

Sensitivity Analysis & Stress Testing

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Definitions

Sensitivity Analysis

Sensitivity Analysis is a tool used in financial modelling to analyse how the different values of a set of independent variables affect a specific dependent variable under certain specific conditions.

Stress Testing

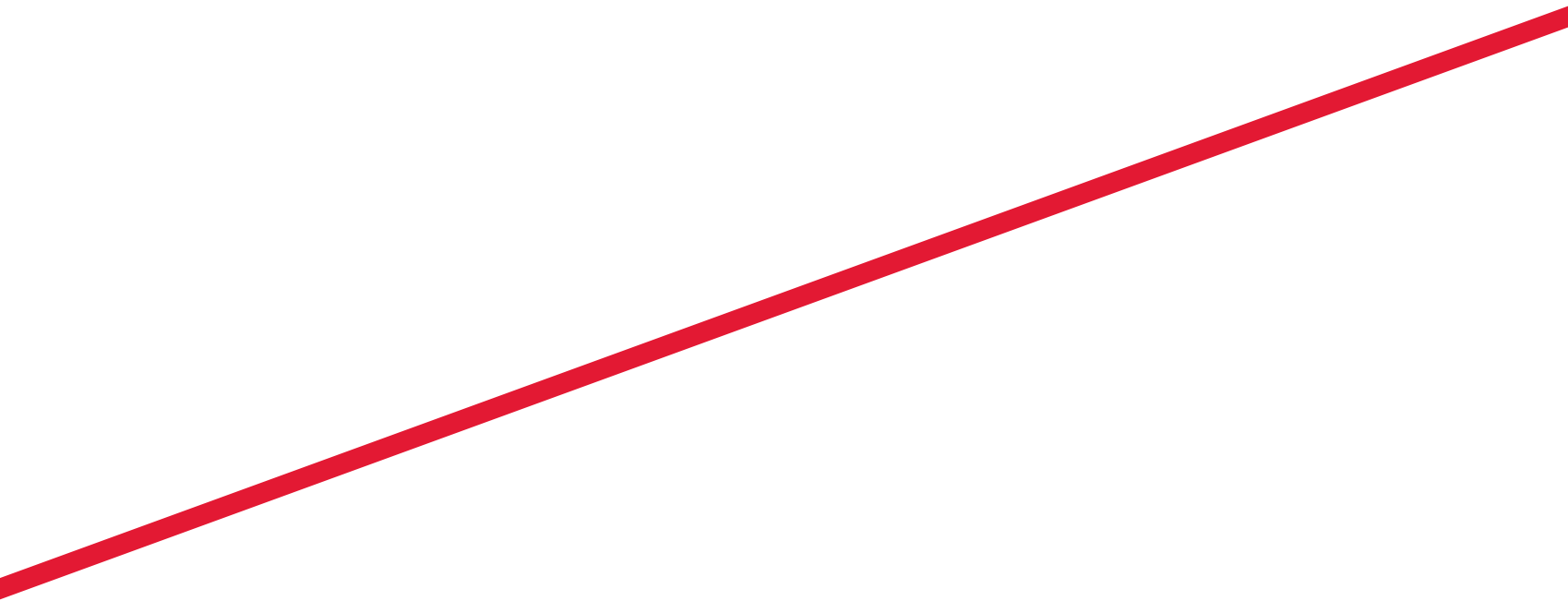
Stress testing is a form of deliberately intense or thorough testing, used to determine the stability of a given system, critical infrastructure or entity. It involves testing beyond normal operational capacity, often to a breaking point, in order to observe the results.

Risk Register

The risk register is a key project document used in many knowledge areas and other processes. Here are some significant points implying the importance of risk register:

- It is a repository in which the outputs of a project's risk management processes are recorded.
- It primarily contains information about individual project risks.
- It is progressively elaborated throughout the processes of risk management knowledge areas.

Operational Risk



Introduction

Operational Risk

Summarizes uncertainties and hazards Tech Mahindra could face when it attempts to do its day-to-day business activities. Some of the operational risks identified for application development projects are:

- Understanding of specifications
- Attrition
- Skilled resources
- Environmental issues
- Contract compliance
- Requirement Volatility
- Testing
- Breakdown in communication

Definitions

Risk Probability

Using a numerical value for risk probability is desirable for ranking risks. Risk probability must be greater than zero, or the risk does not pose a threat. Likewise, the probability must be less than 100 percent or the risk is a certainty – in other words, it is a known problem or an issue.

The following table demonstrates an example of a five-value division for probabilities.

Probability	Probability Rating	Suggested % Range
Very Low	1	Up to 20%
Low	2	Between 20% to 40%
Moderate	3	Between 40% to 60%
High	4	Between 60% to 80%
Very High	5	Greater than 80%

Definitions

Risk Impact

Risk impact is an estimate of the severity of adverse effects, or the magnitude of a loss, or the potential opportunity cost should a risk be realized within a project. It is a direct measure of the risk consequence as defined in the risk statement. This estimate of loss is based on the experience and understanding of the project manager. It can either be measured in financial terms or with a subjective measurement scale.

The following table demonstrates an example of a five-value division for probabilities.

Probability	Probability Rating	Suggested % Range
Very Low	1	Up to 20%
Low	2	Between 20% to 40%
Moderate	3	Between 40% to 60%
High	4	Between 60% to 80%
Very High	5	Greater than 80%

Definitions

Risk Exposure

Risk exposure measures the overall threat of the risk, combining information expressing the likelihood of actual loss with information expressing the magnitude of the potential loss into a single numeric estimate.

In the simplest form of quantitative risk analysis, risk exposure is calculated by multiplying risk probability and impact. Thus,

$$\text{Risk Exposure} = \text{Probability of Risk Occurrence} * \text{Impact of the Risk}$$

Risk Matrix

A risk matrix is a matrix that is used during risk assessment to define the level of risk by considering the category of probability or likelihood against the category of consequence severity. This is a simple mechanism to increase the visibility of risks and assist management decision making.

Probability	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Impact				

Analysis

Example

In an application development project total revenue of the project is **USD 40 million**, out of which **USD 10 million** is license cost. Employee cost is **55%** of revenue after subtracting licence cost. Support cost is **15%** of the revenue. The project duration is **3 years** and payment is milestone-based. If the deadline for the project is missed, then liquidity damage is **10%** of the revenue.

Total Revenue	\$ 40 million
Licence cost	\$ 10 million
Revenue	\$ 30 million
Employee cost	\$ 16.5 million
SG&A cost	\$ 4.5 million
Total cost	\$ 21 million
Company margin	\$ 9 million

Analysis

Below is the risk map/impact matrix of the above-mentioned operational risks:

Probability	5	Understanding of specification				
	4	Environment Issues			Attrition	
	3	Requirement volatility			Skilled Resources	
	2	Testing	Contract Compliance			
	1					
		1	2	3	4	5
		Impact				

Colour	Effect	No. of Risks
Red	High Probability and High Impact	2
Yellow	Medium Probability and Medium Impact	2
Green	Low Probability and Low Impact	3

Maximum Risk no for any parameter'	25
Minimum Risk no for any parameter	1
For this Project	
No of parameters	7
Highest Risk	175
Lowest Risk	7

Risk Range is Between	7-175
Risk Analysis of any project	Range
High risk	106-175
Medium Risk	71-105
Low risk	7-70

Therefore, Application Development project is of medium risk.

Analysis

- The probability and impact would differ based on operational risk of the project.
- Operational risks will also depend upon the project implementation.
- Below are assumed operational risks:

Very high=5, High=4, Medium=3, Low=2, Very low=1

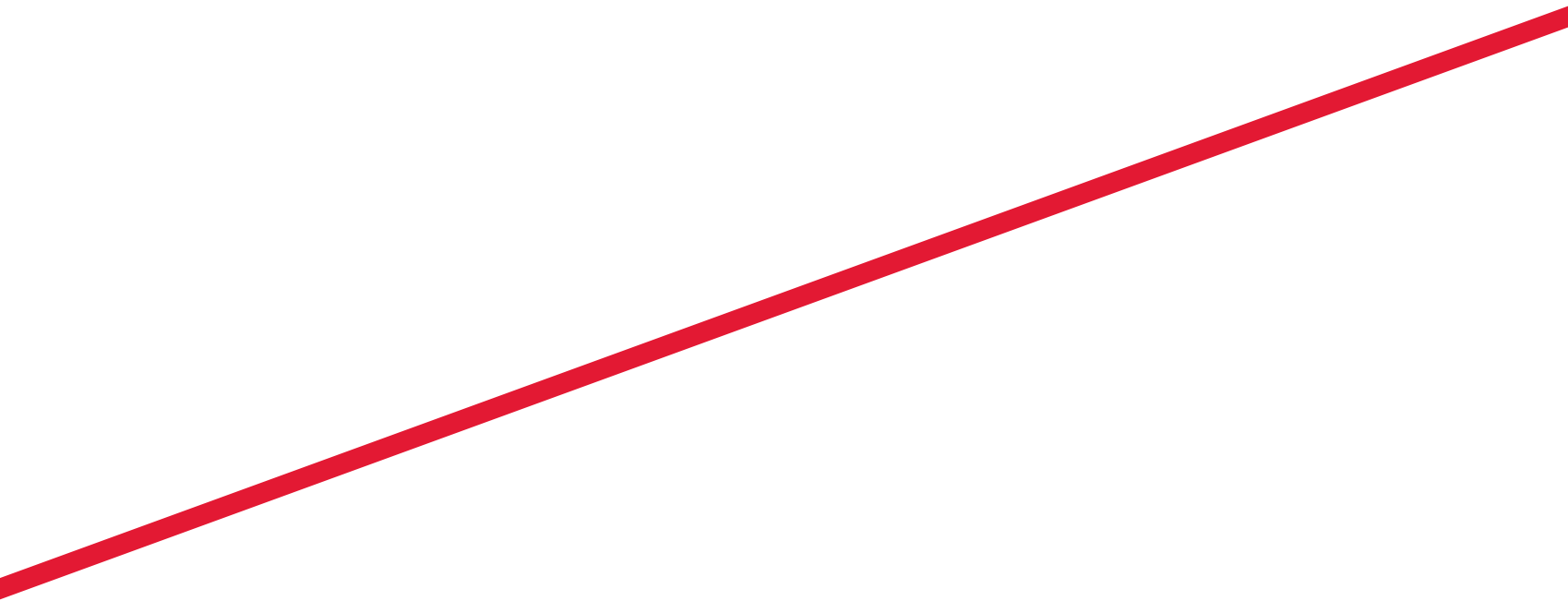
Operational risk	Probability	Impact	Risk exposure
Understanding of specifications	5	5	25
Attrition	4	4	16
Skilled resources	3	4	12
Environment issues	4	3	12
Contract compliance	2	3	6
Requirement Volatility	2	2	4
Testing	2	1	2
Total			77

Here to obtain the whole weightage of the operational risks, probability and impact of each risk are multiplied to get the risk number, which will provide the impact of a particular risk.

