7,32,89,110
Depreciation and Amortization Expense	6,00,68,116	6,31,25,706
Other Expenses	35,18,15,246	35,98,50,111
Total Expenses	**1,97,89,30,384**	**1,81,48,21,904**
V. Profit Before Tax and Prior Period Items (III-IV)	**2,89,46,693**	**7,50,96,508**
VI. Prior Period Items	**13,48,641**	**85,323**
VII. Profit Before Tax (V-VI)	**2,75,98,052**	**7,50,11,185**
VIII. Tax Expense:		
(1) Current Tax (MAT)	56,25,804	1,59,99,399
Less: MAT Credit entitlement	8,89,192	1,59,99,399
Net Current Tax	47,36,612	-
(2) Income Tax for earlier years		-
(3) Deferred Tax	63,72,660	2,71,81,252
	1,11,09,272	**2,71,81,252**
IX. Profit/(Loss) for the year (VII-VIII)	**1,64,88,780**	**4,78,29,933**
Earning per Equity share (Face value of ` 1		
Basic Earning per share (`)	**0.38**	**1.10**
Diluted Earning per equity share (`)	**0.38**	**1.10**

REVENUE

EXPENSES

TAX EXPENSES

PROFIT

Page 1

Figure 2.7: *Income Statement Format with Numbers*

NET PROFIT/LOSS = Revenue – Expenses

If result is positive, it means the business is in profit; if it is negative, it means the business is going in loss.

Terms related to Income Statement

Sales revenue: Total sales during a financial or reporting period

Cost of goods sold: Cost accrued to sell the goods

Interest expenses: Loan/term loan schedule for repayment of debts to get the interest and balance pending of loan

MAT: Minimum Alternate Tax is the amount of minimum tax payable

Cash Flow Statement

The cash flow statement shows the inflows and outflows of a company during a financial period, which can be monthly, quarterly, biannually, annually, or even weekly or fortnightly, depending on management and business requirements. It fills the gap between the balance sheet and income statement, where the funds move in or out. The information we get from the cash flow statement is beneficial for the management to make informed decisions for regulating business operations. Therefore, it is also known as the statement of cash flow.

A cash flow statement can be prepared using two methods:

- Direct method
- Indirect method

  The direct method is not in practice now, so we will focus only on the indirect method.

There are three sections of the statement of cash flow in the indirect method:

- **Operating Activities**: Operating activities refer to the primary revenue-generating activities of a company and other activities that are not related to investing or financing. This includes cash flows from current assets and current liabilities, such as accounts receivable, accounts payable, inventory, and salaries payable. In other words, operating activities are the day-to-day business activities that generate revenue for the company. Examples of operating activities include sales revenue, cost of goods sold, wages and salaries paid to employees, and payments received from customers. By analyzing the cash flows from operating activities, investors and analysts can gain insights into the company's ability to generate cash from its core business operations.**Investing Activities**: Any cash flows from the acquisition

and disposal of long-term assets and other investments not included in cash equivalents

- **Financing Activities**: Any cash flows that result in changes in the size and composition of the contributed equity capital or borrowings of the entity (bonds, stock, dividends)

ABC & XYZ LIMITED
CASH FLOW STATEMENT FOR THE YEAR ENDED MARCH 31, 2016

(Amount in `)

	Particulars	As at 31.03.2016	As at 31.03.2015
I.	**CASH FLOW FROM OPERATING ACTIVITIES**		
	Profit Before Tax, Prior Period and Exceptional Items	**2,89,46,693**	**7,50,96,508**
	Adjustments for:-		
	Depreciation and Amortization Expense	6,00,68,116	6,31,25,706
	Unrealized foreign exchange fluctuation	(25,50,943)	38,73,224
	Interest and financial charges	6,70,31,015	7,32,89,110
	Loss on Sale of Fixed Asset	3,92,389	2,36,763
	Bad Debts	-	10,50,778
	Provision for doubtful debts	-	34,80,578
	Dividend Income	(12,500)	(9,375)
	Interest income	(15,52,374)	(13,71,778)
	Operating profit before working capital changes and tax	**15,23,22,397**	**21,87,71,513**
	Adjustment for working capital:-		
	a) Loans and advances	1,19,86,739	2,14,40,407
	b) Trade Receivables	57,40,66,534	(9,36,00,245)
	c) Inventories	(3,03,23,259)	(16,73,45,909)
	d) Other current assets	(1,84,75,174)	(23,92,857)
	e) Current liabilities and Trade Payable	(53,86,24,835)	17,78,39,187
	f) Long Term Provision for Retirement Benefits	17,79,317	9,07,354
	Cash (used)/ generated from operations before tax and exceptional items	**15,27,31,718**	**15,56,19,451**
	Prior Period Expenses	(13,48,641)	(85,323)
	Direct Taxes paid	(2,12,94,743)	(1,19,60,709)
	Cash Flow From Operating Activities	**13,00,88,334**	**14,35,73,419**
II.	**CASH FLOW FROM INVESTING ACTIVITIES**		
	Purchase of fixed assets	(6,08,24,425)	(8,65,22,470)
	Sale of Fixed Assets	87,912	2,26,666
	Dividend Income	12,500	9,375
	Interest income	6,76,063	13,93,224
	Cash Flow From Investing Activities	**(6,00,47,950)**	**(8,48,93,205)**
III.	**CASH FLOW FROM FINANCING ACTIVITIES**		
	Loan Received	6,19,69,036	4,65,52,656
	Loan Repaid	(5,79,55,204)	(4,04,49,216)
	Interest and financial charges	(6,68,96,508)	(7,27,46,753)
	Cash Flow From Financing Activities	**(6,28,82,676)**	**(6,66,43,313)**
	Net Increase/ (Decrease) in Cash and Cash Equivalents (I+II+III)	**71,57,708**	**(79,63,099)**
	Cash and Cash equivalents at the beginning of the year	**85,03,342**	**1,64,66,441**
	Cash and Cash equivalents at the end of the year	**1,56,61,050**	**85,03,342**

Figure 2.8: *Cash Flow Statement Format with Numbers*

Figure 2.8 shows the format of a cash flow statement.

Operating Activities

The first section of the cash flow statement covers cash flows from operating activities (CFO) and includes transactions from all operational business activities. Operational business activities include inventory transactions, interest and tax payments, employee wages, and rent payments. Any other form of cash flow, such as investments, debts, and dividends, is not included in this section. A cash flow statement should show positive cash flow for its operational activities. If it doesn't, the business may find it difficult to manage its daily business operations. The items in the cash flow statement are not all actual cash flows, but "reasons why cash flow is different from profit."

ABC & XYZ LIMITED
CASH FLOW STATEMENT FOR THE YEAR ENDED MARCH 31, 2016

(Amount in `)

	Particulars	As at 31.03.2016	As at 31.03.2015
I.	**CASH FLOW FROM OPERATING ACTIVITIES**		
	Profit Before Tax, Prior Period and Exceptional Items	**2,89,46,693**	**7,50,96,508**
	Adjustments for:-		
	Depreciation and Amortization Expense	6,00,68,116	6,31,25,706
	Unrealized foreign exchange fluctuation	(25,50,943)	38,73,224
	Interest and financial charges	6,70,31,015	7,32,89,110
	Loss on Sale of Fixed Asset	3,92,389	2,36,763
	Bad Debts	-	10,50,778
	Provision for doubtful debts	-	34,80,578
	Dividend Income	(12,500)	(9,375)
	Interest income	(15,52,374)	(13,71,778)
	Operating profit before working capital changes and tax	**15,23,22,397**	**21,87,71,513**
	Adjustment for working capital:-		
	a) Loans and advances	1,19,86,739	2,14,40,407
	b) Trade Receivables	57,40,66,534	(9,36,00,245)
	c) Inventories	(3,03,23,259)	(16,73,45,909)
	d) Other current assets	(1,84,75,174)	(23,92,857)
	e) Current liabilities and Trade Payable	(53,86,24,835)	17,78,39,187
	f) Long Term Provision for Retirement Benefits	17,79,317	9,07,354
	Cash (used)/ generated from operations before tax and exceptional items	**15,27,31,718**	**15,56,19,451**
	Prior Period Expenses	(13,48,641)	(85,323)
	Direct Taxes paid	(2,12,94,743)	(1,19,60,709)
	Cash Flow From Operating Activities	**13,00,88,334**	**14,35,73,419**

Figure 2.9: *Operating Activities of Cash Flow Statement*

Figure 2.9 shows the format of operating activities of a cash flow statement.

Investment activities

The second section of a cash flow statement records the gains and losses caused by investment in assets (capital expenditure) or dividends received from investment in stocks and interest received on loan payments.

A company may sometimes experience negative cash flow due to heavy investment expenditure, but this is not always an indicator of poor performance because it may lead to high capital growth. Refer to the following figure:

ABC & XYZ LIMITED
CASH FLOW STATEMENT FOR THE YEAR ENDED MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
II. CASH FLOW FROM INVESTING ACTIVITIES		
Purchase of fixed assets	(6,08,24,425)	(8,65,22,470)
Sale of Fixed Assets	87,912	2,26,666
Dividend Income	12,500	- 9,375
Interest income	6,76,063	13,93,224
Cash Flow From Investing Activities	**(6,00,47,950)**	**(8,48,93,205)**

Figure 2.10: *Investing Activities in Cash Flow Statement*

Figure 2.10 shows the format of investing activities of a cash flow statement.

Financial activities

The third section of a cash flow statement shows the cash flow between the company and its owners and creditors. Financial activities include transactions of debt, equity, and dividends. In these transactions, incoming cash is recorded when capital or debt increases (such as from investors or banks), and outgoing cash records are made when dividends are paid and borrowings and bank loans are repaid. Refer to the following figure:

ABC & XYZ LIMITED
CASH FLOW STATEMENT FOR THE YEAR ENDED MARCH 31, 2016

(Amount in `)

Particulars	As at 31.03.2016	As at 31.03.2015
III. CASH FLOW FROM FINANCING ACTIVITIES		
Loan Received	6,19,69,036	4,65,52,656
Loan Repaid	(5,79,55,204)	(4,04,49,216)
Increase/ (decrease) in unsecured Loan		-
Interest and financial charges	(6,68,96,508)	(7,27,46,753)
Cash Flow From Financing Activities	**(6,28,82,676)**	**(6,66,43,313)**
Net Increase/ (Decrease) in Cash and Cash Equivalent:	**71,57,708**	**(79,63,099)**
Cash and Cash equivalents at the beginning of the year	**85,03,342**	**1,64,66,441**
Cash and Cash equivalents at the end of the year	**1,56,61,050**	**85,03,342**

Figure 2.11*: Financing Activities in Cash Flow Statement*

Figure 2.11 shows the format of financing activities of a cash flow statement.

Depreciation and Amortization

Depreciation and amortization are the two methods of calculating the fixed assets and intangible assets for an accounting period, which is usually annual.

Depreciation is used for fixed assets, and amortization is used for intangible assets to calculate the depreciated value of both types of assets. These are the part of the income statement in the expenses block.

Examples of fixed assets are buildings, equipment, furniture, vehicles, and machinery.

Examples of intangible assets are patents, trademarks, goodwill, franchise agreements, and copyrights.

Fixed assets have their salvage value after a period of useful life. On the other hand, intangible assets don't have any salvage value due to their physical non-existence. So, depreciation is calculated by subtracting the salvage value of fixed assets.

Intangible assets usually calculate the amortization value by the straight-line method. Several methods are used to determine a fixed asset's depreciated value over time:

Straight-line method: The most common depreciation method used to spread out the depreciation of an asset evenly over time.

Declining balance (Written Down Value): An accelerated accounting method that shows how depreciation decreases the value of a fixed asset.

Double-declining balance: Another accelerated depreciation method in which the value of an asset depreciates at twice the rate than with the straight-line method.

Units of production: This depreciation method accounts for the number of units an asset produces rather than focusing on the years it is used for.

Sum-of-years-digits: Another way to calculate accelerated depreciation for an asset that factors in the asset's original cost, salvage value, and useful years of life.

We will work only on the **Straight-Line Method** (**SLM**) and **Written Down Value** (**WDV**) whenever required.

Figure 2.12 shows the formulas of SLM and WDV:

Particular	SLM	WDV
FORMULA	Depreciation Rate = $\frac{\text{(Depriciable Value ÷ Life of Assets)}}{\text{Initial value of asset}}$	Depreciation Rate = (1-S/I)^(1/n) Where S = Salvage Value I = Initial Vale of Asset n = Useful Life of Asset

Figure 2.12: *Formula of SLM and WDV Methods*

Let's take an example of SLM and WDV to understand more about these terms:

Short Name	Particular	Figures
I	Initial Value of Assets	1,00,000
n	Useful Life (In Years)	10
S	Salvage Value	5,000

Short Name	Lets Calculate Depriciable Value =I - S	Formula
D	Depriciable Value	95,000 =E2-E4

SLM	Figure	Formula
Annual Depreciation	9,500	=E7/E3
Depreciation Rate	9.5%	=D10/E2

WDV	Figure	Formula
Annual Depreciation	Not Applicable	
Depreciation Rate	25.9%	=(1-(E4/E2)^(1/E3))

Now we prepare a Depreciation Table from both methods

	SLM METHOD			WDV METHOD		
YEAR	Op. Bal	Depericiation	Cl. Bal	Op. Bal	Depericiation	Cl. Bal
YEAR 1	1,00,000	9,500	90,500	1,00,000	25,887	74,113
YEAR 2	90,500	9,500	81,000	74,113	19,185	54,928
YEAR 3	81,000	9,500	71,500	54,928	14,219	40,709
YEAR 4	71,500	9,500	62,000	40,709	10,538	30,171
YEAR 5	62,000	9,500	52,500	30,171	7,810	22,361
YEAR 6	52,500	9,500	43,000	22,361	5,788	16,572
YEAR 7	43,000	9,500	33,500	16,572	4,290	12,282
YEAR 8	33,500	9,500	24,000	12,282	3,179	9,103
YEAR 9	24,000	9,500	14,500	9,103	2,356	6,746
YEAR 10	14,500	9,500	5,000	6,746	1,746	5,000

	SLM METHOD FORMULA			WDV METHOD FORMULA		
YEAR	Op. Bal	Depericiation	Cl. Bal	Op. Bal	Depericiation	Cl. Bal
YEAR 1	=E2	=$B$21*$D$11	=B21-C21	=E2	=E21*$D$15	=E21-F21
YEAR 2	=D21	=$B$21*$D$11	=B22-C22	=G21	=E22*$D$15	=E22-F22
YEAR 3	=D22	=$B$21*$D$11	=B23-C23	=G22	=E23*$D$15	=E23-F23
YEAR 4	=D23	=$B$21*$D$11	=B24-C24	=G23	=E24*$D$15	=E24-F24
YEAR 5	=D24	=$B$21*$D$11	=B25-C25	=G24	=E25*$D$15	=E25-F25
YEAR 6	=D25	=$B$21*$D$11	=B26-C26	=G25	=E26*$D$15	=E26-F26
YEAR 7	=D26	=$B$21*$D$11	=B27-C27	=G26	=E27*$D$15	=E27-F27
YEAR 8	=D27	=$B$21*$D$11	=B28-C28	=G27	=E28*$D$15	=E28-F28
YEAR 9	=D28	=$B$21*$D$11	=B29-C29	=G28	=E29*$D$15	=E29-F29
YEAR 10	=D29	=$B$21*$D$11	=B30-C30	=G29	=E30*$D$15	=E30-F30

Figure 2.13: *Example of Calculation of Depreciation using Both Methods*

Figure 2.13 shows that the initial value of an asset is ₹1,00,000/-, and the residual value is ₹5000. Still, the depreciation calculation and figures in both methods are also different.

The rate of depreciation is different in both cases. The depreciated amount is ₹9,500/- every year in the SLM method, while the depreciated amount is ₹25,887/- in year 1 and decreases to ₹1,746/- in year 10 in WDV Method. We will use the SLM method in *Chapter 6 , Financial Modeling and Cash Flow Modeling*.

Accounting and Financial Terms

We have completed the major topics of this chapter. Now, we need to learn some financial terms that we will use in the upcoming chapters.

Capital Expenditure: Capital expenditures are the funds used by a company to acquire, upgrade, and maintain physical assets like property, buildings, or equipment. These expenditures are typically one-time purchases of fixed assets that will be used for revenue generation over a long period. They are also known as capital expenses or capex.

Revenue Expenditure: Revenue expenditures are short-term expenses that are used for the current period or within a year. They involve all costs required for a business's successful day-to-day operations. They are also known as operating expenses or opex. We will learn more about capex and opex in the upcoming chapters.

Preliminary Expenses: The expenses incurred before the company's incorporation are called preliminary expenses; they are undertaken to promote the company. So, we show this as deferred expenses written off over a period. For example, legal or professional fees, logo designing costs, printing and registration fees, and stamp duty.

Outstanding Expenses: These are expenses that have been incurred in the current accounting period and are due in the next period; the payment has not been made. Such item is to be treated as a payable for the business due. For example, expenses payable and tax payable.

Incurred Expenses: It refers to the costs incurred that have not been paid.

Accrued Income: It indicates that the income has been accrued but is not due yet.

Deferred Expenses: A deferred expense is a cost to a company that has been paid but only impacts the company's profit/loss statement later in the accounting period or in the next accounting period, depending on when it will be used. It comes under current assets in a balance sheet. An example is vehicle insurance.

Deferred Revenue (Unearned Revenue): Advance payment received for the products and/or services that are to be delivered or performed in the future is deferred revenue. It comes under current liabilities. For example, advance from customers.

Deferred Revenue Expenditure: Deferred revenue expenditure is an expenditure incurred in the present accounting period, but whose benefits will be incurred in the following accounting period(s). This expenditure might be written off in the same financial year or over a period of a few years.

Unrealized Gains and Losses: Gains or losses are said to be realized when a stock (or other investment) that we own is actually sold. Until it is unsold, these gains or losses are unrealized gains or losses, also known as paper profits or losses.

Public Equity and Private Equity

We are learning accounting and finance, so we must know the terms equity and private equity, and the difference between them.

Public Equity

Public equity refers to the shares or ownership of a public company. Companies must be listed on the stock market. When a company goes public, it allows the public to buy ownership rights in their business. It gives a person (an individual or an organization) the right to get the small part of share of the company.

As we discussed in the *Balance Sheet* section, after holding the small part of share of the company, an individual or an organization is also a shareholder of the company in the capacity of their share percentage.

The public equity industry is regulated by governmental organizations, and public companies must publish their financial information related to their stocks and assets on a regular basis for compliance purposes. It means that the finances, revenue, and other details about the functioning of a company are visible to the general public.

It can be short-term or long-term investment for an investor in public equity.

Private Equity

Private equity is defined as the total assets or security that represent an individual or organization's ownership in a private company. They do not need to be listed in the stock market. The actual value of these shares depends on the shareholders' investment percentages.

Only business owners and private investors can be shareholders in a private company. These companies target particular investors; only High Net Worth Individuals (HNIs), venture capitals, and angel brokers are allowed to invest.

Long-term investments often require patience and a long-term perspective. Unlike short-term investments that provide quick returns, long-term investments typically require a longer time horizon before generating significant returns. This is because long-term investments often involve greater risks and uncertainties, and may require a longer time for market conditions and trends to develop. Examples of long-term investments include stocks, mutual funds, real estate, and retirement accounts. By being patient and holding on to these investments for the long-term, investors may be able to achieve significant growth and returns over time.

Conclusion

Financial statements include the cash flow statement, balance sheet, and income statement. Separately, each statement provides a glimpse of a company's financial situation. All of them combined determine the company's financial health by displaying whether the company can manage the incoming and outgoing funds.

As accounting and financial professionals, we are well aware of financial statements, and the structure and components of a balance sheet, an income statement and a cash flow statement. We are also familiar with the different terms of finance and know the difference between public and private equity.

In the next chapter we will learn what working capital is, how is it determined, what an accounting and finance professional should do to manage working capital, and what working capital management is.

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Chapter 3

Calculating and Projecting Various Financial Ratios

Introduction

Financial accounting ratios are key to identifying the financial health of a business. So, these ratios are one of the essential parts of learning about accounting and finance.

Financial ratios are the tool to analyze and compare the relationship between two or more items in a financial statement. Basically, it compares a company in two or more periods or compares peer companies for the same period.

In this chapter, we will learn about financial accounting ratios and their types.

Structure

In this chapter, we will discuss the following topics:

- Financial Ratios and Their Types
- Importance of Financial Ratios
- Liquidity Ratios
- Solvency Ratios
- Profitability Ratios
- Return on Sales Ratios

- Return on Investment Ratios
- Turnover Ratios
- Valuation Ratios

Objectives

Financial ratio analysis helps in making decisions for financing, investing and operating activities. Ratio analysis solves the problem of how companies are growing in business year by year or period by period. It allows us to understand the current financial scenario of a company. We will use these ratios in our financial modeling to understand the estimation.

Financial Ratios and Their Types

Financial ratios are tools to analyze the financial health of a business/company. These ratios are calculated on the basis of information taken from all financial statements, which we have learnt about in *Chapter 2, Preparing Financial Statements Smartly*. They are very helpful for the investors, lenders/banks, or creditors to understand a company's financial status.

There are six types of financial ratios:

- Liquidity Ratios
- Solvency Ratios
- Profitability Ratios
    - Return on Sales Ratios (Profitability Ratios)
    - Return on Investment Ratios
- Turnover Ratios
- Valuation Ratios
- Growth Ratios

All ratios have their own need and use. We will discuss each of them in this chapter.

Importance of Financial Ratios

The importance of financial ratios can be explained as follows:

- Analyzing a company's financial ratios can provide a shareholder with a better understanding of its profitability, liquidity and so on.

- Financial ratios are used by investors to understand the financial health of a business. It is applicable for both public and private companies.
- A single ratio cannot be examined; a set of ratios are needed, so the knowledge of various indicators is a must, and it can be used as KPIs in budgeting, costing, financial modeling, CMA loan data and so on.

Let's discuss all ratios one by one.

Liquidity Ratios

They are calculated to understand the company's capability to pay short-term obligations. Liquidity refers to liquidating all current assets to meet all obligations or debt of all current liabilities. Liquidity ratios are also known as working capital ratios because they define the current (immediate) scenario of the company without raising external capital. It is compared with peer competitors or with the company's own performance in the previous years. The comparison cannot happen across industries, for example, a coal manufacturing company cannot be compared with a coal trading company.

We will study working capital in the next chapter.

Three types of liquidity ratios are in trend:

- Current Ratio
- Quick Ratio
- Cash Ratio

Current Ratio

Current ratio is the major liquidity ratio to analyze the current obligations vs current assets.

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Where current assets (resources that are consumed or converted into cash within a year) include the following:

- Cash and cash equivalents
- Bank deposits
- Marketable securities
- Short-term investments
- Accounts receivable
- Inventory

- Prepaid expenses
- Short-term loans and advances

And current liabilities (liabilities or obligations that are to be paid within a year) include the following:

- Accounts payable
- Short-term loans
- Cash credit and overdraft
- Advance from customers
- Outstanding expenses
- Term loan instalments

Let's study the scenarios of current ratios:

If CL > CA (current ratio is less than one):

- There is high liquidity risk.
- Company might need to raise additional funds via debts or by investment.
- Company is unable to meet its short-term obligations.

If CL<CA (current ratio is more than one):

- Company can easily meet its short-term obligations.
- Current assets are utilized very well.
- Company's financial status is good.

The ideal current ratio is 1.33, and a current ratio between 1.33 and 3 is healthy according to investors and lenders. If CR is more than 3, it means current assets are not utilized properly and funds are stuck in inventories or accounts receivables.

Let's take an example to understand this better.

Figure 3.1 shows the balance sheet for a liquidity ratio example. We will use the same example for all liquidity ratios.

	A	B	C	D
1		**Balance Sheets for Educational Purpose Ltd. (All Amount in Lakh)**		
2		***Description***	***Situation A***	***Situation B***
3	A	Cash & Cash Equivalents	₹ 10.00	₹ 5.00
4	B	Bank Deposits	₹ 25.00	₹ 10.00
5	C	Marketable Securities	₹ 30.00	₹ 34.00
6	D	Short Terms Investment	₹ 33.00	₹ 5.00
7	E	Accounts Receivable	₹ 40.00	₹ 37.00
9	G	Pre-Paid Expenses	₹ 30.00	₹ 2.00
10	H	Short Term Advances	₹ 7.00	₹ 3.00
11	**I**	**Current Assets (Sum of A to G)**	**₹ 207.00**	**₹ 131.00**
12	J	Plant and Equipment	₹ 50.00	₹ 54.00
13	K	Intangible Assets	₹ 30.00	₹ 17.00
14	**L**	**Non Current Assets (I + J)**	**₹ 80.00**	**₹ 71.00**
15	**M**	**Total Assets (H + K)**	**₹ 287.00**	**₹ 202.00**
16	N	Accounts Payable	₹ 53.00	₹ 60.00
17	O	Short Term Laon	₹ 34.00	₹ 43.00
18	P	Cash Credit & OD	₹ 25.00	₹ 25.00
19	Q	Advances From Customers	₹ 9.00	₹ 10.00
20	R	Outstanding Expenses	₹ 8.00	₹ 3.00
21	S	Terms Loan Installment	₹ 13.00	₹ 17.00
22	**T**	**Current Liabilities (Sum of M to R)**	**₹ 142.00**	**₹ 158.00**
23	U	Long-Term Debt	₹ 70.00	₹ 40.00
24	**V**	**Total Liabilities(S + T)**	**₹ 212.00**	**₹ 198.00**
25	**W**	**Shareholders' Equity (L - U)**	**₹ 75.00**	**₹ 4.00**
26				
27		**This Fomat of Balance Sheet is only for educational purpose to understand easily. The actual format of Balance Sheet is already discussed in Chapter 2)**		

Figure 3.1: *Balance Sheet for Liquidity Ratio*

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Now, we are applying the preceding equation to the balance sheet in *Figure 3.1*:

Situation A

$$CR = \frac{207}{142} = 1.45$$

Situation B

$$CR = \frac{131}{158} = 0.83$$

As we can see, Situation A is better than Situation B. In Situation A, the company can meet its current obligations easily because it has more current assets than current liabilities, while in Situation B, the company might be liquidated as its current assets are less than its current liabilities.

Quick Ratio

The quick ratio measures a company's ability to meet its short-term obligations with quick assets (quick assets are very short-term assets).

$$Quick\ Ratio = \frac{Quick\ \text{Assets}}{Current\ Liabilities}$$

Where quick assets (resources that are consumed or converted into cash very quickly) include the following:

- Cash and cash equivalents
- Bank deposits
- Marketable securities
- Short-term investments
- Accounts receivable
- Short-terms loans and advances

And current liabilities are the same as those in the case of current ratio.

Let's study the scenarios of quick ratios.

If CL > QA (quick ratio is less than one):

- There is high liquidity risk.
- The company might need to raise additional funds via debts or by investment.
- Company is unable to meet its short-term obligations.

If CL<QA (quick ratio is more than one):

- Company can easily meet its short-term obligations.
- Current assets are utilized very well.
- Company's financial status is good.

The ideal quick ratio is 1, and a quick ratio between 1 and 2.5 is healthy according to investors and lenders. If the QR is more than 2.5, it means quick assets are not utilized properly and funds are stuck in accounts receivable.

Let's take an example to understand this better.

As shown in *Figure 3.1*, we take the values of quick assets as mentioned in *Table 3.1*:

Description	Situation A	Situation B
Cash and Cash Equivalents	₹ 10.00	₹ 5.00
Bank Deposits	₹ 25.00	₹ 10.00
Marketable Securities	₹ 30.00	₹ 34.00
Short Terms Investment	₹ 33.00	₹ 5.00
Accounts Receivable	₹ 40.00	₹ 37.00
Short Term Advances	₹ 7.00	₹ 3.00
Quick Assets	₹ 145.00	₹ 94.00

Table 3.1: *Components of Quick Assets from Balance Sheet*

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Now, we'll apply the preceding equation for calucuation of quick ratio, as shown in *Table 3.1* (The table is part of the balance sheet shown in *Figure 3.1*).

Situation A

$$QR = \frac{145}{142} = 1.02$$

Situation B

$$QR = \frac{94}{158} = 0.59$$

As we can see, Situation A is better than Situation B. In Situation A, the company can meet its current obligations easily because it has more quick assets than current liabilities, while in Situation B, the company might be liquidated because its quick assets are less than its current liabilities.

Cash Ratio

The cash ratio tells us about the immediate liquidity position of the company, that is, at present (within a few days).

$$Cash\ Ratio = \frac{Cash\ and\ \ Cash\ Equivalents}{Current\ Liabilities}$$

Where quick assets (resources consumed or converted into cash very quickly) include the following:

- Cash and cash equivalents
- Bank deposits
- Marketable securities
- Short-term investments

And the current liabilities are the same as in current ratio.

Let's study the scenarios of cash ratios.

If the cash ratio is less than 0.5 (<0.5)

- There is high liquidity risk.
- The company might need to raise additional funds via debts or by investment.
- Company is unable to meet its short-term obligations.

If the cash ratio is more than 0.5 (>0.5):

- Company can easily meet its short-term obligations.
- Current assets are utilized very well.
- Company's financial status is good.

There is no ideal cash ratio parameter, but companies, lenders, investors and bankers consider the ideal cash ratio to be between 0.5 and 1. If the cash ratio is more than 1, it means cash is not utilized properly and funds are stuck in the form of cash.

Sometimes, liquidity ratios misguide in industries like infrastructure or real estate as they cannot maintaine ideal liquidity ratios.

Let's take an example to understand this better.

As shown in *Figure 3.1*, we take the values of cash and cash equivalents as mentioned in *Table 3.2*:

Description	Situation A	Situation B
Cash and Cash Equivalents	₹10.00	₹5.00
Bank Deposits	₹25.00	₹10.00
Marketable Securities	₹30.00	₹34.00
Short-Term Investments	₹33.00	₹5.00
Quick Assets	₹98.00	₹54.00

Table 3.2: *Components of Cash and Cash Equivalents from Balance Sheet*

Now, we will apply the preceding equation for calculation of Cash Ratio, as shown in *Table 3.2* (The table is part of balance sheet shown in *Figure 3.1*).

Situation A

$$Cash\ Ratio = \frac{98}{142} = 0.69$$

Situation B

$$Cash\ Ratio = \frac{54}{158} = 0.34$$

As we can see, Situation A is better than Situation B. In Situation A, the company can meet its current obligations easily because it has ideal cash than current liabilities, while in Situation B, the company might be liquidated because it has not as much as cash it should be.

Note: Sometimes, liquidity ratios are misguiding in industries like infrastructure or real estate, as they cannot manage ideal liquidity ratios.

Solvency Ratios

They are calculated to understand companies' capability to repay long-term debts and obligations. These ratios are commonly used for lenders and banks. If these ratios are not in ideal positions, it indicates that the company is in trouble and will default on its obligations. These ratios indicate whether a company stays solvent in the long term. We can measure a company's cash flow capacity with these ratios. Solvency ratios are also known as leverage ratios.

They cannot be compared across industries, for example, a coal manufacturing company cannot be compared with a coal trading company.

Following are the types of solvency ratios:

- Debt Equity Ratio
- Debt to Assets Ratio
- Debt to Capital Ratio
- Interest Coverage Ratio
- Debt Service Coverage Ratio
- Capital Gearing Ratio

Debt Equity Ratio

It calculates the weight of the total debts and obligations against total shareholders' equity. A higher debt equity ratio indicates a higher risk of solvency.

Formula:

$$\frac{D}{E}Ratio = \frac{Total\ Liabilities}{Total\ Shareholders'Equity}$$

Where total liabilities include all short-term and long-term debts, and total shareholders' equity includes all types of equity.

Let's take an example to understand this better, as shown in *Figure 3.2*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	Shareholders Equity	1000000	1200000
3	B	Short Term Liabilites	500000	400000
4	C	Long Term Liabilites	600000	450000
5	D	**Total of Liabilities (B + C)**	**1100000**	**850000**
6	E	**Total of Equity and Liabilities (A + D)**	**2100000**	**2050000**
7				
8	F	Current Assets	700000	950000
9	G	Non Current Assets	1400000	1100000
10	H	**Total of Assets (F + G)**	**2100000**	**2050000**
11				
12				
13		**Debt to Equity Ratio (D/A)**	**1.1**	**0.71**
14		**Excel Formula**	**=C5/C2**	**=D5/D2**

Figure 3.2: *Example for Debt Equity Ratio (DE Ratio)*

As we can see in *Figure 3.2*, Situation B is better than A because we have enough equity to meet our long-term liabilities and obligations. Situation A has a higher risk of solvency.

Ideally, D/E < 1

Companies with low D/E ratios survive better. Manufacturing companies, banks, and power companies have higher D/E ratios; and retail and software companies have lower D/E ratios because they don't usually need debt.

Debt to Assets Ratio

It calculates the weight of the total debts and obligations against total assets. A higher debt to assets ratio indicates a higher risk of solvency.

Formula:

$$Debt\ Assets\ Ratio = \frac{Total\ Liabilities}{Total\ Assets}$$

Where total liabilities include all short-term and long-term debts, and total assets include all types of assets.

Let's take an example to understand this better, as shown in *Figure 3.3*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	Shareholders Equity	1000000	1200000
3	B	Short Term Liabilites	500000	400000
4	C	Long Term Liabilites	600000	450000
5	D	**Total of Liabilities (B + C)**	**1100000**	**850000**
6	E	**Total of Equity and Liabilities (A + D)**	**2100000**	**2050000**
7				
8	F	Current Assets	700000	950000
9	G	Non Current Assets	1400000	1100000
10	H	**Total of Assets (F + G)**	**2100000**	**2050000**
11				
12				
13		**Debt to Assets Ratio (D/H)**	**0.52**	**0.41**
14		**Excel Formula**	**=C5/C10**	**=D5/D10**

Figure 3.3: *Example for Debt to Assets Ratio (D/A Ratio)*

As we can see in *Figure 3.3*, Situation B is better than A because we have enough assets to meet our long-term liabilities and obligations. Situation A has more risk of solvency.

Ideally, D/A < 0.5

Companies with low D/A ratios survive better. Manufacturing companies, banks, and power companies have higher D/A ratios; and retail and software companies have lower D/A ratios because they don't usually need debt.

Debt to capital ratio

It calculates the weight of the total debts and obligations against the total liabilities. A higher debt to capital ratio indicates a higher risk of solvency.

Formula:

$$Debt\ to\ Capital\ Ratio = \frac{Total\ Liabilities}{Total\ Capital}$$

Where total liabilities include all short-term and long-term debt, and total capital includes all short-term and long-term debt and shareholders equity.

Let's take an example to understand this better, as shown in *Figure 3.4*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	Shareholders Equity	1000000	1200000
3	B	Short Term Liabilites	500000	400000
4	C	Long Term Liabilites	600000	450000
5	D	**Total of Liabilities (B + C)**	**1100000**	**850000**
6	E	**Total of Equity and Liabilities (A + D)**	**2100000**	**2050000**
7				
8	F	Current Assets	700000	950000
9	G	Non Current Assets	1400000	1100000
10	H	**Total of Assets (F + G)**	**2100000**	**2050000**
11				
12				
13		**Debt to Capital Ratio (D/E)**	**0.52**	**0.41**
14		**Excel Formula**	**=C5/C6**	**=D5/D6**
15				

Figure 3.4: *Example for Debt to Capital Ratio (D/C Ratio)*

As we can see in *Figure 3.4*, Situation B is better than A because we have enough cash flow to meet our long-term liabilities and obligations. Situation A has a higher risk of solvency.

Ideally, D/C < 0.5

Companies with low D/C ratios survive better. Manufacturing companies, banks, and power companies have higher D/A ratios; and retail and software companies have lower D/A ratios because they don't usually need debt.

Interest Coverage Ratio (ICR)

It calculates how many times a company's operating profit covers its interest payments. It measures how a company can pay the interest due on outstanding debt. Some companies use EBIT, some use EBITDA and some use EBIAT. We will consider this only with EBIT to avoid confusion, as EBIT is in practice mostly. The lower the ratio, the higher the chance of default.

Formula:

$$Interest\ Coverage\ Ratio = \frac{EBIT}{Interest\ Payment}$$

Where EBIT is Earning Before Interest and Taxes (a component of the income statement), and interest payment includes interest paid as per the income statement.

Let's take an example to understand this better, as shown in *Figure 3.5*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	EBIT	1250000	100000
3	B	Interest Expenses	90000	70000
4	C	Principal Amount	400000	450000
5				
6		**Interest Coverage Ratio (ICR)**	**13.89**	**1.43**
7		**Excel Formula**	**=C2/C3**	**=D2/D3**

Figure 3.5: *Example for Interest Coverage Ratio (ICR Ratio)*

As we can see in *Figure 3.5*, Situation A is better than B because we have higher ICR meet our debt interest payment, whereas ICR in Situation B is 1.43. Situation B has a higher risk of solvency.

Ideally, ICR > 3.

A higher ICR means that the company generates more earnings relative to its interest expense, which gives it a greater cushion to absorb any adverse financial events or economic downturns. As such, investors and analysts often view a high ICR as a positive sign of a company's financial health and stability.Manufacturing companies, banks, and power companies have lower ICR; and retail and software companies have lower ICR or might not be required to calculate ICR because they don't usually need debt.

Debt Service Coverage Ratio (DSCR)

It calculates how many times a company's operating profit cover its debts service (Principal Amount + Interest Amount, or we can say 12 EMIs) payments. It measures how a company can repay its debt and interest on outstanding debt. Some companies use EBIT, some use EBITDA and some use EBIAT. We will consider this only with EBIT to avoid confusion, as EBIT is in practice mostly. The lower the ratio, the higher the chance of default.

Formula:

$$Debt\ Service\ Coverage\ Ratio\ \ (DSCR) = \frac{EBIT}{Debt\ Service\ (Principal + Interest)}$$

Where EBIT is Earning Before Interest and Taxes (a component of the income statement), and debt service includes principal paid and interest paid as per the income statement.

Let's take an example to understand this better, as shown in *Figure 3.6*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	EBIT	1250000	100000
3	B	Interest Expenses	90000	70000
4	C	Principal Amount	400000	450000
5				
6		**Debt Service Coverage Ratio**	**2.55**	**0.19**
7		**Excel Formula**	**=C2/(C3+C4)**	**=D2/(D3+D4)**

Figure 3.6: *Example for Debt Service Coverage Ratio (DSCR Ratio)*

As we can see in *Figure 3.6*, Situation A is better than B because we have a higher DSCR to meet our debts service, while the DSCR in Situation B is 0.19. Situation B has a higher risk of solvency.

Ideally, DSCR > 1.

A higher Debt Service Coverage Ratio (DSCR) generally indicates a stronger solvency position for a company and an ability to make debt interest payments more easily. In other words, the higher the DSCR, the more capable a company is of meeting its debt obligations, which in turn can increase its chances of survival and financial success.Manufacturing companies, banks, and power companies have lower DSCR; and retail and software companies have lower DSCR or might not even be required to calculate it because they don't usually need debt.

Capital Gearing Ratio (CGR)

It calculates how capital is geared equity to total debt ratio. The higher geared the ratio, the higher the chance of default.

Formula:

$$Capital\ Gearing\ Ratio\ (CGR) = \frac{Common\ Stockholders'\ Equity}{Fixed\ Interest\ Bearing\ Funds}$$

Where common stockholders' equity is total shareholders' fund and deduct preferred stock (Share Capital + Reserve and Surplus), and fixed interest-bearing funds include total debt and preference shares.

Let's take an example to understand this better, as shown in *Figure 3.7*:

	A	B	C	D
1		**Description**	**Situation A**	**Situation B**
2	A	Total Equity	1100000	500000
3	B	Preferred Stock	100000	225000
4	C	Debts	120000	150000
5	D	Common Shareholders' Equity (A-B)	1000000	275000
6	E	Fixed Interest Bearing Funds (B+C)	220000	375000
7				
8		**Capital Gearing Ratio**	**0.22**	**1.36**
9		**Excel Formula**	**=C6/C5**	**=D6/D5**

Figure 3.7: *Example for Capital Gearing Ratio (CGR Ratio)*

As we can see in *Figure 3.7*, Situation A is better than B because we have a lower CGR in Situation A; the CGR in Situation B is 1.36, so it has a higher risk of solvency.

Ideally, CGR <0.25.

A lower Capital Gearing Ratio means that the company has a lower level of debt relative to its equity, which gives it greater financial flexibility and reduces its risk of default

CGR>1 Very high geared; risk of solvency is very high

CGR<0.5 - 1 – Higher geared; risk of solvency is high

CGR<0.25 - 0.5 – Optimal geared; risk is optimal for these companies

CGR<0.25 – Low geared, low risk

Profitability Ratios

Profitability ratios evaluate a business's ability to make profit from its operations. The higher the profitability ratios are, the better the indication that a company is going in the right direction. These ratios show us the financial performance of a business and the direction a business is going in.

It has two types:

- Return on Sales
- Return on Investments

Return on Sales

Every company wants to know how much they have earned over a period, along with the profit percentages at each stage of the income statement, the bottom-line percentages, and the top-line percentages. In an income statement, total sales are the top line, while net profit is the bottom line.

There are various types of return on sales ratios:

- **Gross Profit Margin** (**GP Margin**)
- Operating Profit Margin (EBIT Margin)
- Pre-tax Margin
- **Net Profit Margin** (**NP Margin**)

All ratios are to be calculated in percentages.

Gross Profit Margin

The gross profit margin is calculated by subtracting direct expenses or **Cost Of Goods Sold** (**COGS**) from net sales.

Formula:

$$GP\ Margin = \frac{Gross\ Profit}{Total\ Sales}$$

Where Gross Profit (GP) is as per the income statement, and total sales indicates total revenue or total turnover.

Let's take an example to understand this better, as shown in *Figure 3.8*:

	Balance Sheet Components	All Figures in Lakh	Excel Formula
A	Equity Share Capital	50	Not Applicable
B	Reserve & Surplus	30	Not Applicable
C	Preferred Equity @ 12%	20	Not Applicable
D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable
E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)
F	Current Liablilities	20	Not Applicable
G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)
H	Current Assets	70	Not Applicable
I	Non Current Assets	90	Not Applicable
J	Total Assets (F + G)	160	=SUM(C9:C10)

	Income Statement Components	All Figures in Lakh	Excel Formula
K	Sales Turnover	100	Not Applicable
L	Direct Expenses & COGS	30	Not Applicable
M	GP (K - L)	70	=H2-H3
N	Operating Expenses	20	Not Applicable
O	EBIT (M - N)	50	=H4-H5
P	Interest	10	Not Applicable
Q	Profit Before Tax (O - P)	40	=H6-H7
R	Tax @ 30% (30% of Q)	12	=H8*30%
S	NP/Profit After Tax (Q - R)	28	=H8-H9

GP Margin (M/K)	70%
Excel Formula	=H4/H2

Figure 3.8: *GP Margin Ratio*

As we can see in *Figure 3.8*, the gross profit margin is 70%.

Operating Profit Margin

The operating profit margin is calculated by subtracting operating expenses from GP (or subtracting direct expenses, COGS and operating expenses from total sales).

Formula:

$$Operating\ Profit\ Margin = \frac{Operating\ Profit\ or\ EBIT}{Total\ Sales}$$

Where operating profit is EBIT as per the income statement, and total sales indicates total revenue or total turnover.

Let's take an example to understand this better, as shown in *Figure 3.9*:

	Balance Sheet Components	All Figures in Lakh	Excel Formula
A	Equity Share Capital	50	Not Applicable
B	Reserve & Surplus	30	Not Applicable
C	Preferred Equity @ 12%	20	Not Applicable
D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable
E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)
F	Current Liablilities	20	Not Applicable
G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)
H	Current Assets	70	Not Applicable
I	Non Current Assets	90	Not Applicable
J	Total Assets (F + G)	160	=SUM(C9:C10)

	Income Statement Components	All Figures in Lakh	Excel Formula
K	Sales Turnover	100	Not Applicable
L	Direct Expenses & COGS	30	Not Applicable
M	GP (K - L)	70	=H2-H3
N	Operating Expenses	20	Not Applicable
O	EBIT (M - N)	50	=H4-H5
P	Interest	10	Not Applicable
Q	Profit Before Tax (O - P)	40	=H6-H7
R	Tax @ 30% (30% of Q)	12	=H8*30%
S	NP/Profit After Tax (Q - R)	28	=H8-H9

Operating Profit (EBIT) Margin (O/K)	50%
Excel Formula	=H6/H2

Figure 3.9: *Operating Profit (EBIT) Margin Ratio*

As we can see in *Figure 3.9*, the operating profit margin is 50%.

Pre-Tax Profit Margin

The pre-tax profit margin is calculated by subtracting interest expenses from EBIT (or subtracting direct expenses, COGS, operating expenses, and interest from total sales).

Formula:

$$Pre-Tax\ Profit\ Margin = \frac{Profit\ Before\ Tax}{Total\ Sales}$$

Where profit before tax is a component of the income statement, and total sales indicates total revenue or total turnover.

Let's take an example to understand this better, as shown in *Figure 3.10*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**All Figures in Lakh**	**Excel Formula**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Equity Share Capital	50	Not Applicable		K	Sales Turnover	100	Not Applicable
3	B	Reserve & Surplus	30	Not Applicable		L	Direct Expenses & COGS	30	Not Applicable
4	C	Preferred Equity @ 12%	20	Not Applicable		M	GP (K - L)	70	=H2-H3
5	D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable		N	Operating Expenses	20	Not Applicable
6	E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)		O	EBIT (M - N)	50	=H4-H5
7	F	Current Liablilities	20	Not Applicable		P	Interest	10	Not Applicable
8	G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)		Q	Profit Before Tax (O - P)	40	=H6-H7
9	H	Current Assets	70	Not Applicable		R	Tax @ 30% (30% of Q)	12	=H8*30%
10	I	Non Current Assets	90	Not Applicable		S	NP/Profit After Tax (Q - R)	28	=H8-H9
11	J	Total Assets (F + G)	160	=SUM(C9:C10)					
12									
13									
14		**Pretax Profit Margin (Q/K)**	**40%**						
15		**Excel Formula**	**=H8/H2**						

Figure 3.10: *Pre-Tax Profit Margin Ratio*

Figure 3.10 shows that the pre-tax profit margin is 40%.

Net Profit Margin

The net profit margin is calculated by subtracting tax from profit before tax (or subtracting direct expenses, COGS, operating expenses, interest and tax from the total sales).

Formula:

$$Net\ Profit\ Margin = \frac{Net\ Profit}{Total\ Sales}$$

Where net profit is NP as shown in the income statement, and total sales is the total revenue or total turnover.

Let's take an example to understand this better, as shown in *Figure 3.11*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**All Figures in Lakh**	**Excel Formula**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Equity Share Capital	50	Not Applicable		K	Sales Turnover	100	Not Applicable
3	B	Reserve & Surplus	30	Not Applicable		L	Direct Expenses & COGS	30	Not Applicable
4	C	Preferred Equity @ 12%	20	Not Applicable		M	GP (K - L)	70	=H2-H3
5	D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable		N	Operating Expenses	20	Not Applicable
6	E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)		O	EBIT (M - N)	50	=H4-H5
7	F	Current Liablilities	20	Not Applicable		P	Interest	10	Not Applicable
8	G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)		Q	Profit Before Tax (O - P)	40	=H6-H7
9	H	Current Assets	70	Not Applicable		R	Tax @ 30% (30% of Q)	12	=H8*30%
10	I	Non Current Assets	90	Not Applicable		S	NP/Profit After Tax (Q - R)	28	=H8-H9
11	J	Total Assets (F + G)	160	=SUM(C9:C10)					
12									
13									
14		**Net Profit Margin (S/K)**	**28%**						
15		**Excel Formula**	**=H10/H2**						

Figure 3.11: *Net Profit Margin Ratio*

Figure 3.11 shows that the net profit margin is 28%.

Return on Investment (ROI)

Return on investments are different types of ratios that indicate gain or loss on an investment. ROI can be negative or positive. We use both the income statement and the balance sheet for calculating ROI.

Types of ROI:

- Return on Equity
- Return on Common Equity
- Return on Capital Employed
- Return on Assets

Return on Common Equity

It indicates how well a company is generating profit from common equity. The return on common equity is calculated as a company's net income (after paying preferred dividends) divided by its common equity.

Formula:

$$Return\ on\ Common\ Equity = \frac{Net\ Profit - Preferred\ Dividends}{Common\ Equity}$$

Where net profit is NP from income statement, preferred dividends are dividends paid to preferred equity shareholders, and common equity is the sum of shareholders' funds, and reserves and surplus (excluding preferred equity).

Let's take an example to understand this better, as shown in *Figure 3.12*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**All Figures in Lakh**	**Excel Formula**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Equity Share Capital	50	Not Applicable		K	Sales Turnover	100	Not Applicable
3	B	Reserve & Surplus	30	Not Applicable		L	Direct Expenses & COGS	30	Not Applicable
4	C	Preferred Equity @ 12%	20	Not Applicable		M	GP (K - L)	70	=H2-H3
5	D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable		N	Operating Expenses	20	Not Applicable
6	E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)		O	EBIT (M - N)	50	=H4-H5
7	F	Current Liablilities	20	Not Applicable		P	Interest	10	Not Applicable
8	G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)		Q	Profit Before Tax (O - P)	40	=H6-H7
9	H	Current Assets	70	Not Applicable		R	Tax @ 30% (30% of Q)	12	=H8*30%
10	I	Non Current Assets	90	Not Applicable		S	NP/Profit After Tax (Q - R)	28	=H8-H9
11	J	Total Assets (F + G)	160	=SUM(C9:C10)					
12									
13									
14		**Return on Common Equity[(S-C*12%)/(A+B) - C is Preferred Equity @ 12%)**	**32%**						
15		**Excel Formula**	**=(H10-C4*12%)/(C2+C3)**						

Figure 3.12: *Return on Common Equity Ratio*

Return on Capital Employed (ROCE)

It indicates how well a company is generating profit from the capital employed. The return on capital employed is calculated as a company's EBIT divided by the capital employed.

Formula:

$$ROCE = \frac{EBIT}{Capital\ Employed}$$

Where EBIT is the operating profit as in the income statement, and capital employed is the sum of shareholders' fund, reserves and surplus, preferred equity and debts (or capital employed is total assets minus total equity and liabilities).

Let's take an example to understand this better; take a look at *Figure 3.13*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**All Figures in Lakh**	**Excel Formula**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Equity Share Capital	50	Not Applicable		K	Sales Turnover	100	Not Applicable
3	B	Reserve & Surplus	30	Not Applicable		L	Direct Expenses & COGS	30	Not Applicable
4	C	Preferred Equity @ 12%	20	Not Applicable		M	GP (K - L)	70	=H2-H3
5	D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable		N	Operating Expenses	20	Not Applicable
6	E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)		O	EBIT (M - N)	50	=H4-H5
7	F	Current Liablilities	20	Not Applicable		P	Interest	10	Not Applicable
8	G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)		Q	Profit Before Tax (O - P)	40	=H6-H7
9	H	Current Assets	70	Not Applicable		R	Tax @ 30% (30% of Q)	12	=H8*30%
10	I	Non Current Assets	90	Not Applicable		S	NP/Profit After Tax (Q - R)	28	=H8-H9
11	J	Total Assets (F + G)	160	=SUM(C9:C10)					
12									
13									
14		**ROCE (O/E)**	**36%**						
15		**Excel Formula**	**=H6/C6**						

Figure 3.13: *Return on Capital Employed Ratio*

Figure 3.13 shows that the return on capital employed is 36%.

ROE vs ROCE (Return on Equity vs Return on Capital Employed)

ROE does not give the overall picture of returns on capital.

ROE can be manipulated; more debt can be shown to increase ROE.

ROCE gives the overall return on the total capital employed in the business.

ROCE can be compared to the return from other investments.

Return on Assets (ROA)

It indicates whether a company is generating profit from its assets. The return on assets is calculated as a company's net profit divided by total assets.

Formula:

$$ROA = \frac{Net\ Profit}{Total\ Assets}$$

Where NP is Net Profit from income statement, and total assets is current assets plus non-current assets.

Let's take an example to understand this better, as shown in *Figure 3.14*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**All Figures in Lakh**	**Excel Formula**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Equity Share Capital	50	Not Applicable		K	Sales Turnover	100	Not Applicable
3	B	Reserve & Surplus	30	Not Applicable		L	Direct Expenses & COGS	30	Not Applicable
4	C	Preferred Equity @ 12%	20	Not Applicable		M	GP (K - L)	70	=H2-H3
5	D	Debt @ 10% (Non Current Liabilities)	40	Not Applicable		N	Operating Expenses	20	Not Applicable
6	E	Total Capital (Sum of A to D)	140	=SUM(C2:C5)		O	EBIT (M - N)	50	=H4-H5
7	F	Current Liablilities	20	Not Applicable		P	Interest	10	Not Applicable
8	G	Total Equilty & Liabilities (E + F)	160	=SUM(C6:C7)		Q	Profit Before Tax (O - P)	40	=H6-H7
9	H	Current Assets	70	Not Applicable		R	Tax @ 30% (30% of Q)	12	=H8*30%
10	I	Non Current Assets	90	Not Applicable		S	NP/Profit After Tax (Q - R)	28	=H8-H9
11	J	Total Assets (F + G)	160	=SUM(C9:C10)					
12									
13									
14		**ROA (S/J)**	**18%**						
15		**Excel Formula**	**=H10/C11**						

Figure 3.14: *Return on Assets Ratio*

Figure 3.14 shows that the return on assets is 18%.

Turnover Ratio

This ratio shows the amount of assets or liabilities that a company is replacing in relation to its sales. Generally, a high turnover ratio is considered to be good as it

shows higher turnover with minimal investment of funds. These ratios are used to analyze business efficiency in utilizing the assets.

There are five types of turnover ratios:

- Fixed assets turnover ratio
- Current assets turnover ratio
- Creditors turnover ratio/accounts receivable turnover ratio
- Debtors turnover ratio/accounts payable turnover ratio
- Inventory turnover ratio

Fixed Assets Turnover Ratio

It indicates how well a company is generating profit from its fixed assets. The fixed assets turnover ratio is calculated as a company's net sales divided by average fixed assets (some analysts take only the closing balance of fixed assets, but it is recommended that you take the average for better results.).

Formula:

$$FA\ Turnover\ Ratio = \frac{Net\ Sales}{Average\ Fixed\ Assets}$$

Where net sales is the total revenue as shown in the income statement, and the average fixed assets is the average of opening and closing of fixed assets.

Let's take an example to understand this better, as shown in *Figure 3.15*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**Opening Balance All Figures in Lakh (Balance as on Start of a period)**	**Closing Balance All Figures in Lakh (Balance as on end of a period)**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Fixed Assets	50	70		E	Sales Turnover	100	Not Applicable
3	B	Sundry Debtors	30	20		F	Cost of Sale	30	Not Applicable
4	C	Sundry Creditors	40	25		G	GP (K - L)	70	=H2-H3
5	D	Invetory	28	24		H	Operating Expenses	20	Not Applicable
6						I	EBIT (M - N)	50	=H4-H5
7	O	**Average Fixed Assets (Average of A)**	**60**			J	Interest	10	Not Applicable
8		**Excel Formula**	**=AVERAGE(C2:D2)**			K	Profit Before Tax (O - P)	40	=H6-H7
9						L	Tax @ 30% (30% of Q)	12	=H8*30%
10		**Fixed Assets Turnover Ratio(E/O)**	**167%**			M	NP/Profit After Tax (Q - R)	28	=H8-H9
11		**Excel Formula**	**=H2/C7**						

Figure 3.15: *Fixed Assets Turnover Ratio*

Figure 3.15 shows that the fixed assets turnover ratio is 167%.

A high fixed assets turnover ratio indicates the capability of the business to achieve maximum sales with minimum investment in fixed assets.

Current Assets Turnover Ratio

It indicates how well a company is generating profit from its current assets. The current assets turnover ratio is calculated as a company's net sales divided by the average current assets. Some analysts take only the closing balance of current assets, but it is recommended that you take the average for better results.

Formula:

$$CA\ Turnover\ Ratio = \frac{Net\ Sales}{Average\ Current\ Assets}$$

Where net sales is the total revenue as in the income statement, and average current assets is the average of opening and closing of current assets (inventory and sundry debtors). The components of current assets are the same as those of current ratio.

Let's take an example to understand this better, as shown in *Figure 3.16*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**Opening Balance All Figures in Lakh (Balance as on Start of a period)**	**Closing Balance All Figures in Lakh (Balance as on end of a period)**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Fixed Assets	50	70		E	Sales Turnover	100	Not Applicable
3	B	Sundry Debtors	30	20		F	Cost of Sale	30	Not Applicable
4	C	Sundry Creditors	40	25		G	GP (K - L)	70	=H2-H3
5	D	Invetory	28	24		H	Operating Expenses	20	Not Applicable
6						I	EBIT (M - N)	50	=H4-H5
7						J	Interest	10	Not Applicable
8	O	**Average Sundry Debtors (Average of B)**	**25**			K	Profit Before Tax (O - P)	40	=H6-H7
9		**Excel Formula**	**=AVERAGE(C3:D3)**			L	Tax @ 30% (30% of Q)	12	=H8*30%
10						M	NP/Profit After Tax (Q - R)	28	=H8-H9
11									
12		**Sundry Debtors Turnover Ratio(E/O)**	**400%**						
13		**Excel Formula**	**=H2/C8**						

Figure 3.16: *Current Assets Turnover Ratio*

Figure 3.16 shows that the current assets turnover ratio is 196%.

A high current assets turnover ratio indicates the capability of the business to achieve maximum sales with minimum investment in current assets.

Debtors Turnover Ratio/Accounts Receivable Turnover Ratio

It indicates how well a company is collecting money from its customers. The debtors turnover ratio/accounts receivable turnover ratio is calculated as a company's net sales divided by the average debtors (average of opening and closing).

Formula:

$$Accounts\ Receivable\ Turnover\ Ratio = \frac{Net\ Sales}{Average\ Debtors}$$

Where net sales is the total revenue as shown in the income statement, and average debtors is the average of opening and closing of sundry debtors.

Let's take an example to understand this better, as shown in *Figure 3.17*:

	A	B	C	D	E	F	G	H	I
1		Balance Sheet Components	Opening Balance All Figures in Lakh (Balance as on Start of a period)	Closing Balance All Figures in Lakh (Balance as on end of a period)			Income Statement Components	All Figures in Lakh	Excel Formula
2	A	Fixed Assets	50	70		E	Sales Turnover	100	Not Applicable
3	B	Sundry Debtors	30	20		F	Cost of Sale	30	Not Applicable
4	C	Sundry Creditors	40	25		G	GP (K - L)	70	=H2-H3
5	D	Invetory	28	24		H	Operating Expenses	20	Not Applicable
6						I	EBIT (M - N)	50	=H4-H5
7						J	Interest	10	Not Applicable
8	O	Average Sundry Debtors (Average of B)	25			K	Profit Before Tax (O - P)	40	=H6-H7
9		Excel Formula	=AVERAGE(C3:D3)			L	Tax @ 30% (30% of Q)	12	=H8*30%
10						M	NP/Profit After Tax (Q - R)	28	=H8-H9
11									
12		Current Assets Turnover Ratio(E/O)	400%						
13		Excel Formula	=H2/C8						

Figure 3.17: *Accounts Receivable Turnover Ratio*

Figure 3.17 shows that the accounts receivable turnover ratio is 400%.

A high debtors turnover ratio indicates that we are collecting money quickly.

This turnover ratio is used to calculate debtors' collections period. We will learn this in *Chapter 4, Working Capital*.

Creditors Turnover Ratio/Accounts Payable Turnover Ratio

It indicates how well a company is paying off its suppliers and vendors. The creditors turnover ratio/accounts receivable turnover ratio is calculated as a company's net sales divided by the average creditors (average of opening and closing).

Formula:

$$Accounts\ Payable\ Turnover\ Ratio = \frac{Net\ Sales}{Average\ Creditors}$$

Where net sales is the total revenue as shown in the income statement, and average creditors is the average of opening and closing of sundry creditors.

Let's take an example to understand this better, as shown in *Figure 3.18*:

	Balance Sheet Components	Opening Balance All Figures in Lakh (Balance as on Start of a period)	Closing Balance All Figures in Lakh (Balance as on end of a period)
A	Fixed Assets	50	70
B	Sundry Debtors	30	20
C	Sundry Creditors	40	25
D	Invetory	28	24

O	Average Sundry Creditors (Average of C)	32.5
	Excel Formula	=AVERAGE(C4:D4)

	Sundry Creditors Turnover Ratio(E/O)	308%
	Excel Formula	=H2/C8

	Income Statement Components	All Figures in Lakh	Excel Formula
E	Sales Turnover	100	Not Applicable
F	Cost of Sale	30	Not Applicable
G	GP (K - L)	70	=H2-H3
H	Operating Expenses	20	Not Applicable
I	EBIT (M - N)	50	=H4-H5
J	Interest	10	Not Applicable
K	Profit Before Tax (O - P)	40	=H6-H7
L	Tax @ 30% (30% of Q)	12	=H8*30%
M	NP/Profit After Tax (Q - R)	28	=H8-H9

Figure 3.18: *Accounts Payable Turnover Ratio*

Figure 3.18 shows that the accounts payable turnover ratio is 308%.

A high creditors turnover ratio indicates that we are paying suppliers and vendors on time.

This turnover ratio is used to calculate the creditors payment period. We will learn this in *Chapter 4, Working Capital.*

Inventory Turnover Ratio

It indicates how well a company is utilising its inventory timely. The inventory turnover ratio is calculated as a company's net sales divided by its average inventory (average of opening and closing).

Formula:

$$Inventory\ Turnover\ Ratio = \frac{Net\ Sales}{Average\ Inventory}$$

Where net sales is the total revenue as in the income statement, and average inventory is the average of opening and closing of inventory.

Let's take an example to understand this better, as shown in *Figure 3.19*:

	A	B	C	D	E	F	G	H	I
1		**Balance Sheet Components**	**Opening Balance All Figures in Lakh (Balance as on Start of a period)**	**Closing Balance All Figures in Lakh (Balance as on end of a period)**			**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
2	A	Fixed Assets	50	70		E	Sales Turnover	100	Not Applicable
3	B	Sundry Debtors	30	20		F	Cost of Sale	30	Not Applicable
4	C	Sundry Creditors	40	25		G	GP (K - L)	70	=H2-H3
5	D	Invetory	28	24		H	Operating Expenses	20	Not Applicable
6						I	EBIT (M - N)	50	=H4-H5
7						J	Interest	10	Not Applicable
8	O	**Average Inventory (Average of D)**	**26**			K	Profit Before Tax (O - P)	40	=H6-H7
9		**Excel Formula**	**=AVERAGE(C5:D5)**			L	Tax @ 30% (30% of Q)	12	=H8*30%
10						M	NP/Profit After Tax (Q - R)	28	=H8-H9
11									
12		**Inventory Turnover Ratio(E/O)**	**385%**						
13		**Excel Formula**	**=H2/C8**						

Figure 3.19: *Inventory Turnover Ratio*

Figure 3.19 shows that the inventory turnover ratio is 385%.

A high inventory turnover ratio indicates that we are utilizing our inventory well.

This ratio is widely used to analyze the financial performance of retailers and manufacturers.

The higher the ratio, the less inventory the firm is keeping in relation to its sales.

This turnover ratio is used to calculate the inventory conversion period. We will learn this in *Chapter 4, Working Capital.*

The inventory conversion period, debtors collection period, and creditors payment period are used to determine the cash conversion cycle of working capital. We will learn this in *Chapter 4, Working Capital.*

Valuation Ratios

These ratios tell us about a company's worth. Valuation ratios are commonly used in the context of a company's share price, where we can evaluate the potential of investment. We calculate the price of earning per share to get the valuation right. The investors depend greatly on these ratios. These ratios are mostly used by stock investor.

These ratios are as follows:

- **Price Earning per Share (PE)**
- **Price to Book Value (PB)**
- Price to sales

- **Price to Earnings Growth (PEG)**
- Enterprises value
  - EV/EBITA
  - EV/Sales

Before learning about valuation ratios, we should know different terms that will be used in these ratios:

Earnings Per Share (EPS): This is the amount of profit the company made per share. It is calculated as the company's profit divided by the outstanding shares of common stock. The higher the EPS, the more profitable it is to be considered.

EPS = (Net Income – Preferred Dividends)
/ Common Share Outstanding as on end of the period

Basic EPS vs Diluted EPS: The preceding formula calculates the basic EPS. The major difference between Basic EPS and Diluted EPS is that the former is calculated on all common shares outstanding at the end of the period, while the latter is calculated on all common shares plus all convertible securities, which include convertible preferred shares, convertible debentures, stock options and warrants.

Diluted EPS = (Net Income – Preferred Dividends)
/(Common Share Outstanding as on end of the period + Convertible Securities)

Convertible Securities: Convertible securities are those stocks, bonds, and options that can be convertible into common stocks.

Dividends Per Share (DPS): They are not much different from EPS. It is calculated as a company's dividends paid divided by the outstanding shares of common stock. Investors take interest in DPS calculation as it is an important indicator of an investor's income from the investments.

$$DPS = \frac{Dividends\ Paid}{Net\ Income}$$

Dividend Pay-out Ratio: This is the ratio of the total amount of dividend paid out to shareholders to the net income of the company. It indicates the percentage paid in the form of dividends. It is calculated as DPS divided by EPS:

$$Dividend\ Payout\ Ratio = \frac{DPS}{EPS}$$

Dividend Yield: The Dividend Yield is a financial ratio that represents the dividends issued by a company in relation to its current share price. It is calculated by dividing the annual dividends per share by the current share price It gives us an investor's

returns in the form of dividends. A high dividend yield means a high amount of dividends is received by an investor as compared to the share price, and it can be a good investment opportunity.

$$Dividend\ Yield\ = \frac{DPS}{Price\ per\ Share}$$

Book Value and Book Value Per Share: If a company sells its all assets and pays off all liabilities, the balance will be the book value. Book value is equal to total assets – total liabilities.

$$Book\ Value = Total\ Assets\text{-}Total\ Liabilites$$

Book Value per share is book value divided by the number of outstanding shares of common stock.

$$Book\ Value\ Per\ Share\ = \frac{Book\ Value}{Total\ Common\ Share\ Outstanding\ as\ on\ end\ of\ the\ period}$$

Now, let us move to valuation ratios.

Price Earning Per Share (P/E Ratio)

The more relevant measure for valuation is earning. Every investor has the objective of earning profit. The P/E is calculated as the market price of a stock divided by the total profit in the previous 12 months.

A high P/E ratio indicates a high expectation of growth, and a low P/E indicates low expectation of growth.

Formula:

$$P/E\ Ratio = \frac{Price\ Per\ Share\ (\ Market\ Price)}{EPS}$$

Price to Book Ratio (P/B Ratio)

The Price-to-Book (P/B) ratio is a financial metric that is often used to compare a company's stock price with its book value per share. However, because the book value of a company can vary depending on its industry and the accounting methods used, the P/B ratio can only be meaningfully compared with those of peer companies in the same industry. A good P/B ratio for one business may not necessarily be a good P/B ratio for another business in a different industry. Therefore, when evaluating a company's P/B ratio, it is important to consider the industry norms and the P/B ratios of other companies in the same sector. This can provide investors with a better

understanding of how a company's P/B ratio compares to that of its competitors and whether it is overvalued or undervalued relative to its industry peers.

$$P/B\ Ratio = \frac{Price\ Per\ Share\ (\ Market\ Price)}{Book\ \text{Value}\ Per\ Share}$$

Price to Sales Ratio (P/S Ratio)

The price to sales ratio utilizes a company's market capitalization and revenue to determine whether the stock is valued properly. It measures the total value that investors invest in the company to the total sales generated by the company. It is calculated as the share price divided by the sales per share or market capitalization divided by total sales.

$$P/S\ Ratio = \frac{Price\ Per\ Share\ (\ Market\ Price)}{Annual\ Sales\ Per\ Share}$$

If P/S is low, it means the share might be undervalued or investors don't have faith in the company.

If P/S is high, it means the share might be overvalued or investors have too much faith in the company's future.

We cannot find the P/E ratio for a company that is not in profit, so we need to find the P/S ratio.

Price Earning to Growth Ratio (PEG Ratio)

The Price/Earnings to Growth (PEG) ratio is a financial metric that is used to determine the relative value of a company's stock by dividing its Price/Earnings (P/E) ratio by the projected growth rate of its earnings over a specified period. The PEG ratio provides investors with a more complete picture of a company's financial health by adjusting the P/E ratio for the company's estimated earnings growth rate. The PEG ratio takes into account not only the current earnings of a company but also its potential for future earnings growth. A PEG ratio below 1.0 is generally considered favorable, as it suggests that the stock is undervalued relative to its earnings growth potential. On the other hand, a PEG ratio above 1.0 may indicate that the stock is overvalued and may not be a good investment. As such, the PEG ratio is a useful tool for investors who are looking for a more comprehensive assessment of a company's financial health and growth potential

$$L$$

$$.PEG\ Ratio = \frac{PE\ Ratio}{EPS\ Growth\ Rate}\ or\ \frac{\left(\frac{SharePrice}{EPS}\right)}{EPS\ Growth\ Rate}$$

Where EPS Growth Rate = Growth percentage of the difference between 2 EPS.

A lower PEG indicates that a stock is undervalued.

Enterprises Value

Enterprise value calculates the potential cost undertaken to acquire a business based on the company's capital structure. To buy a company, we need to know the EV, which reflects the market value of claims that equity holders, preferred holders, and debt holders have on the company.

EV = (Stock Price x Total No. of Shares) + Debts – Cash and Cash Equivalents

EV/EBITDA Ratio

It is an enterprises multiple that indicates how expensive or cheap the company is.

EV/EBITDA is like P/E. PE is only for equity, while EV/EBITDA is for all capital providers (debt and equity). It is calculated as EV divided by EBITDA of income statement.

$$EV/EBITDA\ Ratio = \frac{EV}{EBITDA}$$

It is better than the PE ratio.

EV/Sales Ratio

The Enterprise Value-to-Sales (EV/Sales) ratio is a financial metric that compares a company's enterprise value to its total sales revenue. This ratio can be used to estimate how much it would cost to acquire a company based on its sales revenue.

EV/Sales is like P/S. PS is only for equity, while EV/Sales is for all capital providers (debt and equity). It is calculated as EV divided by sales of income statement.

$$EV/Sales\ Ratio = \frac{EV}{Net\ Sales}$$

It is better than P/S. A low EV/Sales ratio indicates a better opportunity to invest.

Conclusion

We have learnt various financial ratios in this chapter; it is beneficial to have knowledge of financial ratios as these are great tools to analyze the financial statements and stock market. However, only ratios are not enough to analyze the financial statements and investments in depth. It is recommended to have in-depth knowledge offinancial ratio to analyze the company's performance instead of relying solely on financial ratios.

In the next chapter, we will learn what working capital is, how to manage it to stay in business, and how important it is to manage working capital.

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Chapter 4
Modeling Working Capital

Introduction

Working capital is the primary fuel for a business. The mismanagement of the working capital can lead to the solvency of a business. So, we are going to learn working capital management in this chapter, including how it works and how important it is. We will also go through the types of working capital.

We will learn how to calculate debtors' collection period, creditors' payment period, and inventory conversion period. Moving on, we will learn about the cash conversion cycle and its use.

Structure

- What is Working Capital Management
- Importance of Working Capital
- Types of Working Capital
- Trade Receivable
- Trade Payable
- Inventory

- Cash Conversion Cycle
- Working Capital Assessment

Objectives

Working capital is an essential part of a business, and most companies fail in the long run due to its mismanagement. When companies focus only on long-term plans, solvency is a huge risk. Working capital is the basic need of a business, and we, as accounting and finance professionals, should be aware of working capital management. An accounting and financial professional can take companies to its highs or lead it to its lows only through the management of its working capital.

What is Working Capital Management

Working capital is equal to current assets minus current liabilities. It is the money used to cover day-to-day expenses (operating expenses), short-term debts and obligations, and inventory expenses.

The current ratio is also known as working capital ratio; refer to *Chapter 3, Financial Ratios*, for better understanding. If the current ratio is less than one, it is the alarming sign for the business.

Working capital management is a crucial business strategy that involves managing a company's current assets and liabilities in a manner that maximizes revenue and minimizes operating costs. By effectively managing their working capital, companies can ensure that they have sufficient funds to meet their short-term obligations while also investing in long-term growth opportunities. This involves carefully balancing factors such as inventory management, accounts receivable, and accounts payable to optimize cash flow and minimize financing costs. Ultimately, successful working capital management can help companies to achieve sustainable growth and maintain their competitive edge in the market.

As accounting and finance professionals, we need to ensure low working capital requirement to achieve a smooth working capital cycle or operating cycle, which is the minimum period required to convert the net current assets and current liabilities to cash. It is also known as the cash conversion cycle. We will discuss the cash conversion cycle in detail later in this chapter.

Importance of Working Capital

Let’s focus on the importance of working capital management. Inefficiencies at any level of working capital management cause us losses in business or can even lead to the closure of a business. The importance of working capital is undoubtedly very

high in any business. We must take working capital management seriously for the following reasons:

- **Higher Return on Capital Employed:** To achieve higher return with minimum capital employed.
- **Improvement in Solvency and Credit Profile:** It saves us from solvency. Good working capital management allows us to pay our short-term dues/debts/obligations, like expenses, creditors, lenders, and bank loans, on time. This, in turn, increases our credit profile.
- **Better Liquidity:** It helps us to pay off our obligations easily, even at times of crises, like during COVID-19. It enables us to restore our business in worst-case scenarios.
- **Increase in Profit and Expansion of Business:** The management of accounts payable and accounts receivable increases profitability. And when a company earns profit, they want to expand their business; healthy working capital management ensures that as well.
- **Edge over competitors:** Well-managed working capital gives a company an edge over competitors as they can offer discounts and set the price of products or services lower for customers/clients.

Additionally, working capital management ensures that we can get the best financing terms with our lenders/financing institutions/banks and that our goodwill increases with time. We can also do uninterrupted trading and productions as we can have better payment terms with vendors and customers.

Types of Working Capital

Different industries manage working capital differently, so it is divided into the following types:

- **Gross Working Capital:** It covers only current assets. It doesn't give us full information because we cannot find the exact working capital requirements.
- **Net Working Capital:** The main concept of working capital is net working capital, which includes current assets and current liabilities. Net working capital is equal to current assets minus current liabilities.
- **Positive Working Capital:** This refers the surplus of current assets over current liabilities.
- **Negative Working Capital:** This refers the excess of current liabilities over current assets.
- **Permanent/Fixed Working Capital:** This is the minimum working capital that does not change in a period; it can be easily forecasted.

- **Temporary/Variable Working Capital:** The minimum working capital varies every period. It cannot be predicated exactly due to seasons like summer (example – A/Cs sell only in summers), winter (example – room heaters sell only in winters) or special times, like when a trader gets a large order suddenly.

Components of Working Capital

When we work on working capital, we need to keep current assets and current liabilities in mind.

Current Assets

These assets are generally realized within a short period of time, that is, within a year.

Current assets (resources consumed or converted into cash within a year) include the following:

- Cash and cash equivalents
- Bank deposits
- Marketable securities
- Short-term investments
- Accounts receivable
- Inventory
- Prepaid expenses
- Short-terms loans and advances

Current Liabilities

Current liabilities are generally paid in the ordinary course of business within a short period of time, that is, 1 year.

Current liabilities (obligations that are to be paid within a year) include the following:

- Accounts payable
- Short-term loans
- Cash credit and overdraft
- Advance from customers
- Outstanding expenses

- Term loan instalments

Operating Cycle or Cash Conversion Cycle

Every business needs time to convert cash back into cash in the process of cash to raw material to finished goods to debtors and back to cash. This time is called the cash conversion cycle or operating cycle.

Let's understand this with an example: a manufacturing company uses cash to buy raw materials that cannot be consumed immediately. They will be kept in the factory and will be used whenever required. Then, it will become a work in progress and enter the production process to be converted into finished goods.

The finished goods are put up for sale, and debtors take a credit period to pay the bill. When a debtor pays the sale bill, the manufacturer's expenses convert back to cash. Refer to *Figure 4.1*:

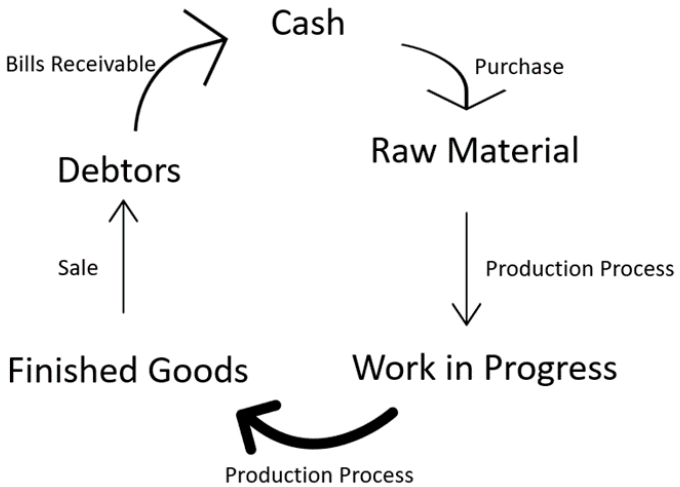

Figure 4.1: *Cash Conversion Cycle*

Let's assume that as per *Figure 4.1*.

Cash will be converted into raw material after purchase: 30 days.

Raw material to work in progress: 10 days

WIP to finished goods: 20 days

Finished goods to sale: 10 days

Sale to cash: 20 days

So the working capital cycle will be 30 + 10 + 20 + 10 + 20 = 90 days

Our cash will be converted back into cash in 90 days.

To calculate the working capital cycle, we must calculate the debtors collection period, creditors payment period, and inventory conversion period.

Trade Receivable

Trade receivable is a type of current assets and is defined as the worth of the goods or services sold by the company on credit basis on the basis of invoices issued.

We calculate the debtor's collection period on the basis of trade receivable. Trade receivable is also known as accounts receivable.

Debtors Collection Period

Debtors Collection Period indicates the average time taken to collect trade debts. It is also known as **Days Sales Outstanding** (**DPO**):

$$Debtors\ Collection\ Period = \frac{365}{Debtors\ Turnover\ Ratio}$$

Some analysts or professionals take 360 days instead of 365 days.

We have already discussed debtors turnover ratio in *Chapter 3, Financial Ratios*.

Trade Payable

Trade payable is a type of current liabilities and is defined as the worth of the goods or services bought by the company on credit basis on the basis of invoice received.

We calculate the creditors collection period on the basis of trade payable. Trade payable is also known as accounts payable.

Creditors Payment Period

Creditors payment period indicates the average time taken to settle its debts with the suppliers. It is also known as **Days Payable Outstanding (DPO)**:

$$Creditors\ Payment\ Period = \frac{365}{Creditors\ Turnover\ Ratio}$$

Some analysts or professionals take 360 days instead of 365 days.

We have already discussed creditors turnover ratio in *Chapter 3, Financial Ratios*.

Inventory

Inventory is a type of current asset and is defined as the amount of invetory kept in stock in the form of raw materials, WIP and finished goods.

We calculate the invetory conversion period on the basis of inventory. It is also known as **Days Inventory Outstanding (DIO)**:

$$Inventory\ Conversion\ Period = \frac{365}{Inventory\ Turnover\ Ratio}$$

We have already discussed the inventory turnover ratio in *Chapter 3, Financial Ratios*.

Cash Conversion Cycle Calculation

Cash conversion cycle or operating cycle or working capital cycle measures how long cash is tied up in inventory sold and cash collected from customers. Working capital reflects the investment required to support the cycle.

The cash conversion cycle should be compared to its historic data and peer companies operating in the same industry and conducted on a trend. The shorter the cash conversion cycle, the better the company is at selling inventories and recovering cash while paying suppliers.

The formula for cash conversion cycle is as follows:

$$Cash\ Conversion\ Cycle = Debtors\ Collection\ Period + Inventory\ Conversion\ Period - Creditors\ Payment\ Period$$

To get the result of the cash conversion cycle, we must calculate the following:

- Debtors turnover ratio and debtors collection period
- Creditors turnover ratio and creditors payment period
- Inventory turnover ratio and inventory conversion period

Let's take an example to understand this better.

Follow these steps:

1. Get the average of opening and closing values of debtors, creditors and inventory to calculate all three turnover ratios, as shown in *Figure 4.2*:

	A	B	C	D
1		**Balance Sheet Components**	**Opening Balance All Figures in Lakh (Balance as on Start of a period)**	**Closing Balance All Figures in Lakh (Balance as on end of a period)**
2	A	Sundry Debtors	30	20
3	B	Sundry Creditors	40	25
4	C	Invetory	28	24
5				
6				
7		**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
8	D	Sales Turnover	100	Not Applicable
9				
10				
11		**Averages**	**All Figures in Lakh**	**Excel Formula**
12	E	Average of Debtors (A Average)	25	=AVERAGE(C2:D2)
13	F	Average of Creditors (B Average)	32.5	=AVERAGE(C3:D3)
14	G	Average of Inventory (C Average)	26	=AVERAGE(C4:D4)

Figure 4.2: *Averages of Debtors, Creditors and Inventory*

Figure 4.2 shows where we have the results of avergaes of debtors, creditors and inventory: 25, 32.5 and 26, respectively.

2. Get the turnover ratio, as shown in *Figure 4.3*, on the basis of averages and sales turnover, as we did in *Chapter 3, Financial Ratios.*

		Balance Sheet Components	Opening Balance All Figures in Lakh (Balance as on Start of a period)	Closing Balance All Figures in Lakh (Balance as on end of a period)
2	A	Sundry Debtors	30	20
3	B	Sundry Creditors	40	25
4	C	Invetory	28	24

	Income Statement Components	All Figures in Lakh	Excel Formula
D	Sales Turnover	100	Not Applicable

	Averages	All Figures in Lakh	Excel Formula
E	Average of Debtors (A Average)	25	=AVERAGE(C2:D2)
F	Average of Creditors (B Average)	32.5	=AVERAGE(C3:D3)
G	Average of Inventory (C Average)	26	=AVERAGE(C4:D4)

	Turnover Ratios	Ratios	Excel Formula
I	Debtors Turnover Ratio (D/E)	4	=ROUND($C$8/C12,2)
J	Creditors Turnover Ratio (D/F)	3.08	=ROUND($C$8/C13,2)
K	Inventory Turnover Ratio (D/G)	3.85	=ROUND($C$8/C14,2)

Figure 4.3: *Various Turnover Ratios*

As we can see in *Figure 4.3*, debtors turnover ratio, creditors turnover ratio and inventory turnover ratio are 4, 3.08 and 3.85, respectively.

3. Now we will calculate the debtors collection period, creditors payment period and inventory conversion period, as shown in *Figure 4.4*:

		Balance Sheet Components	Opening Balance All Figures in Lakh (Balance as on Start of a period)	Closing Balance All Figures in Lakh (Balance as on end of a period)
2	A	Sundry Debtors	30	20
3	B	Sundry Creditors	40	25
4	C	Invetory	28	24

	Income Statement Components	All Figures in Lakh	Excel Formula
D	Sales Turnover	100	Not Applicable

	Averages	All Figures in Lakh	Excel Formula
E	Average of Debtors (A Average)	25	=AVERAGE(C2:D2)
F	Average of Creditors (B Average)	32.5	=AVERAGE(C3:D3)
G	Average of Inventory (C Average)	26	=AVERAGE(C4:D4)

	Turnover Ratios	Ratios	Excel Formula
I	Debtors Turnover Ratio (D/E)	4	=ROUND($C$8/C12,2)
J	Creditors Turnover Ratio (D/F)	3.08	=ROUND($C$8/C13,2)
K	Inventory Turnover Ratio (D/G)	3.85	=ROUND($C$8/C14,2)

	Turnover Ratios	Days	Excel Formula
L	Debtors Collection Period (365/I)	91	=ROUND(365/C18,0)
M	Creditors Payment Period (365/J)	119	=ROUND(365/C19,0)
N	Inventory Conversion Period (365/K)	95	=ROUND(365/C20,0)

Figure 4.4 : *Various Periods*

As we can see in *Figure 4.4*, **Debtors Collection Period** (**DSO**), **Creditors Payment Period** (**DPO**) and **Inventory Conversion Period** (**DIO**) are 91, 119 and 95, respectively.

4. Then, we will get the result of cash conversion cycle, which is CCC = DSO + DIO – DPO, as shown in *Figure 4.5*:

	A	B	C	D
1		**Balance Sheet Components**	**Opening Balance All Figures in Lakh (Balance as on Start of a period)**	**Closing Balance All Figures in Lakh (Balance as on end of a period)**
2	A	Sundry Debtors	30	20
3	B	Sundry Creditors	40	25
4	C	Invetory	28	24
5				
6				
7		**Income Statement Components**	**All Figures in Lakh**	**Excel Formula**
8	D	Sales Turnover	100	Not Applicable
9				
10				
11		**Averages**	**All Figures in Lakh**	**Excel Formula**
12	E	Average of Debtors (A Average)	25	=AVERAGE(C2:D2)
13	F	Average of Creditors (B Average)	32.5	=AVERAGE(C3:D3)
14	G	Average of Inventory (C Average)	26	=AVERAGE(C4:D4)
15				
16				
17		**Turnover Ratios**	**Ratios**	**Excel Formula**
18	I	Debtors Turnover Ratio (D/E)	4	=ROUND($C$8/C12,2)
19	J	Creditors Turnover Ratio (D/F)	3.08	=ROUND($C$8/C13,2)
20	K	Inventory Turnover Ratio (D/G)	3.85	=ROUND($C$8/C14,2)
21				
22		**Turnover Ratios**	**Days**	**Excel Formula**
23	L	Debtors Collection Period (365/I)	91	=ROUND(365/C18,0)
24	M	Creditors Payment Period (365/J)	119	=ROUND(365/C19,0)
25	N	Inventory Conversion Period (365/K)	95	=ROUND(365/C20,0)
26				
27				
28		**Cash Conversion Cycle**	**Days**	**Excel Formula**
29	N	Cash Conversion Cycle (L+N-M)	67	=C23+C25-C24

Figure 4.5 : *Cash Conversion Cycle*

As we can see in *Figure 4.5*, the cash conversion cycle is 67 days as per our example.

It means that the company takes 67 days to complete an operating cycle or working capital cycle.

Determination of Working Capital

Several factors influence the total investment in working capital. The determination of working capital is as follows:

- **Nature and Size of Business:** The first and most significant determination is the nature and size of the business. A service company requires less investment in working capital even if the size of business is large, whereas a trading company requires more investment, even if it is smaller in size than a service company. On the other hand, a manufacturing company requires more investment than all other types of companies.
- **Position of Business Cycle or Business Cycle Fluctuations:** Working capital requirements increase during festive seasons or when large orders are received, like during festivals. We will need more stock at every level of business for these times to expand production or trading. It means the volume of working capital is directly proportionate to the volume of production.
- **Manufacturing Process:** If production takes longer, it means we need a greater amount of working capital.
- **Market Conditions:** If there is a higher competition in the market, products need to be sold cheaper to increase sales, so we need to sell larger amounts of inventories. In this case, we need to make enough working capital for large production.
- **Growth and Expansion of Business:** We need more working capital to grow and expand our business.
- **Credit Policy:** If company gets a small credit period, it means they need more cash to purchase, so more working capital investment is required. On the other hand, if a company gives a small credit period, less working capital investment is required.
- **Dividend Policy:** A shortage of working capital often becomes a reason for reducing or skipping a cash dividend. On the other hand, a strong position may justify continuing dividend payments. Dividend policy also affects working capital. Payment of dividends causes outflow of cash, while retained profits act as a source of working capital.
- **Tax Level:** It is also dependent on the rates of tax and tax provisions.

- **Other Determinations:**
    - Lack of coordination between different departments or even in the same department leads to the need of higher working capital. As accounting and finance professionals, we must bridge the gap and ensure coordination.
    - Transportation of goods or raw materials can cause higher working capital due to lack of good infrastructure as it increases the cost of transportation.
    - A good import-export policy can give an advantage and lower the working capital requirements, whereas the lack of a good policy increases working capital requirements.

Sources of Working Capital Finance

Every business needs working capital but they need working capital. And every business cannot afford 100% equity, so they need financing; there several ways to get finance:

- Financing without Loans
    - **Trade Credit (Supplier Credit)**: Get credit period from vendors
    - **Advance from Customers**: Get advance from customers for their orders
    - **Accrued Expenses**: Clear outstanding payments that are accrued but not due, for example, rent, utility bills, and salaries, later
    - **Provisions**: Make provisions for some expenses or duties so that we can use this as working capital till they are payable, for example, bonus and taxes
- Short-Term Loans and Credit Facilities
    - **Cash Credit**: This is a secured loan where a company must give security against inventory and receivables. The bank provides this cash credit facility for a certain limit, which is evaluated based on security. The interest for cash credit is charged on the daily balance and not on the entire amount.
    - **Overdraft Facility**: It is an agreement between bank and lender by which a current account holder can withdraw a little more than the balance in their account.
    - **Loan**: Banks provide short-term loans or working capital loan to lenders as per their requirements and credit score.

  - **Purchasing and Bill Discounting**: Banks give advances against receivables. The seller draws a bill of exchange for the buyer of goods on credit. The bank purchases the bill on demand and deducts its charges and commission.
  - **Pre-Shipment and Post-Shipment Financing**: Banks pay the advance for pre-shipment and post-shipment financing to exporters against their export sale.

- Non-Fund Based Facilities
  - **Letter of Credit, Bank Guarantee and Buyers Credit**: LC, BG and buyers credit ensure timely delivery of goods as they create trust between the importer and the exporter.

- Long-Term Financing
  - **Equity**: Investment by VC or public investment
  - **Bank Loans for Business**: Term Loan, Loan Against Property, Loans against securities.

Working Capital Assessment

There are various assessments that banks do. Banks assess how much working capital is required by the company. These assessments are as follows:

- MPBF (Maximum Permissible Bank Finance)
- Operating cycle method
- Drawing power method
- Turnover method
- Cash budget method

Maximum Permissible Bank Finance

For companies that require up to ₹10 lakh, banks assess the working capital requirements. Banks finance a maximum of 75% of the required amount, and the balance has come from long-term debt.

It has two methods, and they calculate the current ratio for this:

Method I

MPBF = 75% of (Current Assets – Current Liabilities other than bank borrowings)

Ideal Current Ratio = 1:1

Method II

MPBF = (75% of Current Assets) – (Current Liabilities other than bank borrowings)

Ideal Current Ratio = 1.33:1

Let's take an example to understand this better, as shown in *Figure 4.6*:

	A	B	C	D
1		**Particular**	**Amount In Lakhs**	**Excel Formula**
2	A	Current Assets	2000	Not Applicable
3	B	Other Current Liabilities (Current Liabilities - Bank Borrowings)	400	Not Applicable
4				
5				
6		**Method I**	**Amount In Lakhs**	**Excel Formula**
7	C	Working Capital Gap (A-B)	1600	=C2-C3
8	D	25% of WCG (25% of C)	400	=C7*25%
9				
10		**Method I**	**Amount In Lakhs**	**Excel Formula**
11	E	MPBF (C - D)	1200	=C7-C8
12	F	Current Ratio [A/(B+C)	1.25	=ROUND(C2/(C11+C3),2)
13				
14				
15		**Method II**	**Amount In Lakhs**	**Excel Formula**
16	G	Working Capital Gap (A-B)	1600	=C2-C3
17	H	25% of CA(25% of A)	500	=C2*25%
18				
19		**Method II**	**Amount In Lakhs**	**Excel Formula**
20	I	MPBF (G - H)	1100	=C16-C17
21	J	Current Ratio [A/(B+ I)	1.33	=ROUND(C2/(C3+C20),2)

***Figure 4.6**: MPBF Method*

As we can see in *Figure 4.6*, MPBF in Method I and Method II are 1,200 and 1,100, respectively. It means the banks are liberal in Method 1 and can give more limit in Method I. Current ratios are also 1.25 and 1.33, respectively which are ideal in both cases.

Operating Cycle Method

We have discussed operating cycle earlier in this chapter.

A bank checks the total number of operating cycles in a year and then decides the limit.

Working Capital Requirements = Annual Operating Expenses / No.of Operating Cycles

We looked at an operating cycle example in *Figure 4.5*, so will continue with the same example.

Operating Cycle Day was 67 as per the example.

So, No. of operating cycles in year = 365/67 = 5.45

Let's assume that operating expenses are 120 lakh in a year, so the values are as shown in *Figure 4.7*:

31		Operating Cycle No.	OC No.	Excel Formula
32	M	Number of Cycle in a Year (365/N)	5.45	=ROUND(365/C29,2)
33				
34		Working Capital Requirment	All Figures in Lakh	Excel Formula
35	O	Lets Assume Operating Expenses in a year	120	Not Applicable
36	P	W.C. Required (O/M)	22.02	=ROUND(C35/C32,2)

Figure 4.7: *Working Capital Requirements in Operating Cycle Method*

As we can see in *Figure 4.7*, we will need Rs. 22.02L in operating cycle method.

Drawing Power Method

Drawing power is the limit upon which every borrower can withdraw the money within the cash credit limit. Total working capital limit is allotted to a customer by the bank, and it is based on the collateral submitted by borrower and credit appraisal by the bank.

It can be reviewed periodically.

Sanction Limit: The Withdrawal Limit is the maximum amount that can be withdrawn from a cash credit account, regardless of any increase in the Drawing Power

Drawing Power: Amount that a borrower can withdraw every month/quarter from the cash credit account based on inventory stock, accounts receivable and accounts payable.

Drawing Power = (Stock Less Creditors – WC Margin)+(Book Debts – Margin)

The margin can be 25% - 40%.

Drawing power is a metric that can vary on a monthly basis, based on changes in inventory, accounts receivable, and accounts payable. It's important to note that accounts receivable should be less than 90 days old, as banks typically don't consider debtors who are more than 90 days delinquent. When calculating drawing power, the values from Month 1 are used to determine the drawing power for Month 2, and

the values from Month 2 are used to calculate drawing power for Month 3, and so on.Drawing power limit cannot more than the sanction limit.

Example

Let's take the values shown in *Figure 4.8*:

	A	B	C
1		**Particular**	**Value in Lakhs**
2	A	Sanction Limit	100
3	B	Margin on Stock	25%
4	C	Margin on Debtors	40%
5			
6		**Month 1**	**Value in Lakhs**
7	D	Stock	70
8	F	Creditors	30
9	G	Debors Less than 90 days old	50
10			
11			
12		**Month 2**	**Value in Lakhs**
13	H	Stock	110
14	I	Creditors	20
15	J	Debors Less than 90 days old	7

Figure 4.8: *Values for example of Drawing Power Method*

We will calculate month 2 D.P Limit from the values of Month 1, and Month 3 D.P Limit from the values of Month 2, as shown in *Figure 4.9*:

	D P Month 2 Calculations	**Value in Lakhs**	**Excel Formula**
K	D.P in Month 2 [(D-F)*(1-B)+G*(1-C)	60	=(C7-C8)*(1-$C$3)+C9*(1-$C$4)
L	MPBF for the Month (Min of A and K)	60	=MIN($C$2,G7)

	D P Month 3 Calculations	**Value in Lakhs**	**Excel Formula**
M	D.P in Month 3 [(H-I)*(1-B)+J*(1-C)	109.5	=(C13-C14)*(1-$C$3)+C15*(1-$C$4)
N	MPBF for the Month (Min of A and M)	100	=MIN($C$2,G13)

Figure 4.9: *MPBF as per Drawing Power Method*

As we can see in *Figure 4.9*, Month 2's D.P is 60L, whereas Month 3's D.P is 109.5L. However, the maximum sanction limit is 100L, so we can withdraw a maximum of 100L from our cash credit account but not in Month 2, as its maximum drawing power 60L.

Turnover Method

As the name suggests, it is based on the turnover of a business. This method is used for MSME companies with a maximum turnover of ₹5 crore. The working capital requirement is to be assessed as 25% of the projected turnover; out of this, 5% is the net working capital, and 20% is bank financing, that is, 20% of total projected turnover is considered MPBF.

Example

Let projected turnover = 1 crore

Working Capital Gap = 25% of Project Turnover = 25% of 1 Crore = 25 lakh

Margin Money (Net Working Capital) = 5% of Projected Turnover = 5 lakh

MPBF = 20% of Projected Turnover = 20 Lakhs

This method is very simple, and it is very useful for small scale industries.

Cash Budget Method

Some companies are dependent on cyclical cash flow due. They get huge cash in one season and might be in cash deficit in one season.

The cash budget method is applicable for cyclical (seasonal industries). For those types of company's order may come in one season. Unlike other methods, its working capital limit is based on projected cash flow rather than current assets and current liabilities.

A company must submit its last year's actual cash flow and 1-year projected cash flow statement. Working capital requirements are sanctioned based on peak cash deficit periods.

Let's understand this with the help of an example.

Let projected cash flow be as shown in *Figure 4.10*; we are taking constant closing and opening cash balance in the example as ₹100L.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Particular**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
2	Opening Cash Balance	100	100	100	100	100	100	100	100	100	100	100	100
3	Cash Receipt During the Month	220	270	320	250	370	180	200	350	310	270	260	310
4	Less Payment Made During the Month	180	240	280	270	340	220	270	300	290	300	270	270
5	Less Closing Cash Balance	100	100	100	100	100	100	100	100	100	100	100	100
6	**Surplus/(Deficit)**	**40**	**30**	**40**	**(20)**	**30**	**(40)**	**(70)**	**50**	**20**	**(30)**	**(10)**	**40**
7													

	Particular	Results	Excel Formula
8	**Particular**	**Results**	**Excel Formula**
9	Maximum Deficit	(70)	=MIN(B6:M6)
10	Maximum Deficit Month	Oct	=INDEX(B1:M1,MATCH(B9,B6:M6,0))

***Figure 4.10**: Maximum Deficit*

As we can see in *Figure 4.10*, the maximum deficit is 70L and the deficit month is October.

So, Working Capital Limit = Peak Deficit = 70L

Withdrawal depends on the sanction limit.

Conclusion

Working capital is the fuel of a business, and the mismanagement of working capital can cause liquidity or even solvency of the company. As accounting and finance professionals, we need to manage working capital better. In this chapter, we discussed what working capital is and how to determine it, and we studied the cash conversion cycle and different assessments to get the working capital limit.

In next chapter, we will learn about what budget is and look at operating budget and capital budget processing in Excel.

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Chapter 5
Preparing Business Valuation Modeling

Introduction

As accounting and finance professionals, we must know how to evaluate a business. In this chapter, we will learn about the types of valuation, like NPV, IRR, PP, ARR, CAPM, WACC of a business/project, with different scenarios.

Further on in the chapter, we will discuss business valuation modeling, including discounted cash flow and free cash flow.

Structure

- Time Value of Money
- NPV and IRR
- Payback Period
- Accounting Rate of Return (ARR)
- Capital Assets Pricing Model (CAPM)
- WACC Calculation
- Business Valuation Modeling

- Discounted Cash Flow
- Free Cash Flow

Objectives

We will learn about the time value of money and its importance. To run a business or do any investment, we must know whether the business or investment is profitable. We calculate or estimate thesebased on NPV or IRR. To make an investment to buy a capital asset, we calculate CAPM. The chapter will also cover the use of Discounted Cash Flow.

Time Value of Money (TVM)

A fundamental financial principle known as the Time Value of Money (TVM) states that due to the potential for future profits, an amount of money is worth more today than it will be later.

It implies that a sum of money obtained today is worth more than the same sum received in the future. Investments are the only way for money to expand. An opportunity is wasted when an investment is postponed.

TVM is regarded as a key idea in inflation since it plays a significant role in determining the purchasing power. TVM is significantly impacted by inflation, which reduces the purchasing power of money and lowers its worth. The best examples of time value of money are savings accounts and federal savings bonds.

Future Value: Time value of money tell us about future value.

Formula: $$FV = PV * \left(1 + \frac{i}{n}\right)^{n*t}$$

Where FV is the Future Value of Money. PV is the Present Value of Money, i is the rate of interest, n is the number of compounding periods per year and t is the number of years

Example: Let us consider that we are investing money ₹1,00,000/- in an FD for a period of 10 years, and the interest rate is fixed at 8% compounded annually. The calculation will be as shown in *Figure 5.1*:

	A	B	C	D	E	F	G
1	Particular	Figure					
2	PV	100000			Particular	Figure	Excel Formula
3	i	8%			FV	215892.5	=B2*(1+B3/B4)^(B4*B5)
4	n	1					
5	t	10					
6							
7							
8	Table Year Wise						
9	Year No.	PV	Interest	FV	Excel Formula for PV	Excel Formula for Interest	Excel Formula for FV
10	1	100000	8000	108000	=B2	=B10*$B$3	=B10+C10
11	2	108000	8640	116640	=D10	=B11*$B$3	=B11+C11
12	3	116640	9331.2	125971.2	=D11	=B12*$B$3	=B12+C12
13	4	125971.2	10077.7	136048.896	=D12	=B13*$B$3	=B13+C13
14	5	136048.9	10883.91	146932.808	=D13	=B14*$B$3	=B14+C14
15	6	146932.8	11754.62	158687.432	=D14	=B15*$B$3	=B15+C15
16	7	158687.4	12694.99	171382.427	=D15	=B16*$B$3	=B16+C16
17	8	171382.4	13710.59	185093.021	=D16	=B17*$B$3	=B17+C17
18	9	185093	14807.44	199900.463	=D17	=B18*$B$3	=B18+C18
19	10	199900.5	15992.04	215892.5	=D18	=B19*$B$3	=B19+C19

Figure 5.1: *Calculation of FV*

So, after investing ₹1,00,000/- for 10 years @ 8% compounded annually, we will get ₹2,15,892.5.

If we calculate it year-wise, as shown in *Figure 5.1* cell no. D19, we get the same figure as when we calculate it with the formula as shown in cell F3.

Excel has an inbuilt formula for FV = FV(rate,nper,pmt,[pv],[type])

Syntax

=FV (rate, nper, pmt, [pv], [type])

Arguments:

- **rate**: The interest rate per period.
- **nper**: The total number of payment periods.
- **pmt**: The payment made each period (must be entered as a negative number)
- **pv**: [optional] The present value of future payments (assumed to be zero. if omitted); PV must always be entered as a negative number
- **type**: [optional] When payments are due: 0 = end of period, 1 = beginning of period; the default is 0.

FV is again the same in the year-wise table and formula, which is 2,15,892.5 in Cell F4.

Excel Formula =FV(B3/B4,B4*B5,0,-B2)

In the preceding formula, B3/B4 is the rate of interest that is divided by no. compounding period per year. In our example it is annually = 1. Half yearly, it is = 2, and quarterly, it is = 4.

The same is for B4*B5 is the nper (the total number of payment periods per year.

The **Present Value (PV)** of money that will be received in the future can be calculated using the following formula:

$$FV = PV * \left(1 + \frac{i}{n}\right)^{n*t}$$

The preceding is the formula of FV as we discussed earlier; now we can reverse this to calculate the PV of a FV:

$$PV = FV / \left(1 + \frac{i}{n}\right)^{n*t}$$

Let us look at the example.

Let us consider that FV is ₹2,00,000.

So, we are getting ₹2,00,000 from FD for the period of 10 years at a fixed interest rate of 8% compounded annually. So, the calculation will be as shown in *Figure 5.2*:

	A	B	C	D	E	F	G
1	Particular	Figure					
2	FV	200000			Particular	Figure	Excel Formula
3	i	8%			PV by Formula	92638.70	=B2/(1+B3/B4)^(B4*B5)
4	n	1			PV by Excel Formula	92638.70	=PV(B3,B4*B5,0,-B2)
5	t	10					
6							
7							
8	PV by Year Wise Table						
9	Year No.	FV	Interest	PV	Excel Formula for FV	Excel Formula for Interest	Excel Formula for PV
10	10	200000	14814.81	185185.19	=B2	=B10-B10/(1+$B$3)	=B10-C10
11	9	185185.2	13717.42	171467.76	=D10	=B11-B11/(1+$B$3)	=B11-C11
12	8	171467.8	12701.32	158766.45	=D11	=B12-B12/(1+$B$3)	=B12-C12
13	7	158766.4	11760.48	147005.97	=D12	=B13-B13/(1+$B$3)	=B13-C13
14	6	147006	10889.33	136116.64	=D13	=B14-B14/(1+$B$3)	=B14-C14
15	5	136116.6	10082.71	126033.93	=D14	=B15-B15/(1+$B$3)	=B15-C15
16	4	126033.9	9335.85	116698.08	=D15	=B16-B16/(1+$B$3)	=B16-C16
17	3	116698.1	8644.30	108053.78	=D16	=B17-B17/(1+$B$3)	=B17-C17
18	2	108053.8	8003.98	100049.79	=D17	=B18-B18/(1+$B$3)	=B18-C18
19	1	100049.8	7411.10	92638.70	=D18	=B19-B19/(1+$B$3)	=B19-C19

Figure 5.2: *PV Calculations based on FV*

Figures of PV by year-wise table Cell No. D19 and PV by formula, as shown in *Figure 5.2* Cell No. F3 are the same, that is, ₹92,638.70. It means we have invested ₹92,638.70 to get ₹2,00,000 today as FV after 10 years @ 8% compounded annually.

Excel also has an inbuilt formula for PV as well:

PV(rate,nper,pmt,[pv],[type])

Syntax

=PV (rate, nper, pmt, [fv], [type])

Arguments:

- **rate**: The interest rate per period
- **nper**: The total number of payment periods
- **pmt**: The payment made each period (must be entered as a negative number)
- **fv**: [optional] The future value of present payments (assumed to be zero if omitted); PV must be entered as a negative number
- **type**: [optional] When payments are due: 0 = end of period, 1 = beginning of period; default is 0.

PV is again the same in the year-wise table and via the formula, which is 92,638.70 in Cell F4.

Excel Formula =PV(B3/B4,B4*B5,0,-B2)

In the preceding formula, B3/B4 is the rate of interest, which is divided by compounding period per year. In our example it is annually = 1 . For half yearly, it is 2 and quarterly, it is 4.

The same is for B4*B5.

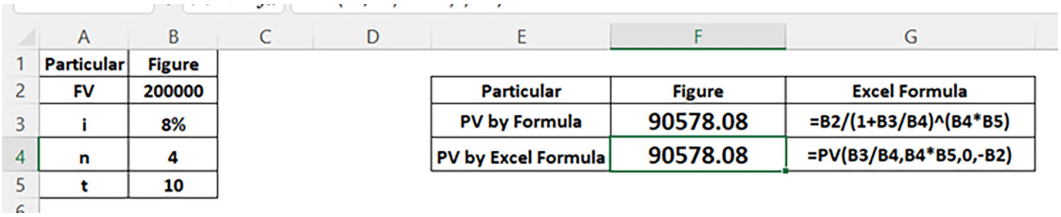
Let's take an example of FV compounded quarterly, so n = 4; the calculation is shown in *Figure 5.3*:

	A	B	C	D	E	F	G
1	Particular	Figure					
2	PV	100000			Particular	Figure	Excel Formula
3	i	8%			FV by Formula	220804.0	=B2*(1+B3/B4)^(B4*B5)
4	n	4			FV by Excel Formula	220804.0	=FV(B3/B4,B4*B5,0,-B2)
5	t	10					

Figure 5.3: *FV compounded quarterly*

As we can see, n = 4 in *Figure 5.3* and the FV = 220804 in both cases.

Let's take an example of PV compounded quarterly, so n = 4; the calculation is shown in *Figure 5.4*:



	A	B	C	D	E	F	G
1	Particular	Figure					
2	FV	200000					
3	i	8%					
4	n	4					
5	t	10					

Particular	Figure	Excel Formula
PV by Formula	90578.08	=B2/(1+B3/B4)^(B4*B5)
PV by Excel Formula	90578.08	=PV(B3/B4,B4*B5,0,-B2)

Figure 5.4: *PV compounded quarterly*

As we can see, n = 4 in *Figure 5.4* and the PV = 90578.08 in both cases.

Net Present Value and Internal Rate of Return (NPV and IRR)

NPV and IRR are the two major factors to analyze whether a project or business should be invested in.

NPV or net present value is the difference between the current value of cash inflows and outflows over a period. NPV is used to analyze the profitability of a projected investment or project in capital budgeting, stock investments, and investment planning.

Starting a new project necessitates a thorough evaluation of the future cash flows that the initiative will produce. We must calculate the estimated sums and the time frame in which they will be paid or received. Making an informed decision is essential, and this is one of the key factors that determine whether a project is realistic.

Because of the time value of money, estimating a project's value can be difficult. We already know that money gained today does not equal money earned tomorrow. We can account for this approach is by discounting cash flows and determining their present value.

To purchase a fixed asset, for instance, a corporation would first estimate the future cash flows that asset would provide, discount those cash flows, and then tally their present values. The investment is potential and will create value if the amount received exceeds the initial investment; otherwise, it is invalid from a financial standpoint.

A positive NPV indicates a profitable investment, and a negative NPV indicates a loss. So, the investment with the positive NPV should be considered.

Formula:

$$NPV = \frac{FV0}{(1+R)^0} + \frac{FV1}{(1+R)^1} + \frac{FV2}{(1+R)^2} + \cdots + \frac{FVn}{(1+R)^n}$$

Where NPV: Net Present ValueFV: Future ValueR: Discount Rate of Interest and n: Number of Year

Let us take an example to understand NPV better.

Assume that we are investing in a toy manufacturing machine that will produce cash in the next 6 years (all values in lakhs): year 1 – 20, year 2 – 30, year 3 – 30, year 4 – 35, year 5 – 25 and year 6 – 10. After that, we will sell the machine for ₹15 lakh as scrap. Our initial cost is ₹1 crore and discounted rate decided for the project is 10%.

We create a timeline as per the preceding numbers and consider Year 6 as ₹25 lakh because we will get ₹10 lakh form its operations and ₹15 lakh as its scrap value. Refer to the following figure:

	A	B	C	D	E	F	G	H	I
1									
2	A	Discounted Rate	10%						
3									
4									
5						Years			
6	B	Timeline	0	1	2	3	4	5	6
7	C	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00
8	D	Present Value	-100.00	18.18	24.79	22.54	23.91	15.52	14.11
9									
10	E	NPV	19.06						
11									
12						EXCEL FORMULA FOR NPV			
13	A	Discounted Rate	N/A						
14									
15									
16						Years			
17	B	Timeline	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	D	Present Value	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6	=I7/(1+$C$2)^I6
20									
21	E	NPV	=SUM(C8:I8)						

Figure 5.5: *NPV after every year PV calculation*

Figure 5.5 shows that Year 6 is equal to 25 as it is the sum of scrap value and cash produced, which are 15 and 10, respectively. First, we calculate every year's PV and add them all, including the initial payment. We got 19.06; it is a positive NPV, so we can go ahead with this project/investment.

Excel has an inbuilt NPV formula, so let us calculate it:

NPV argument

=NPV(discount rate, series of cash flow)

Let's apply this formula in our example

	A	B	C	D	E	F	G	H	I
1									
2	A	Discounted Rate	10%						
3									
4									
5						Years			
6	B	Timeline	0	1	2	3	4	5	6
7	C	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00
8	D	Present Value	-100.00	18.18	24.79	22.54	23.91	15.52	14.11
9									
10	E	NPV	19.06						
11	F	NPV	17.32						
12									
13						EXCEL FORMULA FOR NPV			
14	A	Discounted Rate	N/A						
15									
16									
17						Years			
18	B	Timeline	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	D	Present Value	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6	=I7/(1+$C$2)^I6
21									
22	E	NPV	=SUM(C8:I8)						
23	F	NPV	=NPV(C2,C7:I7)						

Figure 5.6: *NPV Excel formula*

As we can see in *Figure 5.6*, the values of S. No. E and S. No. F are not the same, but they should be equal. For this, we need to make some adjustments.