Conclusion

In this way, by using sensitivity analysis, we have successfully identified the operational risks & for each parameter we have found risk exposure. Since, scale is ranged between **1-5**, where **5** being "**Very high**" & **1** being "**Very low**", therefore highest risk will be **25** and lowest risk will be **1**. In this project, there are **7** operational parameters. Thus, highest risk of the project will be **(25*7)=125** & lowest risk of the project will be **(1*7)=7**. Now, low risk is **(40% of 175)**, therefore the project whose total risk number lies between range of **7 - 70** is be classified as "**Low Risk Project**", range of **71 - 105** is classified as "**Medium Risk Project**" & range of **106 - 175** is classified as "**High Risk Project**". Since the risk number of this project is **77**, it is classified as "**Medium Risk Project**".

Strategy M&A Risk



Introduction

- Inability, delay, or failure to integrate with the acquired portfolio companies to achieve the desired strategic synergies may result in any of the following:
 - Financial losses
 - Damage to reputation
 - Decreased productivity
 - Loss of employee morale
 - Legal matters
- Tech Mahindra has a focused M&A strategy and has acquired various companies in the past years.
- Integration of these companies involve risks of failure of achieving strategic objectives, financial loss, culture, and financial integration etc.

Analysis

- Tech Mahindra carries out a sensitivity analysis for all M&A transactions as part of our valuation.
- We follow a two-step process, wherein
 - In Step 1, we consider three possible scenarios for the performance of the company (Best case, Base case & Worst case). We have also considered stress case scenarios for our deals during COVID-19 pandemic.
 - In Step 2, we go ahead with a sensitivity analysis of the valuation for each of the scenarios given below.

	BEST CASE					
	Parameter	2019	2020	2021	2022	2023
Revenue	Existing Business	24%	7%	10%	10%	10%
Direct Costs	Direct Costs	62%	62%	62%	62%	62%
Indirect Costs	SG&A	17.6%	17%	17%	17%	17%

Analysis

	BASE CASE					
	Parameter	2019	2020	2021	2022	2023
Revenue	Existing Business	24%	7%	6.5%	6.5%	6.5%
Direct Costs	Direct Costs	62%	62%	62%	62%	62%
Indirect Costs	SG&A	17.6%	17%	18%	18%	18%

	WORST CASE					
	Parameter	2019	2020	2021	2022	2023
Revenue	Existing Business	24%	7%	6%	6%	6%
Direct Costs	Direct Costs	62%	64%	64%	64%	64%
Indirect Costs	SG&A	17.6%	20%	20%	20%	20%

Analysis

	Terminal Growth Rate (%)					
		1%	1.5%	2%	2.5%	3%
WACC	13%	90.43	93.31	96.46	99.90	103.69
	14%	84.06	86.46	89.07	91.90	94.99
	15%	78.60	80.63	82.82	85.18	87.74
	16%	73.87	75.60	77.46	79.46	81.61
	17%	69.73	71.23	72.82	74.53	76.36

Forex Risk



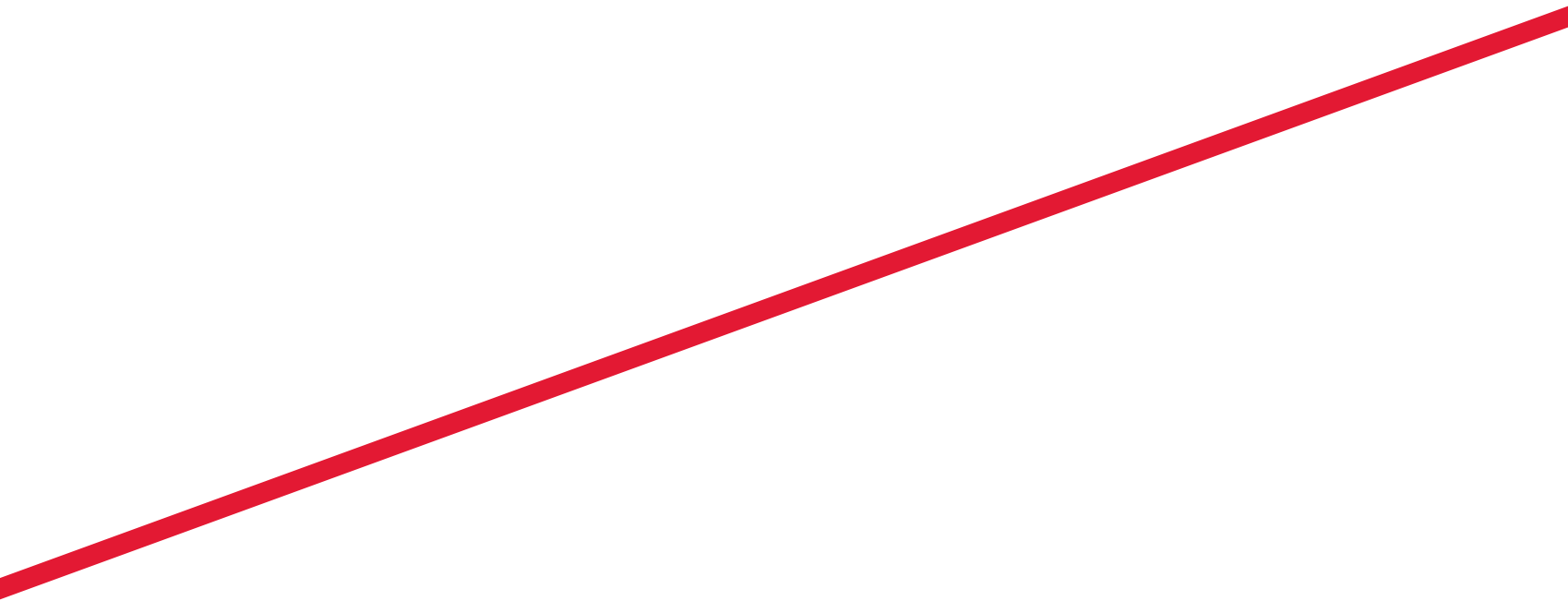
Introduction

- The Company has framed a Risk Management Policy which has been approved by the Board of Directors. Forex risk exposure is managed inline with this policy.
- The objective of framing the policy is to ensure foreign exchange exposures are properly monitored, limiting risks to tolerable levels and not so much to make profits from currency movements. Thus, risk limitation / reduction is the primary objective.
- A Risk Management Committee has also been formed consisting of the CFO, Finance Controller and Function Head - Treasury which monitors the risk exposure and positions on a regular basis.
- The Board (through Audit committee) reviews the forex status every quarter.
- The 'Ring fencing model' followed by TechM also means that most of the profits generated from international business is repatriated back to India and there is little currency exposure in our subsidiary operations.

Analysis

- Revenue for the next two years is forecast by the Corporate Planning team and based on their inputs, net forex exposure for major currencies is worked out, based on past trends of currency mix and onsite costs; and repatriations to India. This is reviewed from time to time.
- The major currencies for are **USD, GBP, EUR, AUD** and **CAD**. As per policy, exposure for next two years is monitored and considered for hedging and each month's exposure is separately monitored.
- Two years' forward rate for each month's USD exposure is determined when exposure falls due under the program (i.e., **T + 23**) and is fixed as the benchmark rate for the exposure for the month. Stop loss rate is fixed at **INR 2** below benchmark rate for USD
 - **75%-100%** of the month's forecast exposure would be hedged using a dynamic hedging approach
 - upto **25%** is covered upfront using forwards or options
 - cover is increased proportionately **~15%** for every **1%** increase in benchmark rate
 - Open exposure (upto **75-100%**) is fully covered if stop loss levels are hit
 - Balance **0-25%** is left open to spot or capturing unusually favourable currency movements
- In case of other currencies (GBP, EUR, AUD & CAD)
 - **50%** of FC/USD leg is covered upfront (USD/INR leg is managed as USD exposure; and
 - Balance **50%** of FC/USD leg is taken at spot
- Hedges are generally delivered on maturity and premature cancellations are done in exceptional circumstances only.

Market Risk



Introduction

Importance of Sensitivity Analysis of Market Risk

The environment in which a business is very uncertain, and it can change quickly due to the influence of external factors. These external factors can be anything from a change in sales demand to new applications of a government policy that is not in the favor of business. This can result in the reduction in sales and maybe increase in costs. This can invariably reduce the profits of the company, and it may suffer losses. To prevent this from happening, Tech Mahindra monitors the external environment, continuously. Regular Sensitivity Analysis for Tech Mahindra is important & is conducted by considering various parameters by appropriate functions.

Sensitivity Analysis of Market Risk

It is entrusted with the company's Risk Management Team in conjunction with various business functions. Market risks are identified via a bottom-up approach where each business function directly contributes to the change aspects and then, they're analyzed. Tech Mahindra's risk management process allows identification, mitigation and management across the broad spectrum of Current and Emerging Market Risks including Financial Risks.

Sensitivity Analysis of Market Risk for EPS

The first step of Market risk is to determine how much risk a stock carries. EPS is a factor in Market Risk assessment which is very sensitive and hence, very volatile. Therefore, for Market Risk assessment of Tech Mahindra, Sensitivity Analysis of EPS has been conducted for the same. Sensitivity analysis of EPS can provide important information regarding the sensitivity of almost every other financial aspect in respect to the Market Risk. Also, it is an important metric to gauge a company's profitability per unit of share. The higher the profit of a company, the better is its EPS.

Analysis

Methodology

A financial model has been developed to assess the Market Risk for EPS of Tech Mahindra using Data Tables in an Excel Spreadsheet.

A quantitative sensitivity analysis for significant assumptions as on **March 31, 2023**, is as shown below:

Sensitivity Analysis of EPS of Tech Mahindra

The consolidated Profit & Loss statement of Tech Mahindra for FY 2022-23 has been imported and three unfavorable scenarios have been simulated on three different parameters:

- **Assumption 1**: Decreased **Revenue** by **3%**
Revenue is the most important financial metric of any organization. Hence, it has been selected to look at how it affects the EPS of the company.
- **Assumption 2**: Increased **Interest** costs by **3%**
As interest cost is a fixed expenditure, higher interest costs post leveraging will lead to higher deterioration in EPS.
- **Assumption 3**: Increased **Depreciation** by **3%**
As a fixed cost recurring the same amount per period throughout the useful life of an asset, Depreciation & amortization expenses can lead to increased deterioration in EPS over time.

Analysis

Income Statement of Tech Mahindra (FY 2022-23)

Particulars	FY 2022-23 (in million)	
Revenue from Operations	INR	532,902.00
Other Income	INR	9,650.00
Total Income	INR	542,552.00
Expenditure		
Employee Benefit Expense	INR	276,918.00
Subcontracting Expenses	INR	80,002.00
Finance Costs	INR	3,256.00
Depreciation and Amortisation Expense	INR	19,567.00
Other Expenses	INR	95,694.00
Impairment of Goodwill and Non Current Assets	INR	2,370.00
Total Expenses	INR	477,807.00
Share in Profit / (Loss) of Associates / Joint Venture	INR	(290.00)
Profit before Tax	INR	64,455.00
Tax Expense		
Current Tax	INR	19,514.00
Deferred Tax	INR	(3,629.00)
Total Tax Expense	INR	15,885.00
Profit after tax	INR	48,570.00
Profit for the period attributable to:		
Owners of the Company	INR	48,313.00
Non Controlling Interests	INR	257.00
Other Comprehensive Income		
Items that will not be reclassified to Profit or Loss		
Remeasurements of the Defined Benefit Liabilities - gain/(loss)	INR	192.00

Equity Instruments through Other Comprehensive Income - gain/(loss)	INR	(188.00)
Income Tax relating to items that will not be reclassified to Profit or Loss	INR	(15.00)
Items that will be subsequently reclassified to Profit or Loss		
Exchange differences in translating the Financial Statements of Foreign Operations - gain/(loss) (net)	INR	5,419.00
Effective portion of gains /(loss) on Designated Portion of Hedging Instruments in a Cash Flow Hedge (net)	INR	(3,146.00)
Income Tax relating to items that will be reclassified to Profit or Loss	INR	886.00
Total Other Comprehensive Income / (Loss)	INR	3,148.00
Total Comprehensive Income	INR	51,718.00
Total Comprehensive Income for the period attributable to:		
Owners of the Company	INR	51,376.00
Non Controlling Interests	INR	342.00
Equity Shares outstanding as at the end of the year		879,911,846
Weighted average Equity Shares outstanding as at the end of the year		882,208,730
Dilutive impact of employee stock options		3,594,899
Number of Equity Shares used as denominator for calculating Diluted Earnings Per Share		885,803,629
Earnings per Equity Share		
Basic	INR	54.76
Diluted	INR	54.54

Analysis

ASSUMPTIONS					
Particulars	FY 2022-23 (in million)	Change	Updated Values (in million)	Updated Earnings per Equity Share	% Change in Earnings per Equity Share
Revenue	INR 532,902.00	DECREASE BY 3%	INR 516,914.94	INR 36.64	-49.46%
Interest	INR 3,256.00	INCREASE BY 3%	INR 3,353.68	INR 54.65	-0.20%
Depreciation	INR 19,567.00	INCREASE BY 3%	INR 22,110.71	INR 51.88	-5.56%

Analysis

ASSUMPTION 1 (Revenue from Operations)

Particulars	FY 2022-23 (in million)	
Revenue from Operations	INR	516,914.94
Other Income	INR	9,650.00
Total Income	INR	526,564.94
Expenditure		
Employee Benefit Expense	INR	276,918.00
Subcontracting Expenses	INR	80,002.00
Finance Costs	INR	3,256.00
Depreciation and Amortisation Expense	INR	19,567.00
Other Expenses	INR	95,694.00
Impairment of Goodwill and Non Current Assets	INR	2,370.00
Total Expenses	INR	477,807.00
Share in Profit / (Loss) of Associates / Joint Venture	INR	(290.00)
Profit before Tax	INR	48,467.94
Tax Expense		
Current Tax	INR	19,514.00
Deferred Tax	INR	(3,629.00)
Total Tax Expense	INR	15,885.00
Profit after tax	INR	32,582.94
Profit for the period attributable to:		
Owners of the Company	INR	32,325.94
Non Controlling Interests	INR	257.00
Other Comprehensive Income		
Items that will not be reclassified to Profit or Loss		
Remeasurements of the Defined Benefit Liabilities - gain/(loss)	INR	192.00

Equity Instruments through Other Comprehensive Income - gain/(loss)	INR	(188.00)
Income Tax relating to items that will not be reclassified to Profit or Loss	INR	(15.00)
Items that will be subsequently reclassified to Profit or Loss	INR	-
Exchange differences in translating the Financial Statements of Foreign Operations - gain/(loss) (net)	INR	5,419.00
Effective portion of gains /(loss) on Designated Portion of Hedging Instruments in a Cash Flow Hedge (net)	INR	(3,146.00)
Income Tax relating to items that will be reclassified to Profit or Loss	INR	886.00
Total Other Comprehensive Income / (Loss)	INR	3,148.00
Total Comprehensive Income	INR	35,730.94
Total Comprehensive Income for the period attributable to:		
Owners of the Company	INR	51,376.00
Non Controlling Interests	INR	342.00
Equity Shares outstanding as at the end of the year		879,911,846
Weighted average Equity Shares outstanding as at the end of the year		882,208,730
Dilutive impact of employee stock options		3,594,899
Number of Equity Shares used as denominator for calculating Diluted Earnings Per Share		885,803,629
Earnings per Equity Share		
Basic	INR	36.64
Diluted	INR	36.49

Analysis

ASSUMPTION 2 (Finance Costs)

Particulars	FY 2022-23 (in million)	
Revenue from Operations	INR	532,902.00
Other Income	INR	9,650.00
Total Income	INR	542,552.00
Expenditure		
Employee Benefit Expense	INR	276,918.00
Subcontracting Expenses	INR	80,002.00
Finance Costs	INR	3,353.68
Depreciation and Amortisation Expense	INR	19,567.00
Other Expenses	INR	95,694.00
Impairment of Goodwill and Non Current Assets	INR	2,370.00
Total Expenses	INR	477,904.68
Share in Profit / (Loss) of Associates / Joint Venture	INR	(290.00)
Profit before Tax	INR	64,357.32
Tax Expense		
Current Tax	INR	19,514.00
Deferred Tax	INR	(3,629.00)
Total Tax Expense	INR	15,885.00
Profit after tax	INR	48,472.32
Profit for the period attributable to:		
Owners of the Company	INR	48,215.32
Non Controlling Interests	INR	257.00
Other Comprehensive Income		
Items that will not be reclassified to Profit or Loss		
Remeasurements of the Defined Benefit Liabilities - gain/(loss)	INR	192.00

Equity Instruments through Other Comprehensive Income - gain/(loss)	INR	(188.00)
Income Tax relating to items that will not be reclassified to Profit or Loss	INR	(15.00)
Items that will be subsequently reclassified to Profit or Loss	INR	-
Exchange differences in translating the Financial Statements of Foreign Operations - gain/(loss) (net)	INR	5,419.00
Effective portion of gains /(loss) on Designated Portion of Hedging Instruments in a Cash Flow Hedge (net)	INR	(3,146.00)
Income Tax relating to items that will be reclassified to Profit or Loss	INR	886.00
Total Other Comprehensive Income / (Loss)	INR	3,148.00
Total Comprehensive Income	INR	51,620.32
Total Comprehensive Income for the period attributable to:		
Owners of the Company	INR	51,376.00
Non Controlling Interests	INR	342.00
Equity Shares outstanding as at the end of the year		879,911,846
Weighted average Equity Shares outstanding as at the end of the year		882,208,730
Dilutive impact of employee stock options		3,594,899
Number of Equity Shares used as denominator for calculating Diluted Earnings Per Share		885,803,629
Earnings per Equity Share		
Basic	INR	54.65
Diluted	INR	54.43