Currently, we have used all cells, including initial payment cell (Cell C7) for series of cash flow, though it is always same. This will add the initial payment cell with NPV of Years 1 to 6. *Figure 5.7* shows how it works.

=NPV(C2,D7:I7)+C7

The preceding is the formula for NPV. Refer to the following figure:

	A	B	C	D	E	F	G	H	I
1									
2	A	Discounted Rate	10%						
3									
4									
5						Years			
6	B	Timeline	0	1	2	3	4	5	6
7	C	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00
8	D	Present Value	-100.00	18.18	24.79	22.54	23.91	15.52	14.11
9									
10	E	NPV	19.06						
11	F	NPV	19.06						
12									
13						EXCEL FORMULA FOR NPV			
14	A	Discounted Rate	N/A						
15									
16									
17						Years			
18	B	Timeline	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	D	Present Value	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6	=I7/(1+$C$2)^I6
21									
22	E	NPV	=SUM(C8:I8)						
23	F	NPV	=NPV(C2,D7:I7)+C7						

Figure 5.7: *Excel Formula of NPV after adjustments*

As we can see in *Figure 5.7*, both values are the same.

The NPV function should be as follows:

=NPV(discounted Rate, series of cash flow from Year 1 to Year N)- Initial Payment

IRR or the internal rate of return is the compounded rate of return on an investment. IRR is a discount rate that, in a discounted cash flow analysis, reduces all cash flows' **Net Present Values** (**NPVs**) to zero. The project's anticipated return can then be thought of as the discount rate.

The project is approved if the IRR exceeds a predetermined percentage threshold, and it is abandoned if the IRR falls short of the desired level. We get at the calculation by thinking about the definition. Instead of earnings, the IRR employs cash flows—more specifically, the cash flows that are pertinent to a project. To make the calculation, we must first determine the discount factor that would result in a project's NPV being zero.

The greater the internal rate of return, the more favorable an investment is. IRR is the best tool available to comprehend and evaluate probable rates of annual return over time for capital budgeting projects.

Formula for IRR:

$$0 = NPV = \frac{FV0}{(1+IRR)^0} + \frac{FV1}{(1+IRR)^1} + \frac{FV2}{(1+IRR)^2} + \cdots + \frac{FVn}{(1+IRR)^n}$$

Where, **NPV**: Net Present Value, **FV**: Future Value,**IRR**: Internal Rate of Return**, N**: Number of Year

NPV is considered zero to find the value of IRR.

Let us take the same example that we used for NPV.

Let us assume that we are investing in a toy manufacturing machine that will produce cash in the next 6 years (all values in lakhs): year 1 – 20, year 2 – 30, year 3 – 30, year 4 – 35, year 5 – 25 and year 6 – 10. After that, we will sell the machine for ₹15 lakh as scrap. Our initial cost is ₹1 crore and discounted rate decided for the project is 10%.

It is difficult to put the formula to calculate IRR manually.

There are two options available: one is to use the IRR formula in MS Excel, and the other is to use the Goal Seek Feature in the NPV formula.

Currently, the NPV is the same, as shown in *Figure 5.8*.

Now we will apply Goal Seek in Cell No. C10 of *Figure 5.8*:

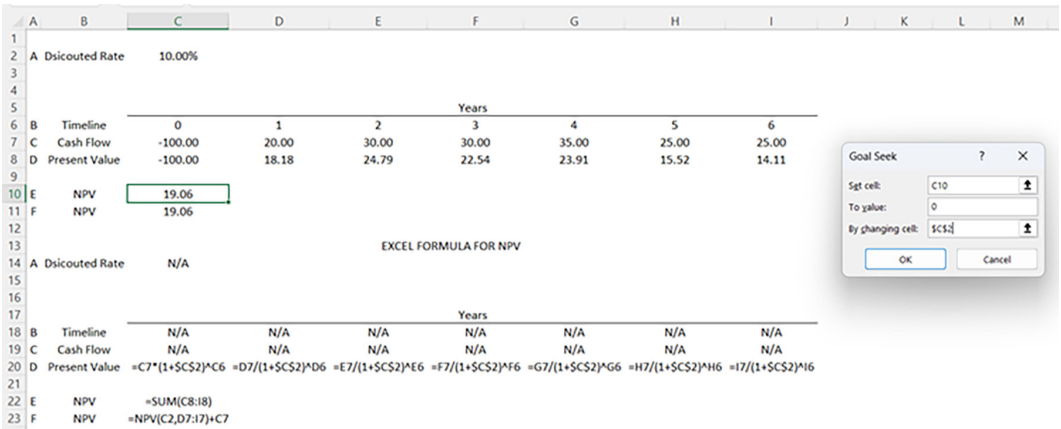


Figure 5.8: *Applying Goal Seek to Get IRR*

In *Figure 5.9*, we can see the Goal Seek Dialog Box where set cell C10, to Value 0 (because NPV is always zero to calculate IRR), by changing cell C2 where we have entered our discounted rate. Now, Click on OK. We will get our desired IRR in cell C2. Refer to the following figure:

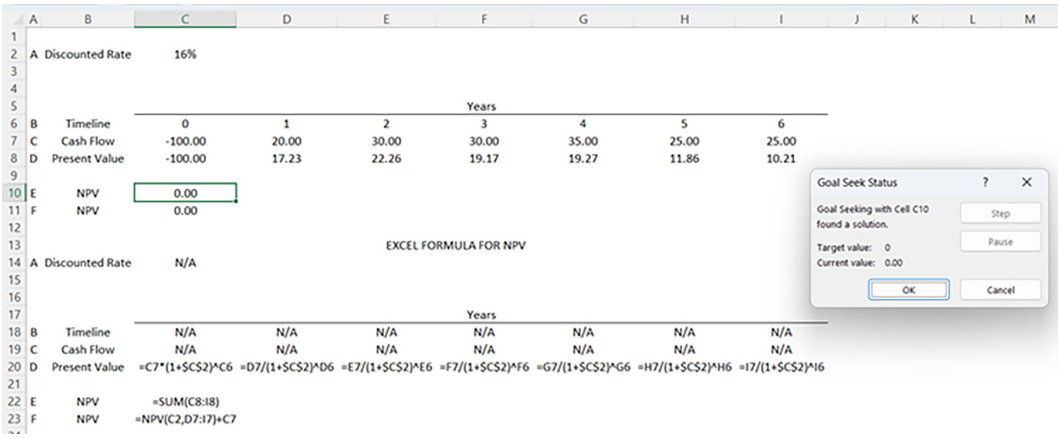


Figure 5.9: *IRR with Goal Seek*

As we can see in *Figure 5.9*, we have our desired IRR as 16.09%, which is more than our discounted rate, as decided; it means the project is worthful, and we can invest in it.

Let us calculate the IRR with the Excel formula: IRR

Augment: IRR(values,[guess])

Where values are series of cash flow, including the initial cash flow.

Now we will put the formula in our current Excel sheet. Refer to the following figure:

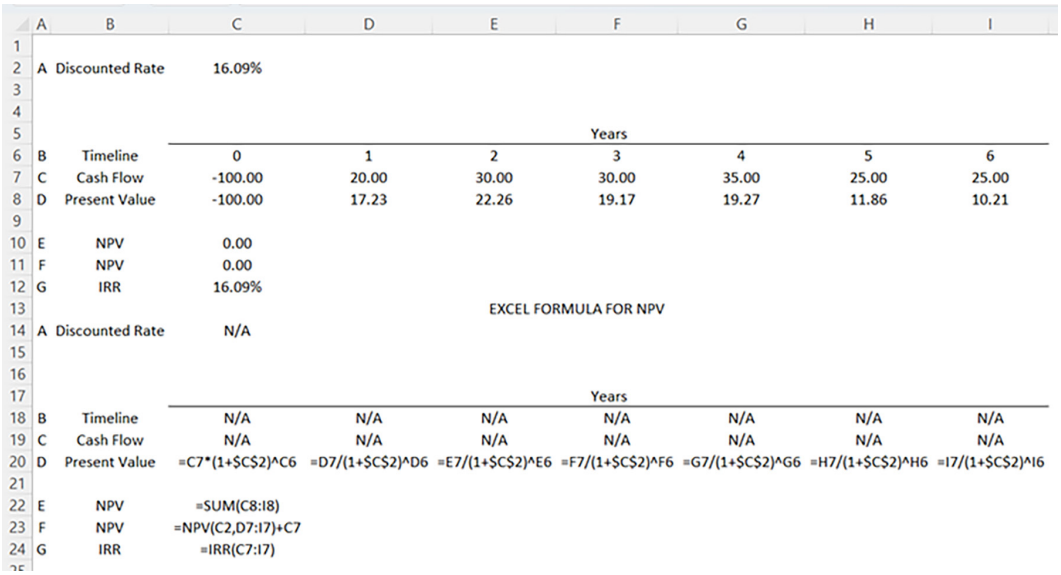


Figure 5.10: *IRR from Excel Formula*

As we can see in *Figure 5.10*, IRR is equal to 16.09%, which is the same as cell C10, which we calculated with the help of Goal Seek.

Comparing multiple projects can be better accomplished by using the Internal Rate of Return (IRR) method, while the Net Present Value (NPV) method may be more suitable for situations where cash flows may change direction or fluctuate between positive and negative over time, or when different discount rates are involved.IRR is used in percentages, and NPV is determined as currency.

The profitability index is derived as the difference between the project's initial investment and the present value of predicted future cash flows. A project will be deemed more attractive if its PI is higher. A PI value greater than 1.0 is regarded as a solid investment, and higher values are associated with ventures that are more alluring.

The formula for PI is as follows:

$$PI = \frac{PV(Inflows)}{PV(Outflows)}$$

Where PI: Profitability Index, PV (Inflows): Present Value of Inflows, PV (Outflows): Present Value of Outflows

Let us take the same example as we worked with for NPV. Take a look at the following figure:

	A	B	C	D	E	F	G	H	I
1									
2	A	Discounted Rate	10%						
3									
4									
5						Years			
6	B	Timeline	0	1	2	3	4	5	6
7	C	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00
8	D	Present Value	-100.00	18.18	24.79	22.54	23.91	15.52	14.11
9									
10	E	NPV	19.06						
11	F	NPV	19.06						
12	G	PI	1.19						
13									
14									
15									
16						EXCEL FORMULA FOR NPV			
17	A	Discounted Rate	N/A						
18									
19									
20			Years						
21	B	Timeline	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	D	Present Value	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6	=I7/(1+$C$2)^I6
24									
25	E	NPV	=SUM(C8:I8)						
26	F	NPV	=NPV(C2,D7:I7)+C7						
27	G	PI	=ROUND(SUM(D8:I8)/-(C8),2)						

Figure 5.11: *Profitability Index*

Figure 5.11 shows that the profitability index is 1.19, so we can comfortably invest in this project.

Payback period

It shows how soon we get back our money/investment. The sooner we get our investment back, the sooner we can reinvest it to make more money.

If the payback period is higher, we should avoid the project. It has a disadvantage: it ignores the time value of money. Calculating the payback period is a quick task.

We will get back our investment in 3.43 years, as per *Figure 5.12*:

	A	B	C	D	E	F	G	H	I	J
1										
2										
3										
4										
5						Years				
6	A	Timeline	0	1	2	3	4	5	6	
7	B	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00	
8										
9	C	Inflow		20.00	50.00	80.00	115.00	140.00	165.00	
	D	Balance pending from investment		-80.00	-50.00	-20.00	15.00	40.00	65.00	
10										
11	E	Pay Back Period		1	1	1	0.43			**3.43**

Figure 5.12: *Payback period*

Firstly, we check the inflow balance and pending balance form investment. In our example, it is completed in the 4th Year, so we calculate the ratio between 15 and 35, which comes to 0.43. So, the payback period is a total of 3.43 years.

Discounted Payback period: A combination of NPV, IRR and DPB (Discounted Payback period gives a better idea for investment. It is a much better metric than the normal payback period.

Let us take the same example with discounted rate of 10%. Refer to the following figure:

	A	B	C	D	E	F	G	H	I	J
1										
2		Discounted Rate	10%							
3										
4										
5						Years				
6	A	Timeline	0	1	2	3	4	5	6	
7	B	Cash Flow	-100.00	20.00	30.00	30.00	35.00	25.00	25.00	
8	C	Discounted Cash Flow	-100.00	18.18	24.79	22.54	23.91	15.52	14.11	
9										
10										
11	D	iscount Cash Inflow		18.18	42.98	65.51	89.42	104.94	119.06	
12	F	Balance pending from investment		-81.82	-57.02	-34.49	-10.58	4.94	19.06	
13	G	Discounted Pay Back Period		1	1	1	1	0.32		**4.32**

Figure 5.13: *Discounted Payback Period*

We will get our investment back in 4.32 years, as shown in *Figure 5.13*.

Firstly, we check the discounted cash inflow balance and pending balance from investment. In our example, it completes in the 5th Year, so we calculate the ratio between 4.94 and 15.52, which comes to 0.32. So, the discounted payback period is a total of 4.32 years.

Note that the discounted cash flow of S. No. C is the same as that in the NPV example. The discounted cash inflow is equal to the total inflows every year.

Accounting Rate of Return (ARR)

The accounting rate of return method is another metric to decide whether an investment is good. This method calculates the average accounting profit that an investment is expected to generate and presents it as a percentage of the average investment in the project, as measured using accounting terms.

To decide whether the return is acceptable, we must compare it with the minimum required return by the business. If the firm has a target ARR less than the percentage achieved, then the investment is acceptable, otherwise it is not.

Formula:

ARR: Average Annual Profit / Average Investment

Where Average Annual Profit: Total Profits/Number of Years**, Average Investment**: (Initial Investment + Salvage Value)/2

Example: ABCD Co Ltd. is considering a project with a required investment of ₹6,00,000/-. The details are as follows:

Expected Useful life: 6 Years (SLM method)

Salvage Value: 1,50,000/-

The cost of capital: 28%

Net Profit

Year 1: 60,000/-

Year 2: 90,000/-

Year 3: 1,10,000/-

Year 4: 1,50,000/-

Year 5: 1,10,000/-

Year 6: 90,000/-

	A	B	C	D	E	F	G
1							
2	Year	Profit			Particular	Figure	Excel Formula
3	1	60000			Average Annual Profit	101666.67	=SUM(B3:B8)/COUNT(B3:B8)
4	2	90000			Average Investment	375000	=SUM(B10:B11)/2
5	3	110000			ARR	27.11%	=F3/F4
6	4	150000			Accepted or Unaccepted	Unaccepted	=IF(F5>B12,"Accepted","Unaccepted")
7	5	110000					
8	6	90000					
9							
10	Investment	600000					
11	Salvage Value	150000					
12	Cost of Capital	28%					

***Figure 5.14**: ARR Calculation*

As we can see in *Figure 5.14*, ARR (27.11%) is less than the cost of capital (28%), so it is not acceptable.

Capital Assets Price Model (CAPM)

A model that explains the connection between the expected return and risk of investing in a security is called the **Capital Asset Pricing Model** (**CAPM**). It demonstrates that a security's expected return is equal to its risk-free return plus a risk premium calculated using the security's beta.

CAPM Formula:

Expected Rate of Return = Risk-Free Premium + Beta * (Market Risk Premium)

$RI = RF + \beta^*(RM - RF)$

Where RI: Rate of expected return/cost of equity, RF: Risk free return, β: Beta is the systemic risk, RM: Market risk

If $\beta > 1$, market risk is higher

If $\beta < 1$, market risk is lower

We can find the β of every listed company on any financial website.

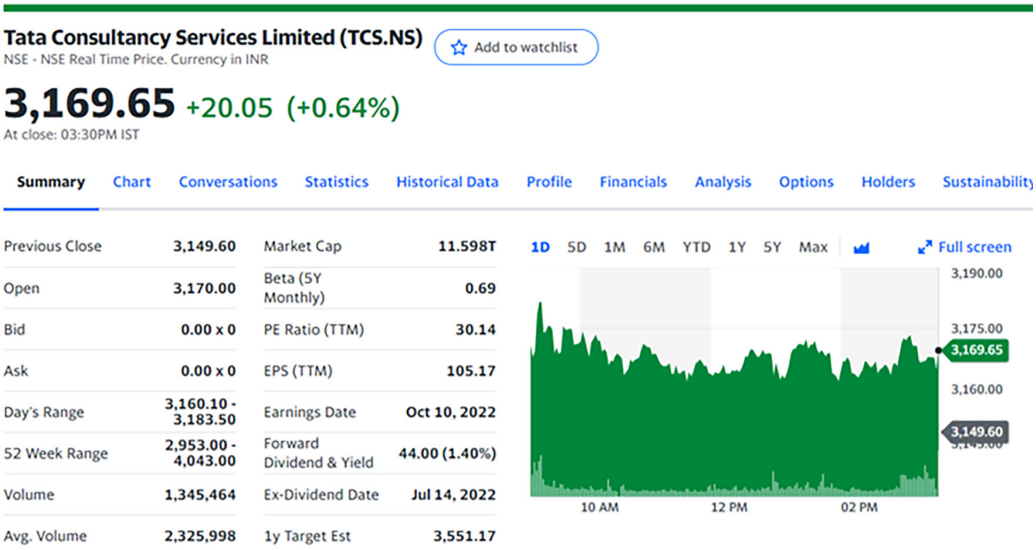


Figure 5.15: *Beta for TCS from Yahoo Finance*

As we can see in *Figure 5.15*, the Beta for TCS is 0.69.

Beta is the systemic risk of inflation, recession, natural disasters, and such.

An example of risk-free returns is interest on saving accounts or FDs. The time value of money is taken into consideration by the risk-free rate in the CAPM formula. The other elements of the CAPM formula take the investor's increased risk into account.

Let's take an example to understand this better.

An investor decides to invest in a stock called XYZ @ ₹1,000/- per share; it pays an annual dividend of 5%. The stock beta is 1.2, which means it is riskier than the market portfolio. Let's assume that the risk free rate is 6%, and the investor expected the market to rise in value by 10% per year.

CAPM Formula:

Expected Rate of Return = Risk-Free Premium + Beta * (Market Risk Premium)

$RI = RF + \beta*(RM - RF)$

$RI = 6\% + 1.2*(10\%-6\%) = 10.80\%$

Cost of Equity = 10.80%

Weightage Average Cost of Capital

The **Weighted Average Cost of Capital** (**WACC**) of a company measures its overall cost of capital from all sources, such as debt, common shares, and preferred shares. Each sort of capital's cost is multiplied by how much of the total capital it makes up. The WACC is the typical interest rate that a business anticipates paying to finance its assets.

When calculating WACC, the cost of each capital source (debt and equity) is multiplied by the relevant weight by market value, and the results are added up to reach the result.

Cost of equity >WACC>Cost of debts to balance equity and debt.

If a business invests all amount as equity, it has higher investors' risk.

If a company takes all amount as debt, it has a higher risk to bank.

WACC is the most preferred investment, as it has medium risk.

Ideally, the debt equity ratio should be less than 1.

If NPV >0 with WACC as discount rate (interest rate) and IRR > WACC, one can take the project in both situations.

WACC Formula:

$$WACC = (E/C \times Re) + ((D/C \times Rd) \times (1 - T))$$

Where:,E: Equity of the firm's.,D: Debts Taken, C: Total Value of Capital (equity plus debt), Re: Expected cost of equity,Rd: Rate of Interest of debt andT: tax rate

Let us understand this with various examples.

We need ₹150 lakh.

Option 1: 100% loan @ 12% interest

Option 2: 50% loan @ 12% interest and 50% equity @ 20% return

Option 3: 30% loan @ 12% interest, 20% bonds @ 11% interest, 35% equity @ 20% return and 15% preferred Shares @ 15% return.

Assume that the tax rate is 30%.

Particular	Figures in Lakh
Value	150
Tax	30%

Option 1	Percentage	Amount	Excel Formula
Loan Taken	100%	150	=B6*B2
Loan Interest	12%	18	=C6*B7

Option 1 Result	Result	Excel Formula
Total Cost	18	=C7
WACC	12%	=B6*B7
Remark	We have only interest in Option 1 and percentage is 12% so WACC is 12%	

Option 2	Percentage	Amount	Excel Formula
Loan Taken	50%	75	=B2*G6
Loan Interest	12%	9	=H6*G7
Equity	50%	75	=B2*G8
ROE	20%	15	=H8*G9

Option 2 Result	Result	Excel Formula
Total Cost	24	=H7+H9
WACC	16%	=G6*G7+G8*G9
Remark	Weightage of Loan is 6% (12% of 50%) & Equity is 10% (20% of 50%) = 6% + 10% = 16%	

Option 3	Percentage	Amount	Excel Formula
Loan Taken	30%	45	=$B$2*L6
Loan Interest	12%	5.4	=M6*L7
Bonds	20%	30	=$B$2*L8
Bonds Interest	11%	3.3	=M8*L9
Equity	35%	52.5	=$B$2*L10
ROE	20%	10.5	=M10*L11
Preferred Shares	15%	22.5	=$B$2*L12
Return of Preferred Shares	15%	3.375	=M12*L13

Option 2 Result	Result	Excel Formula
Total Cost	22.575	=M7+M9+M11+M13
WACC	13.310%	=L6*L7*(1-B3)+L8*L9*(1-B3)+L10*L11+L12*L13
Remark	Bonds and Loans weightages are calculated after deduction of tax	

Figure 5.16: *WACC with Various Options*

As we can see in *Figure 5.16*, Option 1 has a weightage average cost of 12%, and Option 2 has 16%.

Option 3 has 13.31% weightage average cost of capital, which is calculated as follows:

WACC = WL*RL * (1-T) + WB*RB * (1-T)+ WE*RE + WP*RP.

Where,WL: Percentage of Loan Taken, RL: Interest Rate on Loan, WB: Percentage of Bond, RB: Interest of Bond, WE: Percentage of Equity, RE: Percentage of Return on Equity, WP: Percentage of Preferred Shares, RP: Return on Preferred Shares, T: Tax

Business Valuation Modeling

When a company is called a going concern company, there are three main valuation methods used by professionals:

- Comparable Company Analysis
- Precedent Transactions
- Discounted Cash Flow Analysis

Comparable Company Analysis: It is a relative valuation method in which we compare the values and various ratios withs peer companies.

The analysis is dependent on the peer group, which consists of comparable businesses of a similar size in the same sector or locale. **Enterprise Value To Sales** (**EV/S**), **Price To Earnings** (**P/E**), **Price To Book** (**P/B**), and **Price To Sales** (**P/S**) are the most commonly utilized valuation metrics in comparable business evaluation. The company is overvalued if its valuation ratio is higher than the average for its peer group. And it is undervalued if the valuation ratio is lower than the average for its peers.

Precedent Transactions: Precedent traction analysis utilizes a company's prior performance data to estimate its value. Using data from previous merger and acquisition (M&A) deals, precedent transaction analysis is a technique for valuing businesses.

Discounted Cash Flow: This approach is the most popular. For instance, the income approach's discounted cash flow valuation method evaluates a company by adjusting (or discounting) its projected cash flow to its present value.

Let's talk about discounted cash flow in more detail.

For business valuation, DCF is employed. The **Net Present Value** (**NPV**) is a projection of a company's unlevered free cash flow discounted back to today's value. The value of an investment is ascertained using discounted cash flow analysis and the investment's projected cash flows.

The aim of a DCF analysis is to calculate the adjusted time value of a financial investment that an investor has made or intends to make.

Unlevered free cash flow is the cash generated by a business that is available for repayment or distribution to investors or for being reinvested into the business. This FCF is applicable for both equity and debt.

If DCF is higher than the current cost of investment, it means the opportunity is profitable; if DCF is lower than the current cost of investment, it is not a good investment. The investor must also determine the discount rate for DCF, which can be separate for different projects, industries, or companies. The value of WACC is also considered as the discount rate.

DCF formula:

$$DCF = \frac{CF1}{(1+r)^1} + \frac{CF2}{(1+r)^2} + \cdots + \frac{CFn}{(1+r)^n}$$

Where CF1, CF2F is the cash flows of every year and r is the discount rate.

Let's take an example. Suppose:

WACC = 15%

Initial Investment = 12 lakh

Year-wise cash flow

Year 1 – 1.5 lakh

Year 2 – 2 lakh

Year 3 – 4 lakh

Year 4 – 5 lakh

Year 5 – 7 lakh

Refer to the following figure:

	A	B	C	D	E	F	G	H
1								
2	A	Dsicouted Rate	15%					
3								
4								
5					Years			
6	B	Timeline	0	1	2	3	4	5
7	C	Cash Flow	-12.00	1.50	2.00	4.00	4.00	7.00
8	D	DCF	-12.00	1.30	1.51	2.63	2.29	3.48
9								
10	F	DCF Inflow	11.21					
11	G	DCF Outflow	-12.00					
12	H	Net Adjusted DCF	-0.79					
13								
14	I	NPV	-0.79					
15								
16					EXCEL FORMULA FOR DCF			
17								
18	A	Dsicouted Rate	N/A					
19								
20								
21					Years			
22	B	Timeline	0	1	2	3	4	5
23	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A
24	D	DCF	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6
25								
26	F	DCF Inflow	=SUM(D8:H8)					
27	G	DCF Outflow	=C8					
28	H	Net Adjusted DCF	=C10+C11					
29								
30	I	NPV	=SUM(C8:H8)					

Figure 5.17: *DCF Example*

As we can see, the total of net adjusted DCF is -0.79, so we should not invest in this project.

WACC is considered as discounted rate.

If the investment is ₹9 lakh, let's see what changes will be made.

Just change the value of -12 to -9.

	A	B	C	D	E	F	G	H
1								
2	A	Dsicouted Rate	15%					
3								
4								
5						Years		
6	B	Timeline	0	1	2	3	4	5
7	C	Cash Flow	-9.00	1.50	2.00	4.00	4.00	7.00
8	D	DCF	-9.00	1.30	1.51	2.63	2.29	3.48
9								
10	F	DCF Inflow	11.21					
11	G	DCF Outflow	-9.00					
12	H	Net Adjusted DCF	2.21					
13								
14	I	NPV	2.21					
15								
16					EXCEL FORMULA FOR DCF			
17								
18	A	Dsicouted Rate	N/A					
19								
20								
21						Years		
22	B	Timeline	0	1	2	3	4	5
23	C	Cash Flow	N/A	N/A	N/A	N/A	N/A	N/A
24	D	DCF	=C7*(1+$C$2)^C6	=D7/(1+$C$2)^D6	=E7/(1+$C$2)^E6	=F7/(1+$C$2)^F6	=G7/(1+$C$2)^G6	=H7/(1+$C$2)^H6
25								
26	F	DCF Inflow	=SUM(D8:H8)					
27	G	DCF Outflow	=C8					
28	H	Net Adjusted DCF	=C10+C11					
29								
30	I	NPV	=SUM(C8:H8)					

Figure 5.18: *DCF Example 2*

As we can see in *Figure 5.18*, the net adjusted DCF is 2.21, so the investment could be good.

Free Cash Flow

Free Cash Flow (**FCF**) represents the cash a company generates after accounting for cash outflows to support operations and maintain its capital assets. The free cash flow is a measure of profitability that excludes non-cash expenses like depreciation and spendings on equipment and assets, and changes in working capital from the balance sheet.

Free cash flow is an important assessment as it shows how efficient a company is at generating cash. Investors use free cash flow to measure whether a company might have enough cash to pay dividends or pay for share buybacks. In addition, the more free cash flow a company has, the better its position to repay debt and reinvest, making it an attractive choice for investors.

The cash a firm generates after deducting cash outflows for operating expenses and capital asset maintenance is known as **Free Cash Flow** (**FCF**). It is a metric of profitability that takes out of the balance sheet non-cash expenditures, including depreciation, spending on assets and equipment, and adjustments to working capital.

Free cash flow analysis is crucial because it reveals how well a business generates cash. Using free cash flow, investors can determine whether a company has enough money to repurchase shares or pay dividends. Additionally, A business becomes more appealing as it strengthens its ability to pay off debt and reinvest the additional free cash flow it generates..

There are three methods to calculate FCF:

Using operating cash flowFCF = Operating Cash Flow – Capital Expenditure

- Using Sales Revenue

  FCF = Sales Revenue – (Operating Cost + Taxes) – investment needed in operating capital

- Using Operating Profit

  FCF = Total Operating Profit with Taxes – total investment in operating capital

	A	B
1	**Income Statement**	
2	**Total Revenue**	**1100000**
3	**COGS**	**600000**
4	**Operating Expenses**	**100000**
5	**D&A**	**30000**
6	**Interest**	**50000**
7	**Income Tax**	**100000**
8	**Net Income**	**220000**
9		
10	**Balance Sheet Components**	
11	**Current Assets**	**500000**
12	**Current Liabilities**	**300000**
13	**Fixed Assets**	**1200000**
14		
15	**Free Cash Flow**	
16	**FCF**	**1250000**
17	**FCF = Net Income - (Current**	
18	**Assets - Current Liabilities) +**	
19	**(D & A + Fixed Assets)**	

Figure 5.19: *FCF Example*

As we can see in *Figure 5.19*, FCF is 12,50,000/-, which means it is positive and capital expenditure is less than the operating income, so the company has enough money to pay for expansion or other required operations.

PMT Formula and Data Table in Excel

We are calculating the EMI to be paid at a certain interest rate for a certain period. The formula is shown in *Figure 5.20*.

We must pay 4866.33 every month for EMI, and the total amount will be 291980.08 over a period of 5 years @ 8% per annum cost, as shown in *Figure 5.20*.

Now, we want to know the PMT if we will pay it in various years and at different rates. Excel has an option that allows us to can check the PMTs at different rates and for different periods. Let's take the same example:

	A	B	C	D
1	INPUT		For Calculations	Remark
2	Principal	240000	240000	Loan Taken
3	Years	5	60	Years convert in Months
4	Int. Rate	8%	0.67%	Annual Interest convert in Monthly Interest Rate
5				
6	OUTPUT		Excel Formula	Remark
7	PMT	4866.33	=PMT(C4,C3,-C2)	Monthly EMI
8	PMT without converting Years and Int. Rate	4866.33	=PMT(B4/12, B3*12,-B2)	Monthly EMI, Int. Rate/12 and Year *12
9	Total PMT	291980.08	=B7*C3	Total payment during the period
10	Total Interest Paid	51980.08	=B9-B2	Interest Paid

Figure 5.20: *PMT Formula*

1. First, we need to mention different rates in columns and different time in rows, as shown in *Figure 5.21*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	INPUT		For Calculations	Remark			4866.33	2	3	4	5	6	7	8	9	10
2	Principal	240000	240000	Loan Taken			5.00%									
3	Years	5	60	Years convert in Months			5.50%									
4	Int. Rate	8%	0.67%	Annual Interest convert in Monthly Interest Rate			6.00%									
5							6.50%									
6	OUTPUT		Excel Formula	Remark			7.00%									
7	PMT	4866.33	=PMT(C4,C3,-C2)	Monthly EMI			7.50%									
8	PMT without converting Years and Int. Rate	4866.33	=PMT(B4/12, B3*12,-B2)	Monthly EMI, Int. Rate/12 and Year *12			8.00%									
9	Total PMT	291980.08	=B7*C3	Total payment during the period			8.50%									
10	Total Interest Paid	51980.08	=B9-B2	Interest Paid			9.00%									
11							9.50%									
12							10.00%									

Figure 5.21: *Interest Rate in Column and Years in Rows*

We put interest rate 5% to 10% with ½ % of increment, and 2 to 10 years with 1-year increment. And assign Top Row and link PMT cell value B7 with G1 i.e.G1 = B7

2. Select all cells from G1 :P12
3. Select what if analysis – Data Table. Refer to the following figure:

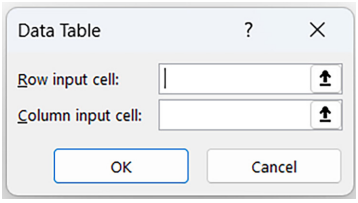


Figure 5.22: *Data Table Dialog Box*

As we can see in *Figure 5.22*, Data Table Dialog Box will appear.

4. Select the row input cell and column input cell, as shown in *Figure 5.23*:

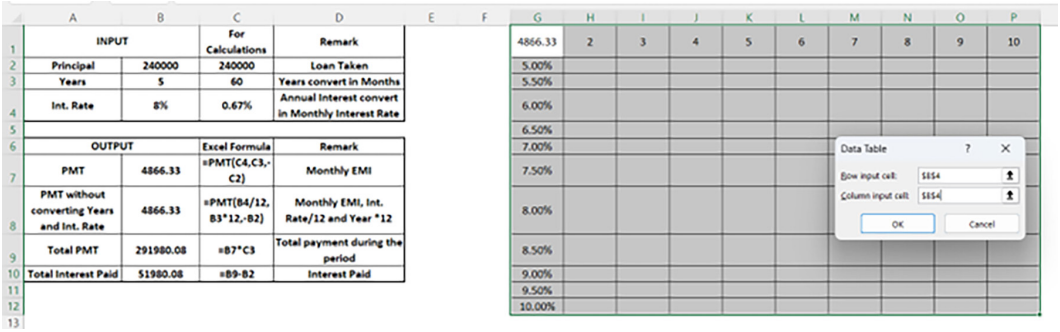


Figure 5.23: *Data Table Input Cells*

As we can see in *Figure 5.23*, we put Row Input Cell with years Cell B3 and Column Input Cell with cell B4 where interest rate is mentioned. Click on OK.

5. We will get the desired result.

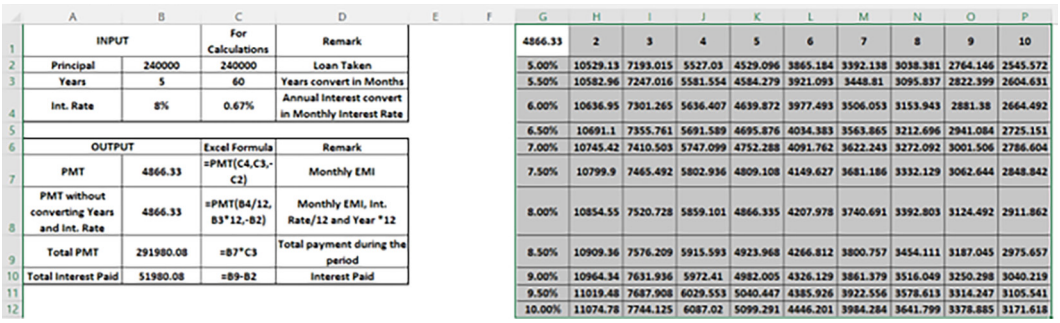


Figure 5.24: *Data Table Result*

Figure 5.24 shows the EMIs calculation with various periods and various rates.

Loan Schedule

As accounting and finance professionals, we must be aware of how to create a loan schedule. A loan schedule shows us the monthly EMI payable, the principal amount paid till date and the interest paid till date.

Loan schedule calculation is shown in *Figure 5.25*:

	A	B	C	D	E
33	27	₹ 4,866.33	₹ 984.04	₹ 3,882.30	₹ 1,43,723.60
34	28	₹ 4,866.33	₹ 958.16	₹ 3,908.18	₹ 1,39,815.42
35	29	₹ 4,866.33	₹ 932.10	₹ 3,934.23	₹ 1,35,881.19
36	30	₹ 4,866.33	₹ 905.87	₹ 3,960.46	₹ 1,31,920.73
37	31	₹ 4,866.33	₹ 879.47	₹ 3,986.86	₹ 1,27,933.87
38	32	₹ 4,866.33	₹ 852.89	₹ 4,013.44	₹ 1,23,920.43
39	33	₹ 4,866.33	₹ 826.14	₹ 4,040.20	₹ 1,19,880.23
40	34	₹ 4,866.33	₹ 799.20	₹ 4,067.13	₹ 1,15,813.09
41	35	₹ 4,866.33	₹ 772.09	₹ 4,094.25	₹ 1,11,718.85
42	36	₹ 4,866.33	₹ 744.79	₹ 4,121.54	₹ 1,07,597.30
43	37	₹ 4,866.33	₹ 717.32	₹ 4,149.02	₹ 1,03,448.28
44	38	₹ 4,866.33	₹ 689.66	₹ 4,176.68	₹ 99,271.61
45	39	₹ 4,866.33	₹ 661.81	₹ 4,204.52	₹ 95,067.08
46	40	₹ 4,866.33	₹ 633.78	₹ 4,232.55	₹ 90,834.53
47	41	₹ 4,866.33	₹ 605.56	₹ 4,260.77	₹ 86,573.76
48	42	₹ 4,866.33	₹ 577.16	₹ 4,289.18	₹ 82,284.58
49	43	₹ 4,866.33	₹ 548.56	₹ 4,317.77	₹ 77,966.81
50	44	₹ 4,866.33	₹ 519.78	₹ 4,346.56	₹ 73,620.25
51	45	₹ 4,866.33	₹ 490.80	₹ 4,375.53	₹ 69,244.72
52	46	₹ 4,866.33	₹ 461.63	₹ 4,404.70	₹ 64,840.02
53	47	₹ 4,866.33	₹ 432.27	₹ 4,434.07	₹ 60,405.95
54	48	₹ 4,866.33	₹ 402.71	₹ 4,463.63	₹ 55,942.32
55	49	₹ 4,866.33	₹ 372.95	₹ 4,493.39	₹ 51,448.94
56	50	₹ 4,866.33	₹ 342.99	₹ 4,523.34	₹ 46,925.59
57	51	₹ 4,866.33	₹ 312.84	₹ 4,553.50	₹ 42,372.10
58	52	₹ 4,866.33	₹ 282.48	₹ 4,583.85	₹ 37,788.24
59	53	₹ 4,866.33	₹ 251.92	₹ 4,614.41	₹ 33,173.83
60	54	₹ 4,866.33	₹ 221.16	₹ 4,645.18	₹ 28,528.65
61	55	₹ 4,866.33	₹ 190.19	₹ 4,676.14	₹ 23,852.51
62	56	₹ 4,866.33	₹ 159.02	₹ 4,707.32	₹ 19,145.19
63	57	₹ 4,866.33	₹ 127.63	₹ 4,738.70	₹ 14,406.49
64	58	₹ 4,866.33	₹ 96.04	₹ 4,770.29	₹ 9,636.20
65	59	₹ 4,866.33	₹ 64.24	₹ 4,802.09	₹ 4,834.11
66	60	₹ 4,866.33	₹ 32.23	₹ 4,834.11	₹ 0.00
67	Excel Formula	=PMT($C$4,$C$3,-$C$2)	=IPMT($C$4,A66,$C$3,-$C$2)	=PPMT($C$4,A66,$C$3,-$C$2)	=E65-D66

Figure 5.25: *Loan Schedule*

As we can see in *Figure 5.25*, we can calculate loan schedules easily.

Conclusion

In this chapter, we learnt a lot about factors and indicators for the purpose of investment. NPV and IRR are the most common indicators to determine whether the investment should be made. Business valuation depends on major factors like DCF and FCF. We also know how to compute a loan schedule.

In the next chapter, we will learn what financial modeling is and how to create financial modeling in Excel.

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Chapter 6
Financial Modeling and Cash Flow Modeling

Introduction

Till now, our progress is on the mark. We have completed five chapters, and now we are ready to go one step further to learn more about Excel for accounting and finance. In this chapter, we will learn about financial modeling.

This chapter is a step-by-step guide to calculating financial modeling and cash flow statement/modeling in Excel.

Structure

- What is Financial Modeling?
- Creating a Financial Modeling

Objectives

With financial modeling, we can understand the financial future of a business as per historical data. We will be able to analyze the financial modeling and future cash flow.

What is Financial Modeling?

Financial modelling is the process of creating a summary of a company's expenses and earnings in the form of a spreadsheet (MS Excel) that can be used to calculate the impact of a future event or decision.

Financial modelling is a tool for determining likely financial outcomes based on a company's historical performance and assumptions about future revenue, expenses, and other variables. It relies on financial forecasts: It takes a forecast's assumptions and plays them out using a company's financial statements to show how those statements may look in the future. As models are created from financial statements, they most often generate results for a month, quarter, or year.

A financial model is simply a tool that's a built-in spreadsheet software, such as MS Excel, to forecast a business' financial performance into the future. The forecast is typically based on the company's historical performance and assumptions about the future, and it requires preparing an income statement, balance sheet, cash flow statement, and supporting schedules (known as a three-statement model).

Use of Financial Modelling: The output of a financial model is used for decision-making and performing financial analysis, whether inside or outside of the company. Inside a company, executives will use financial models to make decisions about the following:

- Growing the business
- Raising capital (debt/equity)
- Valuing a business
- Selling/buying or divesting/investing assets and business units

Creating Financial Modeling

Now, let's learn how to create financial modeling:

1. **Mapping**: First, we will have an unarranged set of data from the income statement. We must map this to create the output income statement.

	A	B	C	D
1	Particulars (Figures in Lakh)	2019-20	2020-21	2021-22
2	Revenue from Sale of TV	774.2	760.5	740.67
3	Revenue from Sale of AC	543	534	552.47
4	Revenue from Sale of Fridge	268	354.17	335.98
5	Direct Material 1	326.34	340.08	307.84
6	Direct Material 2	172.89	173.34	154
7	Direct Material 3	164.22	148.77	168.48
8	Direct Material 4	79.8	74	71.4
9	Direct Labor	236.43	207.92	247.25
10	Indirect Material	70.4	85	83.43
11	Indirect Labor	41.04	34.96	40.68
12	Direct Utilies	42.32	41.65	53.58
13	Insurance & Property Tax	1.96	2.28	2.2
14	Interest to Bank	19.22	18.48	15.43
15	Interest to Lenders	18.67	16.55	15.32
16	Commission	8.5	11.88	10.5
17	Packing Expenses	13.91	12.46	12.48
18	Shiping Expenses	25.53	24	23
19	Salaries	148.5	197.75	167.66
20	Office Rent	30.9	28.8	26.7
21	Advertisment	72.8	81.6	69.66
22	Depriciation	73.92	78	85
23	Taxes	11.36	21.35	22.35
24				

Figure 6.1: *Unarranged Data of Income Statement*

As we can see in *Figure 6.1*, the data is unarranged, and we must do mapping for this unarranged data to build an output income statement.

Income statement has the calculation as shown in *Table 6.1*:

Figures in Lakh
Revenue
Cost of goods sold
Gross Profit
Operating expenses
EBITDA
D&A
EBIT
Interest expenses
EBT
Taxes
Net Income

Table 6.1*: Income Statement calculation*

Let's map the data of *Figure 6.1* as shown in *Table 6.1*.

Insert a column between Particulars and 2019-20, and give the name as per *Table 6.1*. Refer to the following figure:

	A	B	C	D	E
1	Particulars (Figures in Lakh)	Mapping	2019-20	2020-21	2021-22
2	Revenue from Sale of TV	Revenue	774.2	760.5	740.67
3	Revenue from Sale of AC	Revenue	543	534	552.47
4	Revenue from Sale of Fridge	Revenue	268	354.17	335.98
5	Direct Material 1	Cost of Goods Sold	326.34	340.08	307.84
6	Direct Material 2	Cost of Goods Sold	172.89	173.34	154
7	Direct Material 3	Cost of Goods Sold	164.22	148.77	168.48
8	Direct Material 4	Cost of Goods Sold	79.8	74	71.4
9	Direct Labor	Cost of Goods Sold	236.43	207.92	247.25
10	Indirect Material	Cost of Goods Sold	70.4	85	83.43
11	Indirect Labor	Cost of Goods Sold	41.04	34.96	40.68
12	Direct Utilies	Cost of Goods Sold	42.32	41.65	53.58
13	Insurance & Property Tax	Cost of Goods Sold	1.96	2.28	2.2
14	Interest to Bank	Interest Expenses	19.22	18.48	15.43
15	Interest to Lenders	Interest Expenses	18.67	16.55	15.32
16	Commission	Operating Expenses	8.5	11.88	10.5
17	Packing Expenses	Operating Expenses	13.91	12.46	12.48
18	Shiping Expenses	Operating Expenses	25.53	24	23
19	Salaries	Operating Expenses	148.5	197.75	167.66
20	Office Rent	Operating Expenses	30.9	28.8	26.7
21	Advertisment	Operating Expenses	72.8	81.6	69.66
22	Depriciation	D&A	73.92	78	85
23	Taxes	Taxes	11.36	21.35	22.35

Figure 6.2: *Mapping of data of Income Statement*

Figure 6.2 is the mapping of data of income statement to build an output income statement.

2. Now, create an output income statement as per the given data for every year:
   i. First, create the format for income statement.

	A	B	C	D
1	**Income Statement**			
2				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**
4	Revenue			
5	Cost of goods sold			
6	**Gross Profit**			
7	Operating expenses			
8	**EBITDA**			
9	D&A			
10	**EBIT**			
11	Interest expenses			
12	**EBT**			
13	Taxes			
14	**Net Income**			

Figure 6.3: *Income Statement Format*

ii. As shown in *Figure 6.3*, we have created the format of income statement.

3. Now we put figures in the format with Sumifs formula **`in Revenue, Cost of goods sold, Operating Expenses, D & A, Interest Expenses and Taxes rows.`** We will get all these in *Figure 6.4*:

	A	B	C	D
1	**Income Statement**			
2				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**
4	Revenue	1,585.20	1,648.67	1,629.12
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)
6	**Gross Profit**			
7	Operating expenses	(300.14)	(356.49)	(310.00)
8	**EBITDA**			
9	D&A	(73.92)	(78.00)	(85.00)
10	**EBIT**			
11	Interest expenses	(37.89)	(35.03)	(30.75)
12	**EBT**			
13	Taxes	(11.36)	(21.35)	(22.35)
14	**Net Income**			

Figure 6.4: *Figures inserted in the format of Income Statement*

=SUMIFS(Data_of_Income_Statement!C$2:C$23,Data_of_Income_Statement!$B$2:$B$23,Income_Statement!$A4) is the formula used in cell B4 in *Figure 6.4* for **`Revenue`**.

4. Copy and paste the formula in C4:D4 to get the other values of **`Revenue`** *=-SUMIFS(Data_of_Income_Statement!C$2:C$23,Data_of_Income_Statement!$B$2:$B$23,Income_Statement!$A5)* is the formula used in B5 as shown in Figure 6.5 for **`Cost of goods sold`**.

   Copy and paste the formula in cell C5:D5 to get the other values of **`COGS`**.

   Now, copy all 4 cells together (B5:D5) and paste in B7:D7, B9:D9, B11:D11 and B13:D13 to get the values of **`Operating Expenses`**, **`D&A, Interest Expenses and Taxes`**.

5. Now fille the remaining line items to complete the income statement.

   Now, we get gross profit from *Revenue – Cost of Goods Sold, EBITDA = Gross Profit – Operating expenses, EBIT = EBITA – D&A, EBT = EBIT – Interest Expenses, Net Income = EBT – Taxes*, as shown in *Figure 6.5*:

	A	B	C	D
1	**Income Statement**			
2				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**
4	Revenue	1,585.20	1,648.67	1,629.12
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**
7	Operating expenses	(300.14)	(356.49)	(310.00)
8	**EBITDA**	**149.66**	**184.18**	**190.26**
9	D&A	(73.92)	(78.00)	(85.00)
10	**EBIT**	**75.74**	**106.18**	**105.26**
11	Interest expenses	(37.89)	(35.03)	(30.75)
12	**EBT**	**37.85**	**71.15**	**74.51**
13	Taxes	(11.36)	(21.35)	(22.35)
14	**Net Income**	**26.49**	**49.80**	**52.16**

Figure 6.5: *Figures interested in all calculation cells*

Figure 6.5 is the output income statement after all calculations.

6. Now we move forward to the balance sheet.

	A	B	C	D
1	**Balance Sheet**			
2				
3				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**
5	Trade Receivables	122.32	126.94	88.26
6	Inventory	87.55	66.24	85.80
7	Fixed Assets	512.33	478.90	433.60
8	Cash	50.50	87.66	130.43
9	Other Assets	38.56	34.24	53.44
10	**Assets**	**811.26**	**793.98**	**791.53**
11				
12	Trade Payables	101.04	121.05	151.28
13	Provisions	35.86	21.13	31.86
14	Debts	482.93	408.89	318.58
15	Other Liabilities	36.14	32.99	28.12
16	Equity	155.29	209.92	261.69
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**
18				
19	Check	0.00	0.00	0.00

Figure 6.6: *Historic Balance Sheet*

Figure 6.6 is the balance sheet of company for 19-20, 20-21 and 21-22.

7. Now, we will add the forecasting period.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**								
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Figure 6.7: *Adding Forecasting Period in Income Statement*

As shown in *Figure 6.7*, we have added 22-23, 23-24,24-25,25-26 and 26-27 for the next 5 years' forecasting.

8. Now we will add scenarios.

Revenue % growth: Year on Year (YoY) growth/variance percentages to estimate forecasting period.

`Best Case, Base Case, Worst Case`: We create cases with **`Best, Base and Worst Cases`**.

`COGS as % of revenue`: **`Cost of Goods Sold`** percentage against revenue to calculate **`COGS`** for forecasting periods.

`Best Case, Base Case, Worst Case` – We create cases with **`Best, Base and Worst Cases`**.

`OpEx as % of revenue`: **`Operating Expenses`** percentage against revenue to calculate **`OpEx`** for forecasting periods.

`Best Case, Base Case, Worst Case` – We create cases with **`Best, Base and Worst Cases.`**

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**						
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**								
18	**Selected Case**								
19	Best case								
20	Base case								
21	Worst case								
22									
23	**Cogs as % of Revenues**								
24	**Selected Case**								
25	Best case								
26	Base case								
27	Worst case								
28									
29	**Opex as % of Revenues**								
30	**Selected Case**								
31	Best case								
32	Base case								
33	Worst case								

Figure 6.8: *Adding Scenarios*

We also add a cell for scenario for the selection of **`Best Case, Base Case, Worst Case`**. Calculation formula of **`Gross Profit, EBITDA, EBIT, EBT and Net Income`**. Currently, it is zero, as shown in *Figure 6.8*.

9. Now we will calculate **`Revenuergrowth, COGS as % of revenue`** and **`OpEx as % of revenue`** for the past years, as shown in *Figure 6.9*:

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**						
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%					
18	**Selected Case**								
19	Best case								
20	Base case								
21	Worst case								
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%					
24	**Selected Case**								
25	Best case								
26	Base case								
27	Worst case								
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%					
30	**Selected Case**								
31	Best case								
32	Base case								
33	Worst case								

Figure 6.9: *Calculation of various metrics*

Revenue Growth = (Current Year – Previous Year)/Current Year

Cell C17 =ROUND((C4-B4)/C4,3) D17 =ROUND((D4-C4)/D4,3)

`COGS as % of Revenue = COGS/Revenue`

B23 = ROUND (B5/B4,3) and copy paste this to the next two cells

`OpEx as % of Revenue = Opex/Revenue`

B29 =ROUND(B7/B4,3) and copy paste this to the next two cells

And we cannot create case scenarios for historical years, so all scenarios are the same for the past years, as shown in *Figure 6.10*:

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**						
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%					
18	**Selected Case**								
19	Best case		3.80%	-1.20%					
20	Base case		3.80%	-1.20%					
21	Worst case		3.80%	-1.20%					
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%					
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%					
26	Base case	-71.6%	-67.2%	-69.3%					
27	Worst case	-71.6%	-67.2%	-69.3%					
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%					
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%					
32	Base case	-18.9%	-21.6%	-19.0%					
33	Worst case	-18.9%	-21.6%	-19.0%					

Figure 6.10: *All Scenarios are the same for the past years*

As we can see in *Figure 6.10,* we have the same case scenarios in all three metrics. We just used equal to formula for **`Selected Case in Best Case, Base Case and Worst Case`** **for revenue % COGS % and OpEx %**

10. Now we have figures of percentages of all metrics. The next step is to create **`Best Case, Base Case and Worst-Case`** scenarios for all three metrics.
    i. We will take the best percentage between **`COGS as % of revenue and OpEx as % of revenue, best case and worst percentage`** for **`worst case`**, and average of all three years for **`base case`**.

ii. For revenue growth, we have only two percentages, so we will take the lowest as the worst, the highest as the best, and the average of both as the base case.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**						
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%					
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%					
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%					
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.11: *Forecasting years percentages*

11. Feed all percentages in forecasting years, as shown in *Figure 6.11*.
    i. Excel formula is used in all scenarios, as shown in *Figure 6.12*:

Scenarios:								
Revenue % growth		=ROUND((C4-B4)/C4,3)	=ROUND((D4-C4)/D4,3)					
Selected Case								
Best case		=C17	=D17	=ROUND(MAX(C19:D19),3)	=E19	=F19	=G19	=H19
Base case		=C19	=D19	=ROUND(AVERAGE(C20:D20),3)	=E20	=F20	=G20	=H20
Worst case		=C20	=D20	=ROUND(MIN(C21:D21),3)	=E21	=F21	=G21	=H21
Cogs as % of Revenues	=ROUND(E	=ROUND(C5/C4,3)	=ROUND(D5/D4,3)					
Selected Case								
Best case	=B23	=C23	=D23	=ROUND(MAX(B25:D25),3)	=E25	=F25	=G25	=H25
Base case	=B25	=C25	=D25	=ROUND(AVERAGE(B26:D26),3)	=E26	=F26	=G26	=H26
Worst case	=B26	=C26	=D26	=ROUND(MIN(B27:D27),3)	=E27	=F27	=G27	=H27
Opex as % of Revenues	=ROUND(E	=ROUND(C7/C4,3)	=ROUND(D7/D4,3)					
Selected Case								
Best case	=B29	=C29	=D29	=MAX(B31:D31)	=E31	=F31	=G31	=H31
Base case	=B31	=C31	=D31	=ROUND(AVERAGE(B32:D32),3)	=E32	=F32	=G32	=H32
Worst case	=B32	=C32	=D32	=MIN(B33:D33)	=E33	=F33	=G33	=H33

Figure 6.12: *Excel Formula in Scenarios*

ii. As we can see in *Figure 6.12*, the **`MAX, AVERAGE, & MIN`** functions are used for the **`Best, Base & Worst Case`**, respectively.

12. Now we need to create a drop-down list in cell D1 and create a VLookup formula for the selected case. Let's see how:

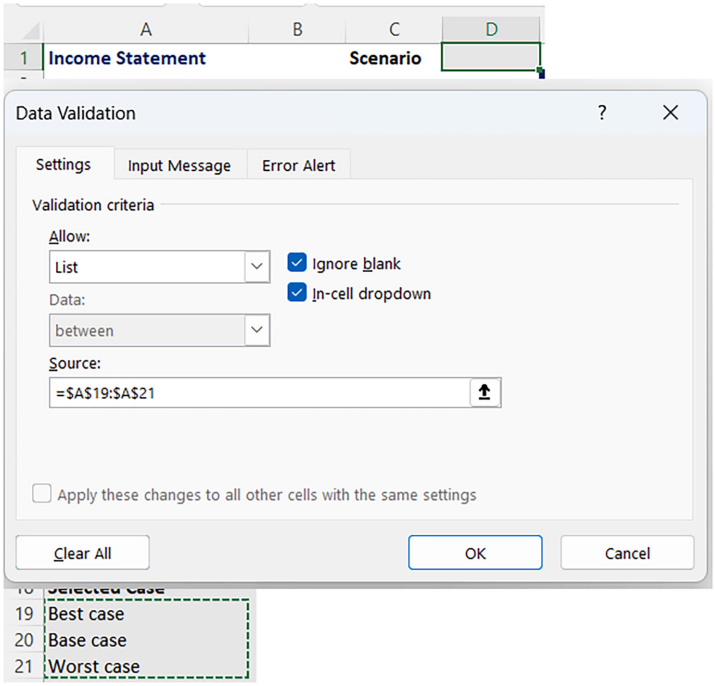

Figure 6.13: *Drop-Down Dialog Box for Scenarios*

i. As we can see in *Figure 6.13*, we have selected A19:A21 as the drop-down list in Source in data validation dialog box (to learn about drop-down lists, refer to *Chapter 1, Getting Started With Advance Excel*).

ii. Then, click on **OK**.