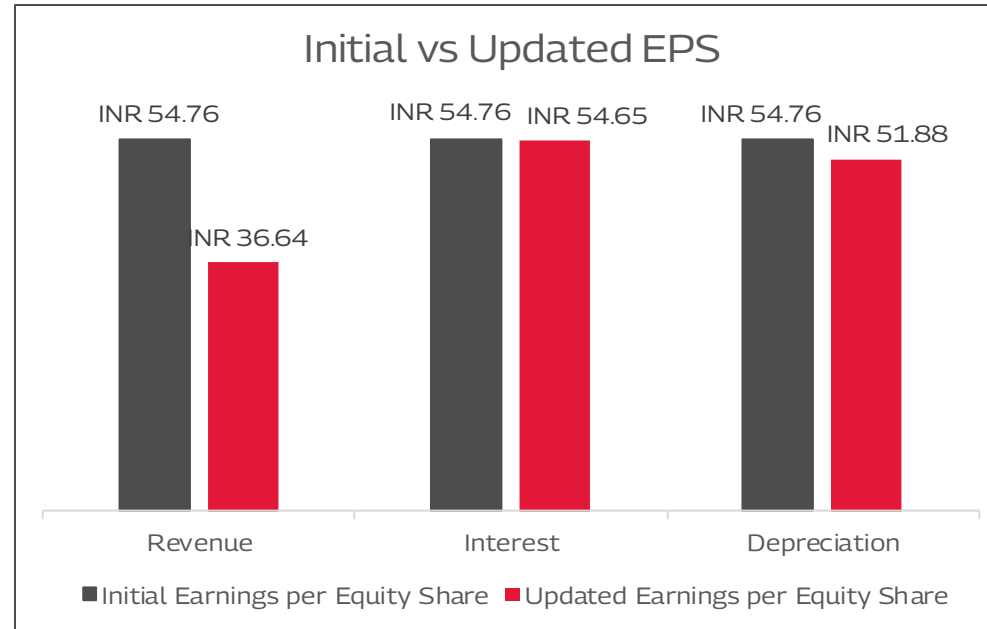
Analysis

ASSUMPTION 3 (Depreciation Expenses)

Particulars	FY 2022-23 (in million)	
Revenue from Operations	INR	532,902.00
Other Income	INR	9,650.00
Total Income	INR	542,552.00
Expenditure		
Employee Benefit Expense	INR	276,918.00
Subcontracting Expenses	INR	80,002.00
Finance Costs	INR	3,256.00
Depreciation and Amortisation Expense	INR	22,110.71
Other Expenses	INR	95,694.00
Impairment of Goodwill and Non Current Assets	INR	2,370.00
Total Expenses	INR	480,350.71
Share in Profit / (Loss) of Associates / Joint Venture	INR	(290.00)
Profit before Tax	INR	61,911.29
Tax Expense		
Current Tax	INR	19,514.00
Deferred Tax	INR	(3,629.00)
Total Tax Expense	INR	15,885.00
Profit after tax	INR	46,026.29
Profit for the period attributable to:		
Owners of the Company	INR	45,769.29
Non Controlling Interests	INR	257.00
Other Comprehensive Income		
Items that will not be reclassified to Profit or Loss		
Remeasurements of the Defined Benefit Liabilities - gain/(loss)	INR	192.00

Equity Instruments through Other Comprehensive Income - gain/(loss)		INR (188.00)
Income Tax relating to items that will not be reclassified to Profit or Loss		INR (15.00)
Items that will be subsequently reclassified to Profit or Loss	INR	-
Exchange differences in translating the Financial Statements of Foreign Operations - gain/(loss) (net)	INR	5,419.00
Effective portion of gains /(loss) on Designated Portion of Hedging Instruments in a Cash Flow Hedge (net)		INR (3,146.00)
Income Tax relating to items that will be reclassified to Profit or Loss	INR	886.00
Total Other Comprehensive Income / (Loss)	INR	3,148.00
Total Comprehensive Income	INR	49,174.29
Total Comprehensive Income for the period attributable to:		
Owners of the Company	INR	51,376.00
Non Controlling Interests	INR	342.00
Equity Shares outstanding as at the end of the year		879,911,846
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Number of Equity Shares used as denominator for calculating Diluted Earnings Per Share		885,803,629
Earnings per Equity Share		
Basic	INR	51.88
Diluted	INR	51.67

Analysis



Finally, their independent effect on EPS is evaluated as follows:

- All three assumptions create unfavourable conditions for EPS of the company.
- **Assumption 1** is the most sensitive factor that impacts EPS out of all three assumptions.
 - If we consider Assumption 1, i.e., a decrease of 3% sales revenue will result in **49.46%** decrease in EPS from **INR 54.76** to **INR 36.64**.
 - It will be the most sensitive factor amongst all.
- **Assumption 3** has second most impact with **5.56%** decrease in EPS from **INR 54.76** to **INR 51.88** followed by **Assumption 2** with **0.20%** decrease in EPS from **INR 54.76** to **INR 54.65**

Analysis

Financial Factors affecting EPS

The following financial factors have an influence on Earnings Per Share (EPS):

Factor 1: Price to Book Value

PB ratio is connected to EPS by "No. of shares issued". If we have to increase the PB ratio, then, sales turnover has to be increased.

Factor 2: Degree of Financial Leverage (DFL)

A higher DFL ratio means that the company's EPS is more volatile, i.e., even a slight change in DFL may lead to a significant increase or decrease in EPS. The DFL determines the % change in company's EPS per unit change in PBIT.

Factor 3: Return on Assets

ROA is an indicator of the profitability of a company w.r.t its total assets. It also indicates how efficiently assets are being used to generate earnings.

Factor 4: P/E Ratio

This is the most crucial ratio from investor's point of view. P/E Ratio is calculated by dividing current market price by EPS. P/E ratios are used by investors & analysts to determine the relative value of a company's share in a neck-to-neck comparison.

Analysis

P&L Statement of Tech Mahindra (FY 2022-23)

Particulars	FY 2022-23 (in million)	
Revenue from Operations	INR	532,902.00
Other Income	INR	9,650.00
Total Income	INR	542,552.00
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Other Comprehensive Income		
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Equity Shares outstanding as at the end of the year		879,911,846
Weighted average Equity Shares outstanding as at the end of the year		882,208,730
Dilutive impact of employee stock options		3,594,899
Number of Equity Shares used as denominator for calculating Diluted Earnings Per Share		885,803,629
Earnings per Equity Share		
Basic	INR	54.76
Diluted	INR	54.54

Analysis

Balance Sheet of Tech Mahindra (FY 2022-23)

Particulars	FY 2022-23 (in million)	
ASSETS		
Non-Current Assets		
Property, Plant and Equipment	INR	28,622.00
Capital Work-in-Progress	INR	836.00
Right-of-Use Asset	INR	10,972.00
Investment Property	INR	748.00
Goodwill	INR	76,657.00
Other Intangible Assets	INR	32,316.00
Intangible Assets under development	INR	361.00
Investment accounted using Equity method	INR	1,729.00
Financial Assets		
Investments	INR	4,320.00
Trade Receivables (Billed)	INR	11.00
Loans	INR	49.00
Other Financial Assets	INR	3,318.00
Current Tax Assets (Net)	INR	30,537.00
Deferred Tax Assets (Net)	INR	12,965.00
Other Non-Current Assets	INR	13,765.00
Total Non - Current Assets	INR	217,206.00
Current Assets		
Inventories	INR	236.00
Financial Assets		
Investments	INR	27,832.00
Trade Receivables (Billed)	INR	81,424.00
Trade Receivables (Unbilled)	INR	47,392.00
Cash and Cash Equivalents	INR	40,563.00
Other Balances with Banks	INR	1,984.00
Other Financial Assets	INR	4,999.00
Other Current Assets	INR	39,897.00
Total Current Assets	INR	244,327.00
Total Assets	INR	461,533.00
EQUITY AND LIABILITIES		
Equity		
Equity Share Capital	INR	4,400.00
Other Equity	INR	274,845.00
Equity Attributable to Owners of the Company	INR	279,245.00
Non controlling Interest	INR	4,702.00
Total Equity	INR	283,947.00
Liabilities		
Non-current liabilities		
Financial Liabilities		
Borrowings	INR	1,288.00

Analysis

Balance Sheet of Tech Mahindra (FY 2022-23)

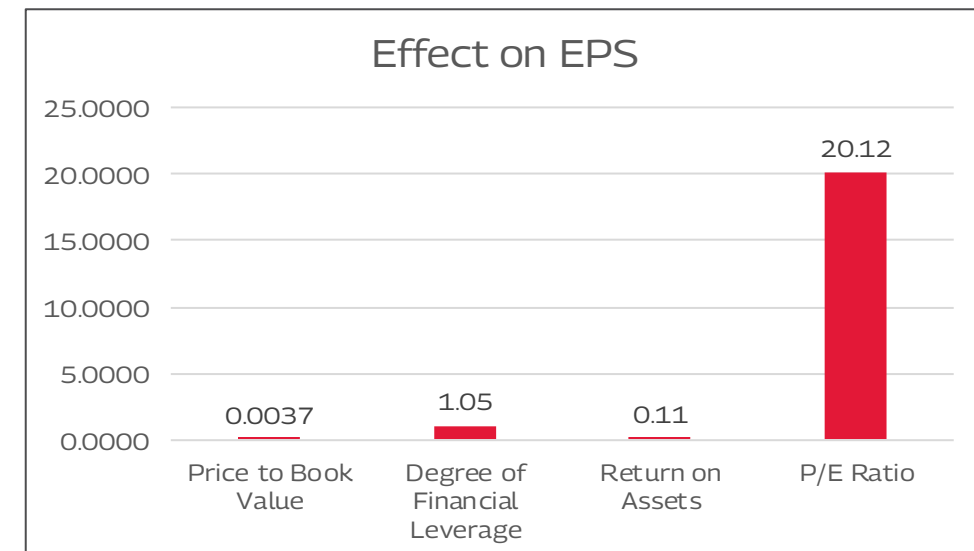
<i>Lease liabilities</i>	INR	7,903.00
<i>Other Financial Liabilities</i>	INR	10,083.00
Provisions	INR	9,288.00
Deferred tax Liabilities (Net)	INR	3,261.00
Other Non-Current Liabilities	INR	249.00
Total Non - Current Liabilities	INR	32,072.00
Current liabilities		
Financial Liabilities		
<i>Borrowings</i>	INR	14,494.00
<i>Lease liabilities</i>	INR	3,717.00
<i>Trade Payables</i>	INR	43,846.00
<i>Other Financial Liabilities</i>	INR	29,617.00
Provisions	INR	6,313.00
Current Tax Liabilities (Net)	INR	15,405.00
Other Current Liabilities	INR	19,818.00
Total Current Liabilities	INR	133,210.00
Suspense Account (Net)	INR	12,304.00
Total Equity and Liabilities and Suspense Account	INR	461,533.00