13. Cell No. E18 to I18 are to be used for **Revenue Growth** percentages, Cell No. E24 to I24 for COGS as % of **Revenue** and E30 to I30 for selected cases with VLOOKUP functions.

    Cell E18 to I18=VLOOKUP($D$1,$A$19:$I$21,COLUMN(),0) for revenue % growth

    Where Column() denotes the column number that is required for the VLOOKUP formula.

    Column A counts as 1, B as 2, C as 3, D as 4, E as 5, F as 6, G as 7, H as 8 and I as 9.

    Cell E24 to I24 =VLOOKUP($D$1,$A$25:$I$27,COLUMN(),0) for **COGS as % of revenue**.

    Cell E30 to I30 =VLOOKUP($D$1,$A$31:$I$33,COLUMN(),0) for **OpEx as % of revenue**, as shown in *Figure 6.14*:

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Base case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.14: *Scenario Percentage in Selected Case*

As we can see in *Figure 6.14*, we have selected the **`Best Case`**, and the **`Selected Case`** is showing the **`Best Case`** percentages.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Best case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12					
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)					
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
7	Operating expenses	(300.14)	(356.49)	(310.00)					
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.15: *Best-Case Scenario Selected case*

i. As we can see in *Figure 6.15*, when we select the best case, we get the base case percentages in the selected case cells; the same will happen for the worst case.

14. Now, it's time to move forward and work on the balance sheet and calculate DSO, DPO and DIO (We have learnt about this in *Chapter 4, Working Capital*) and forecasting for next 5 years

    We also add Other Liabilities % , Other Assets % and Provision % with the previous working capital metrics.

	A	B	C	D
1	**Balance Sheet**			
2				
3				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**
5	Trade Receivables	122.32	126.94	88.26
6	Inventory	87.55	66.24	85.80
7	Fixed Assets	512.33	478.90	433.60
8	Cash	50.50	87.66	130.43
9	Other Assets	38.56	34.24	53.44
10	**Assets**	**811.26**	**793.98**	**791.53**
11				
12	Trade Payables	101.04	121.05	151.28
13	Provisions	35.86	21.13	31.86
14	Debts	482.93	408.89	318.58
15	Other Liabilities	36.14	32.99	28.12
16	Equity	155.29	209.92	261.69
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**
18				
19	Check	0.00	0.00	0.00
20				
21	DSO			
22	DPO			
23	DIO			
24	Other assets %			
25	Other liabilities %			
26	Provision %			

Figure 6.16: *Metrics added in Balance Sheets*

As we can see in *Figure 6.16*, we have added metrics in balance sheets.

15. Now we will calculate with formulas that we learnt in *Chapter 4, Working Capital*:

DSO = Trade Receivable/Revenue*365

DPO = Trade Payable/Revenue*365

DIO = Inventory/Revenue*365

Other Assets % = Other Assets/Revenue

Other Liabilities % = Other Liabilities/Revenue

Provision % = Provisions/Revenue

Now, put the previous formula in Excel. We can get revenue from the income statement sheet.

	A	B	C	D
1	**Balance Sheet**			
2				
3				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**
5	Trade Receivables	122.32	126.94	88.26
6	Inventory	87.55	66.24	85.80
7	Fixed Assets	512.33	478.90	433.60
8	Cash	50.50	87.66	130.43
9	Other Assets	38.56	34.24	53.44
10	**Assets**	**811.26**	**793.98**	**791.53**
11				
12	Trade Payables	101.04	121.05	151.28
13	Provisions	35.86	21.13	31.86
14	Debts	482.93	408.89	318.58
15	Other Liabilities	36.14	32.99	28.12
16	Equity	155.29	209.92	261.69
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**
18				
19	Check	0.00	0.00	0.00
20				
21	DSO	28.2	28.1	19.8
22	DPO	23.3	26.8	33.9
23	DIO	20.2	14.7	19.2
24	Other assets %	2.4%	2.1%	3.3%
25	Other liabilities %	2.3%	2.0%	1.7%
26	Provision %	2.3%	1.3%	2.0%

Figure 6.17: *Putting Formulas in Balance Sheet for Various Metrics*

As we can see in *Figure 6.17*, we have found the **`DSO, DPO and DIO`**, along with **`Other Assets %`** and **`Other Liabilities`**.

Formula used for all three years are mentioned in *Figure 6.18*:

29	DSO	=ROUND(B4/Income_Statement!B4*365,1)	=ROUND(C4/Income_Statement!C4*365,1)	=ROUND(D4/Income_Statement!D4*365,1)
30	DPO	=ROUND(B11/Income_Statement!B4*365,2)	=ROUND(C11/Income_Statement!C4*365,2)	=ROUND(D11/Income_Statement!D4*365,2)
31	DIO	=ROUND(B5/Income_Statement!B4*365,1)	=ROUND(C5/Income_Statement!C4*365,1)	=ROUND(D5/Income_Statement!D4*365,1)
32	Other assets %	=ROUND(B8/Income_Statement!B4,3)	=ROUND(C8/Income_Statement!C4,3)	=ROUND(D8/Income_Statement!D4,3)
33	Other liabilities %	=ROUND(B14/Income_Statement!B4,3)	=ROUND(C14/Income_Statement!C4,3)	=ROUND(D14/Income_Statement!D4,3)
34	Provision %	=ROUND(B12/Income_Statement!B4,3)	=ROUND(C12/Income_Statement!C4,3)	=ROUND(D12/Income_Statement!D4,3)

Figure 6.18: *Excel formula for DSO,DPO and DIO along with Other assets % , other liabilities % and Povision %*

Figure 6.18 shows the formulas used for various components' calculations.

16. The next step is to add the forecasting period in the balance sheet and estimation calculations for the forecasting period.

    Let's add the forecasting period in Balance Sheet, and we average all three historical periods for all five metrics to get the estimation for the first year of forecasting, which is the year ending 31 March 2023.

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					**Forecast**				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26					
6	Inventory	87.55	66.24	85.80					
7	Fixed Assets	512.33	478.90	433.60					
8	Cash	50.50	87.66	130.43					
9	Other Assets	38.56	34.24	53.44					
10	**Assets**	**811.26**	**793.98**	**791.53**					
11									
12	Trade Payables	101.04	121.05	151.28					
13	Provisions	35.86	21.13	31.86					
14	Debts	482.93	408.89	318.58					
15	Other Liabilities	36.14	32.99	28.12					
16	Equity	155.29	209.92	261.69					
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**					
18									
19	Check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%
27									

Figure 6.19: *Forecasting of Metrics in Balance Sheet*

As we can see in *Figure 6.19*, we get **`DSO, DPO, DIO, Other Assets %`**, **`Other Liabilities % Provision %`** to be 25.4, 28.0, 18.0,2.6%, 2.0% and 1.9%, respectively for the first year forecasting.

The formulas used to calculate forecasting of metrics in balance sheet are shown in *Figure 6.20*

20	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
21	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
22	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
23	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
24	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
25	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%
26									
27									
28									
29									
30	DSO				=ROUND(AVERAGE(B20:D20),1)	=ROUND(AVERAGE(C20:E20),1)	=ROUND(AVERAGE(D20:F20),1)	=ROUND(AVERAGE(E20:G20),1)	=ROUND(AVERAGE(F20:H20),1)
31	DPO				=ROUND(AVERAGE(B21:D21),1)	=ROUND(AVERAGE(C21:E21),1)	=ROUND(AVERAGE(D21:F21),1)	=ROUND(AVERAGE(E21:G21),1)	=ROUND(AVERAGE(F21:H21),1)
32	DIO				=ROUND(AVERAGE(B22:D22),1)	=ROUND(AVERAGE(C22:E22),1)	=ROUND(AVERAGE(D22:F22),1)	=ROUND(AVERAGE(E22:G22),1)	=ROUND(AVERAGE(F22:H22),1)
33	Other assets %				=ROUND(AVERAGE(B23:D23),3)	=ROUND(AVERAGE(C23:E23),3)	=ROUND(AVERAGE(D23:F23),3)	=ROUND(AVERAGE(E23:G23),3)	=ROUND(AVERAGE(F23:H23),3)
34	Other liabilities %				=ROUND(AVERAGE(B24:D24),3)	=ROUND(AVERAGE(C24:E24),3)	=ROUND(AVERAGE(D24:F24),3)	=ROUND(AVERAGE(E24:G24),3)	=ROUND(AVERAGE(F24:H24),3)
35	Provision %				=ROUND(AVERAGE(B25:D25),3)	=ROUND(AVERAGE(C25:E25),3)	=ROUND(AVERAGE(D25:F25),3)	=ROUND(AVERAGE(E25:G25),3)	=ROUND(AVERAGE(F25:H25),3)

Figure 6.20: *Formula for Metrics in Balance Sheet*

As we can see in *Figure 6.20*, the average function is used for all metrics, and the averages are rolling forwards averages.

17. Now that we have all forecasting metrics in the balance sheet and **`Income Statement`**, the next step is to calculate the values of **`Income statement`** and balance sheet of the next 5 years from the estimated metrics.

    Now we will calculate the values for the forecasting period in **`Income Statement`**, as shown in *Figure 6.21*:

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Base case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,650.30	1,671.75	1,693.48	1,715.50	1,737.80
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,145.31)	(1,160.19)	(1,175.28)	(1,190.56)	(1,206.03)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**504.99**	**511.56**	**518.20**	**524.94**	**531.77**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(326.76)	(331.01)	(335.31)	(339.67)	(344.08)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
9	D&A	(73.92)	(78.00)	(85.00)					
10	**EBIT**	**75.74**	**106.18**	**105.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.21: *Adding Estimated Values in Forecasting Period of Income Statement*

As we can see in *Figure 6.21*, we get the values of **`Revenue, COGS and OpEx in Income Statement`**. **`D & A, Interest Expenses`** and **`Taxes`** will be calculated later in forecasting.

The formulas used to calculate **`Revenue, COGS and OpEx`** are shown in *Figure 6.22*:

	L	M	N	O	P	Q
		Forecast				
	Figures in Lakh	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
	Revenue	=ROUND(D4*(1+E17),2	=ROUND(E4*(1+F17),2)	=ROUND(F4*(1+G17),2	=ROUND(G4*(1+H17),	=ROUND(H4*(1+I17),2)
	Cost of goods sold	=E4*E23	=F4*F23	=G4*G23	=H4*H23	=I4*I23
	Gross Profit	**=SUM(E4:E5)**	**=SUM(F4:F5)**	**=SUM(G4:G5)**	**=SUM(H4:H5)**	**=SUM(I4:I5)**
	Operating expenses	=ROUND(E4*E29,2)	=ROUND(F4*F29,2)	=ROUND(G4*G29,2)	=ROUND(H4*H29,2)	=ROUND(I4*I29,2)
	EBITDA	**=SUM(E6:E7)**	**=SUM(F6:F7)**	**=SUM(G6:G7)**	**=SUM(H6:H7)**	**=SUM(I6:I7)**
	D&A					
	EBIT	**=SUM(E8:E9)**	**=SUM(F8:F9)**	**=SUM(G8:G9)**	**=SUM(H8:H9)**	**=SUM(I8:I9)**
	Interest expenses					
	EBT	**=ROUND(SUM(E10:E11),2)**	**=ROUND(SUM(F10:F11),2)**	**=ROUND(SUM(G10:G11),2)**	**=ROUND(SUM(H10:H11),2)**	**=ROUND(SUM(I10:I11),2)**
	Taxes					
	Net Income	**=SUM(E12:E13)**	**=SUM(F12:F13)**	**=SUM(G12:G13)**	**=SUM(H12:H13)**	**=SUM(I12:I13)**

***Figure 6.22**: Formula used in Income Statement for Revenue, COGS and OpEx Calculation*

As we can see in *Figure 6.22*, Revenue = Last Year Sales * (1 + Estimated Growth Percentage of that year)

`COGS = Revenue * Estimated Percentage`

`OpEx = Revenue * Estimated Percentage`

`Provisions = Revenue * Estimated Percentage`

18. Now we will work on balance sheet matrics, as shown in *Figure 6.23*.

`Trade Receivable = Revenue/365*DSO`

`Trade Payable = Revenue/365*DPO`

`Inventory = Revenue/365*DIO`

`Other Assets = Revenue * Estimated Percentage`

`Other Liabilities = Revenue * Estimated Percentage`

`Provision = Revenue * Estimated Percentage`

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					**Forecast**				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60					
8	Cash	50.50	87.66	130.43					
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**239.13**	**236.14**	**241.19**	**244.19**	**247.68**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58					
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69					
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**190.97**	**195.75**	**205.87**	**201.65**	**206.18**
18									
19	Check	0.00	0.00	0.00	48.16	40.39	35.32	42.54	41.50
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.23: *Estimated Trade Receivables, Trade Payables, Inventory, Other Assets, Other Liabilities and Provisions*

As we can see in *Figure 6.23*, we get the values of **`Trade Receivables, Trade Payables, Inventory, Other Assets, Other Liabilities and Provision`** for the next 5 years on estimated basis with rolling forward average.

Rolling forward average means for the first year, we use all three historical years, i.e., **`31 Mar 19 to 31 Mar 22`**, while for the second year, we use the last 2 historical years and 1 forecasted year (**`31 Mar 20 to 31 Mar 22`**) and so on.

`Fixed Assets, Cash, Debts, and Equity` will be calculated later in forecasting.

The formulas used for the previous calculations are shown in *Figure 6.24*:

	K	L	M	N	O	P
				Forecast		
	Particulars (Figures in Lakh)	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
	Trade Receivables	=ROUND(Income_Statement!E4/365*E21,2)	=ROUND(Income_Statement!F4/365*F21,2)	=ROUND(Income_Statement!G4/365*G21,2)	=ROUND(Income_Statement!H4/365*H21,2)	=ROUND(Income_Statement!I4/365*I21,2)
	Inventory	=ROUND(Income_Statement!E4/365*E23,2)	=ROUND(Income_Statement!F4/365*F23,2)	=ROUND(Income_Statement!G4/365*G23,2)	=ROUND(Income_Statement!H4/365*H23,2)	=ROUND(Income_Statement!I4/365*I23,2)
	Fixed Assets					
	Cash					
	Other Assets	=ROUND(Income_Statement!E4*E24,2)	=ROUND(Income_Statement!F4*F24,2)	=ROUND(Income_Statement!G4*G24,2)	=ROUND(Income_Statement!H4*H24,2)	=ROUND(Income_Statement!I4*I24,2)
	Assets	**=SUM(E5:E9)**	**=SUM(F5:F9)**	**=SUM(G5:G9)**	**=SUM(H5:H9)**	**=SUM(I5:I9)**
	Trade Payables	=ROUND(Income_Statement!E4/365*E22,2)	=ROUND(Income_Statement!F4/365*F22,2)	=ROUND(Income_Statement!G4/365*G22,2)	=ROUND(Income_Statement!H4/365*H22,2)	=ROUND(Income_Statement!I4/365*I22,2)
	Provisions	=ROUND(Income_Statement!E4*E26,2)	=Income_Statement!F4*F26	=Income_Statement!G4*G26	=Income_Statement!H4*H26	=Income_Statement!I4*I26
	Debts					
	Other Liabilities	=ROUND(Income_Statement!E4*E25,2)	=ROUND(Income_Statement!F4*F25,2)	=ROUND(Income_Statement!G4*G25,2)	=ROUND(Income_Statement!H4*H25,2)	=ROUND(Income_Statement!I4*I25,2)
	Equity					
	Liabilities & Equity	**=SUM(E12:E16)**	**=SUM(F12:F16)**	**=SUM(G12:G16)**	**=SUM(H12:H16)**	**=SUM(I12:I16)**

Figure 6.24: *Formulas used for all five metrics*

As we can see in *Figure 6.24*, all formulas are defined by reveune.

19. Now we will calculate the **`Fixed Assets Forecasting`**.

    Add a new sheet in the Forecasting workbook, rename it as FA and format it and add the values we have from the income statement and balance sheet, as shown in *Figure 6.25*:

	A	B	C	D	E	F	G	H	I
1	**Fixed Assets Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Fixed Assets**		512.33	478.9					
5	D&A		(78.00)	(85.00)					
6	Capex		44.57	39.70					
7	**Closing Fixed Assets**	512.33	478.90	433.60					

Figure 6.25: *Fixed Assets Forecasting Period*

As we can see in *Figure 6.25*, we put whatever values we have.

We have **closing Fixed Assets** (**FA**) in the balance sheet, **`D&A`** in the income statement, and the opening FA is equal to the closing FA of previous years, so we have the opening FA as well.

Only Capex is the new thing in the sheet; it can be calculated with the following formula:

```
Capex = Closing FA – Opening FA + D&A
```

For the year ending 31 Mar 20, we don't have **Opening FA**, so we cannot calculate **Capex** in this case and keep it blank; this is shown in *Figure 6.25*. Now, let's come to the year ending 31 Mar 21.

Opening FA = 512.33, D&A = 78.00 and Closing FA = 478.90

Capex = 478.90 – 512.33 + 78.00 = 44.57 is the result, as shown in *Figure 6.25*.

20. Now, let's add forecasting metrics to forecasting future values, as shown in *Figure 6.26*:

	A	B	C	D	E	F	G	H	I
1	**Fixed Assets Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Fixed Assets**		512.33	478.9					
5	D&A		(78.00)	(85.00)					
6	Capex		44.57	39.70					
7	**Closing Fixed Assets**	512.33	478.90	433.60					
8									
9	D&A as a % of Opening Fixed Assets		-15.2%	-17.7%					
10	Capex as a % of Opening Fixed Assets		8.7%	8.3%					
11									

Figure 6.26: *D&A% and Capex %*

As we can see in *Figure 6.26*, we have defined **D&A** as a % of **Opening Fixed Assets** and **Capex** as a % of **Opening Fixed Assets** to get the future estimates.

D&A as a % of Opening Fixed Assets = D&A/Opening Fixed Assets

Capex as a % of Opening Fixed Assets = Capex/Opening Fixed Assets

Now, rolling forward average the both years for next 5 years, as we did in balance sheet metrics.

	A	B	C	D	E	F	G	H	I
1	**Fixed Assets Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Fixed Assets**		512.33	478.9					
5	D&A		(78.00)	(85.00)					
6	Capex		44.57	39.70					
7	**Closing Fixed Assets**	512.33	478.90	433.60					
8									
9	D&A as a % of Opening Fixed Assets		-15.2%	-17.7%	-16.5%	-17.1%	-16.8%	-17.0%	-16.9%
10	Capex as a % of Opening Fixed Assets		8.7%	8.3%	8.5%	8.4%	8.5%	8.5%	8.5%
11									

Figure 6.27: *Estimate Percentages for the next 5 years*

As we can see in *Figure 6.27*, **DA%** = -16.5% = [(-15.2% + (-17.7%))/2] and **Capex%** = 8.5%= [(8.7%+8.3%)/2] and so on. Refer to the following figure:

9	D&A as a % of Opening Fixed Assets	-15.2%	-17.7%	-16.5%	-17.1%	-16.8%	-17.0%	-16.9%
10	Capex as a % of Opening Fixed Assets	8.7%	8.3%	8.5%	8.4%	8.5%	8.5%	8.5%
11								
12								
13	D&A as a % of Opening Fixed Assets			=ROUND(AVERAGE(C9:D9),3)	=ROUND(AVERAGE(D9:E9),3)	=ROUND(AVERAGE(E9:F9),3)	=ROUND(AVERAGE(F9:G9),3)	=ROUND(AVERAGE(G9:H9),3)
14	Capex as a % of Opening Fixed Assets			=ROUND(AVERAGE(C10:D10),3)	=ROUND(AVERAGE(D10:E10),3)	=ROUND(AVERAGE(E10:F10),3)	=ROUND(AVERAGE(F10:G10),3)	=ROUND(AVERAGE(G10:H10),3)

Figure 6.28: *Formula used for calculation of forecasting period for DA % and Capex %*

21. Next, get the forecasted values.

    `Opening FA` is equal to **`Closing FA`** of the previous year

    `Closing FA = Opening FA + Capex – D&A`

    `D&A` is already in negative format, so we will use the formula =sum(E4:E6) to get **`Closing FA`**, as shown in *Figure 6.29*.

    And we already have the estimated percentages for **`D&A`** and **`Capex`**.

    Lets put the previous calculations/estimations in our sheet, as shown in *Figure 6.29*:

	A	B	C	D	E	F	G	H	I
1	**Fixed Assets Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Fixed Assets**		512.33	478.9	433.60	398.92	364.21	333.98	305.59
5	D&A		(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
6	Capex		44.57	39.70	36.86	33.51	30.96	28.39	25.98
7	**Closing Fixed Assets**	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8									
9	D&A as a % of Opening Fixed Assets		-15.2%	-17.7%	-16.5%	-17.1%	-16.8%	-17.0%	-16.9%
10	Capex as a % of Opening Fixed Assets		8.7%	8.3%	8.5%	8.4%	8.5%	8.5%	8.5%
11									

Figure 6.29: *Estimated Values of Fixed Assets for Forecasting*

As we can see in *Figure 6.29*, we have estimated values of **`Fixed Assets for Forecasting.`**

The formulas used in *Figure 6.29* are shown in *Figure 6.30*:

	Excel Formula				
Particulars (Figures in Lakh)	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
Opening Fixed Assets	=D7	=E7	=F7	=G7	=H7
D&A	=ROUND(E4*E9,2)	=ROUND(F4*F9,2)	=ROUND(G4*G9,2)	=ROUND(H4*H9,2)	=ROUND(I4*I9,2)
Capex	=ROUND(E4*E10,2)	=ROUND(F4*F10,2)	=ROUND(G4*G10,2)	=ROUND(H4*H10,2)	=ROUND(I4*I10,2)
Closing Fixed Assets	=SUM(E4:E6)	=SUM(F4:F6)	=SUM(G4:G6)	=SUM(H4:H6)	=SUM(I4:I6)

Figure 6.30: *Formulas used for Estimated Values of Fixed Assets for Forecasting*

22. Now we put values of **`D&A`** of the forecasted period in the **`Income Statement`**, as shown in *Figure 6.30*, and **`Closing Fixed Assets`** in the balance sheet, as shown in *Figure 6.31*:

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Base case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,650.30	1,671.75	1,693.48	1,715.50	1,737.80
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,145.31)	(1,160.19)	(1,175.28)	(1,190.56)	(1,206.03)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**504.99**	**511.56**	**518.20**	**524.94**	**531.77**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(326.76)	(331.01)	(335.31)	(339.67)	(344.08)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**
11	Interest expenses	(37.89)	(35.03)	(30.75)					
12	**EBT**	**37.85**	**71.15**	**74.51**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**

Figure 6.31: *D&A added in Forecasting Period of Income Statement*

As we can see in *Figure 6.31*, the highlighted cells of **`D&A`** came from **`Fixed Assets`** forecasting.

The formulas used in *Figure 6.32* is as follows:

E9 =FA!E5, F9 = FA!F5 and so on.

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					**Forecast**				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43					
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**638.05**	**600.35**	**575.17**	**549.78**	**527.61**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58					
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69					
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**190.97**	**195.75**	**205.87**	**201.65**	**206.18**
18									
19	Check	0.00	0.00	0.00	447.08	404.60	369.30	348.13	321.43
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.32: *Fixed Assets added in Forecasting Period of Balance Sheet*

As we can see in *Figure 6.32*, we got the values of fixed assets as the highlighted cells.

The formulas used in *Figure 6.33* is as follows:

E6 =FA!E7, F6 =FA!F7 and so on.

23. The next step is to calculate the debt and repayment schedule for the forecasted period.

    Company decides to pay the their all debts in next five years to become debt free and rate of interest of debts are 10%

    First of all, add a new sheet and rename it to Debts; format it as shown in *Figure 6.33* and put the value of closing balance of the last year of the historical period.

	A	B	C	D	E	F	G	H	I
1	**Financial Liabilities Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Debts**								
5	New Debts								
6	Principal Repayment								
7	**Closing Debts**			318.58					
8									
9	**Interest Rate**	**10%**							
10	**Period (In Years)**	**5**							
11	**Installment (PMT)**	**84.04**							

Figure 6.33: *Debts and Principal Repayment Forecasting*

As we can see in *Figure 6.33*, we have the value **`closing balances of Debts`** for FY 21-22 and interest rate 10% and period 5 years. We calculate the **`PMT`** on the basis of the available information.

PMT =ROUND(PMT(B9,B10,-D7),2)

Next, we will make a payment schedule, as shown in *Figure 6.34*:

	A	B	C	D	E	F	G	H	I
1	**Financial Liabilities Forecasting**								
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Debts**								
5	New Debts								
6	Principal Repayment								
7	**Closing Debts**			318.58					
8									
9	**Interest Rate**	**10%**							
10	**Period (In Years)**	**5**							
11	**Installment (PMT)**	**84.04**							
12									
13	**Payment Schedule**								
14	**Years**				**1**	**2**	**3**	**4**	**5**
15	**Installment**				**84.04**	**84.04**	**84.04**	**84.04**	**84.04**
16	**Interest**				**31.86**	**26.64**	**20.90**	**14.59**	**7.64**
17	**Repayment**				**52.18**	**57.40**	**63.14**	**69.45**	**76.40**

Figure 6.34: *Payment Schedule*

As we can see in *Figure 6.34*, we have **`calculated Installment, Interest and Principal Repayment`** with the help of PMT, IPMT and PPMT functions.

Formula used for payment schedule is shown in *Figure 6.35*:

13	**Payment Schedule**								
14	**Years**				**1**	**2**	**3**	**4**	**5**
15	**Installment**				**84.04**	**84.04**	**84.04**	**84.04**	**84.04**
16	**Interest**				**31.86**	**26.64**	**20.90**	**14.59**	**7.64**
17	**Repayment**				**52.18**	**57.40**	**63.14**	**69.46**	**76.40**
18									
19									
20									
21	**Payment Schedule**								
22	**Years**				**1**	**2**	**3**	**4**	**5**
23	**Installment**				**=ROUND(PMT($B$9,$B$10,-**	**=ROUND(PMT($B$9,$B$10,-**	**=ROUND(PMT($B$9,$B$10,-$D$7),2)**	**=ROUND(PMT($B$9,$B$10,-$D$7),2)**	**=ROUND(PMT($B$9,$B$10,-**
24	**Interest**				**=ROUND(IPMT($B$9,E14,$B$10,-$D$7),2)**	**=ROUND(IPMT($B$9,F14,$B$10,-$D$7),2)**	**=ROUND(IPMT($B$9,G14,$B$10,-$D$7),2)**	**=ROUND(IPMT($B$9,H14,$B$10,-$D$7),2)**	**=ROUND(IPMT($B$9,I14,$B$10,-$D$7),2)**
25	**Repayment**				**=ROUND(PPMT($B$9,E14,$B$10,-$D$7),2)**	**=ROUND(PPMT($B$9,F14,$B$10,-$D$7),2)**	**=ROUND(PPMT($B$9,G14,$B$10,-$D$7),2)**	**=ROUND(PPMT($B$9,H14,$B$10,-$D$7),2)**	**=ROUND(PPMT($B$9,I14,$B$10,-$D$7),2)**

Figure 6.35: *Excel Formula for Payment Schedule*

As we can see in *Figure 6.35*, PMT, IPMT and PPMT are used for payment schedule.

24. Now, transfer repayment schedule to Debts Forecasting.

    `Closing Debts` is taken from the balance sheet for the last historical year, and **`Opening Debts`** is equal to Closing Debt of the previous year.

    `Closing Debts for forecasted period = Opening Debts + New Debts – Principal Repayment`

	A	B	C	D	E	F	G	H	I
2					**Forecast**				
3	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
4	**Opening Debts**				318.58	266.40	209.00	145.86	76.40
5	New Debts				0.00	0.00	0.00	0.00	0.00
6	Principal Repayment				(52.18)	(57.40)	(63.14)	(69.46)	(76.40)
7	**Closing Debts**			318.58	266.40	209.00	145.86	76.40	0.00
8									
9	**Interest Rate**	**10%**							
10	**Period (In Years)**	**5**							
11	**Installment (PMT)**	**84.04**							
12									
13	**Payment Schedule**								
14	**Years**				**1**	**2**	**3**	**4**	**5**
15	**Installment**				**84.04**	**84.04**	**84.04**	**84.04**	**84.04**
16	**Interest**				**31.86**	**26.64**	**20.90**	**14.59**	**7.64**
17	**Repayment**				**52.18**	**57.40**	**63.14**	**69.46**	**76.40**
18									

Figure 6.36: *Calculation of Debts and Principal Repayment of Forecasted Period*

As we can see in *Figure 6.36*, **`Debts and Principal Repayment Calculated for Forecasted Period`**

Formula used in forecasted period is shown in *Figure 6.37*:

	Forecast				
Particulars (Figures in Lakh)	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
Opening Debts	=D7	=E7	=F7	=G7	=H7
New Debts	0.00	0.00	0.00	0.00	0.00
Principal Repayment	=-E17	=-F17	=-G17	=-H17	=-I17
Closing Debts	=SUM(E4:E6)	=SUM(F4:F6)	=SUM(G4:G6)	=SUM(H4:H6)	=SUM(I4:I6)

Figure 6.37: *Excel Formula used in calculation of Debts and Principal Repayment*

As we can see in *Figure 6.37*, Excel formula used in **calculation of Debts and Principal Repayment of Forecasting Period.**

25. The next step is to put the Closing Debts and Interest Expenses in balance sheet and income statement, respectively, as shown in *Figure 6.38* and *Figure 6.39*:

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43					
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**638.05**	**600.35**	**575.17**	**549.78**	**527.61**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69					
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**457.37**	**404.75**	**351.73**	**278.05**	**206.18**
18									
19	Check	0.00	0.00	0.00	180.68	195.60	223.44	271.73	321.43
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.38: *Debts added to forecasted period in Balance Sheet*

As we can see in *Figure 6.38*, the highlighted values are **`Debts of Forecasted Period`**.

Formula for *Figure 6.39* is as follows:

E14=Debts!E17, F14 = Debts!F17 and so on.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	**Base case**					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,650.30	1,671.75	1,693.48	1,715.50	1,737.80
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,145.31)	(1,160.19)	(1,175.28)	(1,190.56)	(1,206.03)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**504.99**	**511.56**	**518.20**	**524.94**	**531.77**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(326.76)	(331.01)	(335.31)	(339.67)	(344.08)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**
11	Interest expenses	(37.89)	(35.03)	(30.75)	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)
12	**EBT**	**37.85**	**71.15**	**74.51**	**74.83**	**85.69**	**100.80**	**113.90**	**128.41**
13	Taxes	(11.36)	(21.35)	(22.35)					
14	**Net Income**	**26.49**	**49.80**	**52.16**	**74.83**	**85.69**	**100.80**	**113.90**	**128.41**

Figure 6.39: *Interest Expenses Added to forecasted period in Income Statement*

As we can see in *Figure 6.39*, the highlighted values are **`Interest Expenses of Forecasted Period`**.

Formula for *Figure 6.39* is as follows:

E11 = -Debts!E16, F11 = -Debts!F16 and so on.

26. Our progress in on the mark till now; we are learning everything step by step.

    The next step is to complete the **`Income Statement`**.

    Only taxes are pending, as shown in *Figure 6.39* in the previous step.

    Tax rate is 30% of EBT, so let's calculate the taxes.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	**Base case**					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,650.30	1,671.75	1,693.48	1,715.50	1,737.80
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,145.31)	(1,160.19)	(1,175.28)	(1,190.56)	(1,206.03)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**504.99**	**511.56**	**518.20**	**524.94**	**531.77**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(326.76)	(331.01)	(335.31)	(339.67)	(344.08)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**
11	Interest expenses	(37.89)	(35.03)	(30.75)	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)
12	**EBT**	**37.85**	**71.15**	**74.51**	**74.83**	**85.69**	**100.80**	**113.90**	**128.41**
13	Taxes	(11.36)	(21.35)	(22.35)	(22.45)	(25.71)	(30.24)	(34.17)	(38.52)
14	**Net Income**	**26.49**	**49.80**	**52.16**	**52.38**	**59.98**	**70.56**	**79.73**	**89.89**

Figure 6.40: *Tax Calculation @ 30%*

As we can see in *Figure 6.40*, tax is deducted from **`EBT`** to get the **`Net Income`**.

Th formula used to calculate tax is shown in *Figure 6.41*:

2022-23	2023-24	2024-25	2025-26	2026-2027
=ROUND(IF(E12>0,-E12*30%,0),2)	=ROUND(IF(F12>0,-F12*30%,0),2)	=ROUND(IF(G12>0,-G12*30%,0),2)	=ROUND(IF(H12>0,-H12*30%,0),2)	=ROUND(IF(I12>0,-I12*30%,0),2)

Figure 6.41: *Excel Formula used to calculate Tax*

As we can see in *Figure 6.41*, if EBT is positive (profit), the formula EBT * 30%; and if it is negative (Loss), tax will be zero because we cannot pay tax on loss.

27. We will create the equity schedule to fill equity values in the balance sheet.

    A company decided to pay dividends @ 25% on net income and not to introduce more capital in business.

    Add a new sheet and rename it to **`Equity`**; format it as shown in *Figure 6.42*:

	A	B	C	D	E	F	G	H	I
1	**Equity Schedule**								
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	**Opening Equity**								
6	Increase in Capital								
7	Net Income/(Loss)								
8	Dividends								
9	**Closing Equity**			261.69					

Figure 6.42: *Equity Schedule Format*

As we can see in *Figure 6.42*, we need only the **`closing equity`** of the year ended 31 Mar 2022.

Now, we will put the value of **`Increase in Capital`** (which is nil for every year as decided by the company), Net Income / (Loss) from Income statement, and Dividends @ 25% if there is a profit.

`Opening Equity` is equal to closing equity of the previous years.

	A	B	C	D	E	F	G	H	I
1	**Equity Schedule**								
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	**Opening Equity**				261.69	300.97	345.95	398.87	458.67
6	Increase in Capital				0.00	0.00	0.00	0.00	0.00
7	Net Income/(Loss)				52.38	59.98	70.56	79.73	89.89
8	Dividends				(13.10)	(15.00)	(17.64)	(19.93)	(22.47)
9	**Closing Equity**			261.69	300.97	345.95	398.87	458.67	526.09
10									
11	Dividend %				25%	25%	25%	25%	25%

Figure 6.43: *Equity Schedule for Forecasting Period*

As we can see in *Figure 6.43*, we got the **`closing equity`** to put the value of equity in the balance sheet.

Excel formulas are used in equity schedule, as shown in *Figure 6.44*:

					Excel Formula				
14	Particulars (Figures in Lakh)	31-Mar-20	31-Mar-21	31-Mar-22	31-Mar-23	31-Mar-24	31-Mar-25	31-Mar-26	31-Mar-27
15	**Opening Equity**				=D8	=E8	=F8	=G8	=H8
16	Increase in Capital				0	0	0	0	0
17	Net Income/(Loss)				=Income_Statement!E14	=Income_Statement!F14	=Income_Statement!G14	=Income_Statement!H14	=Income_Statement!I14
18	Dividends				=ROUND(IF(E6>0,-	=ROUND(IF(F6>0,-	=ROUND(IF(G6>0,-	=ROUND(IF(H6>0,-	=ROUND(IF(I6>0,-
19	**Closing Equity**			=BS!D15	=SUM(E4:E7)	=SUM(F4:F7)	=SUM(G4:G7)	=SUM(H4:H7)	=SUM(I4:I7)

Figure 6.44: *Excel Formula for Equity Schedule*

As we can see in *Figure 6.44*, we have Excel formula for equity schedule.

28. Now we can fill the equity in the balance sheet.

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43					
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**638.05**	**600.35**	**575.17**	**549.78**	**527.61**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69	300.97	345.95	398.87	458.67	526.09
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**758.34**	**750.70**	**750.60**	**736.72**	**732.27**
18									
19	Check	0.00	0.00	0.00	(120.29)	(150.35)	(175.43)	(186.94)	(204.66)

Figure 6.45: *Equity Values in Balance Sheet*

As we can see in *Figure 6.45*, we have filled the values of equity in the balance sheet from the equity schedule, in the highlighted cells.

The Excel formula used is as follows:

E16 =Equity!E8, F16 = Equtiy!F8 and so on.

29. Now, we have reached our final step of **`Cash Flow Preparation`** and **`Cash Value`**: filling in the balance sheet.

Create a new sheet and rename it to CFS; format as shown in *Figure 6.46*:

	A	B	C	D	E	F	G	H	I
1	**Cash Flow**								
2									
3			**Forecast**						
4	**Figures in Lakh**	**Calculati**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**	**Remark**	
5	EBITDA	Add						**From Income Statement**	
6	Interest expenses	Less						**From Income Statement**	
7	Taxes	Less						**From Income Statement**	
8	Change in Trade receivables	Less						**Current Year - Previous Year from BS**	
9	Change in Inventory	Less						**Current Year - Previous Year from BS**	
10	Change in Trade payables	Add						**Current Year - Previous Year from BS**	
11	Change in Other assets	Less						**Current Year - Previous Year from BS**	
12	Change in Other liabilities	Add						**Current Year - Previous Year from BS**	
13	Capex	Less						**Capex from FA**	
14	**Operating Cash Flow**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		
15	Dividends	Less						**From Equity**	
16	Change in Debts	Less						**Current Year - Previous Year from BS**	
17	Change in Provisions	Less						**Current Year - Previous Year from BS**	
18	Change in Equity	Less						**From Equity**	
19	**Net Cash Flow**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		

Figure 6.46: *Format of CFS*

As we can see in *Figure 6.46*, we have created a format of **`Cash Flow Statement`** for the forecasted period.

30. Put values as mentioned in the remarks of the **`forecasted`** CFS format in *Figure 6.47*:

	A	B	C	D	E	F	G	H	I
1	**Cash Flow**								
2									
3			**Forecast**						
4	**Figures in Lakh**	**Calculati**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**	**Remark**	
5	EBITDA	Add	178.23	180.55	182.89	185.27	187.69	**From Income Statement**	
6	Interest expenses	Less	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)	**From Income Statement**	
7	Taxes	Less	(22.45)	(25.71)	(30.24)	(34.17)	(38.52)	**From Income Statement**	
8	Change in Trade receivables	Less	(26.58)	3.08	4.12	(6.57)	(0.06)	**Current Year - Previous Year from BS**	
9	Change in Inventory	Less	4.42	2.14	(5.20)	0.78	(1.09)	**Current Year - Previous Year from BS**	
10	Change in Trade payables	Add	(24.68)	8.97	5.94	(3.33)	3.70	**Current Year - Previous Year from BS**	
11	Change in Other assets	Less	10.53	(2.23)	(3.97)	2.79	(2.34)	**Current Year - Previous Year from BS**	
12	Change in Other liabilities	Add	4.89	(1.25)	0.42	0.41	0.43	**Current Year - Previous Year from BS**	
13	Capex	Less	(36.86)	(33.51)	(30.96)	(28.39)	(25.98)	**Capex from FA**	
14	**Operating Cash Flow**		**55.64**	**105.40**	**102.10**	**102.20**	**116.19**		
15	Dividends	Less	(13.10)	(15.00)	(17.64)	(19.93)	(22.47)	**From Equity**	
16	Change in Debts	Less	(52.18)	(57.40)	(63.14)	(69.46)	(76.40)	**Current Year - Previous Year from BS**	
17	Change in Provisions	Less	(0.50)	(2.94)	3.76	(1.30)	0.40	**Current Year - Previous Year from BS**	
18	Change in Equity	Less	0.00	0.00	0.00	0.00	(0.00)	**From Equity**	
19	**Net Cash Flow**		**(10.14)**	**30.06**	**25.08**	**11.51**	**17.72**		

Figure 6.47: *Forecasted Cash Flow Statement*

As we can see in *Figure 6.47*, we got the **`Net Cash Flow`** of every year. It is negative in the first year, , while it is positive in all the other years.

The formulas used for CFS are mentioned in *Figure 6.48*:

	A	B	C	D	E	F	G	H
22			Forecast					
23	Figures in Lakh	Calculation	31-Mar-23	31-Mar-24	31-Mar-25	31-Mar-26	31-Mar-27	Remark
24	EBITDA	Add	=Income_Statement !E8	=Income_Statement !F8	=Income_Statement !G8	=Income_Statement !H8	=Income_Statement !I8	From Income Statement
25	Interest expenses	Less	=Income_Statement !E11	=Income_Statement !F11	=Income_Statement !G11	=Income_Statement !H11	=Income_Statement !I11	From Income Statement
26	Taxes	Less	=Income_Statement !E13	=Income_Statement !F13	=Income_Statement !G13	=Income_Statement !H13	=Income_Statement !I13	From Income Statement
27	Change in Trade receivables	Less	=-(BS!E5-BS!D5)	=-(BS!F5-BS!E5)	=-(BS!G5-BS!F5)	=-(BS!H5-BS!G5)	=-(BS!I5-BS!H5)	Current Year - Previous Year from BS
28	Change in Inventory	Less	=-(BS!E6-BS!D6)	=-(BS!F6-BS!E6)	=-(BS!G6-BS!F6)	=-(BS!H6-BS!G6)	=-(BS!I6-BS!H6)	Current Year - Previous Year from BS
29	Change in Trade payables	Add	=BS!E12-BS!D12	=BS!F12-BS!E12	=BS!G12-BS!F12	=BS!H12-BS!G12	=BS!I12-BS!H12	Current Year - Previous Year from BS
30	Change in Other assets	Less	=-(BS!E9-BS!D9)	=-(BS!F9-BS!E9)	=-(BS!G9-BS!F9)	=-(BS!H9-BS!G9)	=-(BS!I9-BS!H9)	Current Year - Previous Year from BS
31	Change in Other liabilities	Add	=BS!E15-BS!D15	=BS!F15-BS!E15	=BS!G15-BS!F15	=BS!H15-BS!G15	=BS!I15-BS!H15	Current Year - Previous Year from BS
32	Capex	Less	=-FA!E7	=-FA!F7	=-FA!G7	=-FA!H7	=-FA!I7	Capex from FA
33	**Operating Cash Flow**		**=SUM(C5:C13)**	**=SUM(D5:D13)**	**=SUM(E5:E13)**	**=SUM(F5:F13)**	**=SUM(G5:G13)**	
34	Dividends	Less	=Equity!E8	=Equity!F8	=Equity!G8	=Equity!H8	=Equity!I8	From Equity
35	Change in Debts	Less	=Debts!E8-Debts!D8	=Debts!F8-Debts!E8	=Debts!G8-Debts!F8	=Debts!H8-Debts!G8	=Debts!I8-Debts!H8	Current Year - Previous Year from BS
36	Change in Provisions	Less	=BS!E13-BS!D13	=BS!F13-BS!E13	=BS!G13-BS!F13	=BS!H13-BS!G13	=BS!I13-BS!H13	Current Year - Previous Year from BS
37	Change in Equity	Less	=Equity!E9-Equity!D9-Equity!E8	=Equity!F9-Equity!E9-Equity!F8	=Equity!G9-Equity!F9-Equity!G8	=Equity!H9-Equity!G9-Equity!H8	=Equity!I9-Equity!H9-Equity!I7-Equity!I8	From Equity
38	**Net Cash Flow**		**=SUM(C14:C18)**	**=SUM(D14:D18)**	**=SUM(E14:E18)**	**=SUM(F14:F18)**	**=SUM(G14:G18)**	

Figure 6.48: *Excel Formula used in CFS*

Figure 6.48 shows all formulas direved from **`income statement, Balance sheet, equity,`** and **`Fixed Assets Sheets`**.

31. Now we put **`Net Cash Flow`** in the balance sheet to complete it.

`Cash = Net Cash Flow of Cash Flow Statement + Cash of Previous Year`

	A	B	C	D	E	F	G	H	I
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43	120.29	150.35	175.43	186.94	204.66
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**758.34**	**750.70**	**750.60**	**736.72**	**732.27**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69	300.97	345.95	398.87	458.67	526.09
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**758.34**	**750.70**	**750.60**	**736.72**	**732.27**
18									
19	Check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%
27									

Figure 6.49: *Cash Values Added in Balance Sheet*

As we can see in *Figure 6.49*, we got the values of cash.

The formula used in **`Cash Flow`** is as follows:

E8 =D8+CFS!C19 = 34.59 + (10.14) = 24.25

F8 =E8+CFS!D19 = 24.25 + 30.06 = 54.51

and so on.

We have completed our forecasting!

Let's check all cases of **`Income Statement, Balance Sheet &Cash Flow Statement`**.(*Figure 6.50*)

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Base case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,650.30	1,671.75	1,693.48	1,715.50	1,737.80
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,145.31)	(1,160.19)	(1,175.28)	(1,190.56)	(1,206.03)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**504.99**	**511.56**	**518.20**	**524.94**	**531.77**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(326.76)	(331.01)	(335.31)	(339.67)	(344.08)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**178.23**	**180.55**	**182.89**	**185.27**	**187.69**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**106.69**	**112.33**	**121.70**	**128.49**	**136.05**
11	Interest expenses	(37.89)	(35.03)	(30.75)	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)
12	**EBT**	**37.85**	**71.15**	**74.51**	**74.83**	**85.69**	**100.80**	**113.90**	**128.41**
13	Taxes	(11.36)	(21.35)	(22.35)	(22.45)	(25.71)	(30.24)	(34.17)	(38.52)
14	**Net Income**	**26.49**	**49.80**	**52.16**	**52.38**	**59.98**	**70.56**	**79.73**	**89.89**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.50: *Base Case Income Statement*

As we can see in *Figure 6.50,* we have the base case income statement after selecting the base case.

	A	B	C	D	E	F	G	H	I
2									
3					Forecast				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	114.84	111.76	107.64	114.21	114.27
6	Inventory	87.55	66.24	85.80	81.38	79.24	84.44	83.66	84.75
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43	120.29	150.35	175.43	186.94	204.66
9	Other Assets	38.56	34.24	53.44	42.91	45.14	49.11	46.32	48.66
10	**Assets**	**811.26**	**793.98**	**791.53**	**758.34**	**750.70**	**750.60**	**736.72**	**732.27**
11									
12	Trade Payables	101.04	121.05	151.28	126.60	135.57	141.51	138.18	141.88
13	Provisions	35.86	21.13	31.86	31.36	28.42	32.18	30.88	31.28
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	33.01	31.76	32.18	32.59	33.02
16	Equity	155.29	209.92	261.69	300.97	345.95	398.87	458.67	526.09
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**758.34**	**750.70**	**750.60**	**736.72**	**732.27**
18									
19	Check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.51: *Base Case Balance Sheet*

As we can see in *Figure 6.51*, we have the base case balance sheet after selecting the base case:

	A	B	C	D	E	F	G	H
1	**Cash Flow**							
2								
3			Forecast					
4	**Figures in Lakh**	**Calculation**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**	**Remark**
5	EBITDA	Add	178.23	180.55	182.89	185.27	187.69	From Income Statement
6	Interest expenses	Less	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)	From Income Statement
7	Taxes	Less	(22.45)	(25.71)	(30.24)	(34.17)	(38.52)	From Income Statement
8	Change in Trade receivables	Less	(26.58)	3.08	4.12	(6.57)	(0.06)	Current Year - Previous Year from BS
9	Change in Inventory	Less	4.42	2.14	(5.20)	0.78	(1.09)	Current Year - Previous Year from BS
10	Change in Trade payables	Add	(24.68)	8.97	5.94	(3.33)	3.70	Current Year - Previous Year from BS
11	Change in Other assets	Less	10.53	(2.23)	(3.97)	2.79	(2.34)	Current Year - Previous Year from BS
12	Change in Other liabilities	Add	4.89	(1.25)	0.42	0.41	0.43	Current Year - Previous Year from BS
13	Capex	Less	(36.86)	(33.51)	(30.96)	(28.39)	(25.98)	Capex from FA
14	**Operating Cash Flow**		**55.64**	**105.40**	**102.10**	**102.20**	**116.19**	
15	Dividends	Less	(13.10)	(15.00)	(17.64)	(19.93)	(22.47)	From Equity
16	Change in Debts	Less	(52.18)	(57.40)	(63.14)	(69.46)	(76.40)	Current Year - Previous Year from BS
17	Change in Provisions	Less	(0.50)	(2.94)	3.76	(1.30)	0.40	Current Year - Previous Year from BS
18	Change in Equity	Less	0.00	0.00	0.00	0.00	(0.00)	From Equity
19	**Net Cash Flow**		**(10.14)**	**30.06**	**25.08**	**11.51**	**17.72**	

Figure 6.52: *Base Case Cash Flow Statement*

As we can see in *Figure 6.52*, we have the base case cash flow statement after selecting the base case.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Best case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,691.03	1,755.29	1,821.99	1,891.23	1,963.10
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,136.37)	(1,179.55)	(1,224.38)	(1,270.91)	(1,319.20)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**554.66**	**575.74**	**597.61**	**620.32**	**643.90**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(319.60)	(331.75)	(344.36)	(357.44)	(371.03)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**235.06**	**243.99**	**253.25**	**262.88**	**272.87**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**163.52**	**175.77**	**192.06**	**206.10**	**221.23**
11	Interest expenses	(37.89)	(35.03)	(30.75)	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)
12	**EBT**	**37.85**	**71.15**	**74.51**	**131.66**	**149.13**	**171.16**	**191.51**	**213.59**
13	Taxes	(11.36)	(21.35)	(22.35)	(39.50)	(44.74)	(51.35)	(57.45)	(64.08)
14	**Net Income**	**26.49**	**49.80**	**52.16**	**92.16**	**104.39**	**119.81**	**134.06**	**149.51**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.53: *Best Case Income Statement*

As we can see in *Figure 6.53*, we have the best case income statement after the selecting best case.

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					**Forecast**				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	117.68	117.34	115.81	125.91	129.08
6	Inventory	87.55	66.24	85.80	83.39	83.20	90.85	92.23	95.73
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43	148.92	211.50	272.83	323.41	384.84
9	Other Assets	38.56	34.24	53.44	43.97	47.39	52.84	51.06	54.97
10	**Assets**	**811.26**	**793.98**	**791.53**	**792.88**	**823.64**	**866.31**	**898.20**	**944.55**
11									
12	Trade Payables	101.04	121.05	151.28	129.72	142.35	152.25	152.33	160.28
13	Provisions	35.86	21.13	31.86	32.13	29.84	34.62	34.04	35.34
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	33.82	33.35	34.62	35.93	37.30
16	Equity	155.29	209.92	261.69	330.81	409.10	498.96	599.50	711.63
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**792.88**	**823.64**	**866.31**	**898.20**	**944.55**
18									
19	Check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.54: *Best Case Balance Sheet*

As we can see in *Figure 6.54*, we have the best case balance sheet after selecting the best case.

	A	B	C	D	E	F	G	H
1	**Cash Flow**							
2								
3					**Forecast**			
4	**Figures in Lakh**	**Calculation**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**	**Remark**
5	EBITDA	Add	235.06	243.99	253.25	262.88	272.87	From Income Statement
6	Interest expenses	Less	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)	From Income Statement
7	Taxes	Less	(39.50)	(44.74)	(51.35)	(57.45)	(64.08)	From Income Statement
8	Change in Trade receivables	Less	(29.42)	0.34	1.53	(10.10)	(3.17)	Current Year - Previous Year from BS
9	Change in Inventory	Less	2.41	0.19	(7.65)	(1.38)	(3.50)	Current Year - Previous Year from BS
10	Change in Trade payables	Add	(21.56)	12.63	9.90	0.08	7.95	Current Year - Previous Year from BS
11	Change in Other assets	Less	9.47	(3.42)	(5.45)	1.78	(3.91)	Current Year - Previous Year from BS
12	Change in Other liabilities	Add	5.70	(0.47)	1.27	1.31	1.37	Current Year - Previous Year from BS
13	Capex	Less	(36.86)	(33.51)	(30.96)	(28.39)	(25.98)	Capex from FA
14	**Operating Cash Flow**		**93.44**	**148.37**	**149.64**	**154.14**	**173.91**	
15	Dividends	Less	(23.04)	(26.10)	(29.95)	(33.52)	(37.38)	From Equity
16	Change in Debts	Less	(52.18)	(57.40)	(63.14)	(69.46)	(76.40)	Current Year - Previous Year from BS
17	Change in Provisions	Less	0.27	(2.29)	4.78	(0.58)	1.29	Current Year - Previous Year from BS
18	Change in Equity	Less	0.00	0.00	0.00	0.00	0.00	From Equity
19	**Net Cash Flow**		**18.49**	**62.58**	**61.33**	**50.58**	**61.42**	

Figure 6.55: *Best Case Cash Flow Statement*

As we can see in *Figure 6.55*, we have the best case cash flow statement after selecting the best case.

	A	B	C	D	E	F	G	H	I
1	**Income Statement**		**Scenario**	Worst case					
2					**Forecast**				
3	**Figures in Lakh**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-2027**
4	Revenue	1,585.20	1,648.67	1,629.12	1,609.57	1,590.26	1,571.18	1,552.33	1,533.70
5	Cost of goods sold	(1,135.40)	(1,108.00)	(1,128.86)	(1,152.45)	(1,138.63)	(1,124.96)	(1,111.47)	(1,098.13)
6	**Gross Profit**	**449.80**	**540.67**	**500.26**	**457.12**	**451.63**	**446.22**	**440.86**	**435.57**
7	Operating expenses	(300.14)	(356.49)	(310.00)	(347.67)	(343.50)	(339.37)	(335.30)	(331.28)
8	**EBITDA**	**149.66**	**184.18**	**190.26**	**109.45**	**108.13**	**106.85**	**105.56**	**104.29**
9	D&A	(73.92)	(78.00)	(85.00)	(71.54)	(68.22)	(61.19)	(56.78)	(51.64)
10	**EBIT**	**75.74**	**106.18**	**105.26**	**37.91**	**39.91**	**45.66**	**48.78**	**52.65**
11	Interest expenses	(37.89)	(35.03)	(30.75)	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)
12	**EBT**	**37.85**	**71.15**	**74.51**	**6.05**	**13.27**	**24.76**	**34.19**	**45.01**
13	Taxes	(11.36)	(21.35)	(22.35)	(1.82)	(3.98)	(7.43)	(10.26)	(13.50)
14	**Net Income**	**26.49**	**49.80**	**52.16**	**4.23**	**9.29**	**17.33**	**23.93**	**31.51**
15									
16	**Scenarios:**								
17	**Revenue % growth**		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
18	**Selected Case**								
19	Best case		3.80%	-1.20%	3.80%	3.80%	3.80%	3.80%	3.80%
20	Base case		3.80%	-1.20%	1.30%	1.30%	1.30%	1.30%	1.30%
21	Worst case		3.80%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%	-1.20%
22									
23	**Cogs as % of Revenues**	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
24	**Selected Case**								
25	Best case	-71.6%	-67.2%	-69.3%	-67.20%	-67.20%	-67.20%	-67.20%	-67.20%
26	Base case	-71.6%	-67.2%	-69.3%	-69.40%	-69.40%	-69.40%	-69.40%	-69.40%
27	Worst case	-71.6%	-67.2%	-69.3%	-71.60%	-71.60%	-71.60%	-71.60%	-71.60%
28									
29	**Opex as % of Revenues**	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%
30	**Selected Case**								
31	Best case	-18.9%	-21.6%	-19.0%	-18.90%	-18.90%	-18.90%	-18.90%	-18.90%
32	Base case	-18.9%	-21.6%	-19.0%	-19.80%	-19.80%	-19.80%	-19.80%	-19.80%
33	Worst case	-18.9%	-21.6%	-19.0%	-21.60%	-21.60%	-21.60%	-21.60%	-21.60%

Figure 6.56: *Worst Case Income Statement*

As we can see in *Figure 6.56*, we have the worst case income statement after selecting the worst case.