Analysis

Their indirect effect on EPS can be evaluated as follows:

- **Price to Book Value:** In this situation, the PB ratio of Tech Mahindra is **0.0037**. Hence, an increase in PB ratio will lead to an increase in EPS as PB ratio is directly proportional to the Share Price.
- **Degree of financial leverage:** In this case, Tech Mahindra's DFL is **1.05**, hence, the EPS may increase or decrease by **1.05%** approx. with a percentage increase in the same.
- **Return on Assets:** Since, an increase in ROA & EPS is linear with an increase in the stock price and the stock price of Tech Mahindra is increasing as per the trend, hence, it can be concluded that Tech Mahindra is utilizing their assets efficiently. Therefore, it will lead to an increase in EPS.
- **P/E ratio:** So, in this case, it relates to the company's share price to its EPS. As EPS is inversely proportional to P/E ratio, hence, in this case, an increase in the same may lead to a decrease in EPS.

Tech Mahindra	
Price to Book Value	0.0037
Degree of Financial Leverage	1.05
Return on Assets	0.11
P/E Ratio	20.12



Analysis

Formulae

- **Price to Book Value** = Share Price / Book Value
where, Book Value = (Share Capital + Reserves) / Total no. of Shares
- **Degree of financial leverage** = PBIT / PBT
- **Return on Assets** = Net Income / Total Assets
where, Net Income = Reported Net Profit
- **P/E Ratio** = Market Price per Share / EPS

Analysis

EPS Correlation & Regression

Correlation

Correlations are useful as they can indicate a predictive relationship that can be exploited in practice.

- 0 to 1 = positive correlation
- 0 to -1 = negative correlation
- 1 = perfectly positive correlation
- -1 = perfectly negative correlation
- 0 = no correlation

CORRELATION	
Correlation between Revenue and EPS	0.834374371
Correlation between Interest and EPS	0.539145199
Correlation between Depreciation and EPS	0.798417184

Interpretation

There is a negative correlation between the financial parameters and EPS with the following values:

- Correlation between Revenue and EPS: **0.834374371**
- Correlation between Interest and EPS: **0.539145199**
- Correlation between Depreciation and EPS: **0.798417184**

As all the financial parameters have a positive correlation, which indicates that an increase in one will lead to an increase in EPS and vice-versa.

Analysis

Regression

- The purpose of regression is to predict the value of the dependent variable based upon the values of one or more independent variables.
- The sign of regression coefficient tells whether there is a positive or negative correlation between each independent variable and dependent variable.
- **Linear Regression** as well as **Multiple Regression** of the financial parameters (independent variables) has been performed on EPS (dependent variable).

Analysis

Linear Regression of Revenue on EPS

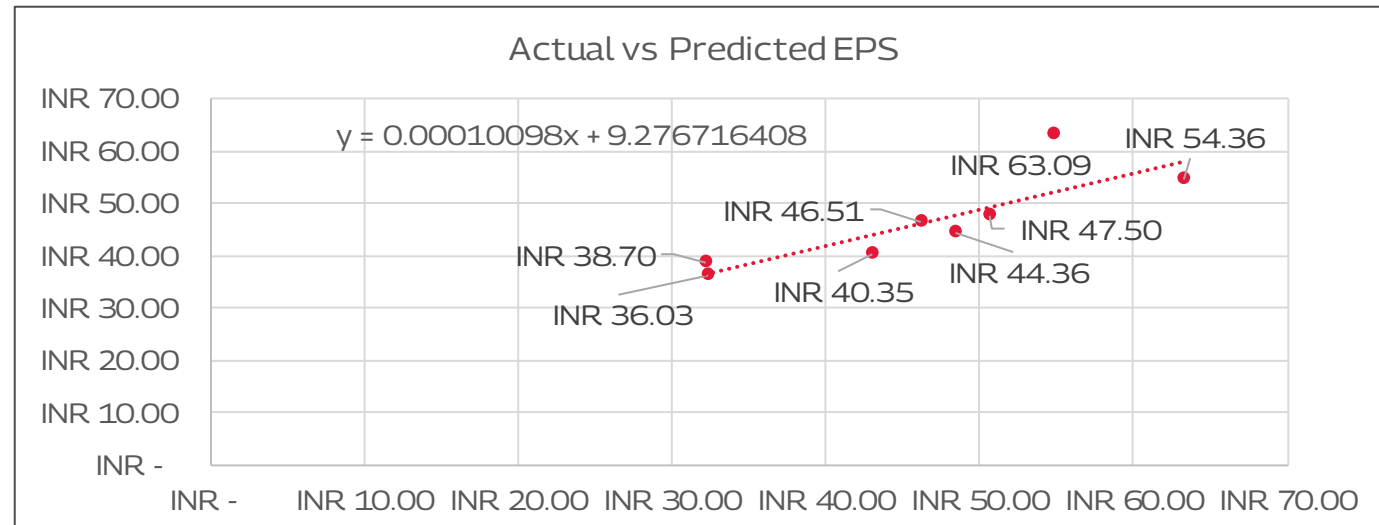
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.83437437
R Square	0.69618059
Adjusted R Square	0.64554402
Standard Error	6.32846122
Observations	8

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	550.6224216	550.6224216	13.74857369	0.009994332
Residual	6	240.2965284	40.0494214		
Total	7	790.91895			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.27671641	10.24901936	0.905132099	0.400279277	-15.8017305	34.35516334	-15.8017305	34.35516334
Revenue	0.00010098	2.72335E-05	3.707906916	0.009994332	3.43413E-05	0.000167617	3.43413E-05	0.000167617

Year	Actual EPS	Predicted EPS
FY 2015-16	INR 32.34	INR 36.03
FY 2016-17	INR 32.14	INR 38.70
FY 2017-18	INR 43.02	INR 40.35
FY 2018-19	INR 48.47	INR 44.36
FY 2019-20	INR 46.21	INR 46.51
FY 2020-21	INR 50.64	INR 47.50
FY 2021-22	INR 63.32	INR 54.36
FY 2022-23	INR 54.76	INR 63.09



Interpretation

Effect of Revenue on EPS:

In this case, the coefficient of Revenue, i.e., **0.00010098** has a positive sign. So, **1 unit** of Revenue is associated with **0.00010098** increase in EPS.

Analysis

Linear Regression of Interest on EPS

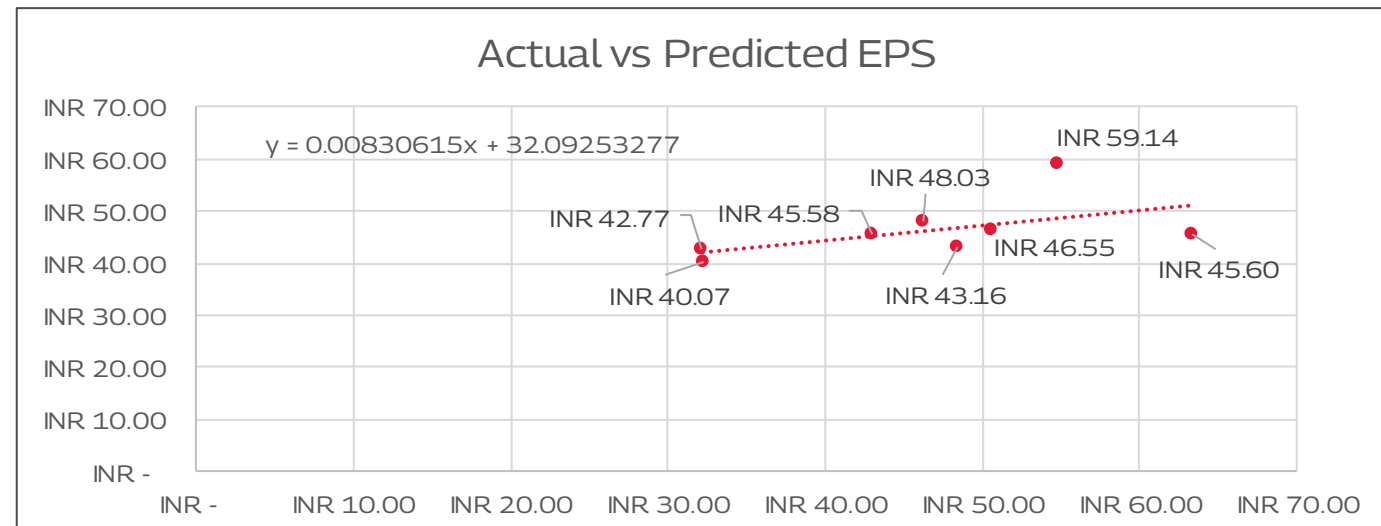
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.5391452
R Square	0.29067755
Adjusted R Square	0.17245714
Standard Error	9.66968261
Observations	8

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	229.9023789	229.9023789	2.458776343	0.16791667
Residual	6	561.0165711	93.50276186		
Total	7	790.91895			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	32.0925328	9.721433142	3.301214163	0.016383064	8.305042804	55.88002274	8.305042804	55.88002274
Interest	0.00830615	0.005297126	1.568048578	0.16791667	-0.00465545	0.021267751	-0.00465545	0.021267751

Year	Actual EPS	Predicted EPS
FY 2015-16	INR 32.34	INR 40.07
FY 2016-17	INR 32.14	INR 42.77
FY 2017-18	INR 43.02	INR 45.58
FY 2018-19	INR 48.47	INR 43.16
FY 2019-20	INR 46.21	INR 48.03
FY 2020-21	INR 50.64	INR 46.55
FY 2021-22	INR 63.32	INR 45.60
FY 2022-23	INR 54.76	INR 59.14



Interpretation

Effect of Interest on EPS:

In this case, the coefficient of Interest, i.e., **0.00830615** has a positive sign. So, **1 unit** of Interest is associated with **0.00830615** increase in EPS.