	A	B	C	D	E	F	G	H	I
1	**Balance Sheet**								
2									
3					**Forecast**				
4	**Particulars (Figures in Lakh)**	**31-Mar-20**	**31-Mar-21**	**31-Mar-22**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**
5	Trade Receivables	122.32	126.94	88.26	112.01	106.31	99.87	103.35	100.85
6	Inventory	87.55	66.24	85.80	79.38	75.37	78.34	75.70	74.79
7	Fixed Assets	512.33	478.90	433.60	398.92	364.21	333.98	305.59	279.93
8	Cash	50.50	87.66	130.43	85.34	78.20	63.93	35.10	9.87
9	Other Assets	38.56	34.24	53.44	41.85	42.94	45.56	41.91	42.94
10	**Assets**	**811.26**	**793.98**	**791.53**	**717.50**	**667.03**	**621.68**	**561.65**	**508.38**
11									
12	Trade Payables	101.04	121.05	151.28	123.47	128.96	131.29	125.04	125.22
13	Provisions	35.86	21.13	31.86	30.58	27.03	29.85	27.94	27.61
14	Debts	482.93	408.89	318.58	266.40	209.00	145.86	76.40	0.00
15	Other Liabilities	36.14	32.99	28.12	32.19	30.21	29.85	29.49	29.14
16	Equity	155.29	209.92	261.69	264.86	271.83	284.83	302.78	326.41
17	**Liabilities & Equity**	**811.26**	**793.98**	**791.53**	**717.50**	**667.03**	**621.68**	**561.65**	**508.38**
18									
19	Check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20									
21	DSO	28.2	28.1	19.8	25.4	24.4	23.2	24.3	24.0
22	DPO	23.3	26.8	33.9	28.0	29.6	30.5	29.4	29.8
23	DIO	20.2	14.7	19.2	18.0	17.3	18.2	17.8	17.8
24	Other assets %	2.4%	2.1%	3.3%	2.6%	2.7%	2.9%	2.7%	2.8%
25	Other liabilities %	2.3%	2.0%	1.7%	2.0%	1.9%	1.9%	1.9%	1.9%
26	Provision %	2.3%	1.3%	2.0%	1.9%	1.7%	1.9%	1.8%	1.8%

Figure 6.57: *Worst Case Balance Sheet*

As we can see in *Figure 6.57*, we have the worst case balance sheet after selecting the worst case.

	A	B	C	D	E	F	G	H
1	**Cash Flow**							
2								
3					**Forecast**			
4	**Figures in Lakh**	**Calculation**	**31-Mar-23**	**31-Mar-24**	**31-Mar-25**	**31-Mar-26**	**31-Mar-27**	**Remark**
5	EBITDA	Add	109.45	108.13	106.85	105.56	104.29	**From Income Statement**
6	Interest expenses	Less	(31.86)	(26.64)	(20.90)	(14.59)	(7.64)	**From Income Statement**
7	Taxes	Less	(1.82)	(3.98)	(7.43)	(10.26)	(13.50)	**From Income Statement**
8	Change in Trade receivables	Less	(23.75)	5.70	6.44	(3.48)	2.50	**Current Year - Previous Year from BS**
9	Change in Inventory	Less	6.42	4.01	(2.97)	2.64	0.91	**Current Year - Previous Year from BS**
10	Change in Trade payables	Add	(27.81)	5.49	2.33	(6.25)	0.18	**Current Year - Previous Year from BS**
11	Change in Other assets	Less	11.59	(1.09)	(2.62)	3.65	(1.03)	**Current Year - Previous Year from BS**
12	Change in Other liabilities	Add	4.07	(1.98)	(0.36)	(0.36)	(0.35)	**Current Year - Previous Year from BS**
13	Capex	Less	(36.86)	(33.51)	(30.96)	(28.39)	(25.98)	**Capex from FA**
14	**Operating Cash Flow**		**9.43**	**56.13**	**50.38**	**48.52**	**59.38**	
15	Dividends	Less	(1.06)	(2.32)	(4.33)	(5.98)	(7.88)	**From Equity**
16	Change in Debts	Less	(52.18)	(57.40)	(63.14)	(69.46)	(76.40)	**Current Year - Previous Year from BS**
17	Change in Provisions	Less	(1.28)	(3.55)	2.82	(1.91)	(0.34)	**Current Year - Previous Year from BS**
18	Change in Equity	Less	(0.00)	0.00	0.00	0.00	0.00	**From Equity**
19	**Net Cash Flow**		**(45.09)**	**(7.14)**	**(14.27)**	**(28.83)**	**(25.24)**	

Figure 6.58: *Worst Case Cash Flow Statement*

As we can see in *Figure 6.58*, we have the worst case cash flow statement after selecting the worst case.

Conclusion

We have completed the forecasting modeling, which included cash flow modeling. We have learnt how to create case scneario and can forecast the income statement, balance sheet and cash flow statement, i.e., the three statements model.

In the next chapter, we will learn about budgeting, including how to create a business budget and capital budget in Excel.

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Chapter 7
Preparing Different Budgets With Analysis

Introduction

We have learned about Excel, accounting, and finance till now. Now is the time to work on another topic: budgeting. Budget helps understand the plan of revenue and related expenses as well as the inflows and outflows of cash with the consideration of debt repayment and such.

Moreover, we will learn how to create Budget in Excel.

Structure

- Budget
- Four Budgeting Methods
- Types of Corporate Budgets
- Operating Budget and Process in Excel

Objectives

Many companies don't create their budget. But without a budget, we cannot understand how our business is performing. With the right budget plan, we can maintain our business well. So, we will learn how to create a budget in this chapter.

Budget

There are several types of budgets, like business budget (corporate budget), individual budget, and government budget, but we are learning Excel for accounting and finance, so we will focus on business budget.

Business Budget is an overview of our business plans. It identifies the status of our business and future goals, and it is the key to make the right decision for our business.

A budget is a plan of prediction of revenue and estimation of expenses over a specified future period and is usually compiled and re-evaluated on a periodic basis. It identifies our available capital, estimates our spending, and helps us predict revenue.

A budget helps us in important business decisions like cost cutting (where is possible), identifying unwanted expenses, and buying new equipment. It also helps us keep out of debt (or take lesser debt) and helps us understand how to reduce our ongoing debt.

We can track our progress with the help of an analysis between actual and planned. It helps tackle short-term problems and aids long-term planning. Budget is required for both start-up companies and established ones.

Procedure to create a small business budget

Let's understand how to create a business budget with the following steps:

1. **Identify Revenue**: First of all, we need to identify how much revenue we are generating and make the prediction on the current basis for future revenue..
2. **Determining Fixed Cost**: Every business has fixed costs like rent, certain utilities, payroll; we need to add these in our budget.
3. **Determine Variable Costs**: Just like fixed costs, every business has some variable costs that add when making an estimation on the basis of current state; for example, costs like travel, freight, and electricity.

4. **Identify One-time Costs**: One-time costs affect a planned budget the most because we always don't consider these in our budget or forget to add them. Some expenses are regular, like fixed and variable costs, but some expenses happen occasionally, so we must remember them; for example, purchase of new equipment or repairing or replacing an old machine.
7. **Put all together**: Now, add all revenue and less all cost from the sum to evaluate the final figure of future profit.

Four Budgeting Methods

Four budgeting methods are in practice:

- Incremental
- Activity-based
- Value proportion
- Zero-based

IncrementalIt is the traditional budget method that is used most widely. Incremental method calculates by taking the current period's budget or actual performance as base and adding or subtracting a percentage from the base. Inflation and planned sales price, and increase or decrease in costs are also considered in incremental method.

Suppose a company is paying a salary of **₹100 lakh** per annum to their employees, but now the company wants to hire two more employees for **₹6 lakh** each per annum. It also decides to increase the current staff's salaries by **10%**, so the budget for the next year will be as shown in *Figure 7.1*:

	A	B	C	D
1		**Particular**	**Figures in Lakhs**	**Excel Formula**
2	A	Base of Previous Year	100	N/A
3	B	Increment @ 10 % (10% of A)	10	=C2*10%
4	C	New Hiring (6*2)	12	=6*2
5	D	Total Budget for This Year (A+B+C)	122	=C2+C3+C4

Figure 7.1: *Incremental Budget Example*

As we can see in *Figure 7.1*, the total budget for next year will be **₹122 lakh**.

Advantages

There are a few advantages of the incremental budgeting method:

- As we can see in the preceding example, it is easy to prepare and easy to explain; no difficult calculations are required.

- It is easy to understand.
- The changes between base and budgets can be identified easily.

Disadvantages

It also has a few disadvantages:

- We cannot examine the activities between base and budgeted.
- We cannot understand why new costs occur and why previous costs increase.

Activity-Based

This is a method of budgeting where activities are thoroughly analyzed to predict costs. It doesn't depend on a company's historical values. Companies analyze the cost on each activity level and remove the unnecessary activities or part of activities to reduce costs.

The Activity-Based Budgeting approach aligns costs with the activities performed and enables businesses to generate greater profits from their revenue.. This method is excellent for start-ups and new businesses due to the lack of requirement for historical data.

Three steps are involved in the activity-based method:

1. Identify relevant activities
2. Determine the number of units related to each activity
3. Calculate the cost per unit of activity relating to that cost driver

Advantages

- We can see the exact requirements of the cost of each activity.
- It facilitates the identification of cost reduction opportunities for each activity level..
- It doesn't need historical data to allocate the base.

Disadvantages

- It is more costly than other methods because it needs time and manpower to analyze each level of activity and all parts of each level.
- As accounts and finance professionals, we cannot have knowledge of each step and level of activity, and we cannot have deep understanding of complex manufacturing business processes.

Value Proportion

In the value proportion budgeting method, professionals consider the following questions:

- Why is an amount included in the budget?
- What value does this provide to our stakeholders, employees, and customers?
- Is the value of the budget item overestimated? If no, then why is it justified?

This method is a balance between the incremental method and the zero-based method (we will look at next): the incremental method doesn't scrutinize anything, whereas the zero-based method scrutinizes too much.

Advantages

- It helps us stay focused on how to add value for our customers, stakeholders, and employees.
- It concentrates on activities that will generate the best results.

Disadvantages

- It is more complex to quantify the values of some line items.
- Quantified values are not always stable; they can be changed for various reasons.

Zero-Based

This is method of budgeting that involves creating a new budget from scratch every time. Professionals must justify each expenditure. An item that was on the budget last year doesn't necessarily need to be on the budget in the future unless it can be justified and needs to be continued.

This method is the best for determining discretionary costs. At the same time, this is a time-consuming method as it needs to analyze each level of the budget in relation to every department.

Advantages

- It is an excellent method for cost cutting.
- It helps companies bring costs under control while minimizing its negative impact on operations.

Disadvantages

- It is a time-consuming method that also requires resources and review.
- It is applicable for short-term plans, not for long-term goals.

Each budgeting method has its own advantages and disadvantages, and every method can be used for different business styles and different business goals. One year, we might be using one method, and another year, we may use a different one.

The importance of creating a business budget is to help organization stay on track for success.

Types of Corporate Budgets

Each business has its budget, and some businesses maintain a set of different business budgets. The following are the types of corporate budgets:

Operating Budget: It consists of a projected revenue and the expenses associated with it for a period. It includes various costs, like fixed cost, variable cost, capital costs and non-operating expenses. Like with all budget types in business, operating budgets can vary depending on the business and its operations. An operating budget outlines the funds a company needs to operate efficiently.

Cash Budget: A cash budget give us an estimate of the cash that comes in and the cash that goes out for a business in a specific period. A cash budget can help a business make important financial decisions, detect issues, and prevent overspending. The information in this budget can help evaluate whether a business has enough cash for operating, whether the money is being used productively, and whether the business is on track to earn a profit.

Financial Budget: It is a draft to understand how much money a business needs to meet its short-term and long-term needs. It consists of assets, liabilities, and stakeholder's equity. It helps get an overall idea of our company's health and stability.

Sales Budget: A sales budget estimates our sales revenue and expenses, along with the sales in a specific period. To make a business sales budget, we need to make a list of our business offerings, their price, and the previous year's revenue to project the sales.

Production Budget: The production budget tells us how much direct labor, direct materials, and direct overheads are required to meet the sales needs. It helps determine the cost of production, and in turn, helps decide the price of the product.

Labor Budget: Every business needs manpower, and the labor budget indicates the number of employees needed to achieve a certain level of production. A business can plan payrolls expenses easily with this, and it also helps allocate the expenses for seasonal workers.

Capital Budget: A capital budget helps to plan to buy a fixed asset, such as machine, land, vehicle and so on. A business's capital budget lays out the cost of the asset, the expected payback period, and the asset's potential return on investment. A capital budget indicates whether the purchase of an asset would be a good investment.

Static Budget: Some businesses with predictable sales and expenses may create a static budget. A static budget doesn't change throughout the year. It is usually prepared by non-profit or educational institutions, or government bodies that have been allocated a fixed amount to use for their activities in each area.

Operating Budget and Process: An operating budget is a detailed projection of a company's expected revenue and expenses over a period. Companies usually formulate an operating budget near the end of the year to show expected activity in the following year.

How to use an operating budget: An operating budget helps companies set and achieve the business goals. Professionals compare projected and actual results and analyze the variance on a monthly or quarterly basis.

Analyses depend on the following:

- Whether revenue increased or decreased
- Whether expenses increased or decreased
- Whether any unexpected expenses are occurring
- Whether we need to adjust the budget for the remaining period

Components of Operating Budget

There are various components of an operating budget; these are used to calculate the operating budget:

- **Revenue:** It is the sale of different products or services or both in whole year. This is based on Year on Year (YoY) projection. It is better for us to divide the revenue between unit volume and average price (can vary monthly) to get better insights.
- **Variable Cost:** These are costs that increase or decrease with revenue. Examples include expenses for raw materials, labor, freight, and sales commissions.

- **Fixed Cost:** Fixed costs are expenses that do not change and must be paid whether sales go up or down. Examples include rent, utilities, equipment leases, and insurance.
- **Non-Cash Expenses:** An operating budget often includes non-cash expenses. The most common non-cash expenses include depreciation, amortization, unrealized gains or losses, and deferred income taxes.
- **Non-Operating Expenses:** These are costs that are not directly related to a business's main activity. The most common non-operating expenses are interest payments, losses on the disposition of assets, and costs of currency exchanges.

Examples in Excel:

Step-by-step calculation:

- **Sales Budget**: To create a budget, we need to find the source of revenue; it is called a sales budget.

  `Estimation of unit sales in a year is S. No. 1` is shown in *Figure 7.2*.

  Sales Price ₹1,500/- as given in S. No. 2.

  We get sales revenue after multiplying S. No. 1 with S. No. 2, as shown in S. No. 3.

  We estimate that 75% cash sales will happen in the whole year, and the remaining 25% will be credit sales. as shown in S. No. 4 and 5. Refer to the following figure:

			ABCD Co. Ltd.												
			Sales Budget for Product A												
			For the Period Ended March 23												
			Month												
Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
Estimated	1	Sales Unit	1,950	3,270	2,810	2,550	2,600	2,230	2,350	2,640	2,420	2,470	2,720	2,370	30,380
Estimated	2	Sale Price	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Calculation	3	Total Sales Revenue (1*2)	29,25,000	49,05,000	42,15,000	38,25,000	39,00,000	33,45,000	35,25,000	39,60,000	36,30,000	37,05,000	40,80,000	35,55,000	4,55,70,000
		% of Sales													
Estimated	4	Cash Sales	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	
Estimated	5	Credit Sales	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	
		Type of sale													
Calculation	6	Cash Sales (3*4)	21,93,750	36,78,750	31,61,250	28,68,750	29,25,000	25,08,750	26,43,750	29,70,000	27,22,500	27,78,750	30,60,000	26,66,250	3,41,77,500
Calculation	7	Credit Sales (3*5)	7,31,250	12,26,250	10,53,750	9,56,250	9,75,000	8,36,250	8,81,250	9,90,000	9,07,500	9,26,250	10,20,000	8,88,750	1,13,92,500
Calculation	8	Total Sales Revenue (6+7)	29,25,000	49,05,000	42,15,000	38,25,000	39,00,000	33,45,000	35,25,000	39,60,000	36,30,000	37,05,000	40,80,000	35,55,000	4,55,70,000

Figure 7.2: *Sales Budget*

`S. No. 1 is number, S. No. 2,3,6,7,8 are currency and S. No. 4,5` are percentages in *Figure 7.2*.

S. No. 6 and 7 are the cash sales and credit sales figures, respectively, while S. No. 8 is the total sales revenue, same as S. No. 3.

- **Production Budget**: The next step is to estimate the production budget.

  In a manufacturing unit, we need to know how much stock we must produce during the year as per sales estimates. We must understand how much closing stock we must maintain every month. In our example, we are maintaining **`20% of Sales Unit as shown in S. No. 10 of Production Budget`** in *Figure 7.3.*

  Note: There will be no **`opening stock in Apr 22`**.

			ABCD Co. Ltd.												
			Production Budget for Product A												
			For the Period Ended March 23												
			Month												
Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Sales Budget	9	Sales Unit (= S. No. 1 of Sales Budget)	1,950	3,270	2,810	2,550	2,600	2,230	2,350	2,640	2,420	2,470	2,720	2,370	30,380
Estimation	10	Desired Closing Stock (20% of 9)	390	654	562	510	520	446	470	528	484	494	544	474	474
Calculation	11	Total Needed (9+10)	2,340	3,924	3,372	3,060	3,120	2,676	2,820	3,168	2,904	2,964	3,264	2,844	30,854
Calculation	12	Less: Opening Stock(Equal to closing Stock of previous month)		390	654	562	510	520	446	470	528	484	494	544	-
Calculation	13	Number of Units to Produce (11-12)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	30,854

***Figure 7.3**: Production Budget*

`S. No. 9 is Unit Sales, which is equal to S. No. 1 of Sales Budget`, as shown in *Figure 7.3.*

S. No. 10 is the desired closing stock, which we want to maintain as discussed earlier; it will be 20% every month.

S. No. 11 is the sum of S. No. 9 and 10, while S. No. 12 is the opening stock of the month, which is equal to the closing stock of the previous month.

S. No 9 to 13 are numbers.

- Direct material budget: There are two direct materials required for our product, so we will two have direct material budgets, as follows:
- DM 1

  S. No. 14 is equal to S. No. 13 of production budget.

  S. No. 15 is the estimate figure that is required to produce product of S. No. 14 per Unit.

ABCD Co. Ltd.
Direct Material 1 for Product A Budget
For the Period Ended March 23

Type	S. No.	Particular	Month											
			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Production Budget	14	Units to be produced (Equal to S. No. 13 of Production Budget)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	30,854
Estimation	15	Quantity in Kgs needed per unit	2	2	2	2	2	2	2	2	2	2	2	2	2
Calculation	16	Total Quatity Needed (In Kgs) (14*15)	4,680	7,068	5,436	4,996	5,220	4,312	4,748	5,396	4,752	4,960	5,540	4,600	61,708
Estimation	17	Desired Closing Stock (In Kgs) (20% of 16)	936	1,414	1,087	999	1,044	862	950	1,079	950	992	1,108	920	920
Calculation	18	Total of Stock required to maintain (16+17)	5,616	8,482	6,523	5,995	6,264	5,174	5,698	6,475	5,702	5,952	6,648	5,520	62,628
Calculation	19	Opening Stock of DM 1 ((Equal to closing Stock of previous month - 17)		936	1,414	1,087	999	1,044	862	950	1,079	950	992	1,108	-
Calculation	20	Total Direct Material 1 required (18-19)	5,616	7,546	5,109	4,908	5,265	4,130	4,836	5,525	4,623	5,002	5,656	4,412	62,628
Estimation	21	Rate per KG for Direct Material 1	190	190	190	190	190	190	190	190	190	190	190	190	190
Calculation	22	Total Cost of DM purchases (20*21)	10,67,040	14,33,740	9,70,710	9,32,520	10,00,350	7,84,700	9,18,840	10,49,750	8,78,370	9,50,380	10,74,640	8,38,280	1,18,99,320

***Figure 7.4**: Direct Material 1 Budget*

S. No. 16 is the total quantity needed, while S. No. 17 is the desired closing stock 20% (Estimation) of S. No. 16, as shown in *Figure 7.4*.

S. No. 18 is the stock that needs to be maintained, which is sum of S. No. 16 and S. No. 17.

S. No. 19 is the opening stock, which is equal to the closing of the previous month, that is, Apr 22 closing stock is equal to May 22 opening stock, May 22 closing stock is equal to Jun 22 opening stock, as so on.

S. No. 20 is the sum of S. No. 18 and 19 as we will get the figure of total direct material 1 that required for the month.

S. No. 21 is the estimated amount for rate per unit. In our example, it is kg.

S. No. 22 is the total cost for DM 1 purchase, which is equal to S. No. 20 multiplied by S. No. 21.

S. No. 14 to 20 are numbers, while S. No. 21 and 22 are in currency format.

- The calculation for the second direct material is the same as that for DM 1.

  S. No. 23 is equal to S. No. 13 of the production budget.

  S. No. 24 is the estimate figure that is required to produce the product of S. No. 23 per unit.

ABCD Co. Ltd.
Direct Material 2 for Product A Budget
For the Period Ended March 23

Type	S. No.	Particular	Month											
			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Production Budget	23	Units to be produced (Equal to S. No. 13 of Production Budget)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	30,854
Estimation	24	Quantity in Kgs needed per unit	5	5	5	5	5	5	5	5	5	5	5	5	5
Calculation	25	Total Quatity Needed (In Kgs) (23*24)	11,700	17,670	13,590	12,490	13,050	10,780	11,870	13,490	11,880	12,400	13,850	11,500	1,54,270
Calculation	26	Desired Closing Stock (In Kgs) (20% of 25)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	2,300
Calculation	27	Total of Stock required to maintain (16+17)	14,040	21,204	16,308	14,988	15,660	12,936	14,244	16,188	14,256	14,880	16,620	13,800	1,56,570
Calculation	28	Opening Stock of DM 1 ((Equal to closing Stock of previous month - 26)		2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	-
Calculation	29	Total Direct Material 1 required (27-28)	14,040	18,864	12,774	12,270	13,162	10,326	12,088	13,814	11,558	12,504	14,140	11,030	1,56,570
Estimation	30	Rate per KG for Direct Material 1	70	70	70	70	70	70	70	70	70	70	70	70	70
Calculation	31	Total Cost of DM purchases (29*30)	9,82,800	13,20,480	8,94,180	8,58,900	9,21,340	7,22,820	8,46,160	9,66,980	8,09,060	8,75,280	9,89,800	7,72,100	1,09,59,900

***Figure 7.5**: Direct Material 2 Budgets*

S. No. 25 is the total quantity needed, while S. No. 26 the desired closing stock 20% (Estimation) of S. No. 25, as shown in *Figure 7.5.*

S. No. 27 is the stock that needs to be maintained, which is the sum of S. No. 25 and S. No. 26.

S. No. 28 is the opening stock, which is equal to the closing stock of the previous month, that is, Apr 22 closing stock is equal to May 22 opening stock, May 22 closing stock is Jun 22 opening stock, and so on.

S. No. 29 is the sum of S. No. 18 and 19 as we will get the figure of total direct material 2 that required for the month.

S. No. 30 is the estimated amount for rate per unit. In our example, it is kg.

S. No. 31 is the total cost for DM 1 purchase, which is equal to S. No. 29 multiply by S. No. 30

S. No. 23 to 29 are numbers, while S. No. 30 and 31 are in currency format.

4. Direct Labor Budget

The next step is to calculate Direct Labor. Let's figure out it as following:

S. No. 32 is equal to S. No. 13 of production budget, as shown in *Figure 7.6*:

ABCD Co. Ltd.
Direct Labor Budget
For the Period Ended March 23

Type	S. No.	Particular	Month											
			Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Production Budget	32	Units to be produced (Equal to S. No. 13 of Production Budget)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	30,854
Estimation	33	Direct Labor Hours per Unit	3	3	3	3	3	3	3	3	3	3	3	3	3
Caluclation	34	Total Hours Required (32*33)	7,020	10,602	8,154	7,494	7,830	6,468	7,122	8,094	7,128	7,440	8,310	6,900	92,562
Estimation	35	Direct Labor cost per hour	75	75	75	75	75	75	75	75	75	75	75	75	75
Caluclation	36	Total Direct Labor cost (34*35)	5,26,500	7,95,150	6,11,550	5,62,050	5,87,250	4,85,100	5,34,150	6,07,050	5,34,600	5,58,000	6,23,250	5,17,500	69,42,150

***Figure 7.6:** Direct Labor Budget*

S. No. 33 and S. No. 35 are the estimation of direct labor hours per unit and direct labor cost per hour, respectively.

S. No. 34 is the total number of hours required, and S. No. 36 is the total direct labor cost.

S. No. 32 to 24 are numbers, while S. No. 35 and 36 are in currency format.

5. Manufacturing Overheads Budget

S. No. 37 is equal to S. No. 13 of the production budget.

After that, we calculate variable overheads.

`S. No. 38, 39 and 40 are the estimation of indirect material, indirect labor and utilities`, as shown in *Figure 7.7*.

S. No. 41 is the total of all variable costs.

S. No. 42, 43,44 are the estimation of various fixed costs.

S. No. 45 are the total of all fixed costs.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			ABCD Co. Ltd.													
2			Manufacturing Cost Budget													
3			For the Period Ended March 23													
4																0
5	Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
6	From Production Budget	37	Cases to be produced (Equal to S. No. 13 of Production Budget)	2,340	3,534	2,718	2,498	2,610	2,156	2,374	2,698	2,376	2,480	2,770	2,300	30,854
7																
8			Variable MOH Costs													
9	Estimation	38	Indirect Materials (Rs. 100 per case) (37*Rs. 100)	2,34,000	3,53,400	2,71,800	2,49,800	2,61,000	2,15,600	2,37,400	2,69,800	2,37,600	2,48,000	2,77,000	2,30,000	30,85,400
10	Estimation	39	Indirect labor (Rs. 150 per case) (37*Rs. 150)	3,51,000	5,30,100	4,07,700	3,74,700	3,91,500	3,23,400	3,56,100	4,04,700	3,56,400	3,72,000	4,15,500	3,45,000	46,28,100
11	Estimation	40	Utilities (Rs. 15 per case) (37*Rs. 15)	35,100	53,010	40,770	37,470	39,150	32,340	35,610	40,470	35,640	37,200	41,550	34,500	4,62,810
12	Caluclation	41	Total Vriable Cost (38+39+40)	6,20,100	9,36,510	7,20,270	6,61,970	6,91,650	5,71,340	6,29,110	7,14,970	6,29,640	6,57,200	7,34,050	6,09,500	81,76,310
13																
14			Fixed MOH Costs													
15	Estimation	42	Insurance and Property tax (10000 pm)	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	1,20,000
16	Estimation	43	Indirect Labor - Fixed(30000 pm)	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	3,60,000
17	Estimation	44	Utilities - Fixed(8000 pm)	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	96,000
18	Caluclation	45	Total Fixed Cost (42+43+44)	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	5,76,000
19																
20			Depreciation													
21	Caluclation	46	Depreciation on factory and equipment(10% WDV Method of S. No. 47)	4,167	4,167	4,167	7,500	12,500	12,500	12,500	12,500	18,333	18,333	18,333	18,333	1,43,333
22																
23	Estimate	47	Manufacturing Equipment	5,00,000			4,00,000	6,00,000				7,00,000				22,00,000
24																
25																
26	Caluclation	48	Total Manufacturing Cost (41+45+46)	6,72,267	9,88,677	7,72,437	7,17,470	7,52,150	6,31,840	6,89,610	7,75,470	6,95,973	7,23,533	8,00,383	6,75,833	88,95,643

Figure 7.7: *Manufacturing Overheads Budget*

S. No. 46 is depreciation of Manufacturing equipment as shown in S. No. 47 of *Figure 7.7*.

S. No. 48 is the total of total variable cost, fixed cost and depreciation.

S. No. 37 is number and all other are currency format.

6. Cost of Goods Sold – Now we will get the cost of goods sold per unit.

   S. No. 49 is equal to the total units produced as per S. No. 13 of the production budget.

   S. No. 50 and 51 are the total of DM 1 and DM 2 after subtracting the closing stock of March 23 as the closing stock is not used for the same year.

   Let's understand the calculation:

   Total of DM 1 as per S. No. 22 = 1,18,99,320/-

   Closing stock of March 23 as per S. No. 17 = 4,600

   Rate as per S. No. 21 = ₹190/-

   Direct Material Cost is = 1,18,99,320 – 4600*190 = 1,17,24,520/-, which is equal to cell no. D9 in *Figure 7.8* of **COGS.**

   Now, cost per case = Cell D9/Cell D6 = 1,17,24,520/30,584 = 380

   So, DM 1 cost per unit/case = 380 for that year.

   The same is for DM 2 (S. No. 51).

	A	B	C	D	E	F
1			ABCD Co. Ltd.			
2			COGS			
3			For the Period Ended March 23			
4						
5	Type	S. No.	Particular	Total In The Year	Cost Per Case	Total
6	From Production Budget	49	Total Unit to be Produce in the Year (Equal to Total No. of S. No. 13)	30854		
7						
8			Budget Manufacturing Costs	Total in the Year	Cost per Case	Total
9	Calculation	50	Direct Material 1 (Total of S. No. 22 - Closing Stock*Rate)	1,17,24,520	380.00	
10	Calculation	51	Direct Material 2 (Total of S. No. 31 - Closing Stock*Rate)	1,07,98,900	350.00	
11	Calculation	52	Direct Labor (Total of S. No. 36)	69,42,150	225.00	
12	Calculation	53	Total Direct Cost (50+51+52)			955.00
13			Variable MOH			
14	Calculation	54	Indirect Materials (Total of S. No. 38)	30,85,400	100.00	
15	Calculation	55	Indirect Labor (Total of S. No. 39)	46,28,100	150.00	
16	Calculation	56	Variable Utilities (Total of S. No. 40)	4,62,810	15.00	
17	Calculation	57	Total Variable MOH (54+55+56)			265.00
18			Fixed MOH			
19	Calculation	58	Insurance And Property Tax (Total of S. No. 42)	1,20,000	3.89	
20	Calculation	59	Indirect Labor - Fixed (Total of S. No. 43)	3,60,000	11.67	
21	Calculation	60	Utilities - Fixed (Total of S. No. 44)	96,000	3.11	
22	Calculation	61	Total Fixed MOH Per Case (58+59+60)			18.67
23						
24	Calculation	62	Total Depreciation (Total of S. No. 46)	1,43,333	4.65	
25	Calculation	63	Total Depreciation (62)			4.65
26						
27						
28	Calculation	64	Cost Per Case (53+57+61+63)	3,83,61,213	1,243.31	1,243.31

Figure 7.8: *Cost of Goods Sold*

S. No. 52 are direct labor per case.

S. No. 53 is the sum of cost per case of DM 1, DM 2 and DL, which are S. No. 50,51 and 52, respectively.

S. No. 54, 55 and 56 are various variable overheads, and S. No. 57 is the total of all variables.

S. No. 58,59 and 60 are various fixed overheads, and S. No. 61 is the total of all fixed overheads.

S. No. 62 is depreciation, and S. No. 63 is cost per case in depreciation.

S. No. 64 is the total of "total cost per case".

S. No. 49 is in number format, and all others are in currency format.

- Operating Budget

  Our next step is to calculate operating budget on estimation basis.

  S. No. 65 is equal to S. No. 1 of the sales budget.

  First, we will **`estimate the variable and fixed operating expenses`**, as shown in *Figure 7.9*.

  S. No. 66 and 67 are variable cost; S. No. 69, 70, 71 and 72 are fixed costs; and S. No. 68 and 73 are the total of both, respectively.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			ABCD Co. Ltd.													
2			Operating Expenses Budget													
3			For the Period Ended March 23													
4				Month												
5	Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
6	From Sales Budget	65	Number of Cases to be Sold (1)	1,950	3,270	2,810	2,550	2,600	2,230	2,350	2,640	2,420	2,470	2,720	2,370	30,380
7																
8																
9			Variable Operating Expenses													
10	Estimation	66	Sales Comission Expenses (Rs. 20.00 per case) (65*Rs. 20)	39,000	65,400	56,200	51,000	52,000	44,600	47,000	52,800	48,400	49,400	54,400	47,400	4,55,700
11	Estimation	67	Shipping Expense (Rs.18.00 per case) (65*Rs. 18)	35,100	58,860	50,580	45,900	46,800	40,140	42,300	47,520	43,560	44,460	48,960	42,660	3,64,560
12	Calculation	68	Total variable Operating Expenses (66+67)	74,100	1,24,260	1,06,780	96,900	98,800	84,740	89,300	1,00,320	91,960	93,860	1,03,360	90,060	8,20,260
13																
14			Fixed Operating Expenses													
15	Estimation	69	Salaries	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000	14,40,000
16	Estimation	70	Office rent	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	1,80,000
17	Estimation	71	Advertising	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	1,20,000
18	Estimation	72	Telephone and internet	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	72,000
19	Calculation	73	Total Fixed Operating Expenses (69+70+71+72)	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	1,51,000	18,12,000
20																
21																
22			Depreciation													
23	Calculation	74	Depreciation(10% WDV Method of S. No. 75)	2,500	2,500	2,500	2,500	2,500	5,833	5,833	5,833	5,833	6,583	6,583	6,583	55,581
24																
25	Estimation	75	Office equipment	3,00,000					4,00,000				90,000			7,90,000
26																
27																
28	Calculation	76	Total operating expenses (68+73+74)	2,27,600	2,77,760	2,60,280	2,50,400	2,52,300	2,41,573	2,46,133	2,57,153	2,48,793	2,51,443	2,60,943	2,47,643	30,22,021

Figure 7.9: *Operating Expenses Budget*

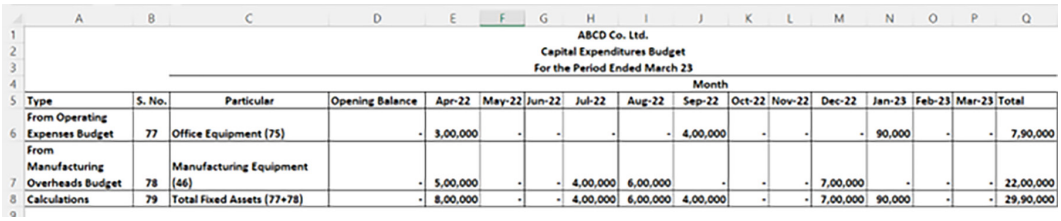
`S. No. 74 is the depreciation of S. No. 75 office equipment` as shown in *Figure 7.9*.

S. No. 76 is the total of all operating costs.

S. No. 65 is in number format, and all others are in currency format.

Capital Expenditure Budget

Our next step is to identify **`Capital Expenditure`**, as shown in *Figure 7.10*:



ABCD Co. Ltd.
Capital Expenditures Budget
For the Period Ended March 23

Type	S. No.	Particular	Opening Balance	Month Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Operating Expenses Budget	77	Office Equipment (75)	-	3,00,000	-	-	-	-	4,00,000	-	-	-	90,000	-	-	7,90,000
From Manufacturing Overheads Budget	78	Manufacturing Equipment (46)	-	5,00,000	-	-	4,00,000	6,00,000	-	-	-	7,00,000	-	-	-	22,00,000
Calculations	79	Total Fixed Assets (77+78)	-	8,00,000	-	-	4,00,000	6,00,000	4,00,000	-	-	7,00,000	90,000	-	-	29,90,000

Figure 7.10: *Capital Expenditure Budget*

S. No. 77 is equal to S. No. 75 of operating expenses budget, as we purchase office equipment as per our requirement and spend money as required.

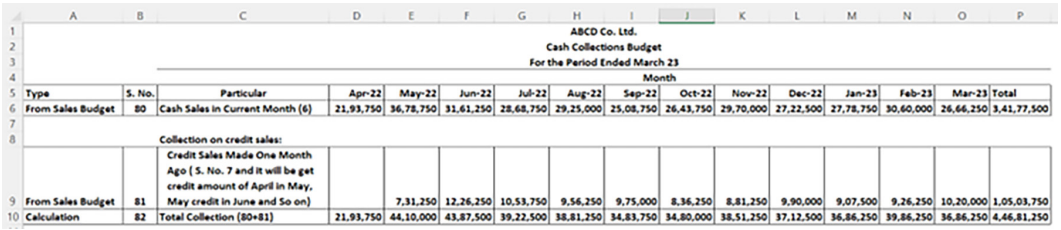
S. No. 78 is equal to S. No. 46 of the manufacturing overheads budget, as we purchase fixed assets as required for the company.

S. No. 79 is the total of all assets, as shown in *Figure 7.10*.

All figures are in currency format.

- Collection and Payment

  As sales happen, we will collect cash against it and pay for the expenses as needed.



ABCD Co. Ltd.
Cash Collections Budget
For the Period Ended March 23

Type	S. No.	Particular	Month Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
From Sales Budget	80	Cash Sales in Current Month (6)	21,93,750	36,78,750	31,61,250	28,68,750	29,25,000	25,08,750	26,43,750	29,70,000	27,22,500	27,78,750	30,60,000	26,66,250	3,41,77,500
		Collection on credit sales:													
From Sales Budget	81	Credit Sales Made One Month Ago (S. No. 7 and it will be get credit amount of April in May, May credit in June and So on)		7,31,250	12,26,250	10,53,750	9,56,250	9,75,000	8,36,250	8,81,250	9,90,000	9,07,500	9,26,250	10,20,000	1,05,03,750
Calculation	82	Total Collection (80+81)	21,93,750	44,10,000	43,87,500	39,22,500	38,81,250	34,83,750	34,80,000	38,51,250	37,12,500	36,86,250	39,86,250	36,86,250	4,46,81,250

Figure 7.11*: Collection of Cash*

As shown in *Figure 7.11*, **`S. No. 80 is equal to the cash we collect from sales as per S. No. 6 -Cash Sales`**.

S. No. 81 is the credit sales that will be received after one month of sale, that is, April 22 credit sales will be received in May 22, and May 22 sales amount will be received on June 22. The figure of March 23 will be displayed in the budgeted balance sheet, which we will do later.

S. No. 82 is the total of S. No. 80 and 81.

All figures are in currency format.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			ABCD Co. Ltd.													
2			Cash Payments Budget													
3			For the Period Ended March 23													
4			Month													
5	Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
6	From DM Budget	83	Cash payments for DM purchases (22+31)		20,49,840	27,54,220	18,64,890	17,91,420	19,21,690	15,07,520	17,65,000	20,16,730	16,87,430	18,25,660	20,64,440	2,12,48,840
7	From DL Budget	84	Cash payment for Direct Labor(36)	5,26,500	7,95,150	6,11,550	5,62,050	5,87,250	4,85,100	5,34,150	6,07,050	5,34,600	5,58,000	6,23,250	5,17,500	69,42,150
8	From MOH Budget	85	Cash payments for MOH (41+45)	6,68,100	9,84,510	7,68,270	7,09,970	7,39,650	6,19,340	6,77,110	7,62,970	6,77,640	7,05,200	7,82,050	6,57,500	87,52,310
9	From OE Budget	86	Cash payments for Operating Expenses (68+73)	2,25,100	2,75,260	2,57,780	2,47,900	2,49,800	2,35,740	2,40,300	2,51,320	2,42,960	2,44,860	2,54,360	2,41,060	29,66,440
10	From Capital Expenditure Budget	87	Cash payments for Fixed Assets(79)	8,00,000	-	-	4,00,000	6,00,000	4,00,000	-	-	7,00,000	90,000	-	-	29,90,000
11	Estimation	88	Cash payments for Dividends	-	-	2,00,000	-	-	2,00,000	-	-	2,00,000	-	-	2,00,000	8,00,000
12	From Income Statement	89	Tax on Income (109)	81,881	1,68,481	1,38,302	1,21,204	1,24,525	98,625	1,05,061	1,25,314	1,11,716	1,12,633	1,29,877	1,08,015	14,25,633
13	Calculation	90	Total cash payments (83+84+85+86+87+88)	23,01,581	42,73,241	47,30,122	39,06,014	40,92,645	39,60,495	30,64,141	35,11,654	44,83,646	33,98,123	36,15,197	37,88,515	4,51,25,373

Figure 7.12: *Payment of Cash*

As we can see *Figure 7.12*, **`S. No. 83 is the cash payment of Direct Material`**. Remember that we consider a 1-month **`credit period for payment of Direct Material`**, so we will not pay anything in **`April 22`**; the **`April 22`** purchases will be paid for in **`May 22`**, and so on. And **`March 23`** purchases will go to the **`Budget Balance Sheet`** in Accounts Payable. It is equal **`to DM 1 S. No. 22 + DM 2 S. No. 31.`**

S. No. 84 is the cash payment of Direct Labor, which is equal to S. No. 36.

S. No. 85 is Cash Payment of Fixed Cost and Variable cost of manufacturing overheads, which is equal to S. No. 41 + S. No. 45.

S. No. 86 is cash payment of Fixed Cost and Variable Cost of Operating Expenses, which is equal to S. No. 68 + S. No. 73.

S. No. 87 is the payment of fixed assets, which is S. No. 79.

S. No. 88 is the estimation of the dividend we pay on a quarterly basis to stakeholders.

S. No. 89 We must keep it blank for now; this will come from the income statement, which we will calculate in step 11 (we are currently on step 9). It will be equal to S. No. 109 of the income statement. We will calculate 30% tax on EBT.

S. No. 90 is the total of all payments, from S. No. 83 to 89.

All figures are in currency format.

- Combined Cash

  Now we have Collection and Payment figures, so we will combine both.

  S. No. 91 is the Opening Cash Balance for the month, which is equal to the closing cash balance of the previous month.

  We will not have the **`Opening balance in Apr 22`**, as shown in *Figure 7.13*, **`Cell D6.`**

S. No. 91 is equal to Last Month Closing Balance of S. No. 100.

S. No. 92 is the estimation of the initial capital introduced in the business.

S. No. 93 is equal to S. No. 82.

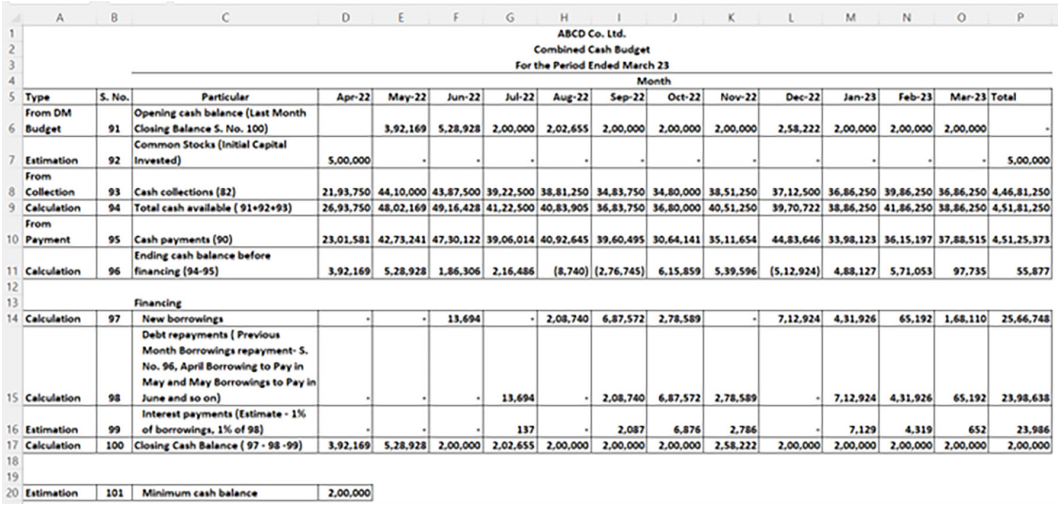
S. No. 94 is the total of S. No. 91, 92 and 93.

S. No. 95 is equal to S. No. 90.

S No. 96 is difference between S. No. 94 and 95.

Sometime we need financing(debt/equity) to keep when the **`cash balance go dip or in negative`**. suppose we maintain **`minimum cash balance of ₹2,00,000/-`** every month, as shown in *Figure 7.13*, **`S. No. 101`**.

We need new borrowing as S. No. 97. Let us understand the calculation of how much we need and how we will repay the debt.



ABCD Co. Ltd.
Combined Cash Budget
For the Period Ended March 23

	Type	S. No.	Particular	Month Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
6	From DM Budget	91	Opening cash balance (Last Month Closing Balance S. No. 100)		3,92,169	5,28,928	2,00,000	2,02,655	2,00,000	2,00,000	2,00,000	2,58,222	2,00,000	2,00,000	2,00,000	-
7	Estimation	92	Common Stocks (Initial Capital Invested)	5,00,000	-	-	-	-	-	-	-	-	-	-	-	5,00,000
8	From Collection	93	Cash collections (82)	21,93,750	44,10,000	43,87,500	39,22,500	38,81,250	34,83,750	34,80,000	38,51,250	37,12,500	36,86,250	39,86,250	36,86,250	4,46,81,250
9	Calculation	94	Total cash available (91+92+93)	26,93,750	48,02,169	49,16,428	41,22,500	40,83,905	36,83,750	36,80,000	40,51,250	39,70,722	38,86,250	41,86,250	38,86,250	4,51,81,250
10	From Payment	95	Cash payments (90)	23,01,581	42,73,241	47,30,122	39,06,014	40,92,645	39,60,495	30,64,141	35,11,654	44,83,646	33,98,123	36,15,197	37,88,515	4,51,25,373
11	Calculation	96	Ending cash balance before financing (94-95)	3,92,169	5,28,928	1,86,306	2,16,486	(8,740)	(2,76,745)	6,15,859	5,39,596	(5,12,924)	4,88,127	5,71,053	97,735	55,877
12																
13			Financing													
14	Calculation	97	New borrowings	-	-	13,694	-	2,08,740	6,87,572	2,78,589	-	7,12,924	4,31,926	65,192	1,68,110	25,66,748
15	Calculation	98	Debt repayments (Previous Month Borrowings repayment- S. No. 96, April Borrowing to Pay in May and May Borrowings to Pay in June and so on)	-	-	-	13,694	-	2,08,740	6,87,572	2,78,589	-	7,12,924	4,31,926	65,192	23,98,638
16	Estimation	99	Interest payments (Estimate - 1% of borrowings, 1% of 98)	-	-	-	137	-	2,087	6,876	2,786	-	7,129	4,319	652	23,986
17	Calculation	100	Closing Cash Balance (97 - 98 -99)	3,92,169	5,28,928	2,00,000	2,02,655	2,00,000	2,00,000	2,00,000	2,58,222	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
18																
19																
20	Estimation	101	Minimum cash balance	2,00,000												

Figure 7.13: *Combine Cash*

The following is the formula for Apr 22:

=IF(D11-D15-D16>$D$20,0,$D$20-D11+D15+D16)

Where D11 is Apr 22 Ending Cash before Financing (S. No. 96).

D15 is debt repayment of the previous month (S. No. 98). Apr 22 will not have any repayment. S. No. 98 is equal to S. No. 97, which is payable next month, which means Apr 22 borrowings are payable in May 22, and May 22 borrowings are payable in Jun 22. For March 23, this will go in the budget balance sheet under current liabilities.

D16 is the interest paid on the debt of the last month, along with debt (S. No. 99). In our example, we consider 1% pm of the debt amount.

D20 is the Minimum Cash Balance requirement as S. No. 101.

Let's keep no. instead on cell no..

=IF(392169-0-0>200000,0,200000-392169+0+0)

=IF(392169>200000,0,-292169)

We can see that the if condition comes true, so the answer will be 0.

Let's take the same for Sep 22, where we have all figures in S. No. 96,98 and 99.

The Formula for Sep 22 is as follows:

=IF(I11-I15-I16>$D$20,0,$D$20-I11+I15+I16)

=IF(-276745-208740-2087>200000,0,200000-(-276745)+208740+2087)

=IF(-487572>200000,0,687572)

Here, the if condition is false, so the answer will be 678572. So, the borrowing required for Sep 22 is □6,78,572/-

In Apr 22, May 22, Jul 22 and Nov 22, we don't need borrowings as we have enough cash available for cash flow.

All figures are in currency format.

- Income Statement

  We have completed our budgeting part; now we need to make an income statement and a balance sheet.

  In this step, we will work on the income statement to know how much profit we earn in the entire year.

  S. No. 102 is sales revenue, which is equal to S. No. 3.

  S. No. 103 is COGS, which is equal to the total units' sales multiplied by COGS per unit (S. No. 6 * S. No. 64).

  S. No. 104 is gross profit, which is the difference between sales revenue and COGS (102-103).

  S. No. 105 is operating expenses, which is equal to 76.

  S. No. 106 is the operating profit, difference of gross profit and operating expenses, as shown in *Figure 7.14*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1								ABCD Co. Ltd.								
2								Budgeted Income Statement								
3								For FY 22-23								
4										Month						
5	Type	S. No.	Particular	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
6	From Sales Budget	102	Sales revenue(3)	29,25,000	49,05,000	42,15,000	38,25,000	39,00,000	33,45,000	35,25,000	39,60,000	36,30,000	37,05,000	40,80,000	35,55,000	4,55,70,000
7	Calculation	103	COGS(6*64)	24,24,462	40,65,637	34,93,713	31,70,451	32,32,617	27,72,590	29,21,788	32,82,349	30,08,820	30,70,986	33,81,814	29,46,654	3,77,71,882
8	Calculation	104	Gross profit (102-103)	5,00,538	8,39,363	7,21,287	6,54,549	6,67,383	5,72,410	6,03,212	6,77,651	6,21,180	6,34,014	6,98,186	6,08,346	77,98,118
9	From OE Budget	105	Operating expenses(76)	2,27,600	2,77,760	2,60,280	2,50,400	2,52,900	2,41,573	2,46,133	2,57,153	2,48,793	2,51,443	2,60,943	2,47,643	30,22,021
10	Calculation	106	Operating income(104-105	2,72,938	5,61,603	4,61,007	4,04,149	4,15,083	3,30,837	3,57,079	4,20,498	3,72,387	3,82,571	4,37,243	3,60,703	47,76,097
11	From Combine Cash	107	Interest expense (99)	-	-	-	137	-	2,087	6,876	2,786	-	7,129	4,319	652	23,986
12	Calculation	108	EBT (106-107)	2,72,938	5,61,603	4,61,007	4,04,012	4,15,083	3,28,749	3,50,203	4,17,712	3,72,387	3,75,442	4,32,923	3,60,051	47,52,110
13	Estimation	109	Tax on income @ 30% (30% of 108)	81,881	1,68,481	1,38,302	1,21,204	1,24,525	98,625	1,05,061	1,25,314	1,11,716	1,12,633	1,29,877	1,08,015	14,25,633
14	Calculation	110	Net income (107-108)	1,91,056	3,93,122	3,22,705	2,82,808	2,90,558	2,30,124	2,45,142	2,92,398	2,60,671	2,62,809	3,03,046	2,52,035	33,26,477

Figure 7.14: *Income Statement*

S. No. 107 is the interest paid during the year, which is equal to S. No. 99 of combined cash.

S. No. 108 is EBT, which is equal to operating income and interest expenses (106-107).

S. No. 109 is tax against income; we estimated 30% of EBT, i.e., 30% of 108.

S. No. 110 is net income, which is the difference between EBT and Tax (108-109).

We might earn □33,26,477/- in the year.

All figures are in currency format.

Budgeted Balance Sheet: We have reached our last milestone to complete the budgeting process.

The purpose of making a budgeted balance sheet is to know how much we owe at the end of the year/period.

Figure 7.15 shows the budgeted balance sheet of our budget:

	A	B	C	D
1			ABCD Co. Ltd.	
2			Budgeted Balance Sheet	
3			For the Period Ended March 23	
4	Type	S. No.	Assets:	Amount
5	From Cobined Cash	111	Cash (Closing of 99)	2,00,000
6	From Sales Budget	112	Accounts Receivable (Closing of Credit Sales March S. No. 7)	8,88,750
7	From DM1 and DM2 Budget	113	Raw Materials Inventory (March Closing Stock S. No. 17* Rate per unit S. No. 21 for DM1 + March Closing Stock S. No. 26* Rate per unit S. No. 30)	3,35,800
8	From Production Budget	114	Finished Goods Inventory (Closing Stock of Production S. No.10 * COGS S. No. 64)	5,89,331
9	Calculation	115	Total Current Assets (110+111+112+113)	20,13,881
10	From Fixed Assets	116	Fixed Assets (S. No. 79 - Total of S. No. 46 - Total of S. No. 74)	27,91,086
11	Calculation	117	Total Assets (114+115)	48,04,967
12				
13			Liabilities and Stockholders' Equity	
14	From DM1 and DM2	118	Accounts Payable (March Pending of DM1 + DM2 , S. No. 22 + S. No. 31 [Only March])	16,10,380
15	From Combine Cash	119	Other Current Liabilities (March Pending of S. No.97)	1,68,110
16	Calcualtion	120	Total Current Liabilities (117+118)	17,78,490
17	From Combine Cash	121	Common Stock (Closing of S. No. 91)	5,00,000
18	From Income Statement	122	Retained Earnings (Profit - Dividend Paid), Total of S. No. 110 - Total of S. No. 88)	25,26,477
19	Calcualtion	123	Total Stockholders Equity (121+122)	30,26,477
20	Calcualtion	124	Total Liabilities and Stockholders' Equity (120+123)	48,04,967

Figure 7.15: *Budgeted Balance Sheet*

S. No. 111 is the cash balance from combined cash, closing of S. No. 99.

S. No. 112 is accounts receivable, which is the closing of March credit sales of S. No. 7.

S. No. 113 is the total of raw material of DM 1 and DM 2 March closing stock multiplied by their rates. (March Closing Stock S. No. 17* Rate per unit S. No. 21 for DM1 + March Closing Stock S. No. 26* Rate per unit S. No. 30).

S. No. 114 is equal to March Closing Stock of production S. No. 10 multiplied by COGS per unit S. No. 64 of COGS.

All the preceding four are current assets, and S. No. 115 is the total of S. No. 111 to 114.

S. No. 116 is the fixed assets, which are equal to total Capital Expenditure less Operating Expenses, Depreciation and Manufacturing Overheads Depreciation (Total of S. No. 79 – Total of S. No. 46 – Total of S. No. 74).

S. No. 117 is the total of current and fixed assets.

S. No. 118 is accounts payable, which is equal to March pending of DM 1 and DM 2.

Total of Balances of March 23 of S. No. 22 and S. No. 31)

S. No. 119 is the closing balance of March of new borrowings S. No. 97.

S. No. 120 is the closing total of all current liabilities, which is equal to the sum of S. No. 118 and 119.

S. No. 121 is the capital invested by stakeholders, which is equal to the total of S. No. 91.

S. No. 122 is the retained earnings, which is equal to net profit less total dividend paid during the year (Total of S. No. 110 – Total of S. No. 88).

S. No. 123 is total equity, which is equal to sum of S. No. 121 and 122 (Common Stock + Retained Earnings).

S. No. 124 is total of equity and liabilities, which is equal to S. No. 120 + 123.

All figures in currency format.

With this, we have completed our budget preparation!

Conclusion

We have now enough knowledge about Types of Budgets, How to work on Budget, Calculation of Budget, Projections in Budgeting.

In next chapter we are going to learn, we will continue learning of Chapter 5, 6 and 7 with Leverage Buyout, Leverage Modelling and Capital Budgeting. We will learn Capital Budgeting, Leverages and Types of Leverages and Leverage Buyout Modelling.

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Chapter 8

Capital Budgeting and Leverage Buyout Modeling

Introduction

In *Chapter 7, Preparing Different Budgets With Analysis*, we learned about budget and operating budget and how to calculate them. Now, we will continue it with capital budgeting. We will also learn about leverage buyout modeling and what leverage means in accounting and finance.