Analysis

Linear Regression of Depreciation on EPS

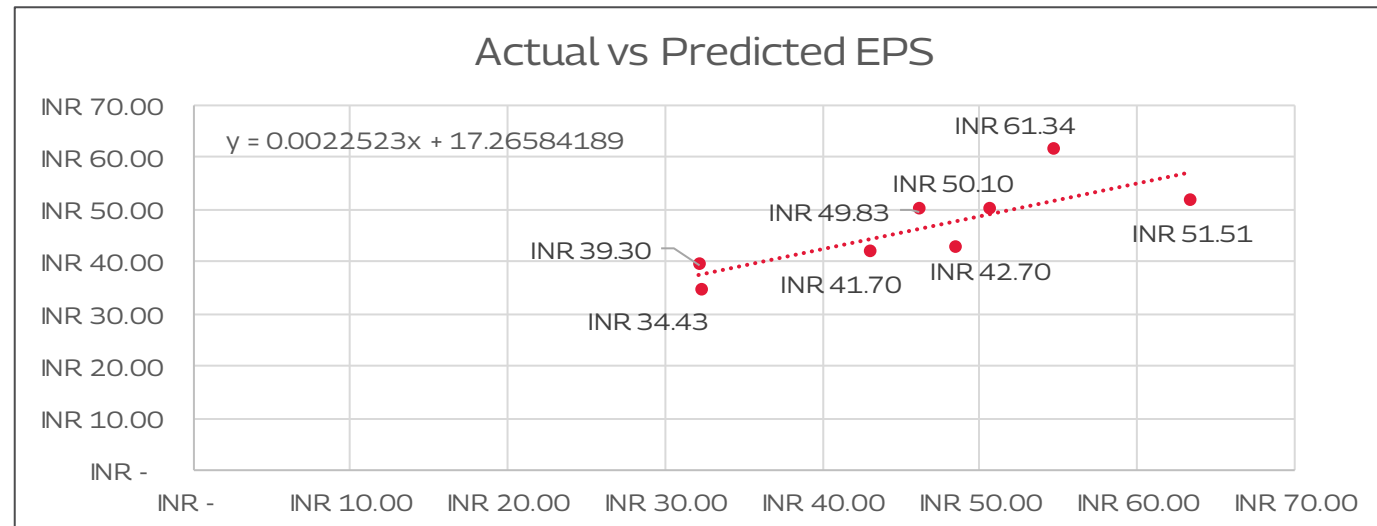
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.79841718
R Square	0.63747
Adjusted R Square	0.57704833
Standard Error	6.9129329
Observations	8

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	504.1871023	504.1871023	10.55035441	0.017507335
Residual	6	286.7318477	47.78864129		
Total	7	790.91895			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	17.2658419	9.285407928	1.859459706	0.112307843	-5.45473281	39.98641659	-5.45473281	39.98641659
Depreciation	0.0022523	0.000693415	3.24813091	0.017507335	0.000555577	0.003949029	0.000555577	0.003949029

Year	Actual EPS	Predicted EPS
FY 2015-16	INR 32.34	INR 34.43
FY 2016-17	INR 32.14	INR 39.30
FY 2017-18	INR 43.02	INR 41.70
FY 2018-19	INR 48.47	INR 42.70
FY 2019-20	INR 46.21	INR 49.83
FY 2020-21	INR 50.64	INR 50.10
FY 2021-22	INR 63.32	INR 51.51
FY 2022-23	INR 54.76	INR 61.34



Interpretation

Effect of Depreciation on EPS:

In this case, the coefficient of Depreciation, i.e., **0.0022523** has a positive sign. So, **1 unit** of Depreciation is associated with **0.0022523** increase in EPS.

Analysis

Multiple Regression

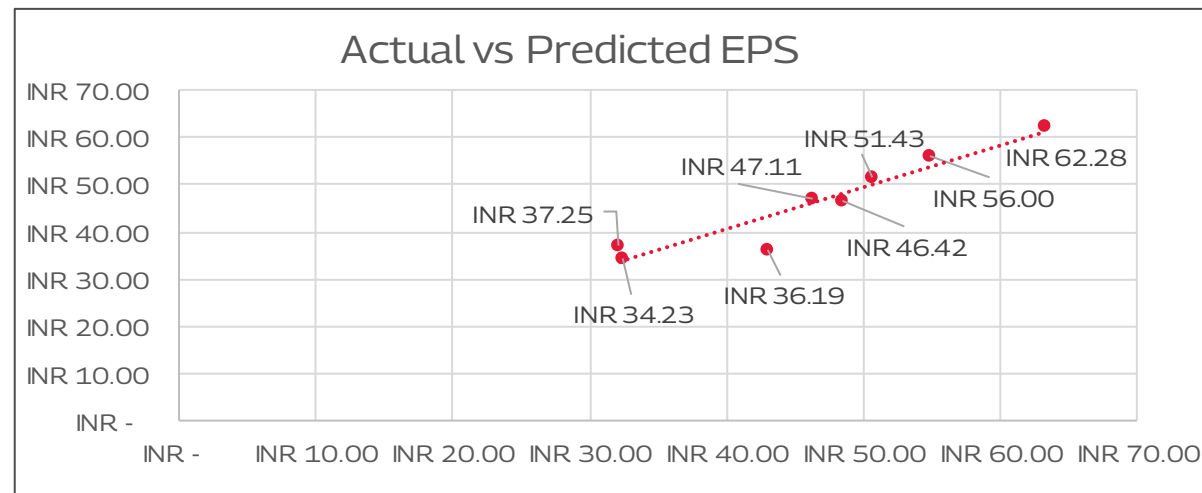
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.94499015
R Square	0.89300638
Adjusted R Square	0.81276117
Standard Error	4.59954559
Observations	8

ANOVA					
	df	SS	MS	F	Significance F
Regression	3	706.2956713	235.4318904	11.12846933	0.020682745
Residual	4	84.62327872	21.15581968		
Total	7	790.91895			

Year	Actual EPS	Predicted EPS
FY 2015-16	INR 32.34	INR 34.23
FY 2016-17	INR 32.14	INR 37.25
FY 2017-18	INR 43.02	INR 36.19
FY 2018-19	INR 48.47	INR 46.42
FY 2019-20	INR 46.21	INR 47.11
FY 2020-21	INR 50.64	INR 51.43
FY 2021-22	INR 63.32	INR 62.28
FY 2022-23	INR 54.76	INR 56.00

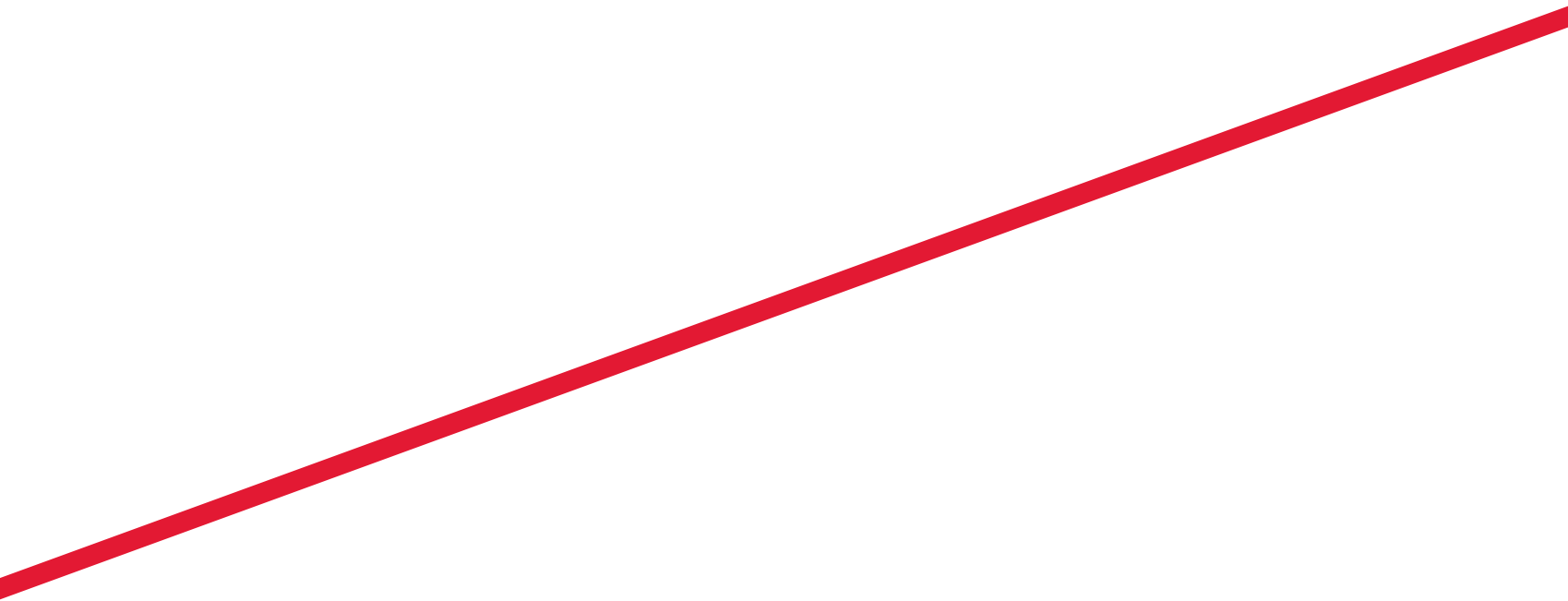
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.85231764	8.868603693	0.208862377	0.844760745	-22.7708737	26.47550896	-22.7708737	26.47550896
Revenue	0.00010896	7.69816E-05	1.415351468	0.22989015	-0.00010478	0.000322691	-0.00010478	0.000322691
Interest	-0.0163996	0.006060083	-2.70616122	0.053750334	-0.03322505	0.000425926	-0.03322505	0.000425926
Depreciation	0.00252885	0.002082763	1.214182424	0.291458498	-0.00325382	0.008311533	-0.00325382	0.008311533



Interpretation

- Holding all other parameters fixed, a **1 unit** increase in Revenue is associated with an **0.000108956** increase in EPS.
- Holding all other parameters fixed, a **1 unit** increase in Interest is associated with an **0.016399562** decrease in EPS.
- Holding all other parameters fixed, a **1 unit** increase in Depreciation is associated with **0.002528855** increase in EPS.

Climate Risk



Introduction

Climate sensitivity analysis measures ways in which a climate crisis would affect the financial system of an organization. At Tech Mahindra, we are cognizant of climate-related risks and how do they affect the firm's resilience and financial stability. Therefore, we are improving our approaches and policies to manage these risks by implementing scenario analysis planning and sensitivity analysis to manage our risks.

Risk of physical impacts of climate change

The physical risks, which are caused by weather-related events such as droughts, an increase in temperature, and a rise in sea levels, can be of two types, i.e., Acute physical and Chronic physical. The potential impact due to climate change risks will lead to diminished asset value, reduction in the value of infrastructure, and impact on the resources of an organization, which could potentially impact revenues.

Climate Sensitivity analysis

To assess the physical impact of climate change event, we perform climate sensitivity analysis in order to ascertain the impact on the resources of our organization, which could potentially affect our revenues.

Analysis

We consider these as tail risks, which would have the potential to disrupt our operations even though the probability of occurrence is substantially low. For building sensitivity analysis, we considered our facilities located in the Delhi NCR region and found out how temperature deviations could affect our associates' well-being and disrupt our operations, which has the potential to affect our revenues, eventually. The sensitivity analysis is based on minimum temperatures, maximum temperatures, and was conducted using an Excel-based analysis. The correlation ratio between the temperature and associates absenteeism were derived for each variable on a monthly basis. Sensitivity analysis, thus, shows the impact of temperatures on our operations and well-being of our associates. We calculated the impact on revenue based upon the historical monthly absenteeism, max & min temperatures, as inputs to calculate the forecast for a year.

The dependent and independent variables of our sensitivity analysis are:

Independent Variables	Dependent Variables
Max Temperature Min Temperature	Employee Absenteeism

Analysis

Assumptions

- Facilities considered - Delhi (NCR) region
- The relation between every **1%** increase in temperature (°C) with absenteeism data for the location.
- The relation between every **1%** decrease in temperature (°C) with absenteeism data for the location.

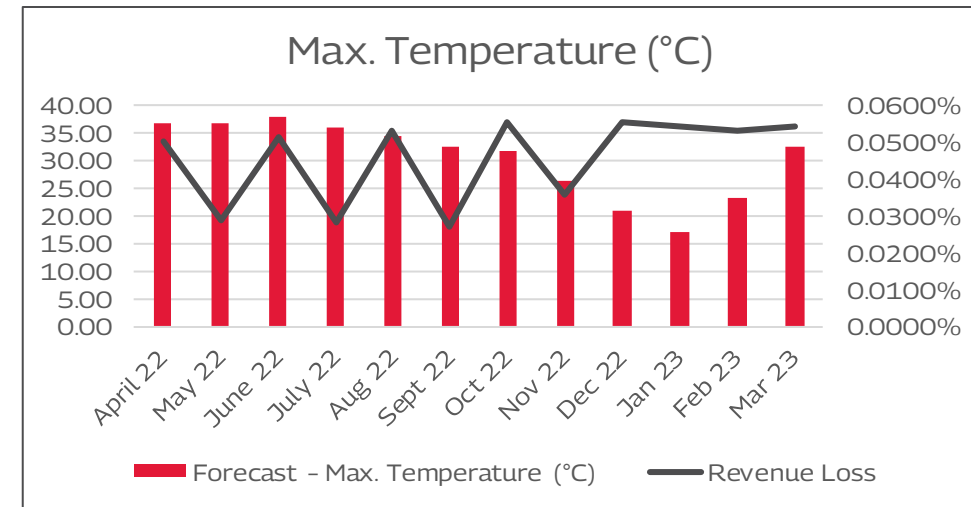
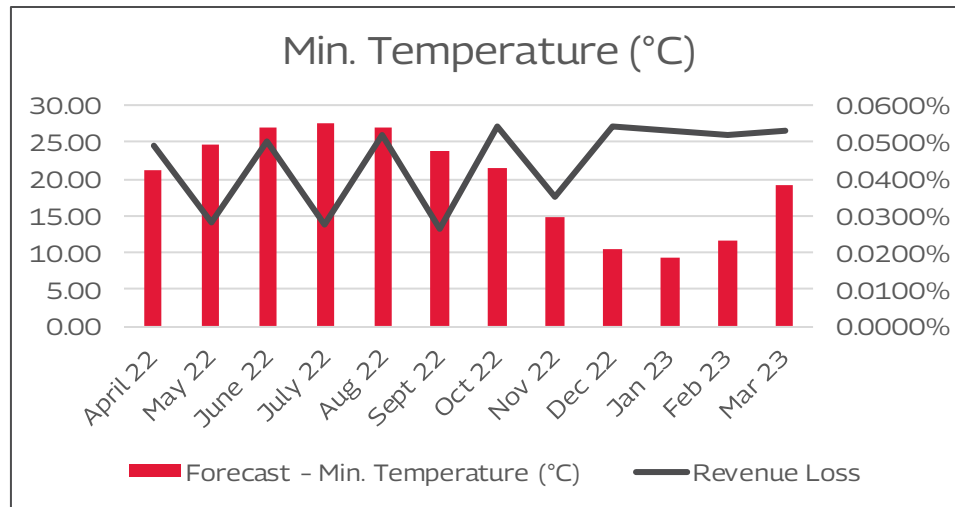
Revenues of Tech Mahindra from India (INR million)	32,621
Revenues from Delhi NCR region (INR million)	5,730.02
Employees working from facilities located at Delhi-NCR region	17,010

Month	Forecast - Min. Temperature (°C)	Revenue Loss	Forecast - Max. Temperature (°C)	Revenue Loss
April 22	21.05	0.0491%	36.68	0.0501%
May 22	24.68	0.0280%	36.58	0.0285%
June 22	27.01	0.0502%	37.71	0.0512%
July 22	27.52	0.0275%	35.97	0.0281%
Aug 22	26.88	0.0519%	34.19	0.0529%
Sept 22	23.80	0.0266%	32.45	0.0271%
Oct 22	21.48	0.0542%	31.67	0.0553%
Nov 22	14.91	0.0349%	26.22	0.0356%
Dec 22	10.47	0.0542%	21.00	0.0553%
Jan 23	9.17	0.0533%	17.13	0.0543%
Feb 23	11.59	0.0520%	23.03	0.0530%
Mar 23	19.20	0.0529%	32.54	0.0540%
		0.5347%		0.5455%

Analysis

These variables are used to evaluate the impact on revenue for our facilities located in the Delhi NCR region:

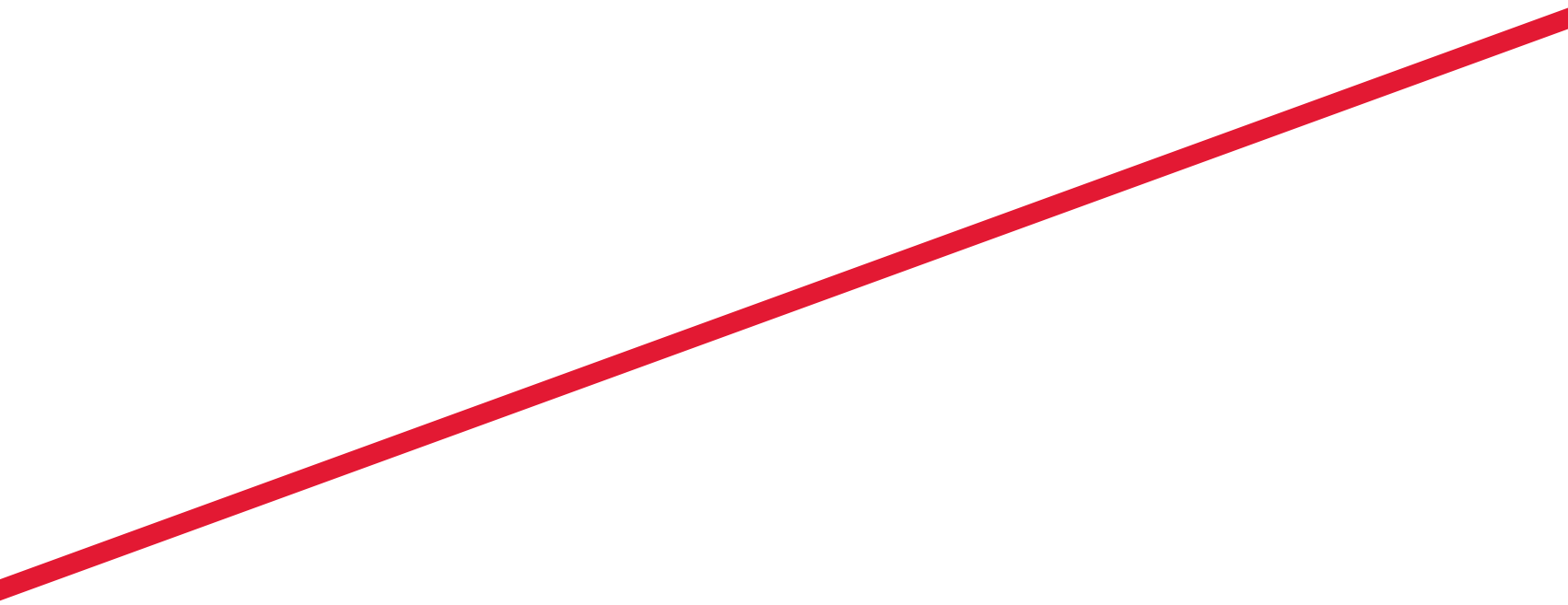
- The increase in Max temperature will have an estimated increase in a revenue loss of **0.5347%**
- The decrease in Min temperature will have an estimated increase in revenue loss of **0.5455%**