Structure

- Capital Budgeting
- Introduction to Leverage
- Operating Leverage
- Financial Leverage
- Combined Leverage
- Leverage Buyout

Objectives

Capital budgeting is the need of hour for buying assets/investing in projects by creating cases of best, base and worst case. We will be able to Analysis with the help of IRR and NPVabout Capital Budgeting. We will understand what discounted cash flow and free cash flow are. We will have knowledge of leverage and its types and will be able to analyze whether to acquire a company with leverage buyout modeling.

Capital budgeting

Capital budgeting is a term relating to the decision-making process companies go through when determining whether to invest in a long-term initiative or in assets. In addition, capital budgeting is used as a tool for company executives to compare alternatives when making strategic decisions.

Capital budgeting is used to assess the following:

- The investment in a new production plant
- The acquisition of an old company
- Expanding the existing warehouse
- Purchase or lease of a new vehicle

Decisions that have a significant impact on a company's future for an extended period, involving substantial investments and long-term importance.. The topic of discussion in the first team meeting will be the amount of capital to invest, the project timeline and the financial returns.

We have discussed the time value of money, IRR, NPV, and WACC in *Chapter 5, Preparing Business Valuation Modeling*. We will use these terms in capital budgeting.

We will also cover discounted cash flow modeling, which is part of the capital budgeting process.

Let's dive straight into preparing a capital budget.

We need some **`drivers`** (Input) to start preparation.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Drivers													
2	1	Selected case	Worst case												
4		Installed capacity (MW)													
5	2	Best case	240												
6	3	Base case	220												
7	4	Worst case	200												
9	5	Capacity factor	35%												
10	6	Days in one year	365												
11	7	Hours per day	24												
13		Inflation													
14	8	Expected long-term inflation rate	1.10%												
16		Price per MWh (INR)													
17	9	Best case	360												
18	10	Base case	340												
19	11	Worst case	320												
21		Opex as a % of Revenue													
22	12	Best case	-20%												
23	13	Base case	-22%												
24	14	Worst case	-24%												
26		Initial Investment													
27	15	Best case	34,00,00,000												
28	16	Base case	36,00,00,000												
29	17	Worst case	38,00,00,000												
31	18	Useful life (years)	10												
32	19	Capex after year 1	3%												
34		Financing facilities													
35	20	Principal	24,00,00,000												
36	21	Interest Rate	8%												
37	22	Period (In Years)	10												
39			23(i)	23(ii)	23(iii)	23(iv)	23(v)	23(vi)	23(vii)	23(viii)	23(ix)	23(x)	23(xi)	23(xii)	23(xiii)	
40		Repayment schedule	0	1	2	3	4	5	6	7	8	9	10	11	12	
41	23	Repayment %	0%	0%	5%	10%	10%	10%	10%	10%	10%	10%	10%	10%	5%	
43	24	Tax rate	30%													
44	25	Residual value of the project	7,00,00,000													
46		Comparable companies	Leverage (D/E)	Beta												
47	26	Company A	70%	0.50												
48	27	Company B	80%	0.40												
49	28	Company C	65%	0.35												
51	29	Company X beta	0.9													
53	30	Market risk premium	6.5%													
54	31	Risk-free rate	6.0%													

Figure 8.1: *Drivers (Input) Given to prepare Capital Budgeting with 3 case scenarios*

The sheet is named **`Drivers`**.

For *Figure 8.1*, following are the descriptions:

S. No. 1 is the Selected Case; we can select the Best, Base and Worst Cases from Cell C2.

S. No. 2,3 and 4 are Installed Capacity in MW for the Best, Base and Worst Case, respectively.

S. No. 5 is the capacity factor, S. No. 6 is the Days in one year considered, and S. No. 7 is the hours per day count of work.

S. No. 8 is the inflation rate. S. No. 9, 10 and 11 are Price per MWh for the Best, Base and Worst Case, respectively.

S. No. 12,13 and 14 are OpEx as a % of Revenue for all three cases.

S. No. 15,16 and 17 are Initial Investment decided by the company for all three cases.

S. No 18 is the useful life of Asset, and S. No. 19 is Capex after year 1.

S. No. 20, 21 and 22 are Loan Amount, Rate and period of financing, while S. No. 23 is the Repayment Schedule.

S. No. 24 is the tax rate in India.

S. No. 25 is the residual value of the project/asset.

S. No. 26, 27 and 28 are the peer companies' Debt Equity Ratio and Beta.

S. No. 29 is the company's own beta.

S. No. 30 and 31 are market risk premium and risk-free rate for CAPM Calculation.

First, we will calculate revenue.

Add a new sheet, and rename it as revenue and format it as shown in *Figure 8.2*; add the input of this sheet from **`Drivers Worksheet`**.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1			Revenue										
2	32	From Drivers	Selected case	Base case									
3													
4			Installed capacity (MW)										
5	33	From Drivers	Best case	240									
6	34	From Drivers	Base case	220									
7	35	From Drivers	Worst case	200									
8													
9	36	From Drivers	Capacity factor	35%									
10	37	From Drivers	Days in one year	365									
11	38	From Drivers	Hours per day	24									
12													
13			Energy production MWh	1	2	3	4	5	6	7	8	9	10
14	39	Calculations	Best case										
15	40	Calculations	Base case										
16	41	Calculations	Worst case										
17	42	Calculations	Selected case	-	-	-	-	-	-	-	-	-	-
18													
19	43	From Drivers	Expected long-term inflation	1.10%									
20													
21			Price per MWh	1	2	3	4	5	6	7	8	9	10
22	44	Calculations	Best case										
23	45	Calculations	Base case										
24	46	Calculations	Worst case										
25	47	Calculations	Selected case	-	-	-	-	-	-	-	-	-	-
26													
27													
28			Revenue (INR)	1	2	3	4	5	6	7	8	9	10
29	48	Calculations	Best case										
30	49	Calculations	Base case										
31	50	Calculations	Worst case										
32	51	Calculations	Selected case	-	-	-	-	-	-	-	-	-	-
33													

Figure 8.2: *Revenue Calculation Format*

As we can see in *Figure 8.2*, we have the format of revenue calculations.

In *Figure 8.2* the S. No. 32, 33, 34, 35, 36, 37,38 and 43 are given in Drivers Sheet, we take these figures from there itself.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1			Revenue										
2	32	From Drivers	Selected case	=Drivers!C2									
3													
4			Installed capacity (MW)										
5	33	From Drivers	Best case	=Drivers!C5									
6	34	From Drivers	Base case	=Drivers!C6									
7	35	From Drivers	Worst case	=Drivers!C7									
8													
9	36	From Drivers	Capacity factor	=Drivers!C9									
10	37	From Drivers	Days in one year	=Drivers!C10									
11	38	From Drivers	Hours per day	=Drivers!C11									
12													
13			Energy production MWh	1	2	3	4	5	6	7	8	9	10
14	39	Calculations	Best case										
15	40	Calculations	Base case										
16	41	Calculations	Worst case										
17	42	Calculations	Selected case	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)	=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)
18													
19	43	From Drivers	Expected long-term inflation	=Drivers!C14									
20													
21			Price per MWh	1	2	3	4	5	6	7	8	9	10
22	44	Calculations	Best case										
23	45	Calculations	Base case										
24	46	Calculations	Worst case										
25	47	Calculations	Selected case	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)	=VLOOKUP($D$2,$C22:$M24,COLUMN()-2,0)
26													
27													
28			Revenue (INR)	1	2	3	4	5	6	7	8	9	10
29	48	Calculations	Best case										
30	49	Calculations	Base case										
31	50	Calculations	Worst case										
32	51	Calculations	Selected case	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)	=VLOOKUP($D$2,$C29:$M31,COLUMN()-2,0)
33													

Figure 8.3: *Formula used in Revenue Calculation Format*

Figure 8.3 shows the Excel formula used in **`Revenue Calculation Format`**.

S. No. 32 is for the selection of Best, Base and Worst, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting case selection solely to that sheet

S. No. 32 to 35 are equal to S. No. 2 to 4, respectively, for all three scenarios.

S. No. 36 to 38 and 43 are equal to S. No. 5 to 7 and 8 for various metrics given in the Drivers Sheet.

We will calculate S. No. 39 to 41 for Energy production MWh, S. No. 44 to 46 for Price per MWh, and S. No. 48 to 50 for Revenue.

While S. No. 42, 47 and 51 will be selected case based on Best, Base and Worst Case.

Let's understand the VLOOKUP formula used for the selected cases cells in S. No. 42, 47 and 51

=VLOOKUP($D$2,$C14:$M16,COLUMN()-2,0)

The above-mentioned is the formula of cell D17. We know that the $D$2 is the lookupvalue, $C14:$M16 is the table array and COLUMN()-2 defines the column number.

The result of COLUMN()-2 in D Column is 2 because:

COLUMN() in D Column = 4; COLUMN()-2 in D Column = 2

COLUMN() in A Column = 1; COLUMN()-2 in A Column = -1

COLUMN() in B Column = 2; COLUMN()-2 in B Column = 0

COLUMN() in M Column = 12; COLUMN()-2 in M Column = 10

So we can consider the formula in D column as follows:

=VLOOKUP($D$2,$C14:$M16,2,0)

And for M column as follows:

=VLOOKUP($D$2,$C14:$M16,10,0)

Now we fill the blank cells of the revenue sheet.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1			Revenue										
2	32	From Drivers	Selected case	Base case									
3													
4			Installed capacity (MW)										
5	33	From Drivers	Best case	240									
6	34	From Drivers	Base case	220									
7	35	From Drivers	Worst case	200									
8													
9	36	From Drivers	Capacity factor	35%									
10	37	From Drivers	Days in one year	365									
11	38	From Drivers	Hours per day	24									
12													
13			Energy production MWh	1	2	3	4	5	6	7	8	9	10
14	39	Calculations	Best case	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840	7,35,840
15	40	Calculations	Base case	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520
16	41	Calculations	Worst case	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200	6,13,200
17	42	Calculations	Selected case	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520	6,74,520
18													
19	43	From Drivers	Expected long-term inflation	1.10%									
20													
21			Price per MWh	1	2	3	4	5	6	7	8	9	10
22	44	Calculations	Best case	360	364	368	372	376	380	384	388	392	396
23	45	Calculations	Base case	340	344	348	352	356	360	364	368	372	376
24	46	Calculations	Worst case	320	324	328	332	336	340	344	348	352	356
25	47	Calculations	Selected case	340	344	348	352	356	360	364	368	372	376
26													
27													
28			Revenue (INR)	1	2	3	4	5	6	7	8	9	10

Figure 8.4: *Calculation of Energy Production MWh, Price per MWh and Revenue*

Figure 8.4 shows the **`Energy Production MWh, Price per MWh and Revenue`** calculated.

Energy Production MWh = Installed Capacity x Capacity Factor x Days in a year x Hours per Day

So Base Case = Base Case Installed Capacity (220) x 35% x 365 x 24 = 6,74,520

And worst case and best case calculation for others as well.

Price per MWh for the first year as mentioned in Drivers Sheet that is 360 and 340 and 320 as given in Drivers Sheet S. No. 9 and 10 and 11, respectively.

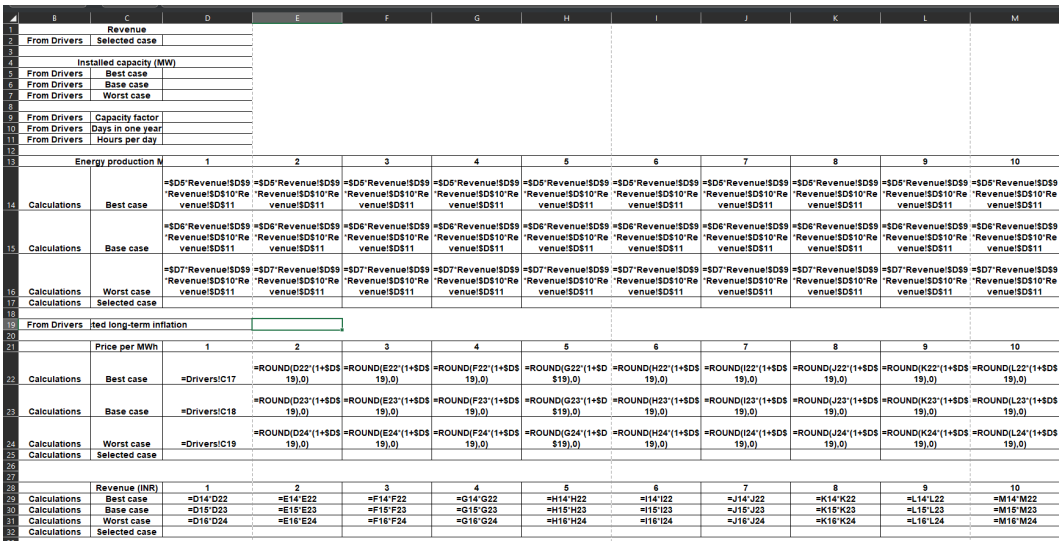
From the second year onward, Price per MWh = ROUND (Rate of Previous Year x (Inflation Rate + 1)).

So, the second year calculations for base case = ROUND (Rate of Previous Year (340) x (Inflation Rate 1.10% +1)) = 344

Revenue = Energy Production MWh x Price per MWh

Revenue for base case in year 1 = 674520 x 340 = 229336800/-

Following is the formula used in Excel:

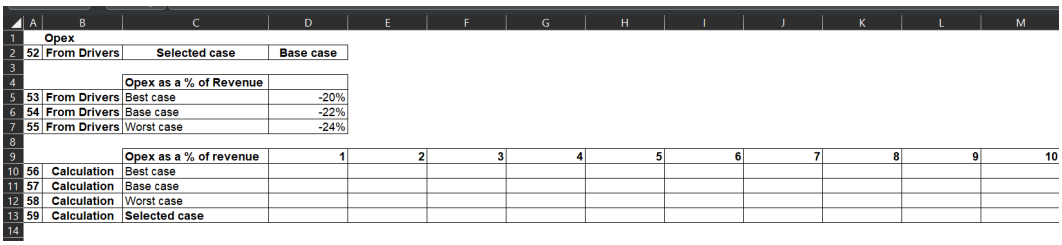


	B	C	D	E	F	G	H	I	J	K	L	M
1		Revenue										
2	From Drivers	Selected case										
3												
4		Installed capacity (MW)										
5	From Drivers	Best case										
6	From Drivers	Base case										
7	From Drivers	Worst case										
8												
9	From Drivers	Capacity factor										
10	From Drivers	Days in one year										
11	From Drivers	Hours per day										
12												
13		Energy production M	1	2	3	4	5	6	7	8	9	10
14	Calculations	Best case	=$D5*Revenue!$D$9	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D5*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11
15	Calculations	Base case	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D6*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11
16	Calculations	Worst case	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11	=$D7*Revenue!$D$9 *Revenue!$D$10*Re venue!$D$11
17	Calculations	Selected case										
18												
19	From Drivers	ted long-term inflation										
20												
21		Price per MWh	1	2	3	4	5	6	7	8	9	10
22	Calculations	Best case	=Drivers!C17	=ROUND(D22*(1+D 19),0)	=ROUND(E22*(1+D 19),0)	=ROUND(F22*(1+D 19),0)	=ROUND(G22*(1+$D $19),0)	=ROUND(H22*(1+D 19),0)	=ROUND(I22*(1+D 19),0)	=ROUND(J22*(1+D 19),0)	=ROUND(K22*(1+D 19),0)	=ROUND(L22*(1+D 19),0)
23	Calculations	Base case	=Drivers!C18	=ROUND(D23*(1+D 19),0)	=ROUND(E23*(1+D 19),0)	=ROUND(F23*(1+D 19),0)	=ROUND(G23*(1+$D $19),0)	=ROUND(H23*(1+D 19),0)	=ROUND(I23*(1+D 19),0)	=ROUND(J23*(1+D 19),0)	=ROUND(K23*(1+D 19),0)	=ROUND(L23*(1+D 19),0)
24	Calculations	Worst case	=Drivers!C19	=ROUND(D24*(1+D 19),0)	=ROUND(E24*(1+D 19),0)	=ROUND(F24*(1+D 19),0)	=ROUND(G24*(1+$D $19),0)	=ROUND(H24*(1+D 19),0)	=ROUND(I24*(1+D 19),0)	=ROUND(J24*(1+D 19),0)	=ROUND(K24*(1+D 19),0)	=ROUND(L24*(1+D 19),0)
25	Calculations	Selected case										
26												
27												
28		Revenue (INR)	1	2	3	4	5	6	7	8	9	10
29	Calculations	Best case	=D14*D22	=E14*E22	=F14*F22	=G14*G22	=H14*H22	=I14*I22	=J14*J22	=K14*K22	=L14*L22	=M14*M22
30	Calculations	Base case	=D15*D23	=E15*E23	=F15*F23	=G15*G23	=H15*H23	=I15*I23	=J15*J23	=K15*K23	=L15*L23	=M15*M23
31	Calculations	Worst case	=D16*D24	=E16*E24	=F16*F24	=G16*G24	=H16*H24	=I16*I24	=J16*J24	=K16*K24	=L16*L24	=M16*M24
32	Calculations	Selected case										

Figure 8.5: *Excel Formula used for the Calculation of Energy Production MWh, Price per MWh and Revenue*

As we can see in *Figure 8.5*, we have the Excel Formula used for getting values in Figure 8.4in cells for **`Energy, Production MWh, Price per MWh and Revenue`**.

The next step is to calculate **`Opex: add a new sheet`**, rename it as **`Opex`** and format it as shown in *Figure 8.6*:



	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Opex											
2	52	From Drivers	Selected case	Base case									
3													
4			Opex as a % of Revenue										
5	53	From Drivers	Best case	-20%									
6	54	From Drivers	Base case	-22%									
7	55	From Drivers	Worst case	-24%									
8													
9			Opex as a % of revenue	1	2	3	4	5	6	7	8	9	10
10	56	Calculation	Best case										
11	57	Calculation	Base case										
12	58	Calculation	Worst case										
13	59	Calculation	Selected case										
14													

Figure 8.6: *Opex Calculation Format*

As we can see in *Figure 8.6*, we have got the **`Opex % from Drivers Sheet`** as given in Drivers Sheet.

S. No 53, 54 and 55 are equal to S. No. 12, 13 and 14, respectively.

S. No. 52 is for the selection of the Best, Base and Worst cases, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting case selection solely to that sheet.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Opex											
2	52	From Drivers	Selected case	Base case									
3													
4			Opex as a % of Revenue										
5	53	From Drivers	Best case	-20%									
6	54	From Drivers	Base case	-22%									
7	55	From Drivers	Worst case	-24%									
8													
9			Opex as a % of revenue	1	2	3	4	5	6	7	8	9	10
10	56	Calculation	Best case	(5,29,80,480)	(5,35,69,152)	(5,41,57,824)	(5,47,46,496)	(5,53,35,168)	(5,59,23,840)	(5,65,12,512)	(5,71,01,184)	(5,76,89,856)	(5,82,78,528)
11	57	Calculation	Base case	(4,58,67,360)	(4,64,06,976)	(4,69,46,592)	(4,74,86,208)	(4,80,25,824)	(4,85,65,440)	(4,91,05,056)	(4,96,44,672)	(5,01,84,288)	(5,07,23,904)
12	58	Calculation	Worst case	(3,92,44,800)	(3,97,35,360)	(4,02,25,920)	(4,07,16,480)	(4,12,07,040)	(4,16,97,600)	(4,21,88,160)	(4,26,78,720)	(4,31,69,280)	(4,36,59,840)
13	59	Calculation	Selected case	**(4,58,67,360)**	**(4,64,06,976)**	**(4,69,46,592)**	**(4,74,86,208)**	**(4,80,25,824)**	**(4,85,65,440)**	**(4,91,05,056)**	**(4,96,44,672)**	**(5,01,84,288)**	**(5,07,23,904)**

Figure 8.7: *Opex Calculation*

As we can see in *Figure 8.7*, we have completed **`OpEx`** calculation.

OpEx = Revenue (From Revenue Sheet) x OpEx %

For First Year Best Case, OpEx = 229336800 x (20%) = (4,58,67,360)

The Excel formula used for **`Opex`** calculation is given in *Figure 8.8*:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Opex											
2	52	From Drivers	Selected case	=Drivers!C2									
3													
4			Opex as a % of Revenue										
5	53	From Drivers	Best case	=Drivers!C22									
6	54	From Drivers	Base case	=Drivers!C23									
7	55	From Drivers	Worst case	=Drivers!C24									
8													
9			Opex as a % of revenue	1	2	3	4	5	6	7	8	9	10
10	56	Calculation	Best case	=ROUND(RevenueID29*$D$5,0)	=ROUND(RevenueIE29*$D$5,0)	=ROUND(RevenueIF29*$D$5,0)	=ROUND(RevenueIG29*$D$5,0)	=ROUND(RevenueIH29*$D$5,0)	=ROUND(RevenueII29*$D$5,0)	=ROUND(RevenueIJ29*$D$5,0)	=ROUND(RevenueIK29*$D$5,0)	=ROUND(RevenueIL29*$D$5,0)	=ROUND(RevenueIM29*$D$5,0)
11	57	Calculation	Base case	=ROUND(RevenueID30*$D$5,0)	=ROUND(RevenueIE30*$D$5,0)	=ROUND(RevenueIF30*$D$5,0)	=ROUND(RevenueIG30*$D$5,0)	=ROUND(RevenueIH30*$D$5,0)	=ROUND(RevenueII30*$D$5,0)	=ROUND(RevenueIJ30*$D$5,0)	=ROUND(RevenueIK30*$D$5,0)	=ROUND(RevenueIL30*$D$5,0)	=ROUND(RevenueIM30*$D$5,0)
12	58	Calculation	Worst case	=ROUND(RevenueID31*$D$5,0)	=ROUND(RevenueIE31*$D$5,0)	=ROUND(RevenueIF31*$D$5,0)	=ROUND(RevenueIG31*$D$5,0)	=ROUND(RevenueIH31*$D$5,0)	=ROUND(RevenueII31*$D$5,0)	=ROUND(RevenueIJ31*$D$5,0)	=ROUND(RevenueIK31*$D$5,0)	=ROUND(RevenueIL31*$D$5,0)	=ROUND(RevenueIM31*$D$5,0)
13	59	Calculation	Selected case	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**	**=VLOOKUP($D$2,$C$10:$M$12,COLUMN()-2,0)**

Figure 8.8: *Formula used for Opex Calculation*

Figure 8.8 shows the Excel Formula for **`OpEx`** calculations.

S. No. 56 to 58 are the Best, Base and Worst Case, respectively.

S. No. 59 is the selected case as per selection.

Now, we move further toFixed Asset Roll Forward.

Add a new sheet, rename it as FA, and format it as shown in *Figure 8.9*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Fixed asset roll-forward												
2	60	From Drivers	Selected case	Base case										
3														
4			Estimated initial investment (in INR)											
5	61	From Drivers	Best case	34,00,00,000										
6	62	From Drivers	Base case	36,00,00,000										
7	63	From Drivers	Worst case	38,00,00,000										
8														
9	64	From Drivers	Useful life (years)	10										
10														
11			Investment plan	0	1	2	3	4	5	6	7	8	9	10
12	65	From Drivers	Year 1	100%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
13														
14			in INR	0	1	2	3	4	5	6	7	8	9	10
15	66	Calculation	Opening FA											
16	67	Calculation	Capex											
17	68	Calculation	D&A											
18	69	Calculation	Closing FA											
19														
20			D&A schedule (in INR)		1	2	3	4	5	6	7	8	9	10
21	70	Calculation	D&A Year 1											
22	71	Calculation	D&A Year 2											
23	72	Calculation	D&A Year 3											
24	73	Calculation	D&A Year 4											
25	74	Calculation	D&A Year 5											
26	75	Calculation	D&A Year 6											
27	76	Calculation	D&A Year 7											
28	77	Calculation	D&A Year 8											
29	78	Calculation	D&A Year 9											
30	79	Calculation	D&A Year 10											
31	80	Calculation	Total D&A											
32														

Figure 8.9: *Format for Fixed Assets Roll Forward*

S. No. 60 is for the selection of Best, Base and Worst, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting case selection solely to that sheet.

S. No. 61, 62 and 63 are for the Best, Base and Worst Cases from Estimated Initial Investment, as given in S. No. 15, 16 and 17.

S. No. 64 is useful life, which is given in S. No. 18.

S. No. 65 is Capex %, which is equal to S. No. 19 from the Drivers Sheet. Initial Investment on Year 0 will be 100% and Year 1 to 10 are same as S. No. 19.

S. No. 66, 67, 68 and 69 are the calculation of Opening FA, Capex, D&A and Closing FA.

S. No. 70 to 79 are the calculation of D&A(Depreciation) every year, and S. No. 80 is Total D&A.

Now, let's fill the S. No. 66 to S. No. 80.

First, we must fill Closing FA of Year 0 in cell no. D18, S. No. 69.

=VLOOKUP(D2,C5:D7,2,0) is the Excel formula where D2 is the case scenario of the Best, Base and Worst Case; and C5:C7 is the table for initial payment of Case Scenario., 2 column no.

If we select the best case, we will get 34000000. Refer to the following figure:

	A	B	C	D
1		**Fixed asset roll-forward**		
2	60	From Drivers	Selected case	Base case
3				
4			**Estimated initial investment (in INR)**	
5	61	From Drivers	Best case	34,00,00,000
6	62	From Drivers	Base case	36,00,00,000
7	63	From Drivers	Worst case	38,00,00,000
8				
9	64	From Drivers	**Useful life (years)**	10
10				
11			**Investment plan**	**0**
12	65	From Drivers	Year 1	100%
13				
14			**in INR**	**0**
15	66	Calculation	Opening FA	
16	67	Calculation	Capex	
17	68	Calculation	D&A	
18	69	Calculation	**Closing FA**	**36,00,00,000**

Figure 8:10: *Initial Investment in FA*

As we can see in *Figure 8.10*, we get the value of **`INR 36,00,000/- for Closing FA`**, which is the base case.

S. No. 66 is the Opening FA, which is equal to the Closing FA of Previous year.

Cell E15 = D18

S. No. 67 is Capex of Initial investment.

In our example, 3% of Initial Investment of INR 36,00,00,000/- = 1,08,00,000/-.

S. No. 68 is the D&A, which is equal to S. No. 80.

S. No. 69 is the Closing FA = Opening FA(S. No. 66) + Capex(S. No. 67) – D&A (S. No. 68).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			**Fixed asset roll-forward**											
2	60	From Drivers	Selected case	Base case										
3														
4			**Estimated initial investment (in INR)**											
5	61	From Drivers	Best case	34,00,00,000										
6	62	From Drivers	Base case	36,00,00,000										
7	63	From Drivers	Worst case	38,00,00,000										
8														
9	64	From Drivers	**Useful life (years)**	10										
10														
11			**Investment plan**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
12	65	From Drivers	Year 1	100%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
13														
14			**in INR**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
15	66	Calculation	Opening FA		36,00,00,000	33,48,00,000	30,85,20,000	28,11,60,000	25,27,20,000	22,32,00,000	19,26,00,000	16,09,20,000	12,81,60,000	9,43,20,000
16	67	Calculation	Capex		1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000	1,08,00,000
17	68	Calculation	D&A		(3,60,00,000)	(3,70,80,000)	(3,81,60,000)	(3,92,40,000)	(4,03,20,000)	(4,14,00,000)	(4,24,80,000)	(4,35,60,000)	(4,46,40,000)	(4,57,20,000)
18	69	Calculation	**Closing FA**	**36,00,00,000**	**33,48,00,000**	**30,85,20,000**	**28,11,60,000**	**25,27,20,000**	**22,32,00,000**	**19,26,00,000**	**16,09,20,000**	**12,81,60,000**	**9,43,20,000**	**5,94,00,000**
19														
20			**D&A schedule (in INR)**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
21	70	Calculation	D&A Year 1		(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)	(3,60,00,000)
22	71	Calculation	D&A Year 2			(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
23	72	Calculation	D&A Year 3				(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
24	73	Calculation	D&A Year 4					(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
25	74	Calculation	D&A Year 5						(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
26	75	Calculation	D&A Year 6							(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
27	76	Calculation	D&A Year 7								(10,80,000)	(10,80,000)	(10,80,000)	(10,80,000)
28	77	Calculation	D&A Year 8									(10,80,000)	(10,80,000)	(10,80,000)
29	78	Calculation	D&A Year 9										(10,80,000)	(10,80,000)
30	79	Calculation	D&A Year 10											(10,80,000)
31	80	Calculation	**Total D&A**		**(3,60,00,000)**	**(3,70,80,000)**	**(3,81,60,000)**	**(3,92,40,000)**	**(4,03,20,000)**	**(4,14,00,000)**	**(4,24,80,000)**	**(4,35,60,000)**	**(4,46,40,000)**	**(4,57,20,000)**
32														

Figure 8.11: *Calculation of FA*

As we can see in *Figure 8.11*, we have the calculation of FA.

S. No. 70 to 79 are D&A calculations year-wise, and S. No. 80 is the total of S. No. 70 to 79.

D&A Year 1 (S. No. 70) is 10% Depreciation of Initial Investment Opening FA for 10 Years, which is 3,60,00,000/- (Cell No. E21 to N21) every year in the base case for the first year.

D&A Year 2 (S. No. 71) is 3,60,00,000/- for the first year (S. No. 70) plus D&A of additional capex as per S. No. 67. The depreciation will start from the second year for the first year capex.

Capex = 1,08,00,000/- in Year 1 (Cell No. E16)

Now, we will calculate this for the next 9 years, starting from Year 2 (Cell No. F22 to N22), which will be 10,80,000/- every year for the next 9 years.

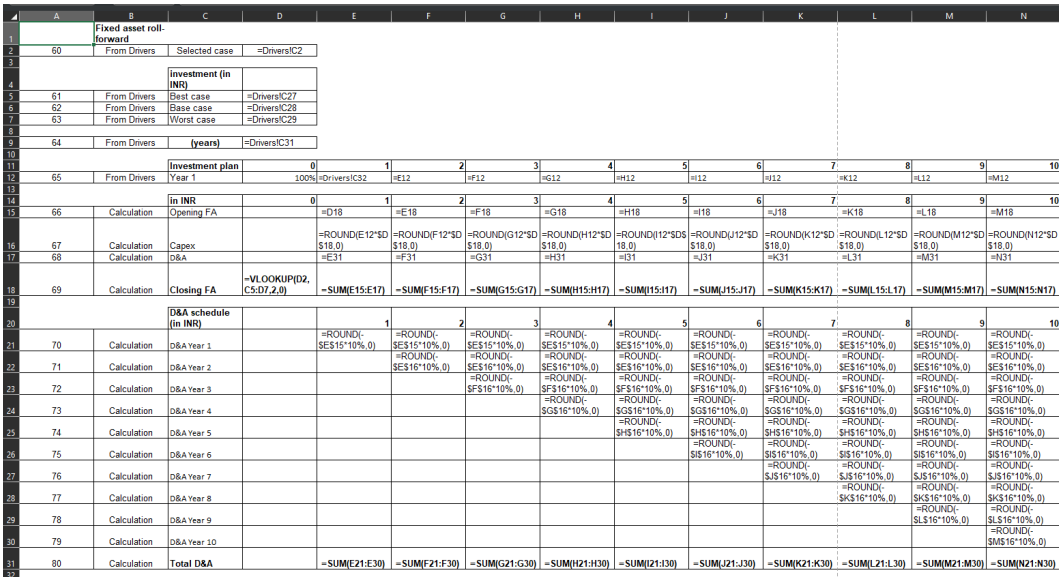
Year 2 has addition 1,08,00,000/- capex added, and depreciation will start from year 3.

For the following eight years, the D&A Year 3 (S No. 72) amounting to 10,80,000/- will remain constant and be recorded in cells G23 to N23..

The same method is applied for D&A Year 4 to D&A Year 10 (S. No. 73 to S. No. 79).

All the preceding calculations are done with the Base Case selection in the Drivers Sheet.

We considered the depreciation rate @ 10%.



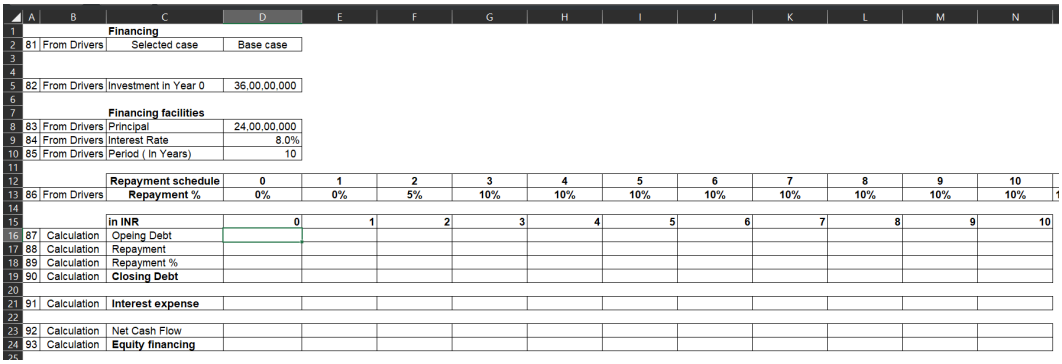
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Fixed asset roll-forward												
2	60	From Drivers	Selected case	=Drivers!C2										
3														
4			investment (in INR)											
5	61	From Drivers	Best case	=Drivers!C27										
6	62	From Drivers	Base case	=Drivers!C28										
7	63	From Drivers	Worst case	=Drivers!C29										
8														
9	64	From Drivers	(years)	=Drivers!C31										
10														
11			Investment plan	0	1	2	3	4	5	6	7	8	9	10
12	65	From Drivers	Year 1	100%	=Drivers!C32	=E12	=F12	=G12	=H12	=I12	=J12	=K12	=L12	=M12
13														
14			in INR	0	1	2	3	4	5	6	7	8	9	10
15	66	Calculation	Opening FA		=D18	=E18	=F18	=G18	=H18	=I18	=J18	=K18	=L18	=M18
16	67	Calculation	Capex		=ROUND(E12*$D $18,0)	=ROUND(F12*$D $18,0)	=ROUND(G12*$D $18,0)	=ROUND(H12*$D $18,0)	=ROUND(I12*D 18,0)	=ROUND(J12*$D $18,0)	=ROUND(K12*$D $18,0)	=ROUND(L12*$D $18,0)	=ROUND(M12*$D $18,0)	=ROUND(N12*$D $18,0)
17	68	Calculation	D&A		=E31	=F31	=G31	=H31	=I31	=J31	=K31	=L31	=M31	=N31
18	69	Calculation	Closing FA	=VLOOKUP(D2, C5:D7,2,0)	=SUM(E15:E17)	=SUM(F15:F17)	=SUM(G15:G17)	=SUM(H15:H17)	=SUM(I15:I17)	=SUM(J15:J17)	=SUM(K15:K17)	=SUM(L15:L17)	=SUM(M15:M17)	=SUM(N15:N17)
19														
20			D&A schedule (in INR)		1	2	3	4	5	6	7	8	9	10
21	70	Calculation	D&A Year 1		=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)	=ROUND(-$E$15*10%,0)
22	71	Calculation	D&A Year 2			=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)	=ROUND(-$E$16*10%,0)
23	72	Calculation	D&A Year 3				=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)	=ROUND(-$F$16*10%,0)
24	73	Calculation	D&A Year 4					=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)	=ROUND(-$G$16*10%,0)
25	74	Calculation	D&A Year 5						=ROUND(-$H$16*10%,0)	=ROUND(-$H$16*10%,0)	=ROUND(-$H$16*10%,0)	=ROUND(-$H$16*10%,0)	=ROUND(-$H$16*10%,0)	=ROUND(-$H$16*10%,0)
26	75	Calculation	D&A Year 6							=ROUND(-$I$16*10%,0)	=ROUND(-$I$16*10%,0)	=ROUND(-$I$16*10%,0)	=ROUND(-$I$16*10%,0)	=ROUND(-$I$16*10%,0)
27	76	Calculation	D&A Year 7								=ROUND(-$J$16*10%,0)	=ROUND(-$J$16*10%,0)	=ROUND(-$J$16*10%,0)	=ROUND(-$J$16*10%,0)
28	77	Calculation	D&A Year 8									=ROUND(-$K$16*10%,0)	=ROUND(-$K$16*10%,0)	=ROUND(-$K$16*10%,0)
29	78	Calculation	D&A Year 9										=ROUND(-$L$16*10%,0)	=ROUND(-$L$16*10%,0)
30	79	Calculation	D&A Year 10											=ROUND(-$M$16*10%,0)
31	80	Calculation	Total D&A		=SUM(E21:E30)	=SUM(F21:F30)	=SUM(G21:G30)	=SUM(H21:H30)	=SUM(I21:I30)	=SUM(J21:J30)	=SUM(K21:K30)	=SUM(L21:L30)	=SUM(M21:M30)	=SUM(N21:N30)

Figure 8.12: *Excel Formula for Fixed Asset Roller Forward*

As we can see in *Figure 8.12*, we use the formula of Excel to complete the **`Fixed Assets Roller Forward`**.

The next step is Financing.

Add a new sheet, rename it as Financing, format it as shown in *Figure 8.13* and fill the data given in Driver Sheet:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			Financing											
2	81	From Drivers	Selected case	Base case										
3														
4														
5	82	From Drivers	Investment in Year 0	36,00,00,000										
6														
7			Financing facilities											
8	83	From Drivers	Principal	24,00,00,000										
9	84	From Drivers	Interest Rate	8.0%										
10	85	From Drivers	Period (In Years)	10										
11														
12			Repayment schedule	0	1	2	3	4	5	6	7	8	9	10
13	86	From Drivers	Repayment %	0%	0%	5%	10%	10%	10%	10%	10%	10%	10%	10%
14														
15			in INR	0	1	2	3	4	5	6	7	8	9	10
16	87	Calculation	Opeing Debt											
17	88	Calculation	Repayment											
18	89	Calculation	Repayment %											
19	90	Calculation	Closing Debt											
20														
21	91	Calculation	Interest expense											
22														
23	92	Calculation	Net Cash Flow											
24	93	Calculation	Equity financing											

Figure 8.13: *Format for Financing*

As we can see in *Figure 8.13*, we have entered S. No. 81 to 86, while S. No. 87 to 93 are blank; we will calculate them now.

S. No. 81 is for the selection of Best, Base and Worst cases, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting

case selection solely to that sheet.

S. No. 82 is Investment in year 0, which is equal to the initial investment we calculated in FA Year 0 S. No. 69 Cell No. FA!D18

S. No. 83 to 85 are Principal, Interest Rate and Period (in years), which are equal to S. No. 20,21 and 22 of Drivers Sheet.

S. No. 86 is the repayment schedule, which is equal to S. No. 23 of Drivers Sheet.

Now, we fill the blank cells of S. No. 87 to 91, as shown in *Figure 8.14*:

		Financing													
81	From Drivers	Selected case	Base case												
82	From Drivers	Investment in Year 0	36,00,00,000												
		Financing facilities													
83	From Drivers	Principal	24,00,00,000												
84	From Drivers	Interest Rate	8.0%												
85	From Drivers	Period (In Years)	10												
		Repayment schedule	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
86	From Drivers	**Repayment %**	**0%**	**0%**	**5%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**5%**
		in INR	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
87	Calculation	Opeing Debt	24,00,00,000	24,00,00,000	24,00,00,000	22,80,00,000	20,40,00,000	18,00,00,000	15,60,00,000	13,20,00,000	10,80,00,000	8,40,00,000	6,00,00,000		
88	Calculation	Repayment	-	-	(1,20,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)		
89	Calculation	Repayment %	0%	0%	5%	10%	10%	10%	10%	10%	10%	10%	10%		
90	Calculation	**Closing Debt**	**24,00,00,000**	**24,00,00,000**	**22,80,00,000**	**20,40,00,000**	**18,00,00,000**	**15,60,00,000**	**13,20,00,000**	**10,80,00,000**	**8,40,00,000**	**6,00,00,000**	**3,60,00,000**		
91	Calculation	**Interest expense**	**-**	**(1,92,00,000)**	**(1,92,00,000)**	**(1,82,40,000)**	**(1,63,20,000)**	**(1,44,00,000)**	**(1,24,80,000)**	**(1,05,60,000)**	**(86,40,000)**	**(67,20,000)**	**(48,00,000)**		
92	Calculation	Net Cash Flow													
93	Calculation	**Equity financing**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**		

Figure 8.14: *Calculation of Debt and Interest*

As we can see in *Figure 8.14*, we have **`Closing Debts`** and **`Interest Expenses`** every year.

S. No. 87 is the Opening Debt, which is equal to the Principal as per S. No. 83; next year onward, the previous year's closing debt will be equal to the current year's opening debt.

S. No. 89 is equal to S. No. 86 repayment %.

S. No. 88 is equal to repayment, which is Initial Principal (S. No. 83) x Repayment % (S. No. 89)

S. No. 90 is Closing Debts = Opening Debts – Repayment (S. No. 87-88)

In Year 0, we took the loan; year 1 repayment is 0%, so Opening and Closing are the same in both years. Repayment of 5% in year 2 comes up to 1,20,00,000/-, so the closing debt is equal to (24,00,00,000-1,20,00,000) = 22,80,00,000/- and so on.

S. No. 91 is Interest Expenses, which start from Year 1; it is equal to 8% of 24,00,00,000/- (Opening Debts of Year 1) = 1,92,00,000/-

S. No. 92 will be calculated later.

S. No. 93 is Equity For Year 0 decided by the amount of funds are required for initial investment and how much debt we can take. For example, in Base Case, we need ₹36,00,00,000/-, and we are taking debt of ₹24,00,00,000/-, so we will need ₹12,00,00,000/- for equity; it will be the same for the next 10 years.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			**Financing**													
2	81	From Drivers	Selected case	=Drivers!C2												
3																
4																
5	82	From Drivers	Investment in Year 0	=FAID18												
6																
7			**Financing facilities**													
8	83	From Drivers	Principal	=Drivers!C35												
9	84	From Drivers	Interest Rate	=Drivers!C36												
10	85	From Drivers	Period (In Years)	=Drivers!C37												
11																
12			**Repayment schedule**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
13	86	From Drivers	**Repayment %**	**=Drivers!C41**	**=Drivers!D41**	**=Drivers!E41**	**=Drivers!F41**	**=Drivers!G41**	**=Drivers!H41**	**=Drivers!I41**	**=Drivers!J41**	**=Drivers!K41**	**=Drivers!L41**	**=Drivers!M41**	**=Drivers!N41**	**=Drivers!O41**
14																
15			**in INR**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
16	87	Calculation	Opeing Debt	=D8	=D19	=E19	=F19	=G19	=H19	=I19	=J19	=K19	=L19	=M19		
17	88	Calculation	Repayment	=-$D$16*D18	=-$D$16*E18	=-$D$16*F18	=-$D$16*G18	=-$D$16*H18	=-$D$16*I18	=-$D$16*J18	=-$D$16*K18	=-$D$16*L18	=-$D$16*M18	=-$D$16*N18		
18	89	Calculation	Repayment %	=D13	=E13	=F13	=G13	=H13	=I13	=J13	=K13	=L13	=M13	=N13		
19	90	Calculation	**Closing Debt**	**=D16+D17**	**=E16+E17**	**=F16+F17**	**=G16+G17**	**=H16+H17**	**=I16+I17**	**=J16+J17**	**=K16+K17**	**=L16+L17**	**=M16+M17**	**=N16+N17**		
20																
21	91	Calculation	**Interest expense**	**=IF(D15=0,0,-D16*$D$9)**	**=IF(E15=0,0,-E16*$D$9)**	**=IF(F15=0,0,-F16*$D$9)**	**=IF(G15=0,0,-G16*$D$9)**	**=IF(H15=0,0,-H16*$D$9)**	**=IF(I15=0,0,-I16*$D$9)**	**=IF(J15=0,0,-J16*$D$9)**	**=IF(K15=0,0,-K16*$D$9)**	**=IF(L15=0,0,-L16*$D$9)**	**=IF(M15=0,0,-M16*$D$9)**	**=IF(N15=0,0,-N16*$D$9)**		
22																
23	92	Calculation	Net Cash Flow													
24	93	Calculation	**Equity financing**	**=D5-D8**	**=D24**	**=E24**	**=F24**	**=G24**	**=H24**	**=I24**	**=J24**	**=K24**	**=L24**	**=M24**		
25																

Figure 8.15: *Excel Formula used in Financing Sheet*

Figure 8.15 shows the Excel Formula used in **`Financing`**.

Now, we will calculate the P&L statement (Income Statement).

Add a new sheet, rename it as P&L, and format it as shown in *Figure 8.16*:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1			**P&L**										
2	94	From Drivers	Selected case	Base case									
3													
4	95	From Drivers	Tax rate	30%									
5													
6													
7			**in INR**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
8	96	From Revenue	Revenue										
9	97	From Opex	Opex										
10	98	From FA	D&A										
11	99	Calculation	**EBIT**										
12	100	From Financing	Interest expenses										
13	101	Calculation	**EBT**										
14	102	Calculation	Taxes										
15	103	Calculation	**Net Income**										
16													
17													

Figure 8.16: *Format to Calculate P&L*

Figure 8.16 shows the format of **`P&L`** statement.

S. No. 94 is for the selection of the Best, Base and Worst cases, which is equal to Drivers S. No. 1. Selection Drop Down is created on Drivers Sheet only can select the case form drivers sheet only.

Now, we will fill the blank cells of the P&L statement.

		P&L										
94	From Drivers	Selected case	Base case									
95	From Drivers	Tax rate	30%									
		in INR	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
96	From Revenue	Revenue	22,93,36,800	23,20,34,880	23,47,32,960	23,74,31,040	24,01,29,120	24,28,27,200	24,55,25,280	24,82,23,360	25,09,21,440	25,36,19,520
97	From Opex	Opex	(4,58,67,360)	(4,64,06,976)	(4,69,46,592)	(4,74,86,208)	(4,80,25,824)	(4,85,65,440)	(4,91,05,056)	(4,96,44,672)	(5,01,84,288)	(5,07,23,904)
98	From FA	D&A	(3,60,00,000)	(3,70,80,000)	(3,81,60,000)	(3,92,40,000)	(4,03,20,000)	(4,14,00,000)	(4,24,80,000)	(4,35,60,000)	(4,46,40,000)	(4,57,20,000)
99	Calculation	**EBIT**	**14,74,69,440**	**14,85,47,904**	**14,96,26,368**	**15,07,04,832**	**15,17,83,296**	**15,28,61,760**	**15,39,40,224**	**15,50,18,688**	**15,60,97,152**	**15,71,75,616**
100	From Financing	Interest expenses	(1,92,00,000)	(1,92,00,000)	(1,82,40,000)	(1,63,20,000)	(1,44,00,000)	(1,24,80,000)	(1,05,60,000)	(86,40,000)	(67,20,000)	(48,00,000)
101	Calculation	**EBT**	**12,82,69,440**	**12,93,47,904**	**13,13,86,368**	**13,43,84,832**	**13,73,83,296**	**14,03,81,760**	**14,33,80,224**	**14,63,78,688**	**14,93,77,152**	**15,23,75,616**
102	Calculation	Taxes	(3,84,80,832)	(3,88,04,371)	(3,94,15,910)	(4,03,15,450)	(4,12,14,989)	(4,21,14,528)	(4,30,14,067)	(4,39,13,606)	(4,48,13,146)	(4,57,12,685)
103	Calculation	**Net Income**	**8,97,88,608**	**9,05,43,533**	**9,19,70,458**	**9,40,69,382**	**9,61,68,307**	**9,82,67,232**	**10,03,66,157**	**10,24,65,082**	**10,45,64,006**	**10,66,62,931**

Figure 8.17: *P&L statement*

As we can see in *Figure 8.17*, Tax Rate in S. No. 95 is taken from **`Drivers`** Sheet, which is equal to S. No. 24.

S. No. 96 is Revenue, which is taken from Revenue Sheet S. No. 51.

S. No. 97 is Opex from Opex Sheet S. No. 59.

S. No. 98 is D&A from FA Sheet S. No. 68.

S. No. 99 is EBIT, which is equal to Revenue – Opex -D&A (96-97-98).

S. No. 100 is Interest from Financing Sheet S. No. 91.

S. No. 101 is EBT, which is equal to EBIT – Interest (99-100).

S. No. 102 is taxes, which is equal to EBT * Tax Rate% (101*95).

S. No. 103 is Net Income, which is equal to EBT – Taxes (102-101).

The Excel formula used in the P&L statement is shown in *Figure 8.18*:

		P&L										
94	From Drivers	Selected case	=DriversIC2									
95	From Drivers	Tax rate	=DriversIC43									
		in INR	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
96	From Revenue	Revenue	=RevenueID32	=RevenueIE32	=RevenueIF32	=RevenueIG32	=RevenueIH32	=RevenueII32	=RevenueIJ32	=RevenueIK32	=RevenueIL32	=RevenueIM32
97	From Opex	Opex	=OpexID13	=OpexIE13	=OpexIF13	=OpexIG13	=OpexIH13	=OpexII13	=OpexIJ13	=OpexIK13	=OpexIL13	=OpexIM13
98	From FA	D&A	=FAIE17	=FAIF17	=FAIG17	=FAIH17	=FAII17	=FAIJ17	=FAIK17	=FAIL17	=FAIM17	=FAIN17
99	Calculation	**EBIT**	**=SUM(D8:D10)**	**=SUM(E8:E10)**	**=SUM(F8:F10)**	**=SUM(G8:G10)**	**=SUM(H8:H10)**	**=SUM(I8:I10)**	**=SUM(J8:J10)**	**=SUM(K8:K10)**	**=SUM(L8:L10)**	**=SUM(M8:M10)**
100	From Financing	Interest expenses	=FinancingIE21	=FinancingIF21	=FinancingIG21	=FinancingIH21	=FinancingII21	=FinancingIJ21	=FinancingIK21	=FinancingIL21	=FinancingIM21	=FinancingIN21
101	Calculation	**EBT**	**=SUM(D11:D12)**	**=SUM(E11:E12)**	**=SUM(F11:F12)**	**=SUM(G11:G12)**	**=SUM(H11:H12)**	**=SUM(I11:I12)**	**=SUM(J11:J12)**	**=SUM(K11:K12)**	**=SUM(L11:L12)**	**=SUM(M11:M12)**
102	Calculation	Taxes	=IF(D13<0,0,ROUND(-D13*$D$4,0))	=IF(E13<0,0,ROUND(-E13*$D$4,0))	=IF(F13<0,0,ROUND(-F13*$D$4,0))	=IF(G13<0,0,ROUND(-G13*$D$4,0))	=IF(H13<0,0,ROUND(-H13*$D$4,0))	=IF(I13<0,0,ROUND(-I13*$D$4,0))	=IF(J13<0,0,ROUND(-J13*$D$4,0))	=IF(K13<0,0,ROUND(-K13*$D$4,0))	=IF(L13<0,0,ROUND(-L13*$D$4,0))	=IF(M13<0,0,ROUND(-M13*$D$4,0))
103	Calculation	**Net Income**	**=SUM(D13:D14)**	**=SUM(E13:E14)**	**=SUM(F13:F14)**	**=SUM(G13:G14)**	**=SUM(H13:H14)**	**=SUM(I13:I14)**	**=SUM(J13:J14)**	**=SUM(K13:K14)**	**=SUM(L13:L14)**	**=SUM(M13:M14)**

Figure 8.18: *Excel Formula Used in P&L*

As we can see in *Figure 8.18*, we used the Excel formula for **`P&L`**.

The next step is to create cash flow.

Add a new sheet, rename it as CF, create the format shown in *Figure 8.19* and insert a value we have. Refer to the following figure:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			Cash Flow												
2	103	From Drivers	Selected case	Base case											
3															
4	104	From Drivers	Residual Value	7,00,00,000											
5															
6			in INR	0	1	2	3	4	5	6	7	8	9	10	Residual Value
7	105	From P&L	Revenue												
8	106	From P&L	Opex												
9	107	From P&L	Taxes												
10	108	From F&A	Capex												
11	109	Calculation	Operating Cash Flow												
12	110	From Financing	Debt repayment												
13	111	From P&L	Interest expenses												
14	112	From Financing	Increase of equity												
15	113	Calculation	Net Cash Flow												
16															
17															

***Figure 8.19**: Format for Cash Flow*

Figure 8.19 shows the Format of Cash Flow.

S. No. 103 is for the selection of Best, Base and Worst, which is equal to Drivers S. No. 1. Selection Drop Down is created on Drivers Sheet only can select the case form drivers sheet only.

S. No. 104 is the residual value, which is equal to S. No. 25.

Now, we fill the blank cells of Cash Flow.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			Cash Flow												
2	103	From Drivers	Selected case	Base case											
3															
4	104	From Drivers	Residual Value	7,00,00,000											
5															
6			in INR	0	1	2	3	4	5	6	7	8	9	10	Residual Value
7	105	From P&L	Revenue		22,93,36,800	23,20,34,880	23,47,32,960	23,74,31,040	24,01,29,120	24,28,27,200	24,55,25,280	24,82,23,360	25,09,21,440	25,36,19,520	
8	106	From P&L	Opex		(4,58,67,360)	(4,64,06,976)	(4,69,46,592)	(4,74,86,208)	(4,80,25,824)	(4,85,65,440)	(4,91,05,056)	(4,96,44,672)	(5,01,84,288)	(5,07,23,904)	
9	107	From P&L	Taxes		(3,60,00,000)	(3,70,80,000)	(3,81,60,000)	(3,92,40,000)	(4,03,20,000)	(4,14,00,000)	(4,24,80,000)	(4,35,60,000)	(4,46,40,000)	(4,57,20,000)	
10	108	From F&A	Capex	(36,00,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	(1,08,00,000)	
11	109	Calculation	Operating Cash Flow	(36,00,00,000)	13,66,69,440	13,77,47,904	13,88,26,368	13,99,04,832	14,09,83,296	14,20,61,760	14,31,40,224	14,42,18,688	14,52,97,152	14,63,75,616	
12	110	From Financing	Debt repayment		-	(1,20,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	
13	111	From P&L	Interest expenses		(1,92,00,000)	(1,92,00,000)	(1,82,40,000)	(1,63,20,000)	(1,44,00,000)	(1,24,80,000)	(1,05,60,000)	(86,40,000)	(67,20,000)	(48,00,000)	
14	112	From Financing	Increase of equity		-	-	-	-	-	-	-	-	-	-	
15	113	Calculation	Net Cash Flow	(36,00,00,000)	11,74,69,440	10,65,47,904	9,65,86,368	9,95,84,832	10,25,83,296	10,55,81,760	10,85,80,224	11,15,78,688	11,45,77,152	11,75,75,616	7,00,00,000
16															
17															

***Figure 8.20:** Cash Flow*

As shown in *Figure 8.20*, we have prepared **`Cash Flow`**.

S. No. 105 – Revenue, S. No. 106 – Opex, S. No. 107 – Taxes & S. No. 111 – Interest Expenses are taken from P&L, which are equal to S. No. 96, S. No. 97, S. No. 102 and S. No. 100, respectively.

S. No. 108 is Capex, which is on Year 0 (Initial Investment) is equal to Closing FA S. No. 69 (Cell No. FA!C18) for Year 0 only. From Year 1, this is equal to S. No. 67 of FA.

S. No. 109 is the Operating Cash Flow, which is equal to Revenue – Opex – Taxes – Capex (105 -106-107-108).

S. No. 110 is debt repayment, which is taken from Financing S. No. 88.

S. No. 112 is increase of equity, which is equal to Equity Current Year – Equity Previous Year.

For year 1 (Equity in Year 1 – Equity in Year 0). For Year 2 (Equity in Year 2 – Equity in Year 1), S. No. 93 is the Equity every year.

S. No. 113 Net Cash Flow, which is equal to Operating Cash Flow – Debt Repayment – Interest Expenses – Increase of Equity (109-110-111-112).

In S. No. 113 end value in Residual Value, which is given in the Drivers Sheet, which is equal to S. No. 104 of CF.

The Excel formulas used in **`Cash Flow`** are shown in *Figure 8.21*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			Cash Flow												
2	103	From Drivers	Selected case	=Drivers!C2											
3															
4	104	From Drivers	Residual Value	=Drivers!C44											
5															
6			in INR	0	1	2	3	4	5	6	7	8	9	10	Residual Value
7	105	From P&L	Revenue		='P&L'!D8	='P&L'!E8	='P&L'!F8	='P&L'!G8	='P&L'!H8	='P&L'!I8	='P&L'!J8	='P&L'!K8	='P&L'!L8	='P&L'!M8	
8	106	From P&L	Opex		='P&L'!D9	='P&L'!E9	='P&L'!F9	='P&L'!G9	='P&L'!H9	='P&L'!I9	='P&L'!J9	='P&L'!K9	='P&L'!L9	='P&L'!M9	
9	107	From P&L	Taxes		='P&L'!D10	='P&L'!E10	='P&L'!F10	='P&L'!G10	='P&L'!H10	='P&L'!I10	='P&L'!J10	='P&L'!K10	='P&L'!L10	='P&L'!M10	
10	108	From F&A	Capex	=-FA!D18	=-FA!E16	=-FA!F16	=-FA!G16	=-FA!H16	=-FA!I16	=-FA!J16	=-FA!K16	=-FA!L16	=-FA!M16	=-FA!N16	
11	109	Calculation	Operating Cash Flow	=SUM(D7:D10)	=SUM(E7:E10)	=SUM(F7:F10)	=SUM(G7:G10)	=SUM(H7:H10)	=SUM(I7:I10)	=SUM(J7:J10)	=SUM(K7:K10)	=SUM(L7:L10)	=SUM(M7:M10)	=SUM(N7:N10)	
12	110	From Financing	Debt repayment						=Financing!I17						
13	111	From P&L	Interest expenses		='P&L'!D12	='P&L'!E12	='P&L'!F12	='P&L'!G12	='P&L'!H12	='P&L'!I12	='P&L'!J12	='P&L'!K12	='P&L'!L12	='P&L'!M12	
14	112	From Financing	Increase of equity						=Financing!I24						
15	113	Calculation	Net Cash Flow	=SUM(D11:D14)	=SUM(E11:E14)	=SUM(F11:F14)	=SUM(G11:G14)	=SUM(H11:H14)	=SUM(I11:I14)	=SUM(J11:J14)	=SUM(K11:K14)	=SUM(L11:L14)	=SUM(M11:M14)	=SUM(N11:N14)	=D4
16															

Figure 8.21: *Formula used in Cash Flow*

Figure 8.21 shows the Excel formulas used in Cash Flow Statement.

S. No. 92 is **`Net Cash Flow`**, which is equal to S. No. 113 of CF, as shown in *Figure 8.22*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			Financing													
2	81	From Drivers	Selected case	Base case												
3																
4																
5	82	From Drivers	Investment in Year 0	36,00,00,000												
6																
7			Financing facilities													
8	83	From Drivers	Principal	24,00,00,000												
9	84	From Drivers	Interest Rate	8.0%												
10	85	From Drivers	Period (In Years)	10												
11																
12			**Repayment schedule**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
13	86	From Drivers	**Repayment %**	**0%**	**0%**	**5%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**5%**
14																
15			**in INR**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
16	87	Calculation	Opeing Debt	24,00,00,000	24,00,00,000	24,00,00,000	22,80,00,000	20,40,00,000	18,00,00,000	15,60,00,000	13,20,00,000	10,80,00,000	8,40,00,000	6,00,00,000		
17	88	Calculation	Repayment	-	-	(1,20,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)	(2,40,00,000)		
18	89	Calculation	Repayment %	0%	0%	5%	10%	10%	10%	10%	10%	10%	10%	10%		
19	90	Calculation	**Closing Debt**	**24,00,00,000**	**24,00,00,000**	**22,80,00,000**	**20,40,00,000**	**18,00,00,000**	**15,60,00,000**	**13,20,00,000**	**10,80,00,000**	**8,40,00,000**	**6,00,00,000**	**3,60,00,000**		
20																
21	91	Calculation	**Interest expense**	**-**	**(1,92,00,000)**	**(1,92,00,000)**	**(1,82,40,000)**	**(1,63,20,000)**	**(1,44,00,000)**	**(1,24,80,000)**	**(1,05,60,000)**	**(86,40,000)**	**(67,20,000)**	**(48,00,000)**		
22																
23	92	Calculation	Net Cash Flow	(36,00,00,000)	11,74,69,440	10,65,47,904	9,65,86,368	9,95,84,832	10,25,83,296	10,55,81,760	10,85,80,224	11,15,78,688	11,45,77,152	11,75,75,616		
24	93	Calculation	**Equity financing**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**	**12,00,00,000**		
25																

Figure 8.22: *Net Cash Flow added in Financing Sheet*

As we can see in *Figure 8.22*, we have added **`Net Cash Flow`**.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1			**Financing**													
2	81	From Drivers	Selected case													
3																
4																
5	82	From Drivers	Investment in Year 0													
6																
7			**Financing facilities**													
8	83	From Drivers	Principal													
9	84	From Drivers	Interest Rate													
10	85	From Drivers	Period (In Years)													
11																
12			**Repayment schedule**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
13	86	From Drivers	**Repayment %**													
14																
15			**in INR**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
16	87	Calculation	Opeing Debt													
17	88	Calculation	Repayment													
18	89	Calculation	Repayment %													
19	90	Calculation	**Closing Debt**													
20																
21	91	Calculation	**Interest expense**													
22																
23	92	Calculation	Net Cash Flow	=CFID15	=CFIE15	=CFIF15	=CFIG15	=CFIH15	=CFII15	=CFIJ15	=CFIK15	=CFIL15	=CFIM15	=CFIN15		
24	93	Calculation	**Equity financing**													
25																
26																

Figure 8.23: *Excel Formula to Add Net Cash Flow in Financing Sheet*

As we can see in *Figure 8.23*, we have completed the **`Financing`** Sheet.

The next step is to calculate the WACC .

Insert a new sheet, rename it as WACC, format it and insert the values given in *Figure 8.24*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			**WACC**											
2	**114**	**From Drivers**	**Selected case**	**Base case**										
3														
4	**115**	**From Drivers**	Cost of debt	8%										
5	**116**	**From Drivers**	Risk-free	6%										
6	**117**	**From Drivers**	Tax rate	30%										
7	**118**	**From Drivers**	Market risk premium	6.5%										
8														
9			**Comparable companies**	**Leverage (D/E)**	**Beta**									
10	**119**	**From Drivers**	Company A	70%	50%									
11	**120**	**From Drivers**	Company B	80%	40%									
12	**121**	**From Drivers**	Company C	65%	35%									
13	**122**	**Calculation**	Average leverage & beta	72%	42%									
14	**123**	**Calculation**	Beta unlevered		0.28									
15														
16			**in INR**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
17	**124**	**From Financing**	Debt financing											
18	**125**	**From Financing**	Equity financing											
19	**126**	**Calculation**	**Total financing**											
20	**127**	**Calculation**	Debt financing %											
21	**128**	**Calculation**	Equity financing %											
22	**129**	**Calculation**	**Total financing %**											
23														
24			Project beta:											
25	**130**	**Calculation**	Debt / Equity											
26	**131**	**Calculation**	**Project beta:**											
27														
28	**132**	**Calculation**	**Cost of equity**											
29	**133**	**Calculation**	**WACC**											

Figure 8.24: *Format for WACC*

As we can see in *Figure 8.24*, we are going to calculate **`WACC`**.

S. No. 114 is for the selection of Best, Base and Worst, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting case selection solely to that sheet.

S. No. 115 – Cost of Debt, S. No. 116 – Risk Free Rate, S. No. 117 – Tax Rate, S. No. 118 – Market risk premium, which are given in Drivers Sheet and are equal to S. No. 21 – Interest Rate, S. No. 31, S. No. 24, S. No. 30, respectively.

S. No. 119 to 121 are Leverage and Beta of Company A, B & C, which are equal to S. No. 26 to 28, respectively.

Let's fill the blank cell of WACC:

		WACC											
114	From Drivers	Selected case	Base case										
115	From Drivers	Cost of debt	8%										
116	From Drivers	Risk-free	6%										
117	From Drivers	Tax rate	30%										
118	From Drivers	Market risk premium	6.5%										
		Comparable companies	Leverage (D/E)	Beta									
119	From Drivers	Company A	70%	50%									
120	From Drivers	Company B	80%	40%									
121	From Drivers	Company C	65%	35%									
122	Calculation	Average leverage & beta	72%	42%									
123	Calculation	Beta unlevered		0.28									
		in INR	0	1	2	3	4	5	6	7	8	9	10
124	From Financing	Debt financing	24,00,00,000	24,00,00,000	24,00,00,000	22,80,00,000	20,40,00,000	18,00,00,000	15,60,00,000	13,20,00,000	10,80,00,000	8,40,00,000	6,00,00,000
125	From Financing	Equity financing	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000	12,00,00,000
126	Calculation	Total financing	36,00,00,000	36,00,00,000	36,00,00,000	34,80,00,000	32,40,00,000	30,00,00,000	27,60,00,000	25,20,00,000	22,80,00,000	20,40,00,000	18,00,00,000
127	Calculation	Debt financing %	66.7%	66.7%	66.7%	65.5%	63.0%	60.0%	56.5%	52.4%	47.4%	41.2%	33.3%
128	Calculation	Equity financing %	33.3%	33.3%	33.3%	34.5%	37.0%	40.0%	43.5%	47.6%	52.6%	58.8%	66.7%
129	Calculation	Total financing %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Project beta:											
130	Calculation	Debt / Equity	2.00	2.00	2.00	1.90	1.70	1.50	1.30	1.10	0.90	0.70	0.50
131	Calculation	Project beta:	0.94	0.94	0.94	0.90	0.80	0.71	0.61	0.52	0.42	0.33	0.24
132	Calculation	Cost of equity	12.1%	12.1%	12.1%	11.9%	11.2%	10.6%	10.0%	9.4%	8.7%	8.1%	7.6%
133	Calculation	WACC	7.8%	7.8%	7.8%	7.8%	7.7%	7.6%	7.5%	7.4%	7.2%	7.1%	6.9%

Figure 8.25: *WACC*

As we can see in *Figure 8.25*, we find the WACC for our Financing.

S. No. 122 is average leverage and beta of Company A, B & C.

S. No. 123 is beta unlevered.

Formula to Calculate Beta unlevered:

$$= \textit{Average Beta}/(1 + \{(1\text{-}\textit{tax rate}) \times \textit{Average Leverage}\})$$

Where Average Beta = Average of all peer companies' beta, Tax Rate = Rate of Tax, Average Leverage = Average of all peer companies leverages

In our example:

Average Leverage = 0.042/(1+(1-0.3)*0.072 = 0.28.

Excel Formula =E13/((1+(1-D6)*(D13))).

S. No. 124 is debt financing, which is equal to S. No. 87.

S. No. 125 is equity financing, which is equal to S. No. 93.

S No. 126 is total equity, which is equal to the total of Debt and Equity (S . No. 124 + S. No. 125).

S. No. 127 is debt financing percentage over total financing (S. No. 124/S. No. 126).

S. No. 128 is equity financing percentage over total financing (S. No. 125/S. No. 126).

S. No. 129 is the total of debt and equity percentages (S. No. 127 +128).

S. No. 130 is the ratio of debt over equity (Leverage – S. No. 124/S. No. 125).

S. No. 131 is project beta.

Formula for Project Beta:

Project Beta = Unlevered Beta X (1 + (1 – Tax Rate)X Leverage

In our example, for Year 0 and Year 1:

Project Beta = 0.28*(1+(1-0.3)*2.0 = 0.94

Excel Formula = ROUND($E$14*(1+(1-$D$6))*D25,2)

S. No. 132 is the cost of equity, which is equal to CAPM (we learnt about CAPM in *Chapter 5, Business Valuation*.

Cost of Equity = CAPM = Risk Free Rate + Beta x Market risk premium.

In our example for Year 0 and Year 1:

Cost of Equity = 0.06 + 0.94*0.065 = 12.1%

Excel Formula = ROUND($D$5+$D$7*D26,3)

S. No. 133 is WACC.

WACC = Debt Financing % x (1-tax rate) x Cost of Debt + Equity Financing % * Cost of Equity

In our example, for Year 0 and Year 1:

WACC = 0.667*(1-0.3)*0.08 + 0.333*0.121 = 7.8%.

Excel Formulas used in **WACC** are shown in *Figure 8.26*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			WACC											
2	114	From Drivers	Selected case	=Drivers!C2										
3														
4	115	From Drivers	Cost of debt	=Drivers!C36										
5	116	From Drivers	Risk-free	=Drivers!C54										
6	117	From Drivers	Tax rate	=Drivers!C43										
7	118	From Drivers	Market risk premium	=Drivers!C53										
8														
9			Comparable	Leverage (D/E)	Beta									
10	119	From Drivers	Company A	=Drivers!C47	=Drivers!D47									
11	120	From Drivers	Company B	=Drivers!C48	=Drivers!D48									
12	121	From Drivers	Company C	=Drivers!C49	=Drivers!D49									
13	122	Calculation	Average leverage & beta	=ROUND(AVERAGE(D10:D12),3)	=ROUND(AVERAGE(E10:E12),3)									
14	123	Calculation	Beta unlevered		=E13/((1+(1-D6)*(D13)))									
15														
16			in INR	0	1	2	3	4	5	6	7	8	9	10
17	124	From Financing	Debt financing	=FinancingID16	=FinancingIE16	=FinancingIF16	=FinancingIG16	=FinancingIH16	=FinancingII16	=FinancingIJ16	=FinancingIK16	=FinancingIL16	=FinancingIM16	=FinancingIN16
18	125	From Financing	Equity financing	=FinancingID24	=FinancingIE24	=FinancingIF24	=FinancingIG24	=FinancingIH24	=FinancingII24	=FinancingIJ24	=FinancingIK24	=FinancingIL24	=FinancingIM24	=FinancingIN24
19	126	Calculation	**Total financing**	**=SUM(D17:D18)**	**=SUM(E17:E18)**	**=SUM(F17:F18)**	**=SUM(G17:G18)**	**=SUM(H17:H18)**	**=SUM(I17:I18)**	**=SUM(J17:J18)**	**=SUM(K17:K18)**	**=SUM(L17:L18)**	**=SUM(M17:M18)**	**=SUM(N17:N18)**
20	127	Calculation	Debt financing %	=ROUND(D17/D19,3)	=ROUND(E17/E19,3)	=ROUND(F17/F19,3)	=ROUND(G17/G19,3)	=ROUND(H17/H19,3)	=ROUND(I17/I19,3)	=ROUND(J17/J19,3)	=ROUND(K17/K19,3)	=ROUND(L17/L19,3)	=ROUND(M17/M19,3)	=ROUND(N17/N19,3)
21	128	Calculation	Equity financing %	=ROUND(D18/D19,3)	=ROUND(E18/E19,3)	=ROUND(F18/F19,3)	=ROUND(G18/G19,3)	=ROUND(H18/H19,3)	=ROUND(I18/I19,3)	=ROUND(J18/J19,3)	=ROUND(K18/K19,3)	=ROUND(L18/L19,3)	=ROUND(M18/M19,3)	=ROUND(N18/N19,3)
22	129	Calculation	**Total financing %**	**=D20+D21**	**=E20+E21**	**=F20+F21**	**=G20+G21**	**=H20+H21**	**=I20+I21**	**=J20+J21**	**=K20+K21**	**=L20+L21**	**=M20+M21**	**=N20+N21**
23														
24			Project beta:											
25	130	Calculation	Debt / Equity	=ROUND(D17/D18,2)	=ROUND(E17/E18,2)	=ROUND(F17/F18,2)	=ROUND(G17/G18,2)	=ROUND(H17/H18,2)	=ROUND(I17/I18,2)	=ROUND(J17/J18,2)	=ROUND(K17/K18,2)	=ROUND(L17/L18,2)	=ROUND(M17/M18,2)	=ROUND(N17/N18,2)
26	131	Calculation	**Project beta:**	**=ROUND($E$14*(1+(1-$D$6))*D25,2)**	**=ROUND($E$14*(1+(1-$D$6))*E25,2)**	**=ROUND($E$14*(1+(1-$D$6))*F25,2)**	**=ROUND($E$14*(1+(1-$D$6))*G25,2)**	**=ROUND($E$14*(1+(1-$D$6))*H25,2)**	**=ROUND($E$14*(1+(1-$D$6))*I25,2)**	**=ROUND($E$14*(1+(1-$D$6))*J25,2)**	**=ROUND($E$14*(1+(1-$D$6))*K25,2)**	**=ROUND($E$14*(1+(1-$D$6))*L25,2)**	**=ROUND($E$14*(1+(1-$D$6))*M25,2)**	**=ROUND($E$14*(1+(1-$D$6))*N25,2)**
27														
28	132	Calculation	**Cost of equity**	**=ROUND($D$5+$D$7*D26,3)**	**=ROUND($D$5+$D$7*E26,3)**	**=ROUND($D$5+$D$7*F26,3)**	**=ROUND($D$5+$D$7*G26,3)**	**=ROUND($D$5+$D$7*H26,3)**	**=ROUND($D$5+$D$7*I26,3)**	**=ROUND($D$5+$D$7*J26,3)**	**=ROUND($D$5+$D$7*K26,3)**	**=ROUND($D$5+$D$7*L26,3)**	**=ROUND($D$5+$D$7*M26,3)**	**=ROUND($D$5+$D$7*N26,3)**
29	133	Calculation	**WACC**	=ROUND(D20*(1-D6)*$D$4+D21*D28,3)	=ROUND(E20*(1-$D$6)*$D$4+E21*E28,3)	=ROUND(F20*(1-$D$6)*$D$4+F21*F28,3)	=ROUND(G20*(1-$D$6)*$D$4+G21*G28,3)	=ROUND(H20*(1-$D$6)*$D$4+H21*H28,3)	=ROUND(I20*(1-$D$6)*$D$4+I21*I28,3)	=ROUND(J20*(1-$D$6)*$D$4+J21*J28,3)	=ROUND(K20*(1-$D$6)*$D$4+K21*K28,3)	=ROUND(L20*(1-$D$6)*$D$4+L21*L28,3)	=ROUND(M20*(1-$D$6)*$D$4+M21*M28,3)	=ROUND(N20*(1-$D$6)*$D$4+N21*N28,3)
30														

***Figure 8.26**: Excel Formula used in WACC*

As we can see in *Figure 8.26*, we have Excel Formula for calculating **WACC**.

The next and final step is Discounted Cash Flow.

Create a new sheet, rename it as DCF and format it as shown in *Figure 8.27*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			Discounted Cash Flows											
2	134	From Drivers	Selected case	Base case										
3														
4	135	From Drivers	Residual Value											
5														
6			in INR	0	1	2	3	4	5	6	7	8	9	10
7	136	From Financing	Net Cash Flow											
8	137	From Financing	Residual value											
9	138	From Financing	**Net Cash Flow with Residual Value**											
10	139	From Financing	Cost of equity											
11	140	From Financing	**Discounted Cash Flow**											
12	141	From Financing	**Present Value Residual Value**											
13	142	From Financing	**Discounted Cash Flow with Residual Value**											
14														

***Figure 8.27:** Format of DCF*

As we can see in *Figure 8.27, We have created have format of DCF.*

S. No. 134 is for the selection of Best, Base and Worst, which is equal to Drivers S. No. 1. A selection drop-down has been established on the Drivers Sheet, limiting case selection solely to that sheet. ()

Now we will fill the blank cells, as shown in *Figure 8.28*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			Discounted Cash Flows											
2	134	From Drivers	Selected case	Base case										
3														
4	135	From Drivers	Residual Value	3,40,00,000										
5														
6			in INR	0	1	2	3	4	5	6	7	8	9	10
7	136	From Financing	Net Cash Flow	(36,00,00,000)	11,74,69,440	10,65,47,904	9,65,86,368	9,95,84,832	10,25,83,296	10,55,81,760	10,85,80,224	11,15,78,688	11,45,77,152	11,75,75,616
8	137	From Financing	Residual value											3,40,00,000
9	138	From Financing	Net Cash Flow with Residual Value	(36,00,00,000)	11,74,69,440	10,65,47,904	9,65,86,368	9,95,84,832	10,25,83,296	10,55,81,760	10,85,80,224	11,15,78,688	11,45,77,152	15,15,75,616
10	139	From Financing	Cost of equity	12.1%	12.1%	12.1%	11.9%	11.2%	10.6%	10.0%	9.4%	8.7%	8.1%	7.6%
11	140	From Financing	Discounted Cash Flow	(36,00,00,000)	10,47,89,866	8,47,87,862	6,89,32,745	6,51,28,945	6,19,87,056	5,95,98,151	5,78,93,456	5,72,45,967	5,68,41,663	5,65,19,010
12	141	From Financing	Present Value Residual Value											1,63,43,919
13	142	From Financing	Discounted Cash Flow with Residual Value	(36,00,00,000)	10,47,89,866	8,47,87,862	6,89,32,745	6,51,28,945	6,19,87,056	5,95,98,151	5,78,93,456	5,72,45,967	5,68,41,663	7,28,62,929
14														

***Figure 8.28**: Discounted Cash Flows*

As we can see in *Figure 8.28*, we have **DCF**.

S. No. 135 is the residual value of project, which is equal to the difference between the residual value of FA and Closing Debt of Year 10; residual value can be taken from Net Cash Flow S. No. 104, and Closing Debt can be taken from Financing Sheet. Closing Debt is S. No. 90 and Year No. 10 (Cell No. Financing!N19).

S. No. 136 is Net Cash Flow, which is equal to S. No. 113.

S. No. 137 is Residual Value, which we have calculated in S. No. 135 of DCF.

S. No. 138 is the Net Cash Flow with Residual Value (S. No. 136 – S. No. 137).

S. No. 139 is Cost of Equity, which is to be taken from WACC S. No. 132.

S. No. 140 is Discounted Cash Flow.

Discounted Cash Flow Formula:

$DCF = NCF/(1 + COE)^n$

Where, DCF = Discounted Cash Flow, NCF = Net Cash Flow, Cost of Equity = Cost of Equity, n = Year No. for that year where it is to be calculated

Let's take the examples of Year 1 and Year 3.

For Year 1:

DCF = 117469440 / (1+0.0121)1 = 104789866

For Year 3:

DCF = 96586368 / (1+0.119)3 = 68932745

S. No. 140 = S. No. 136 / (1 + S. No. 139)n

S. No. 141 is present value of residual value, the formula is same as DCF as mentioned below and Year No. will be 10.

PV of RV = 34000000 / (1 + 0.076)10 = 16343919

S. No. 142 is the difference between the Discounted Cash Flow and the Present Value of Residual Value. (S. No. 140 – S. No. 141)

The Excel Formulas used in DCF are shown in *Figure 8.29*:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			**Discounted Cash Flows**											
2	134	From Drivers	Selected case	=Drivers!C2										
3														
4	135	From Drivers	Residual Value	=CFIO15-Financing!N19										
5														
6			in INR	0	1	2	3	4	5	6	7	8	9	10
7	136	From Financing	Net Cash Flow	=CFID15	=CFIE15	=CFIF15	=CFIG15	=CFIH15	=CFII15	=CFIJ15	=CFIK15	=CFIL15	=CFIM15	=CFIN15
8	137	From Financing	Residual value											=D4
9	138	From Financing	Net Cash Flow with Residual Value	=SUM(D7:D8)	=SUM(E7:E8)	=SUM(F7:F8)	=SUM(G7:G8)	=SUM(H7:H8)	=SUM(I7:I8)	=SUM(J7:J8)	=SUM(K7:K8)	=SUM(L7:L8)	=SUM(M7:M8)	=SUM(N7:N8)
10	139	From Financing	Cost of equity	=WACCID28	=WACCIE28	=WACCIF28	=WACCIG28	=WACCIH28	=WACCII28	=WACCIJ28	=WACCIK28	=WACCIL28	=WACCIM28	=WACCIN28
11	140	From Financing	Discounted Cash Flow	=ROUND(D7/(1+D10)^D6,0)	=ROUND(E7/(1+E10)^E6,0)	=ROUND(F7/(1+F10)^F6,0)	=ROUND(G7/(1+G10)^G6,0)	=ROUND(H7/(1+H10)^H6,0)	=ROUND(I7/(1+I10)^I6,0)	=ROUND(J7/(1+J10)^J6,0)	=ROUND(K7/(1+K10)^K6,0)	=ROUND(L7/(1+L10)^L6,0)	=ROUND(M7/(1+M10)^M6,0)	=ROUND(N7/(1+N10)^N6,0)
12	141	From Financing	Present Value Residual Value											=ROUND(N8/(1+N10)^N6,2)
13	142	From Financing	Discounted Cash Flow with Residual Value	=SUM(D11:D12)	=SUM(E11:E12)	=SUM(F11:F12)	=SUM(G11:G12)	=SUM(H11:H12)	=SUM(I11:I12)	=SUM(J11:J12)	=SUM(K11:K12)	=SUM(L11:L12)	=SUM(M11:M12)	=SUM(N11:N12)
14														

Figure 8.29: *Excel Formula used in DCF*

As we can see in *Figure 8.29*, we have Excel Formula for **`DCF`**.

Now that our Modelling Part is completed, the next step is analyzing.

We will check the NPV and IRR of DCF.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			**Discounted Cash Flows**											
2	134	From Drivers	Selected case	Base case										
3														
4	135	From Drivers	Residual Value	3,40,00,000										
5														
6			in INR	0	1	2	3	4	5	6	7	8	9	10
7	136	From Financing	Net Cash Flow	(36,00,00,000)	11,74,69,440	10,65,47,904	9,65,86,368	9,95,84,832	10,25,83,296	10,55,81,760	10,85,80,224	11,15,78,688	11,45,77,152	11,75,75,616
8	137	From Financing	Residual value											3,40,00,000
9	138	From Financing	Net Cash Flow with Residual Value	**(36,00,00,000)**	**11,74,69,440**	**10,65,47,904**	**9,65,86,368**	**9,95,84,832**	**10,25,83,296**	**10,55,81,760**	**10,85,80,224**	**11,15,78,688**	**11,45,77,152**	**15,15,75,616**
10	139	From Financing	Cost of equity	12.1%	12.1%	12.1%	11.9%	11.2%	10.6%	10.0%	9.4%	8.7%	8.1%	7.6%
11	140	From Financing	Discounted Cash Flow	(36,00,00,000)	10,47,89,866	8,47,87,862	6,89,32,745	6,51,28,945	6,19,87,056	5,95,98,151	5,78,93,456	5,72,45,967	5,68,41,663	5,65,19,010
12	141	From Financing	Present Value Residual Value											1,63,43,919
13	142	From Financing	Discounted Cash Flow with Residual Value	**(36,00,00,000)**	**10,47,89,866**	**8,47,87,862**	**6,89,32,745**	**6,51,28,945**	**6,19,87,056**	**5,95,98,151**	**5,78,93,456**	**5,72,45,967**	**5,68,41,663**	**7,28,62,929**
14														
15					Excel Formula									
16			**NPV**	**33,00,68,640**	=SUM(D13:N13)									
17														
18			**IRR**	**16%**	=IRR(D13:N13)									
19														

Figure 8.30: *NPV and IRR calculations with Excel Formula used*

As we can see in *Figure 8.30*, **`NPV is 33,00,68,640/-`** and **`IRR = 16%`**.

In both parameters, Project is Positive, so we can work on the Base Case Basis.

Let's check with the Best Case and then the Base Case.

We will select Best Case in the Drivers Sheet Drop Down list of Scenarios and see the difference.

		Discounted Cash Flows											
134	From Drivers	Selected case	Best case										
135	From Drivers	Residual Value	3,40,00,000										
		in INR	0	1	2	3	4	5	6	7	8	9	10
136	From Financing	Net Cash Flow	(34,00,00,000)	14,85,21,920	13,78,56,608	12,81,51,296	13,14,05,984	13,46,60,672	13,79,15,360	14,11,70,048	14,44,24,736	14,76,79,424	15,09,34,112
137	From Financing	Residual value											3,40,00,000
138	From Financing	Net Cash Flow with Residual Value	(34,00,00,000)	14,85,21,920	13,78,56,608	12,81,51,296	13,14,05,984	13,46,60,672	13,79,15,360	14,11,70,048	14,44,24,736	14,76,79,424	18,49,34,112
139	From Financing	Cost of equity	13.3%	13.3%	13.3%	13.0%	12.2%	11.5%	10.8%	10.0%	9.3%	8.6%	7.8%
140	From Financing	Discounted Cash Flow	(34,00,00,000)	13,10,87,308	10,73,90,971	8,88,15,276	8,29,17,026	7,81,38,747	7,45,37,372	7,24,42,556	7,09,05,559	7,02,83,206	7,12,19,644
141	From Financing	Present Value Residual Value											1,60,43,211
142	From Financing	Discounted Cash Flow with Residual Value	(34,00,00,000)	13,10,87,308	10,73,90,971	8,88,15,276	8,29,17,026	7,81,38,747	7,45,37,372	7,24,42,556	7,09,05,559	7,02,83,206	8,72,62,855
				Excel Formula									
		NPV	52,37,80,876	=SUM(D13:N13)									
		IRR	25%	=IRR(D13:N13)									

Figure 8.31: *NPV and IRR in Best Case Scenario*

As we can see in *Figure 8.31*, NPV and IRR are in positive and higher than in the Base Case.

Now, we will move to the Worst Case.

		Discounted Cash Flows											
134	From Drivers	Selected case	Worst case										
135	From Drivers	Residual Value	3,40,00,000										
		in INR	0	1	2	3	4	5	6	7	8	9	10
136	From Financing	Net Cash Flow	(38,00,00,000)	8,83,79,200	7,72,01,440	6,69,83,680	6,97,25,920	7,24,68,160	7,52,10,400	7,79,52,640	8,06,94,880	8,34,37,120	8,61,79,360
137	From Financing	Residual value											3,40,00,000
138	From Financing	Net Cash Flow with Residual Value	(38,00,00,000)	8,83,79,200	7,72,01,440	6,69,83,680	6,97,25,920	7,24,68,160	7,52,10,400	7,79,52,640	8,06,94,880	8,34,37,120	12,01,79,360
139	From Financing	Cost of equity	11.3%	11.3%	11.3%	11.0%	10.5%	10.0%	9.4%	8.9%	8.3%	7.8%	7.3%
140	From Financing	Discounted Cash Flow	(38,00,00,000)	7,94,06,289	6,23,21,095	4,89,77,890	4,67,67,606	4,49,97,026	4,38,70,640	4,29,17,624	4,26,40,111	4,24,41,474	4,25,99,651
141	From Financing	Present Value Residual Value											1,68,06,671
142	From Financing	Discounted Cash Flow with Residual Value	(38,00,00,000)	7,94,06,289	6,23,21,095	4,89,77,890	4,67,67,606	4,49,97,026	4,38,70,640	4,29,17,624	4,26,40,111	4,24,41,474	5,94,06,322
				Excel Formula									
		NPV	13,37,46,077	=SUM(D13:N13)									
		IRR	6%	=IRR(D13:N13)									

Figure 8.32: *NPV and IRR in Worst Case Scenario*

As we can see in *Figure 8.32*, NPV and IRR are still positive, so it means we can go ahead with this project, even in the worst case scenario.

Introduction to leverage

Leverage is a tool that makes work easier. When we talk about higher leverage or when we increase lever, it means we must put less effort to get more output. We apply the same concept in finance, so first is the operating leverage of the cost structure, and second is financial leverage of capital structure. For any business that has a high fixed cost, we will say that the company has high operating leverage. In any financial leverage, for example, if a company has taken a big loan, they must put in less effort and they might get more output.

Leverage is of two types:

- Operating leverage
- Financial leverage

Operating leverage

When we talk about Operating Leverage in Finance, what is the leverage in that, and what is a lever? Here, our leverage is Fixed Cost. Fixed costs have a significant impact on a business, and an increase in sales can lead to a substantial increase in profits. The exact increase in profit depends on the magnitude of the fixed costs, as they remain constant regardless of the level of sales. As sales increase, the contribution margin (the amount of revenue that exceeds variable costs) also increases, and a greater portion of that revenue can be applied towards covering the fixed costs. This results in a higher profit margin, with the degree of increase depending on the amount of fixed costs relative to the contribution margin.

Let's try to understand this with an example of Airlines.

The Fixed Cost is very high in the Airlines industry.

Fixed Costs: Aircrafts, Hangars and Insurance

Variable Costs: Jet Fuel and Runway Charges

Aircrafts leased or bought is a fixed cost for a company.

Hangars must be rented wherever these aircrafts are parked; this is also a fixed cost.

The same goes for insurance; we must take insurance for aircrafts, and it is very expensive.

Jet fuel must be paid for whenever the planes fly, and we will incur runway charges when the planes are in use; these are the variable costs.

The more sales are made, the more our runway charges will increase and the more jet fuel will be consumed.

As our incremental sales increase, our fixed costs will remain the same. Let's say if the sales are double, then our profits can be 3-4 times. This is the advantage of an operating leverage company. But it also has a disadvantage: the company can default as quickly if the economy or the market conditions are bad.

Now, let's talk about a Low Operating Leverage Company. In that case, fixed costs are very less in the Consulting or Service Industry.

Fixed Costs: Rent and Utilities

Variable Costs: Salaries

Monthly rent or utilities bills are fixed costs that are too low. The variable cost is very high in these, which is the salary of the employees. So, the more work comes, the more people will be hired. And if there is no work in consulting or service industry, no employee will be hired.

Degree of Operating Leverage: The degree of operating leverage measures how much a company's operating income changes in response to a change in sales.

Formula:

$$DOL = \frac{\%\ \text{change in EBIT}}{\%\ \text{change in sales}}$$

Where DOL is Degree of Operating Leverage.

Financial leverage

When we say a company is a high financial leverage company, when it takes a lot of debt and must pay high interest on it. Let's say in real estate, companies must take a lot of debt. Assume that we must make a building and rent it: people do not prefer to use their own money; they prefer to use a bank's money. If the return on investment is greater than the interest paid on the loan taken from the bank, then the company can grow rapidly.

In a real estate company, let's say the rent is very good from a particular location, and the company is getting a great total return on investment. Suppose we are getting 20% return from rent and are paying 12% interest on debt; our total profit will be 8%, so the company can grow fast. But if we are getting only 6% returns from rent and are paying 12% interest on debt, we are in 6% loss directly, so no one can stop this company from going down.

Degree of Financial Leverage: If the more debt the company takes, the more we say that its financial leverage is high. However, an excessive amount of financial leverage increases the risk of failure since it becomes more difficult to repay debt. The **degree of financial leverage** (**DFL**) is a multiple that measures how the net profit of a company will change in response to change in interest.

Formula:

$$DFL = \frac{\%\text{ change in PBT}}{\%\text{ change in EBIT}}$$

Where DFL is Degree of Financial Leverage.

Combined leverage

Combined leverage represents a company's total risk related to operating leverage, financial leverage, and the net effect on the EPS.

Combined leverage identifies any potential issues with the company's capital structure.

Degree of Combined Leverage: The degree of combined leverage to which a company uses operating leverage and financial leverage can be different. Some companies frequently use more financial leverage rather than operating leverage, whereas some use more operating leverage. It can be misleading to use a single leverage of find the risk factor. The **Degree Of Combined Leverage** (**DCL**) makes it possible to do this. DCL shows the combined effect of DOL and DFL, which makes life easy for an analyst.

Formula:

$$DCL = DOL\ x\ DFL$$

Where DCL: Degree of Combined Leverage, DOL: Degree of Operating Leverage, DFL: Degree of Financial Leverage

Let's take an example.

As we can see in *Figure 8.33*, in Case I and Case II of Degree of Operating Leverage, when Sales increased by 20% and decreased by 20%, respectively, while the Fixed cost remained the same, the profit went up by 40% in case I and down by -40%, and DOL remained the same at 2. Refer to the following figure:

	A	B	C	D	E	F	G	H	J	K	L	M	N
3	**S. No.**	**Calculation**	**Particular**	**Year 1**	**Year 2 (Case I)**	**Change in Percentage/ Degree from Year 1**	**Year 2 (Case II)**	**Change in Percentage/ Degree from Year 1**	**Year 1**	**Year 2 (Case I)**	**Change in Percentage/ Degree from Year 1**	**Year 2 (Case II)**	**Change in Percentage/ Degree from Year 1**
4	A	Add	Sales	200	240	20%	160	-20%	N/A	N/A	=(E4-$D4)/$D4	N/A	=(G4-$D4)/$D4
5	B	Less	Variable Cost	40	48	20%	32	-20%	N/A	N/A	=(E5-$D5)/$D5	N/A	=(G5-$D5)/$D5
6	C	A-B	Contribution	160	192	20%	128	-20%	=D4-D5	=E4-E5	=(E6-$D6)/$D6	=G4-G5	=(G6-$D6)/$D6
7	D	Less	Fixed Cost	80	80	0%	80	0%	N/A	N/A	=(E7-$D7)/$D7	N/A	=(G7-$D7)/$D7
8	E	C-D	EBIT (O.P.)	80	112	40%	48	-40%	=D6-D7	=E6-E7	=(E8-$D8)/$D8	=G6-G7	=(G8-$D8)/$D8
9	F	Less	Interest	40	30	-25%	30	-25%	N/A	N/A	=(E9-$D9)/$D9	N/A	=(G9-$D9)/$D9
10	G	E-F	PBT	40	82	105%	18	-55%	=D8-D9	=E8-E9	=(E10-$D10)/$D10	=G8-G9	=(G10-$D10)/$D10
11	H	30% of G	Tax @ 30%	12	24.6	105%	5.4	-55%	=D10*30%	=E10*30%	=(E11-$D11)/$D11	=G10*30%	=(G11-$D11)/$D11
12	I	G-H	PAT	28	57.4	105%	12.6	-55%	=D10-D11	=E10-E11	=(E12-$D12)/$D12	=G10-G11	=(G12-$D12)/$D12

S. No.	Calculation	Particular	Case I	Case II
J	E/A	**DOL(E/A)**	**2.0**	**2.0**
		Excel Formula	**=F8/F4**	**=H8/H4**

S. No.	Calculation	Particular	Case I	Case II
K	G/E	**DFL(G/E)**	**2.6**	**0.4**
		Excel Formula	**=F10/F8**	**=G10/G8**

S. No.	Calculation	Particular	Case I	Case II
L	J*K	**DCL(J*K)**	**5.3**	**0.8**
		Excel Formula	**=D16*D20**	**=E16*E20**

Figure 8.33: *Various Degree of Leverage*

In Case I and Case II of Degree of Financial Leverage, the interest decreased by the same amount, but the net effect of PBT is huge in Case II. It means if Sales goes down, the DFL will be greatly impacted.

The variance in the Degree of Combined Leverage between Case I and Case II is primarily attributed to the dissimilar impact of the Degree of Financial Leverage (DFL) in both cases.

Leverage Buyout

A **Leveraged Buyout** (**LBO**) is the acquisition of a public or private company with a significant amount of borrowed funds. It happens to meet the cost of acquisitions. The assets of an acquired company are used as collateral for loans. By investing a little capital, PE firms can achieve expected **Return on Equity** (**ROE**).

Let's understand the LBO model with the help of an example:

We need some drivers (Input) to start preparation.

	A	B	C
1			All amounts in Lakhs
2	S. No.	Current Data	Figures
3	1	Current Date	2022-23
4	2	Current Share Price	30
5	3	Fully Diluted Shares Outstanding	5000
6	4	Current Debt	6000
7	5	Current Cash	1000
8	6	Current Revenue	60000
9	7	Current EBITDA	24000
10	8	FCF after Debt payment	4800
11			
12	S. No.	LBO Assumptions	Figures
13	9	Exit Date	2026-27
14	10	Exit LBO Debt Capacity (Net Debt/EBITDA)	6
15	11	Minimum cash balance	500
16	12	ROE Needed	25.0%
17	13	Reveneu Growth Rate	10%
18	14	Required Paydown	1000

Figure 8.34: *LBO Model Drivers*

The sheet is named Drivers.

In *Figure 8.34*, S. No. 1 to 8 are current data, while S. No. 9 to 14 are assumptions.

We need some tools to go forward as per *Figure 8.35*, add a new sheet and name it as Tools.

	A	B	C	D
1				All amounts in Lakhs
2	S. No.	Calculations	Tools	Figures
3	15	S. No. 2 x S. No. 3	Market Cap	150000
4	16	S. No. 5 - S. No. 6	Current Net Debt	5000
5	17	S. No. 15 + S. No. 16	Enterprises Value	155000
6	18	S. No. 17/ S. No. 7	Current EV/EBITDA	6.5
7	19	S. No. 18	EBITDA multiple in exit year	6.5
8	20	S. No. 7/ S. No. 6	*EBITDA Margin (%)*	40%
9	21	S. No. 8/ S. No. 6	*FCF Margin (%)*	8%

Figure 8.35: *Tools for LBO*

As we can see in *Figure 8.35*, we have Tools for LBO.

S. No. 15 is Market Cap, which is equal to multiple of Current Share Price and Fully Diluted Shares Outstanding.

S. No. 16 is Current Net Debt, which is equal to the difference between Current Debt and Current Cash.

S. No. 17 is Enterprises Value, which is equal to the total of Market Cap and Net Current Debt.

S. No. 18 is Current EV/EBITDA, which is the ratio of EV and EBITDA.

S. No. 19 is EBITDA multiple in exit year; normally, we assume that it will remain constant till the exit year.

S. No. 20 is EBITDA Margin (%), which is the ratio of EBITDA to revenue.

S. No. 21 is FCF Margin (%), which is the ratio of FCF and Revenue.

Now, we will calculate revenue, EBITDA, FCF after debt payment, net debt and debt repayment schedule for projected annual forecast. We will also add a new sheet, name it as LBO, and perform calculations as shown in *Figure 8.36:*

	A	B	C	D	E	F	G	H	I
1				Current	Projected Annual Forecast				
2			Description	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3	22	Calculation	Revenue	60,000.0	66,000.0	72,600.0	79,860.0	87,846.0	96,631.0
4									
5	23	Calculation	EBITDA	24,000.0	26,400.0	29,040.0	31,944.0	35,138.0	38,652.0
6									
7	24	Calculation	FCF after Debt payment	4,800.0	5,280.0	5,808.0	6,389.0	7,028.0	7,730.0
8									
9	25	Calculation	Cash	1,000.0	500.0	500.0	500.0	500.0	500.0
10	26	Calculation	Debt	6,000.0	1,28,220.0	1,12,412.0	96,023.0	78,995.0	61,265.0
11	27	Calculation	Net Debt	5,000.0	1,27,720.0	1,11,912.0	95,523.0	78,495.0	60,765.0
12									
13									
14			Debt Schedule		Projected Annual Forecast				
15					2023-24	2024-25	2025-26	2026-27	2027-28
16	28	Calculation	LBO Debt, Beginning of Period		1,44,000.0	1,28,220.0	1,12,412.0	96,023.0	78,995.0
17	29	Calculation	- Required paydown		(10,000.0)	(10,000.0)	(10,000.0)	(10,000.0)	(10,000.0)
18	30	Calculation	- Optional paydown (after min cash balance)		(5,780.0)	(5,808.0)	(6,389.0)	(7,028.0)	(7,730.0)
19	31	Calculation	LBO Debt, End of Period		1,28,220.0	1,12,412.0	96,023.0	78,995.0	61,265.0

Figure 8.36: *LBO Model*

As we can see in *Figure 8.36*, we have the LBO model ready.

S. No. 22 is the Revenue; for the current FY 22-23 period, we have the given value (60000) in Drivers, and our assumption for revenue growth is 10%, as given in S. No.

13 of Drivers. The Projected Annual Forecast is 66,000 for FY 23-24 (60000 + 10%) and so on.

S. No. 23 is EBITDA; for the current FY 22-23 period, we have the given value in Drivers, and our assumption for EBITDA for every year is 40% of the revenue, as we calculated in Tools S. No. 20. The Projected Annual Forecast is 26400 for FY 23-24 (66000 X 40%), and so on.

S. No. 24 is Free Cash Flow after Debt Payment; for the current FY 22-23, we have the given value in Drivers, and our assumption of FCF Margin for every year is 8% of revenue as we have calculated in Tools Sheet S. No. 21. The Projected Annual Forecast is 5280 for FY 23-24 (66000 X 8%).

S. No. 25 is Cash; for the current FY 22-23, we have the given value in Drivers, and our assumption for Cash is Minimum 500 as per S. No. 11. The Value for the Current FY 22-23 is 1000 (S. No. 5).

In the first year of the Projected Annual Forecast for FY 23-24, the LBO Debt at the Beginning of Period (S No. 28) will be calculated as the product of the Exit LBO Debt Capacity (S. No. 10) and the Current EBITDA (S. No. 7), resulting in an amount of 144000 (24000 X 6). Starting from the FY 24-25, the LBO Debt at the End of Period (S. No. 31) will be used instead.

S. No. 29 is the Required paydown as per assumption S. No. 14 for every year in Projected Annual Forecast, which is 10000 for every year.

S. No. 30 is the Optional paydown (after min cash balance), which is equal to the previous year Cash Balance + FCF after Debt Payment for the current year. For FY 23-24 – 1000 + 5280 – 500 = 5780.

The LBO Debt at the End of Period (S. No. 31) is determined by subtracting the Required Paydown (S. No. 29) and Optional Paydown (after maintaining the minimum cash balance) (S. No. 30) from the LBO Debt at the Beginning of Period (S. No. 28). For the FY 23-24 period, the LBO Debt at the End of Period is calculated as 128220, which is obtained by subtracting 10000 (Required Paydown) and 5780 (Optional Paydown) from the LBO Debt at the Beginning of Period, 144000..

S. No. 26 is Debt; for the current FY 22-23, we have the given value in Drivers S. No. 4, for Projected Annual Forecast FY 23-24 which is equal to LBO Debt, End of Period (S. No. 31).

S. No. 27 is Net Debt, which is the difference between Debt and Cash.

For better understanding, following is the Excel formula used for the preceding calculations:

	A	B	C	D	E	F	G	H	I
1				Current	Projected Annual Forecast				
2			Description	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3	22	Calculation	Revenue	=Drivers!C8	=ROUND(D3*(1+Drivers!$C$17),0)	=ROUND(E3*(1+Drivers!$C$17),0)	=ROUND(F3*(1+Drivers!$C$17),0)	=ROUND(G3*(1+Drivers!$C$17),0)	=ROUND(H3*(1+Drivers!$C$17),0)
4									
5	23	Calculation	EBITDA	=Drivers!C9	=ROUND(E3*Tools!$D$8,0)	=ROUND(F3*Tools!$D$8,0)	=ROUND(G3*Tools!$D$8,0)	=ROUND(H3*Tools!$D$8,0)	=ROUND(I3*Tools!$D$8,0)
6									
7	24	Calculation	FCF after Debt payment	=Drivers!C10	=ROUND(E3*Tools!$D$9,0)	=ROUND(F3*Tools!$D$9,0)	=ROUND(G3*Tools!$D$9,0)	=ROUND(H3*Tools!$D$9,0)	=ROUND(I3*Tools!$D$9,0)
8									
9	25	Calculation	Cash	=Drivers!C7	=Drivers!C15	=E9	=F9	=G9	=H9
10	26	Calculation	Debt	=Drivers!C6	=E19	=F19	=G19	=H19	=I19
11	27	Calculation	Net Debt	=D10-D9	=E10-E9	=F10-F9	=G10-G9	=H10-H9	=I10-I9
12									
13									
14			Debt Schedule		Projected Annual Forecast				
15					2023-24	2024-25	2025-26	2026-27	2027-28
16	28	Calculation	LBO Debt, Beginning of Period		=ROUND(Drivers!C14*Drivers!C9,0)	=E19	=F19	=G19	=H19
17	29	Calculation	- Required paydown		=-Drivers!C18	=E17	=F17	=G17	=H17
18	30	Calculation	- Optional paydown (after min cash balance)		=-(D9+E7-E9)	=-(E9+F7-F9)	=-(F9+G7-G9)	=-(G9+H7-H9)	=-(H9+I7-I9)
19	31	Calculation	LBO Debt, End of Period		=SUM(E16:E18)	=SUM(F16:F18)	=SUM(G16:G18)	=SUM(H16:H18)	=SUM(I16:I18)

Figure 8.37: *Excel Formula for LBO Model*

Figure 8.37 shows the Excel formulas used in the LBO model.

Now, we will analyze whether LBO is likely by calculating Enterprises Value, Equity Value, Investment Required to Acquire, Investment Required with Debts Payoff to Acquire, Share Price, and Premium Percentage.

Add a new sheet named Analysis, and perform the calculations shown in *Figure 8.38*:

	A	B	C	D	E	F	G	H	I
1				Current	Projected Annual Forecast				
2			Description	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3	22	Calculation	Enterprises Value		1,70,500.0	1,87,550.0	2,06,305.0	2,26,933.0	2,49,628.0
4	23	Calculation	Equity Value		42,780.0	75,638.0	1,10,782.0	1,48,438.0	1,88,863.0
5	24	Calculation	Investment Required to Acquire		11,215.0	19,828.0	36,301.0	60,800.0	96,698.0
6	25	Calculation	Investment Required with Debts Payoff to Acquire		1,55,215.0	1,63,828.0	1,80,301.0	2,04,800.0	2,40,698.0
7	26	Calculation	Share Price		30.0	31.8	35.1	40.0	47.1
8	27	Calculation	Premium		0%	6%	17%	33%	57%
9	28	Calculation	LBO is Likely		Yes	Yes	Yes	Yes	Yes

Figure 8.38: *LBO Analysis*

As we can see in *Figure 8.38*, LBO is likely.

S. No. 32 is Enterprises Value, which is equal to multiples of EBITDA (S. No. 23) and EV/EBITDA (S. No. 18).

S. No. 33 is Equity Value, which is equal to the difference between Enterprises Value (S. No. 32) and Net Debt (S. No. 27).

S. No. 34 is the Investment Required to Acquire; it has the following formula:

Investment Required to Acquire = Equity Value/(1+ROE Needed)^No. of Years in investment.

Where Equity Value = S. No. 33 and

ROE Needed = S. No. 12

FY 23-24 is Year 1; FY 24-25 is Year 2 and so on

FY 23-24 = 170500/(1+0.25)^1 = 34224

FY 24-25 = 187550/(1+0.25)^2 = 48408 and so on

S. No. 35 is the Investment Required with Debts Payoff to Acquire, which is equal to the sum of Investment Required to Acquire (S. No. 33) and LBO Debt which is equalto Beginning of Period – First Year of Projected Annual Forecast (S. No. 28).

For FY 23-24 = 34224 + 144000 = 178224.

For FY 24-25 = 48408 + 144000 = 192408 and so on.

S. No. 36 is the Share Price; it has the following formula:

Share Price = (Investment Required with Debts Payoff to Acquire – Net Debt in Current Year)/Fully Diluted Shares Outstanding

Share Price = (S. No. 35 – S. No. 16)/S. No. 3

FY 23-24 = (178224-5000)/5000 = 34.6

FY 24-25 = (192408-5000)/5000 = 37.5 and so on

S. No. 37 is Premium; it has the following formula:

Premium = Yearly Share Price/Current Year Share Price – 1

Premium = S. No. 36/S. No. 2 – 1

FY 23-24 = 34.6/30 -1 = 0.15 = 15%

FY 24-25 = 37.5/30 – 1 = 0.25 = 25%

S. No. 38 is LBO is Likely: If Premium is Positive, LBO is Likely is Yes; and If Premium is Negative, LBO is Likely is No.

As we can see in Figure 8.38, LBO is Likely is Yes every year so LBO can go ahead.

For more clarity over the formula used in the Analysis Sheet, take a look at *Figure 8.39* for the Excel formula:

	A	B	C	D	E	F	G	H	I
1				Current	Projected Annual Forecast				
2			Description	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3	32	Calculation	Enterprises Value		=ROUND(LBO!E5*Tools!$D$6,0)	=ROUND(LBO!F5*Tools!$D$6,0)	=ROUND(LBO!G5*Tools!$D$6,0)	=ROUND(LBO!H5*Tools!$D$6,0)	=ROUND(LBO!I5*Tools!$D$6,0)
4	33	Calculation	Equity Value		=E3-LBO!E11	=F3-LBO!F11	=G3-LBO!G11	=H3-LBO!H11	=I3-LBO!I11
5	34	Calculation	Investment Required to Acquire		=ROUND(E4/(1+Drivers!$C$16)^COUNTA($E$2:E2),0)	=ROUND(F4/(1+Drivers!$C$16)^COUNTA($E$2:F2),0)	=ROUND(G4/(1+Drivers!$C$16)^COUNTA($E$2:G2),0)	=ROUND(H4/(1+Drivers!$C$16)^COUNTA($E$2:H2),0)	=ROUND(I4/(1+Drivers!$C$16)^COUNTA($E$2:I2),0)
6	35	Calculation	Investment Required with Debts Payoff to Acquire		=E5+LBO!$E$16	=F5+LBO!$E$16	=G5+LBO!$E$16	=H5+LBO!$E$16	=I5+LBO!$E$16
7	36	Calculation	Share Price		=(E6-LBO!$D$11)/Drivers!$C$5	=(F6-LBO!$D$11)/Drivers!$C$5	=(G6-LBO!$D$11)/Drivers!$C$5	=(H6-LBO!$D$11)/Drivers!$C$5	=(I6-LBO!$D$11)/Drivers!$C$5
8	37	Calculation	Premium		=E7/Drivers!$C$4-1	=F7/Drivers!$C$4-1	=G7/Drivers!$C$4-1	=H7/Drivers!$C$4-1	=I7/Drivers!$C$41
9	38	Calculation	LBO is Likely		=IF(E8>0,"Yes","No")	=IF(F8>0,"Yes","No")	=IF(G8>0,"Yes","No")	=IF(H8>0,"Yes","No")	=IF(I8>0,"Yes","No")
10									

Figure 8.39: *Excel Formula for Analysis*

As we can see in *Figure 8.39*, we have used the Excel formula for analysis.

Conclusion

We have learnt about capital budgeting with FCF, DCF and IRR analysis, with best, base and worst-case scenarios. Now, we can determine whether to go with certain fixed assets/capital/investments/projects.

We also know about leverage buyout, and we can determine whether to go with acquisition.

In the next chapter, we will learn how to design business dashboards in Excel. We will have great knowledge about using MS Excel for Accounting and Finance after completing the next chapter.

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Chapter 9
Dashboards With Excel

Introduction

We possess sufficient expertise in utilizing MS Excel for financial modeling, as well as in the fields of accounting and finance. In the final chapter of this book, we will learn how to create a creative and lucrative business dashboard step by step.

Structure

- What is an Excel Dashboard, and what are its uses?
- Step to follow to create a Dashboard
- Selection of Data
- Layout of Data
- Use of Pivot Table
- Creation of Pivot Chart
- Insertion of Slicers
- Finalization of Dashboards

Objectives

Looking at raw data of a huge sheet/workbook is boring and is not understandable. Excel Dashboard is a powerful tool to compile and visualize data. It helps us get insights from data in single window. With this, we can analyze data easily and make decisions based on it.

What is an Excel dashboard, and what are its uses

Excel Dashboard is the summary of key metrics that helps in analyzing raw data and aids decision-making based on it. A dashboard usually has summarized tables, pies, charts and graphs.

A dashboard can be defined as a data visualization tool that displays the status of metrics and **Key Performance Indicators** (**KPIs**), simplifying complex data sets to inform users of the current performance at a glance.