Results

With an increase in Max Temperature, we estimate an impact of **INR 31.25 million** (as a loss) on our revenue while a decrease in Min Temperature can have an impact of **INR 30.64 million** (as a loss) on our revenue.

Water Stress



Introduction

Other Impacts of climate change include increasing water scarcity and flood risks, along with decline in water quality. Increase in Temperatures & drying up of water bodies will result in water scarcity directly affecting operations. Water stress or scarcity is a major risk being faced by corporates, due to increase in Temperatures and reduced supply of freshwater. India ranks 13th on National Water Stress Rankings across Globe. 11 out of 20 largest cities are identified as extreme risk for water stress.

The potential risks for Corporates include:

- Rising costs due to reduced water supply
- Business interruptions
- Possible need for relocation of Operations
- Reputation damage

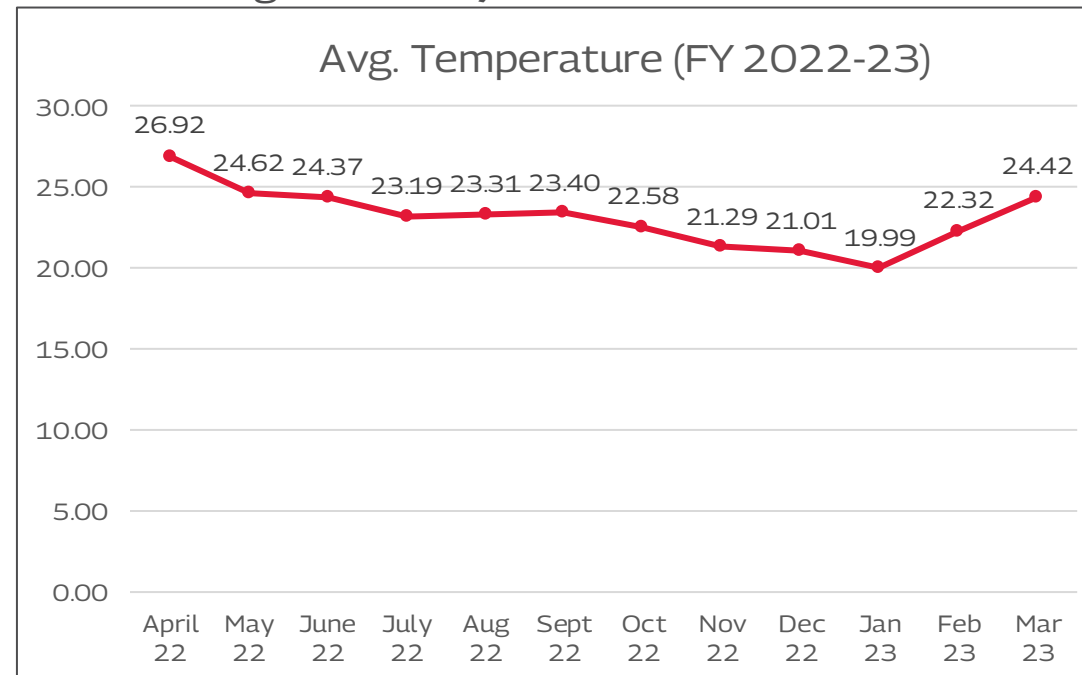
Water stress along with drying up of reservoirs are directly proportional to the Rising Temperatures. Water stress in the commercial areas will lead to demand outstripping supply. Due to an increased demand, there is an exponential increase in the waiting period for water tankers across all major cities. The waiting period for tankers stood at 15-25 days in most of the major locations, which can impact the business operations and can also lead to an increase in the water prices.

Analysis

In FY 2022-23, Bangalore has faced a severe water stress, which is caused by rise in Temperatures in the same year.

FY 2022-23	April 22	May 22	June 22	July 22	Aug 22	Sept 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23
Avg. Temperature	26.92	24.62	24.37	23.19	23.31	23.40	22.58	21.29	21.01	19.99	22.32	24.42

For Bangalore facility, this water crisis affected the overall increase in operating expenses. The total water withdrawal in FY 2022-23 is **26,216 kL** and overall water cost is **INR 2,251,553**. So, the water price per kL is **INR 85.89**. The Employee Headcount for Bangalore is **15,151**.



Analysis

Assumptions

Water stress testing is conducted on the basis of the following variables for FY 2022-23:

Avg. Temp (°C) in FY 2022-23	23.12
Water Withdrawal (kL) in FY 2022-23	26,216
Water Cost	INR 2,251,553
Water Cost per kL	INR 85.89

- Due to expansion in operations, there will be **2%** increase in workforce.
- There will be surge in water price by **5%** per kL.
- There will be an increase in temperature by **3%**, annually.

Analysis

Scenario 1

If Employee Headcount increases by **2%** and Water cost per kL by **5%**, annually, leading to an overall increase in Total Water costs by **6.62%**, annually, it could increase our future operating costs by **INR 0.15 million**.

Month	Employee Headcount	Water cost per kL	Water Withdrawal (kL)	Total Water cost
April 22	15,151	INR 85.89	26,215.74	INR 2,251,553.00
May 22	15,176	INR 86.24	26,259.43	INR 2,264,702.69
June 22	15,202	INR 86.60	26,303.20	INR 2,277,929.19
July 22	15,227	INR 86.96	26,347.04	INR 2,291,232.93
Aug 22	15,252	INR 87.33	26,390.95	INR 2,304,614.36
Sept 22	15,278	INR 87.69	26,434.93	INR 2,318,073.95
Oct 22	15,303	INR 88.06	26,478.99	INR 2,331,612.15
Nov 22	15,329	INR 88.42	26,523.12	INR 2,345,229.41
Dec 22	15,354	INR 88.79	26,567.33	INR 2,358,926.20
Jan 23	15,380	INR 89.16	26,611.61	INR 2,372,702.99
Feb 23	15,405	INR 89.53	26,655.96	INR 2,386,560.23
Mar 23	15,431	INR 89.91	26,700.39	INR 2,400,498.40

Analysis

Scenario 2

Due to climate change, if Avg. temperature increases by **3%**, it will increase the demand for water supply leading to an increase in water costs. Assuming an increase in Water cost per kL by **5%**, annually, Total Water costs could increase by almost **5.85%** which can have an impact on future Operating costs by **INR 0.13 million**.

Month	Actual Temperature (°C)	Predicted Temperature (°C)	Water cost per kL	Water Withdrawal (kL)	Total Water cost
April 22	26.92	27.73	INR 85.89	1,439.33	INR 123,617.83
May 22	24.62	25.36	INR 86.24	1,997.77	INR 172,294.26
June 22	24.37	25.10	INR 86.60	1,552.08	INR 134,414.07
July 22	23.19	23.88	INR 86.96	1,977.09	INR 171,934.45
Aug 22	23.31	24.01	INR 87.33	1,312.37	INR 114,604.37
Sept 22	23.40	24.10	INR 87.69	1,269.28	INR 111,302.88
Oct 22	22.58	23.26	INR 88.06	2,121.25	INR 186,787.47
Nov 22	21.29	21.93	INR 88.42	2,660.09	INR 235,210.63
Dec 22	21.01	21.64	INR 88.79	2,276.26	INR 202,110.26
Jan 23	19.99	20.59	INR 89.16	2,677.65	INR 238,740.63
Feb 23	22.32	22.99	INR 89.53	3,199.22	INR 286,432.74
Mar 23	24.42	25.15	INR 89.91	4,155.21	INR 373,574.06

Analysis

Conclusion

- Due to increased operations leading to an increase in Employee Headcount, we could experience an increase in the purchase prices of commercial water because of increased demand of water leading to increased operating costs, eventually. At the end of FY 2022-23, it is projected that the total expenses incurred by the company could be **INR 0.15 million** due to **2%** increase in Employee Headcount and **5%** increase in Water cost per kL that will have an impact on our future operating costs.
- Due to an increase in Temperatures & drying up of water bodies, we could experience an increase in the purchase prices of commercial water because of Demand Supply gaps leading to increased operating costs, eventually. At the end of FY 2022-23, it is projected that the total expenses incurred by the company could be **INR 0.13 million** due to **3%** increase in Temperature and **5%** increase in Water cost per kL along with a **2%** surge in Employee Headcount.



Thank You

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