Its uses are as follows:

- Collection of data and its summarization in an informative manner
- Presentation of performance measure
- Identification of negative trends for various periods
- Ability to make more informed decisions based on collected data

Steps to follow to create a dashboard

We will learn how to create a dashboard with the following steps:

1. **Selection of Data**: First of all, we need to learn which data to show in our dashboard.
2. **Layout of Data**: The next step is to create a visualization of the data's layout.
3. **Use of Pivot Table**: Pivot tables are vital in creating a dashboard in MS Excel; we must use it carefully.
4. **Creation of Pivot Chart**: After selecting data and visualizing it after inserting a pivot table, we can create pivot chart/s. Some data can be shown in the form of a chart.

5. **Insertion of Slicer**: Insertion of Slicer in Dashboard is the next step as it gives the Dashboard an amazing look.
6. **Cleaning the Dashboards**: Cleaning the Dashboard is the next step.
7. **Finalization of Dashboards**: Now, we are ready to view / show the dashboard.
8. **How to show a Dashboard**: It's now up to us to demonstrate the Dashboard to the stakeholders..

Let us execute this now.

Selection of Data

The first thing to do is select the data to initiate the dashboard.

The data is in the following format:

Month	Store	Product	Sales Person	Total Sold Value

Table 9.1: *Table Format for Dashboard*

As we can see in *Table 9.1*, Table format for given data.

Layout of data

Months – Jan 22 to Dec 23 (24 Months, 2 Years)

Stores – 5 (Store 1, Store 2, Store 3, Store 4, Store 5)

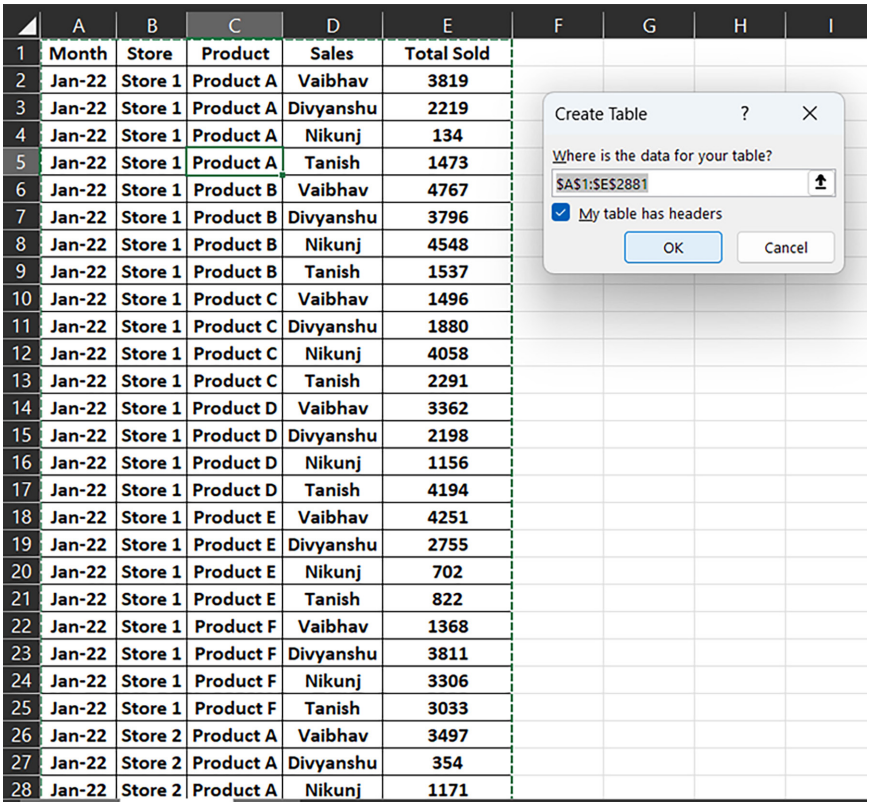
Product – 6 (Product A, Product B, Product C, Product D, Product E, Product F)

Sales Persons – 4 (Vaibhav, Divyanshu, Nikunj, Tanish)

Total Sold Value – As Actual

Total No. of Rows - 2881(2880 Data + 1 Header)

Convert the data in table (*Ctrl + T*), as shown in the following figure:



	A	B	C	D	E
1	Month	Store	Product	Sales	Total Sold
2	Jan-22	Store 1	Product A	Vaibhav	3819
3	Jan-22	Store 1	Product A	Divyanshu	2219
4	Jan-22	Store 1	Product A	Nikunj	134
5	Jan-22	Store 1	Product A	Tanish	1473
6	Jan-22	Store 1	Product B	Vaibhav	4767
7	Jan-22	Store 1	Product B	Divyanshu	3796
8	Jan-22	Store 1	Product B	Nikunj	4548
9	Jan-22	Store 1	Product B	Tanish	1537
10	Jan-22	Store 1	Product C	Vaibhav	1496
11	Jan-22	Store 1	Product C	Divyanshu	1880
12	Jan-22	Store 1	Product C	Nikunj	4058
13	Jan-22	Store 1	Product C	Tanish	2291
14	Jan-22	Store 1	Product D	Vaibhav	3362
15	Jan-22	Store 1	Product D	Divyanshu	2198
16	Jan-22	Store 1	Product D	Nikunj	1156
17	Jan-22	Store 1	Product D	Tanish	4194
18	Jan-22	Store 1	Product E	Vaibhav	4251
19	Jan-22	Store 1	Product E	Divyanshu	2755
20	Jan-22	Store 1	Product E	Nikunj	702
21	Jan-22	Store 1	Product E	Tanish	822
22	Jan-22	Store 1	Product F	Vaibhav	1368
23	Jan-22	Store 1	Product F	Divyanshu	3811
24	Jan-22	Store 1	Product F	Nikunj	3306
25	Jan-22	Store 1	Product F	Tanish	3033
26	Jan-22	Store 2	Product A	Vaibhav	3497
27	Jan-22	Store 2	Product A	Divyanshu	354
28	Jan-22	Store 2	Product A	Nikunj	1171

Figure 9.1: *Converting Data in Table*

As shown in *Figure 9.1,* we converted data of 2881 rows into a table.

Change the **`Table Name`** to **`RawData`**:

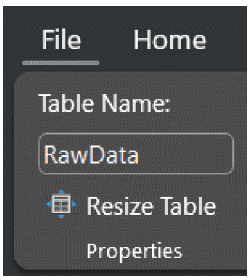


Figure 9.2: *Table Name Changed to Raw Data*

As shown in *Figure 9.2*, the table name was changed to rawdata.

Use of Pivot Table

Now we are ready to create a Pivot Table. We have learnt about Pivot Table in *Chapter 1, Getting Ready With Advance Excel*. Now we will use it to create Dashboards. First, we will create various Pivot Tables and Pivot Charts.

Worksheet name is Raw Data from where the Data is coming. Insert a new sheet in the Workbook, rename it to Sales Revenue, and then insert a Pivot Table for Sales Revenue.

Insert a Pivot Table in Raw Data, and then select any cell and click on **`insert tab`** | **`Pivot Table`** | **`From Table/Range`** | **`Existing Worksheet`** | **`Select Sales Revenue`** | **`Cell A1`**.

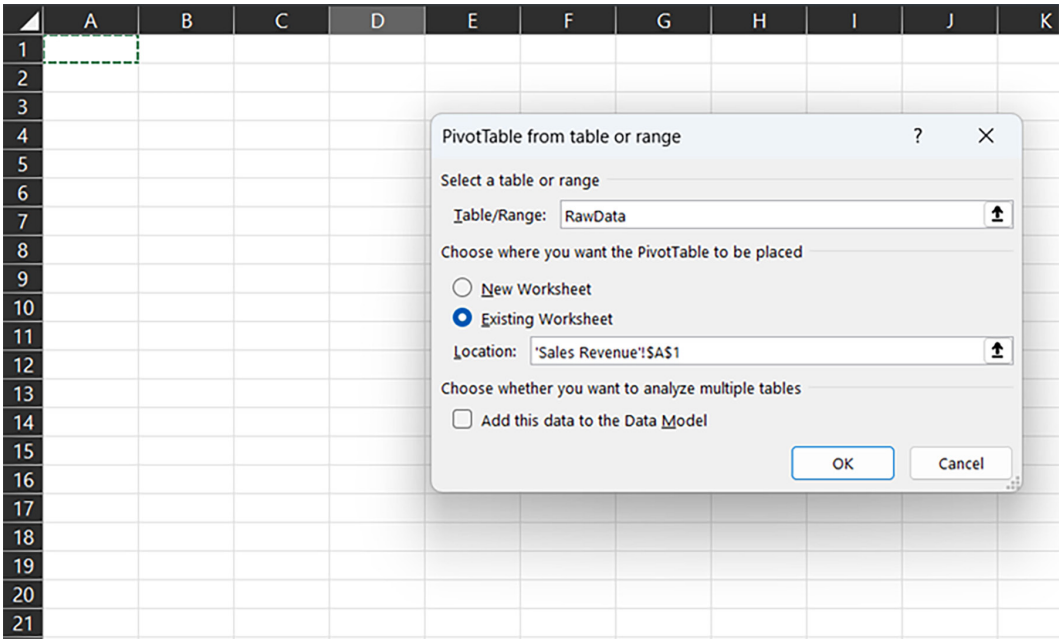


Figure 9.3: *Insertion of Pivot Table*

As we can see in *Figure 9.3*, we are ready with Pivot Table formalities. Click on OK.

Now, we will select the fields in Pivot Tables for sales revenue month-wise.

Select **`Month`** in **`Rows`** and **`Total Value Sold`** in **`Value`**.

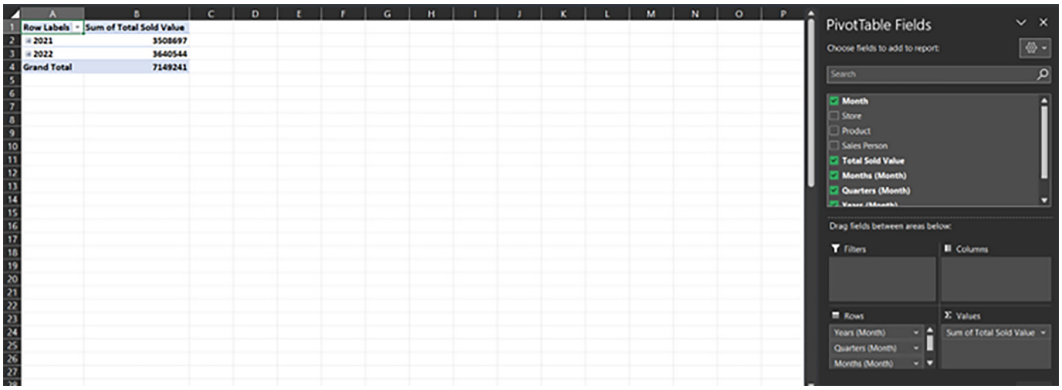


Figure 9.4: *Pivot Table for Month-wise Sales*

As we can see in *Figure 9.4*, we have selected fields for Row and Value.

Note: When we select month for Column/Row Fields Month, it is automatically converted into Months (Month), Quarters (Month) and Years (Month).

So we will unselect Months (Month) and Quarters (Month), and keep the Years (Month) selected.

The Pivot Table will look as shown in *Figure 9.5*:

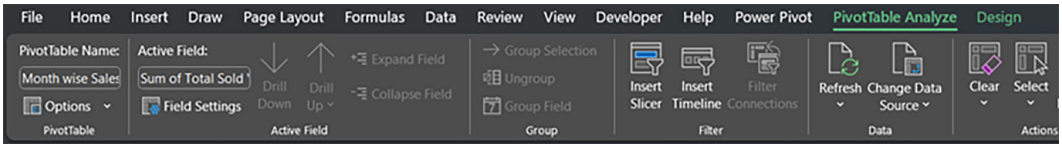


Figure 9.5: *Pivot Table for Month-wise Sales*

As we can see in *Figure 9.5*, the Pivot Table for Month-wise Sales is ready.

Rename the Pivot Table as **`Month wise Sales`** from the **`Pivot Table Analyze`** tab.

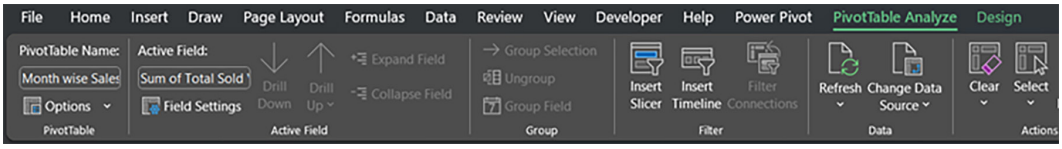


Figure 9.6: *Rename Pivot Table to Month wise Sales*

As we can see in *Figure 9.6*, We have renamed the Pivot Table Name to **`Month wise Sales`**.

The next step is to insert a Pivot Chart, for which we will go to the Dashboard Sheet later.

Now, select the Monthly Sales Revenue Pivot Table and insert a Pivot Chart.

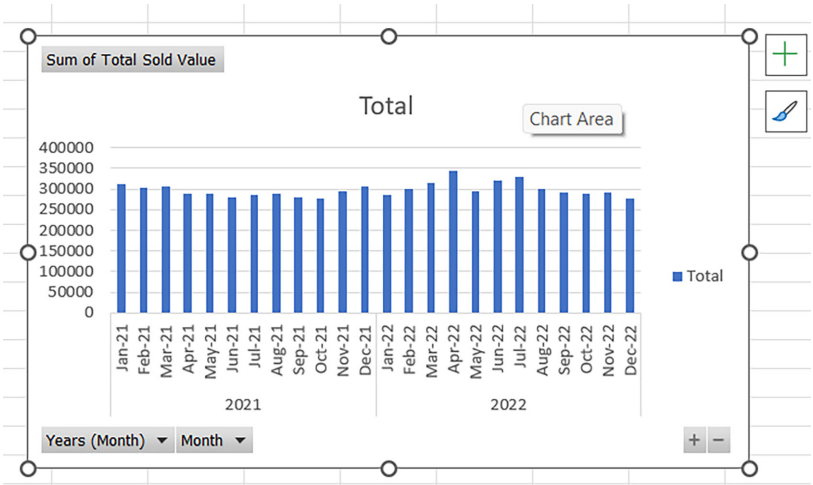


Figure 9.7: *Pivot Chart of Month wise Sales*

Figure 9.7 is showing selected Column Chart for Pivot Chart for Monthly Sales Revenue.

Now, we will clean our chart for a lucrative look.

Select **`Pivot Chart`** and add a new tab; name it **`PivotChart Analyze`**. Hide all Field Buttons from Show/Hide: select **`Hide All`**.

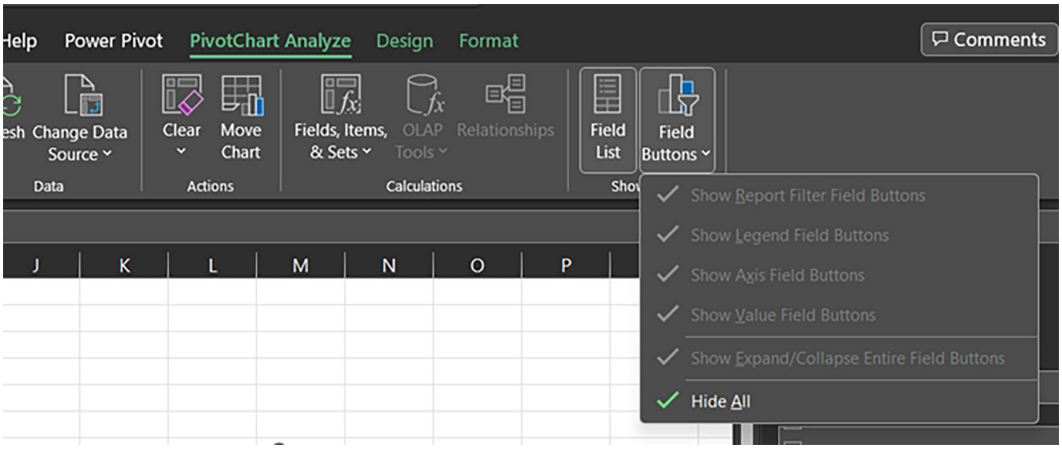


Figure 9.8: *Hide All Field Buttons from Pivot Chart*

As we can see in *Figure 9.8*, we selected **`Hide All`** in **`Field Buttons`**.

The Chart will look as shown in the following figure, and we will delete all items circled in red from the Chart:

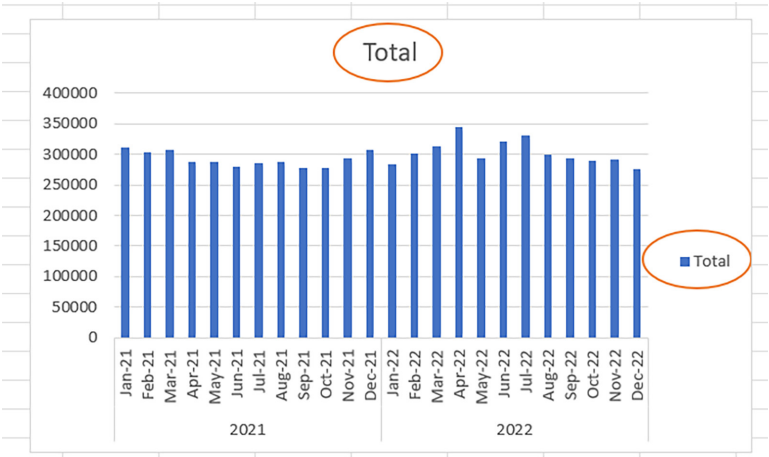


Figure 9.9: *Pivot Chart after Hide All Process*

As we can see in *Figure 9.9,* our chart looks better; but we will delete all unwanted items circled in red for a much better look of the chart.

We will remove Gridlines as well from the chart by Selecting Chart and unselecting Gridlines, as shown in the following figure:

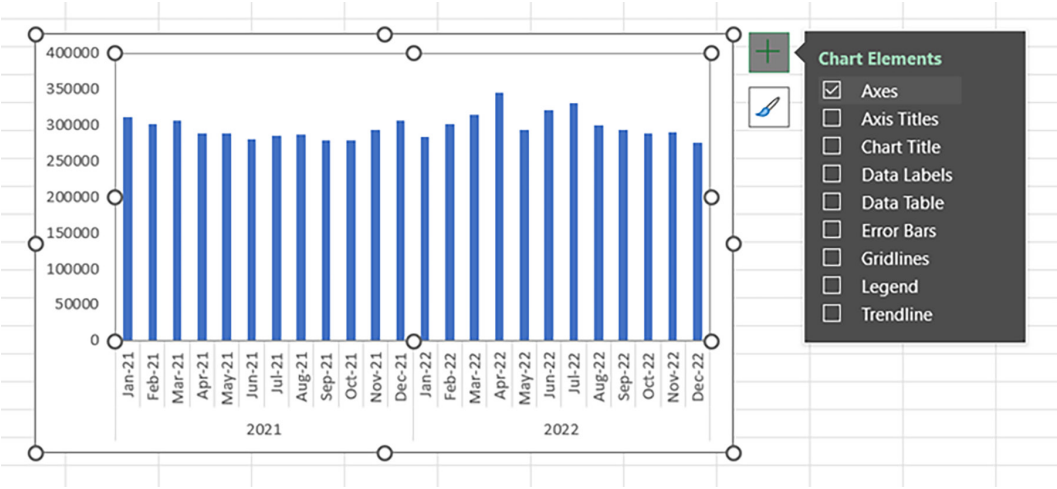


Figure 9.10: *Removed Red Circle items and Gridlines*

As we can see in *Figure 9.10*, we have removed all items circled in red and all Gridlines from the Pivot Chart.

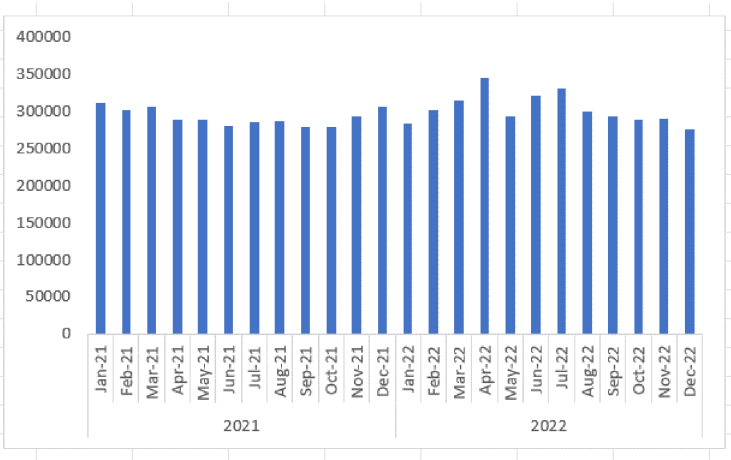


***Figure 9.11**: Pivot Chart of Month wise Sales*

As we can see in *Figure 9.11*, we have our final chart for Month wise Sales.

Now, rename the Pivot Chart to Month wise Sales.

We will copy this chart to our Dashboard later.

Now, we will create Pivot Tables and Pivot Charts with the same process for Store wise Sales Revenue, Product wise Sales Revenue and Salesperson wise Sales Revenue.

The Store wise Sales Revenue Pivot Table is as follows:

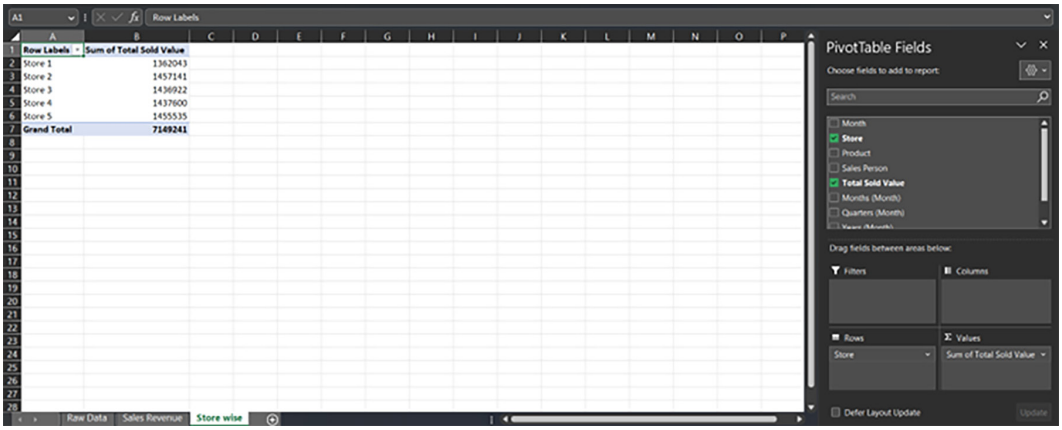


***Figure 9.12:** Store wise Sales Revenue Pivot Table*

As we can see in *Figure 9.12*, we have selected Store in row field and Total Sold Value in Value field, and we have renamed the Pivot Table to Store wise.

Now, to create a Pivot Chart for the same, we will remove all fields and items that are not required from the Chart:

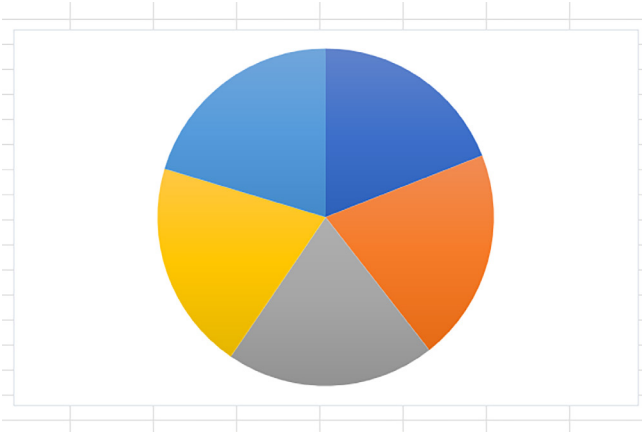


Figure 9.13: *Pivot Chart for Store Wise Sales*

As we can see in *Figure 9.13*, we have a Pivot Chart for Store wise Sales. However, it does not look informative, so we must add some figures.

Select Chart and click on the **`Design Tab`** and **`Quick Layout`**; then, select whatever you want.

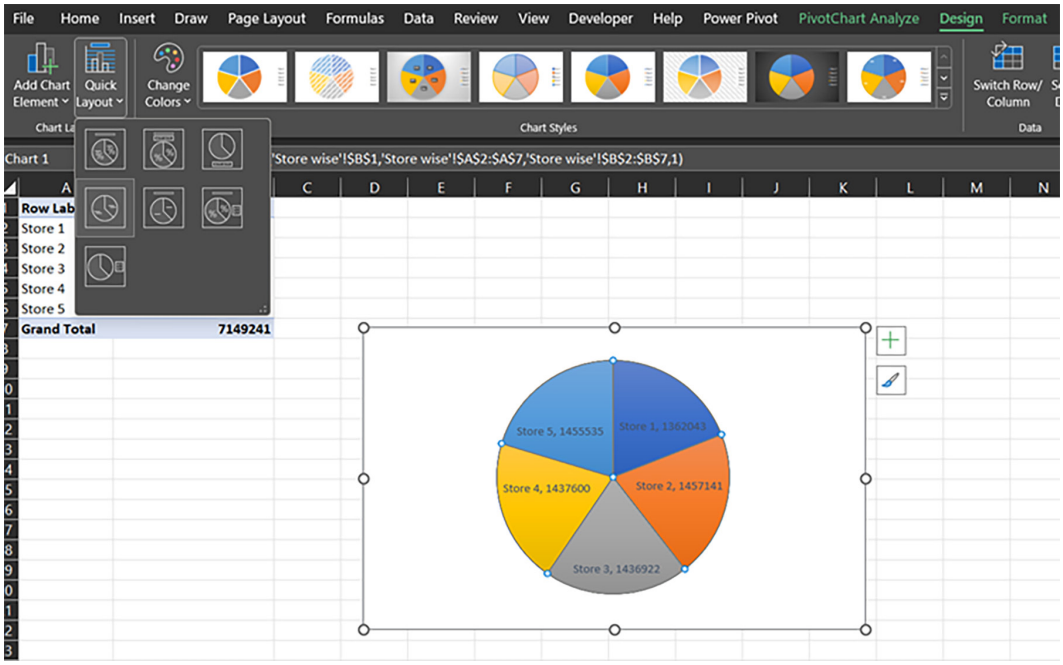


Figure 9.14: *Adding Some Number*

As we can see in *Figure 9.14*, we have added layout 4 where we have store no. and its total during the period.

Now we want to add percentage as well, so select any number in the Chart and then select percentage in Label Option from right-hand side format data label as shown in *Figure 9.15*:

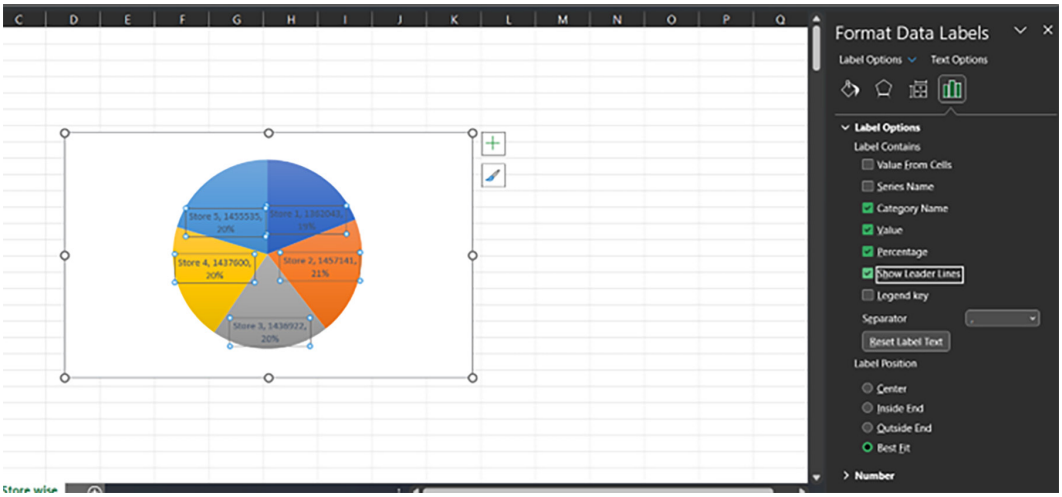


Figure 9.15: *Adding percentage in Pie Chart*

Rename the Chart as Store wise Sales.

As we can see in *Figure 9.15*, we have added percentage as well in the Pie Chart.

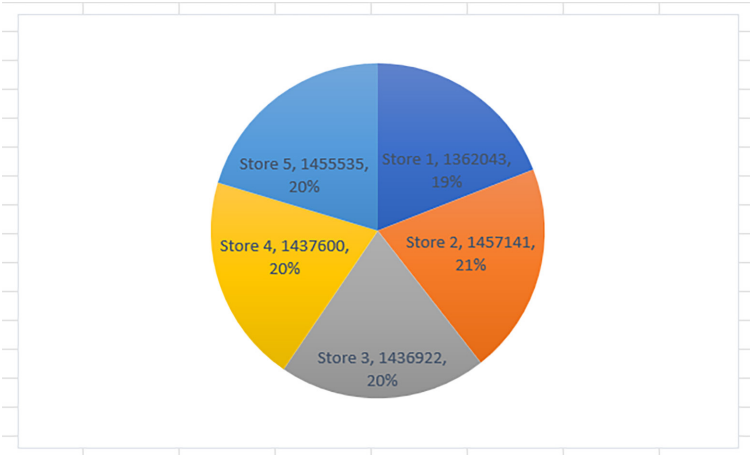


Figure 9.16*: Pie Chart for Store wise Sales*

As we can see in *Figure 9.16*, we have created a Pie Chart for Store wise Sales.

Next, we will create a Pivot Table for Product wise Sales. We will not create a Pivot Chart for Product wise Sales because we will show only the Table for Product wise Sales:

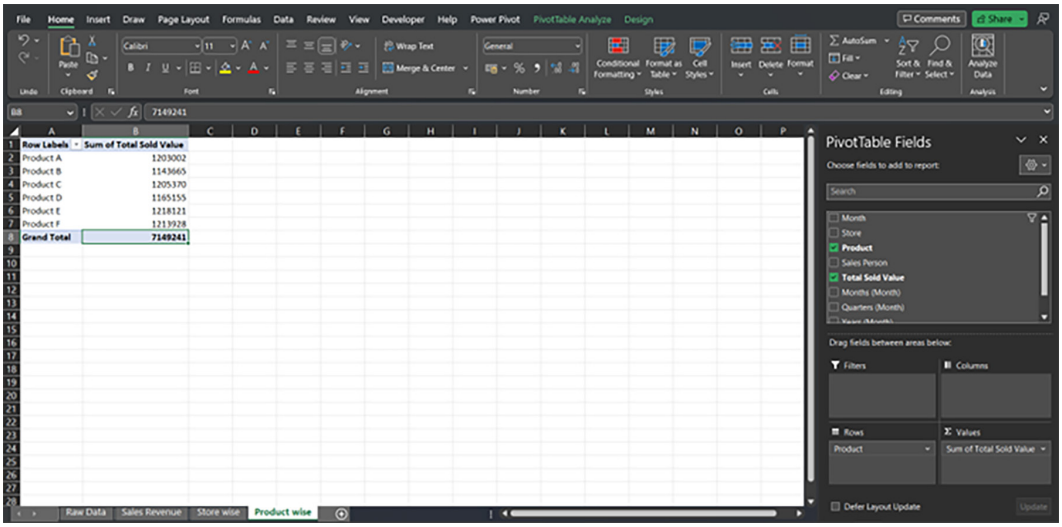


***Figure 9.17**: Product wise Sales Pivot Table*

As we can see in *Figure 9.17*, we have Product wise Sales.

Rename the Pivot Table as **`Product wise Sales`**.

We will copy this pivot table to the Dashboard.

Next, we will create a Pivot Table and a Pivot Chart for Salesperson wise Sales.

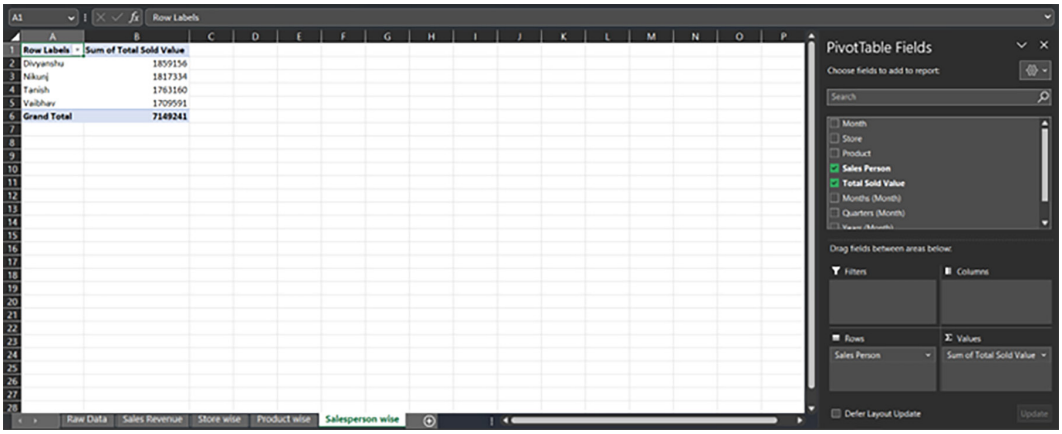


***Figure 9.18:** Salesperson wise Sales Pivot Table*

As we can see in *Figure 9.18*, we have Salesperson wise Sales.

Now, we will create a Pivot Chart with the previous Pivot Table and do the needful to get a better-looking Chart.

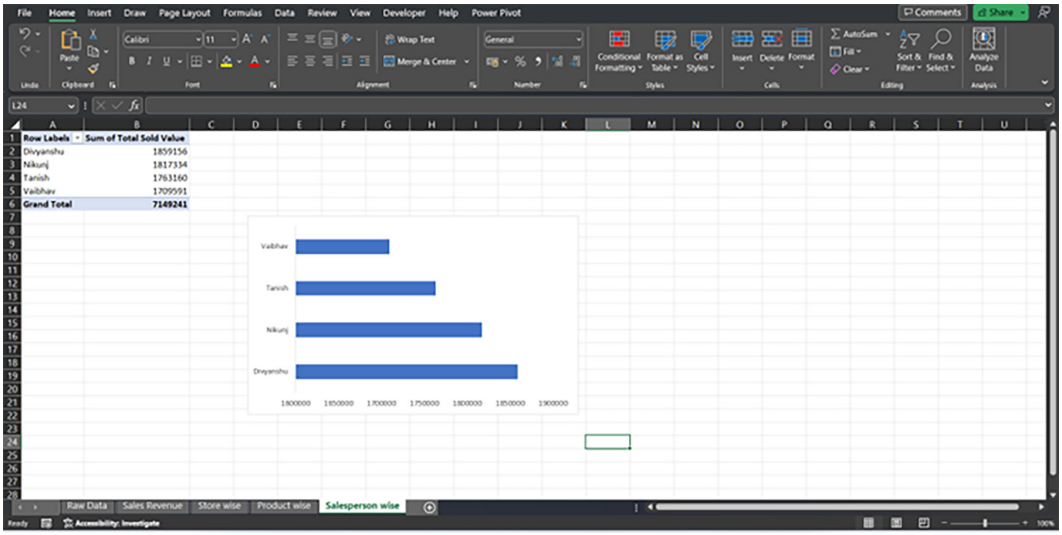


***Figure 9.19**: Salesperson wise Sales Pivot Chart in Bar Chart Format*

As we can see in *Figure 9.19*, we have Salesperson wise Sales Pivot Chart.

Now we are ready to make an amazing dashboard.

Copy the Month wise Sales Pivot Chart, the Store wise Sales Pivot Chart, the Product wise Sales Pivot Table and the Salesperson wise Sales Pivot Chart in a New Sheet (that is, the Dashboard).

Remove Gridlines from the Dashboard Sheet.

Paste these one by one in the Dashboard Sheet, as shown in the following figure:

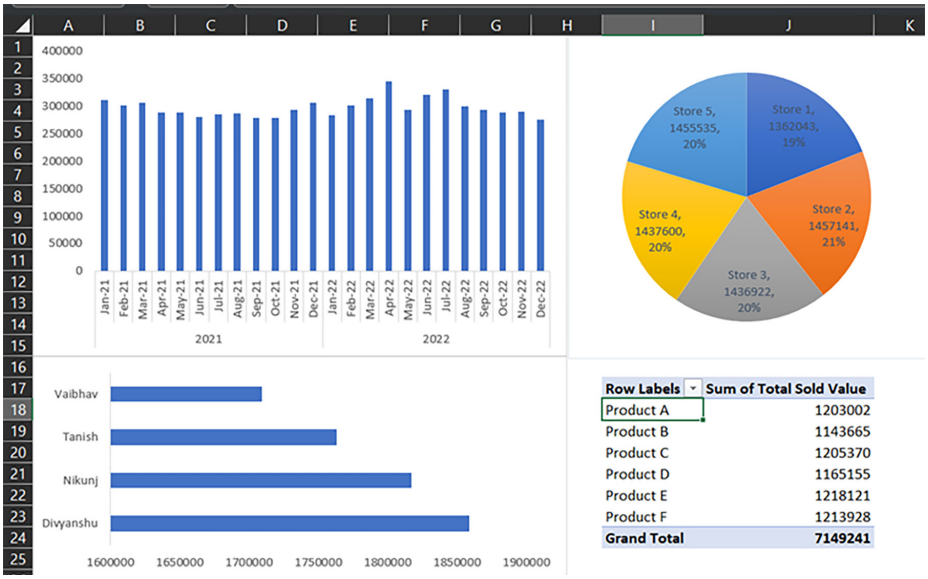


Figure 9.20: *Layout of Dashboard*

As we can see in *Figure 9.20,* we have created a layout of the Dashboard.

Rename the Pivot Table of Product wise Sales in the Dashboard Table. Refer to the following figure:

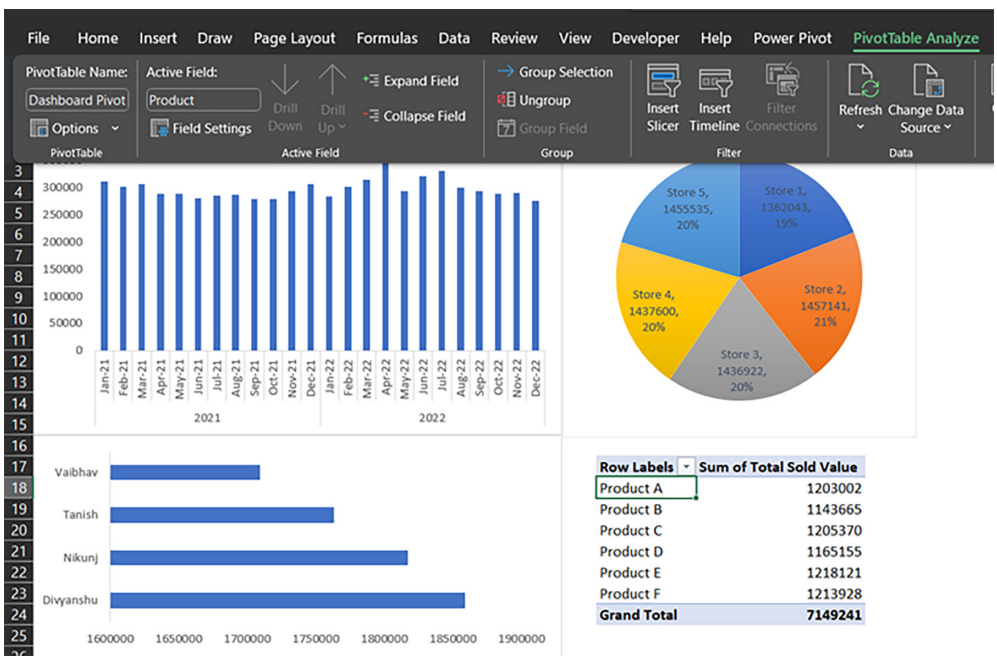


Figure 9.21: *Pivot Table renamed in Dashboard Sheet*

As we can see in *Figure 9.21*, Pivot Table has been renamed in Dashboard Sheet of Product wise Sales.

The next step is to add slicers, about which we learnt in *Chapter 1, Getting Ready With Advance Excel*.

Insert slicer

Select any Pivot Chart or Pivot Table from the Dashboard Sheet, click on Slicers, and select whatever Slicers you want. In our case, we will select Store, Years (Month), Months (Month), and Month. Refer to the following figure:

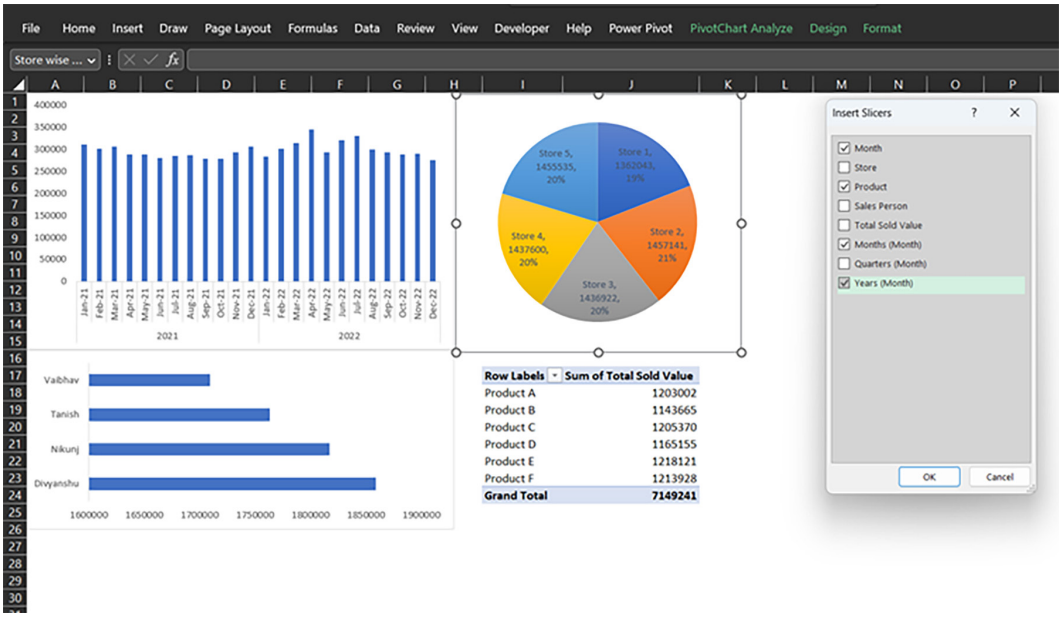


Figure 9.22: *Slicer Insertion in Dashboard*

As we can see in *Figure 9.22*, we have added Slicers for Month, Product, Months (Month) and Years (Month).

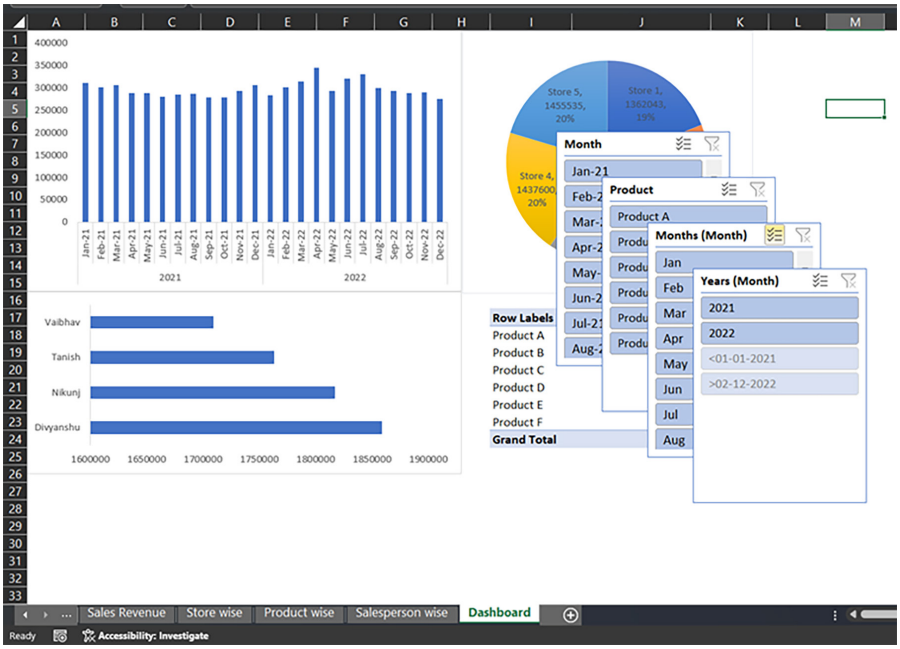


Figure 9.23: *Slicers Added in Dashboard*

As we can see in *Figure 9.23,* Slicers have been added in the Dashboard; now, we need to use them properly and in an informative way.

Although slicers typically appear as shown in Figure 9.23 by default, we will ensure that they are properly positioned and formatted to enhance the aesthetics of the dashboard..

First of all, we place all slicer tiles vertically on the right side of the Dashboard (It can be placed anywhere in the Sheet).

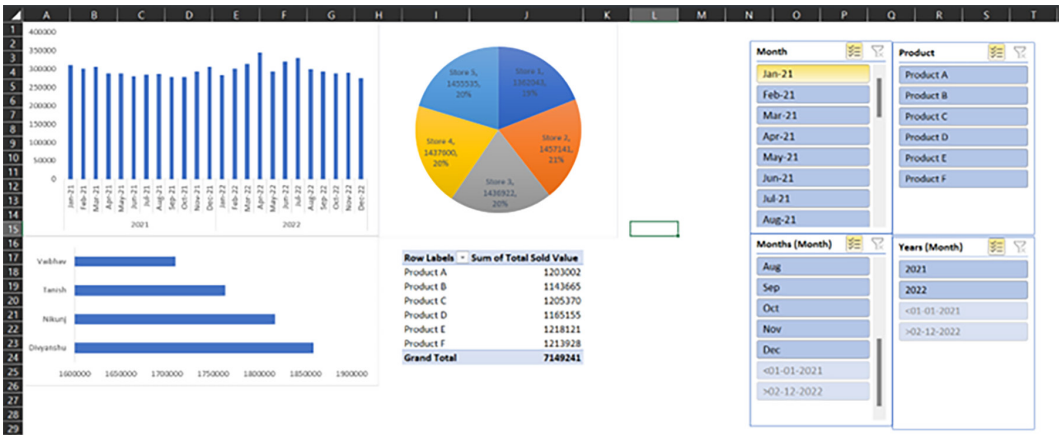


Figure 9.24: *Slicers Placed Vertically*

As we can see in *Figure 9.24*, Slicers have been placed vertically, After Placing all tiles Vertically, select all slicers one by one and format the same.

Let us start with Month Slicer; it has 24 months | 24 buttons, so we will convert 4 columns and 6 rows for 24 buttons.

Select **`Month Slicers | Right Click | Size and Properties | Number of Columns – 4`**.

Now, select Product Slicers and increase/decrease the slicers for a full view of all tabs, as shown in *Figure 9.25*.

Next Months (Month) Slicer | *Right Click* | **`Size and Properties | Number of Columns – 2`**

Then, increase/decrease the slicers for a full view of all tabs, as shown in *Figure 9.25.*

Now, Select Years (Month) Slicers and increase/decrease the slicers for a full view of all tabs, as shown in *Figure 9.25:*

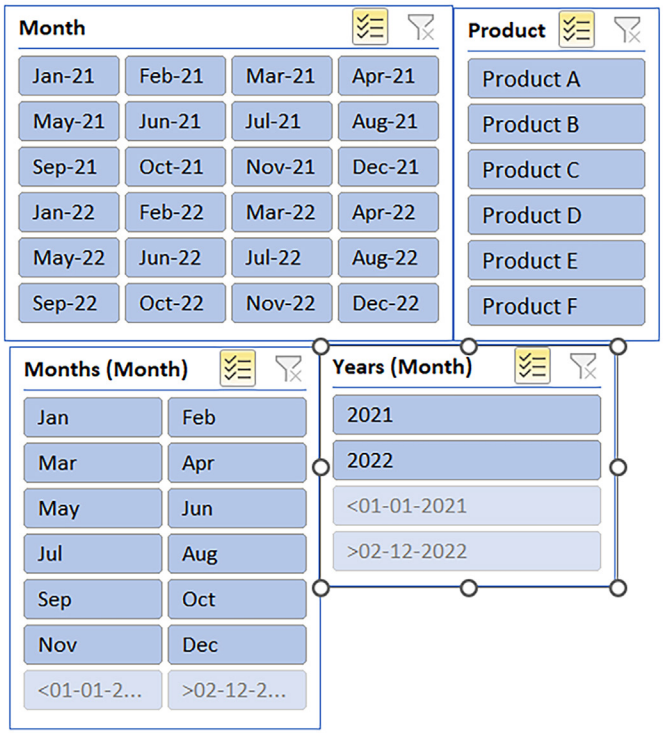


Figure 9.25: *Formatted Slicers*

As we can see in *Figure 9.26*, we have four formatted slicers. We can do more formatting in slicers, but we will let it be as is for now (You can explore more options for better results).

Now we need to link all slicers with all pivot tables so that slicers can work for all charts and table. We do this one by one for all slicers.

Select **`Month Slicers`** | Go to **`Slicer Tab`** | **`Report Connections`** | Select **`All Tables`**:

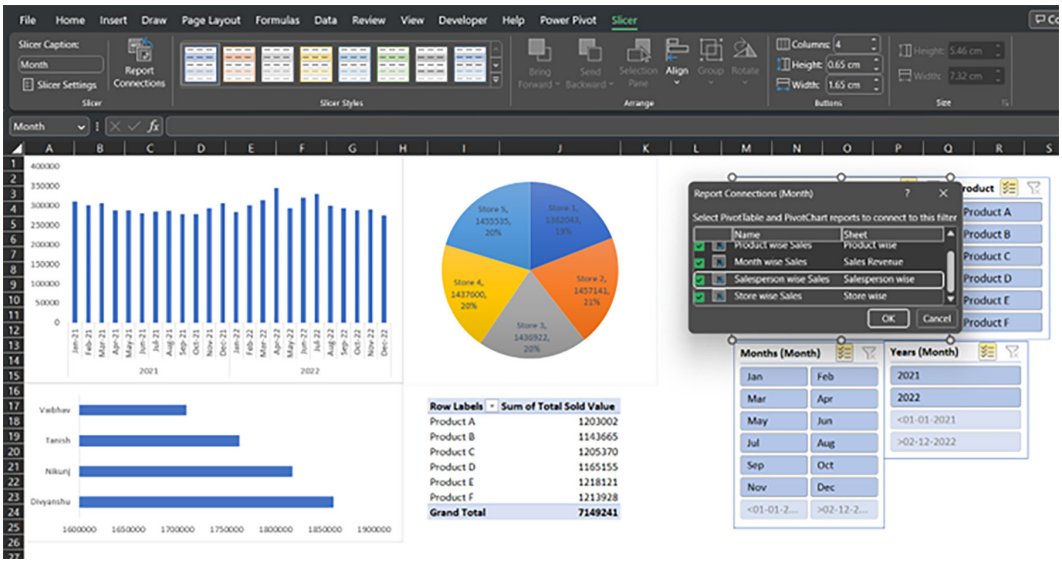


Figure 9.26: *Connections for all Pivot Tables*

As we can see in *Figure 9.26*, we have connected all tables with Month Slicer.

Repeat the same for the Product, Months (Month) and Years (Month) Slicers.

Now we ready to see the magic of Slicers.

Just Click on different tabs of slicers and see the changes in the Dashboard.

For example, suppose we want to check the performance of Product E in the month of Apr 22.

Deselect all the tabs by clicking on the deselect filter from all slicers, and then select the 2022 tab from the Years (Month) Slicer and Apr from the Months (Month) Slicer and Product E from Product Slicer.

The result is as follows:

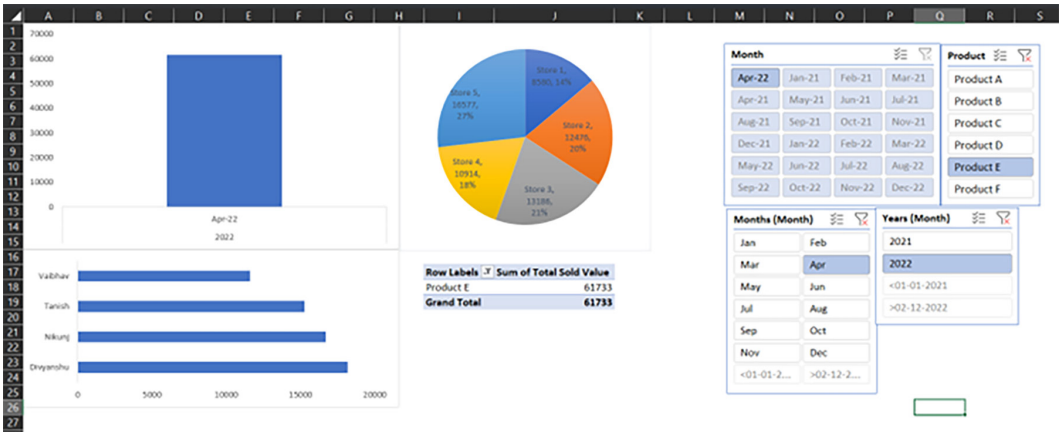


Figure 9.27: *Product E result for Apr 22*

As we can see in *Figure 9.27*, the total sale of Product E is 61,733, from which Store 5 has the highest percentage of sale, and Divyanshu is the best seller of Product E.

Now you can check out the dashboard with different combinations.

Creating a Dashboard is not a time-consuming task if our data set is clean. Before creating any dashboard, the first rule is to check the cleanliness of data, i.e., checking whether the numbers are okay and avoiding blank cells.

Conclusion

Throughout the book, you've covered various Excel functions and tools that are essential for financial and accounting professionals. You've highlighted the importance of accuracy and efficiency in financial reporting, and you've seen how Excel can help achieve both goals.

Excel's versatility and accessibility make it an invaluable tool for financial analysis, forecasting, budgeting, and much more. By utilizing the various features and formulas discussed in this book, you can streamline your financial processes, save time, and improve the overall accuracy of your financial reporting.

In addition to the technical skills discussed in the book, it's important to remember the importance of communication and collaboration in finance and accounting. Whether you're working with a team or presenting financial information to stakeholders, clear communication and collaboration are essential to success.

Overall, *Excel for Finance and Accounting* provides readers with a solid foundation of Excel skills and knowledge that can be applied to a wide range of financial tasks. By mastering the techniques and concepts discussed in this book, you'll be well on your way to becoming a more efficient and effective financial professional.

Thank you for taking the time to read this book, and I hope it serves as a valuable resource for years to come.

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Excel for Finance and Accounting

DESCRIPTION

Excel is a widely-used tool in finance and accounting, and this book provides a comprehensive guide on how to utilize it for maximum efficiency.

The book covers basic to advanced Excel functions such as data manipulation, financial modeling, and scenario analysis. It also offers practical tips on how to create professional-looking reports, charts, and tables, which are essential in presenting financial data to stakeholders. With Excel's ever-evolving features and functions, it can be challenging for professionals to keep up with its latest updates. This book keeps you updated with the latest Excel features and offers practical examples of how to apply them in finance and accounting. Additionally, it offers tips on how to use Excel to automate repetitive tasks, freeing up more time for strategic analysis and decision-making.

With this book, you can learn to leverage Excel to its full potential and gain a competitive advantage in your roles.

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- Learn how to create financial models in Excel.
- Explore ways to use Excel functions and formulas for financial calculations.
- Implement advanced Excel techniques for finance and accounting tasks.

WHAT YOU WILL LEARN

- Learn how to effectively manage financial data in Excel.
- Discover different techniques for preparing financial statements.
- Learn how to perform budget analysis in Excel.
- Learn how to create a forecast in Excel.
- Build dynamic dashboards and reports for financial data.

WHO THIS BOOK IS FOR

For individuals working in finance and accounting positions, whether at an entry-level or in senior management, this book is a must-have. It will enable professionals to enhance their productivity, precision, and effectiveness, resulting in significant savings of time and resources.

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