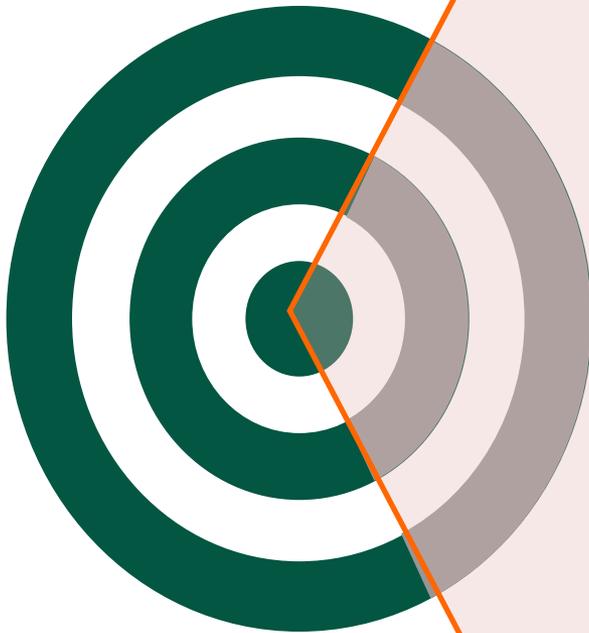


Financial Forecasting

IMARTICUS
LEARNING



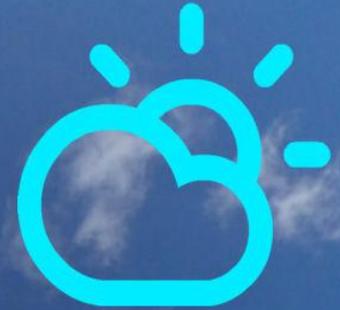


In this session, you will learn about:

- Objectives of Forecasting
- Understanding Business Model
- Understanding Financial Variables – Revenue
- Understanding Financial Variables – Operating Expenses
- Understanding Financial Variables – Depreciation and Capital Expenditure

Objectives





Paris
Friday 19 february

9°
4°

Partly Cloudy



10%

Forecasting involves
**estimating the value
of a variable in future
based on judgment**

Requires certain amount of visibility



Personal Income

You may be able to **forecast** your income for rest of the **year based on your current income, expected performance rating and company's overall performance.**



Company Sales

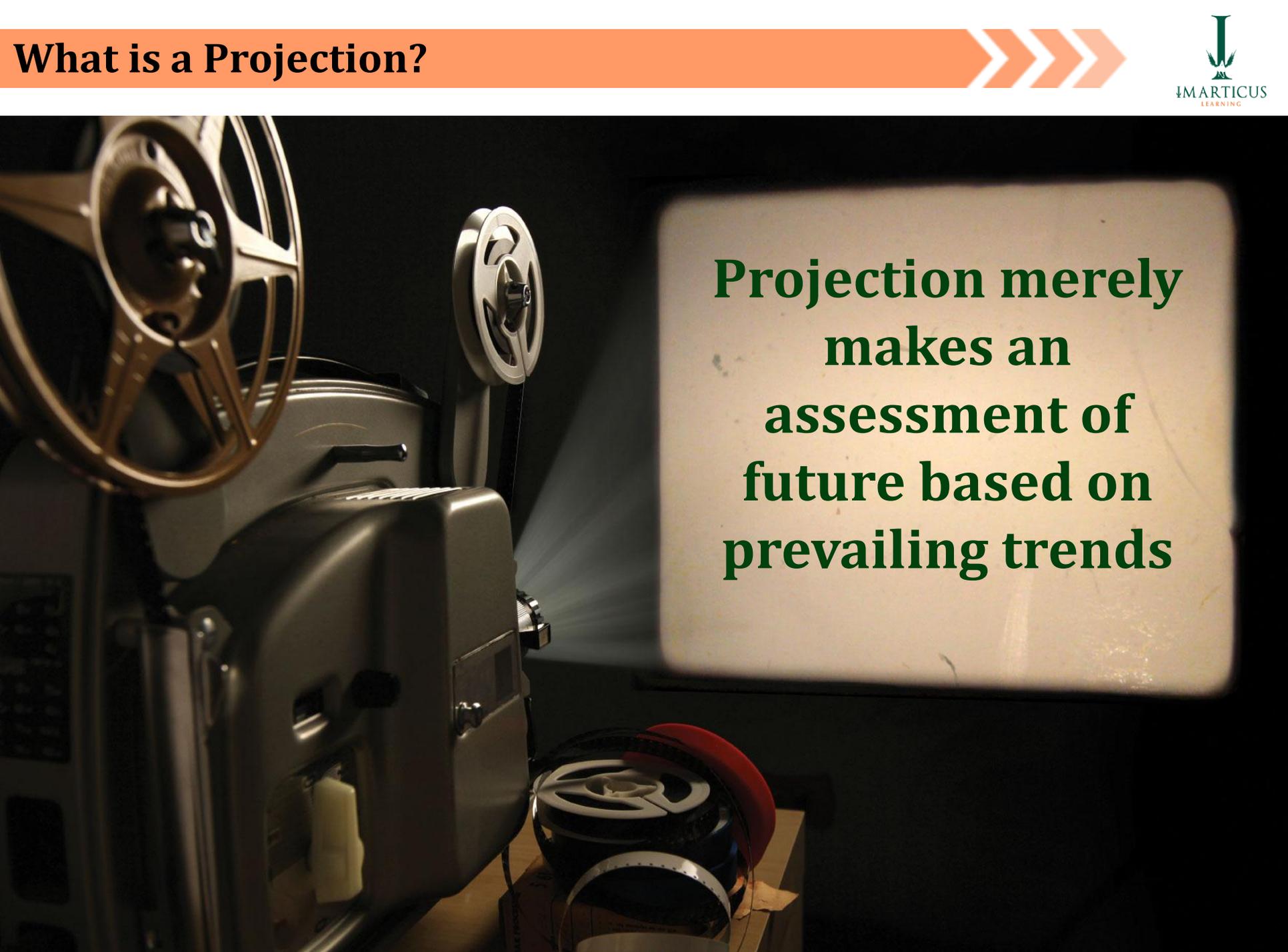
A company may be able to have a ball park **idea about sales** in coming quarter based on **views and commitments** given by the sales team.

Forecasting way too much into the future could be disastrous



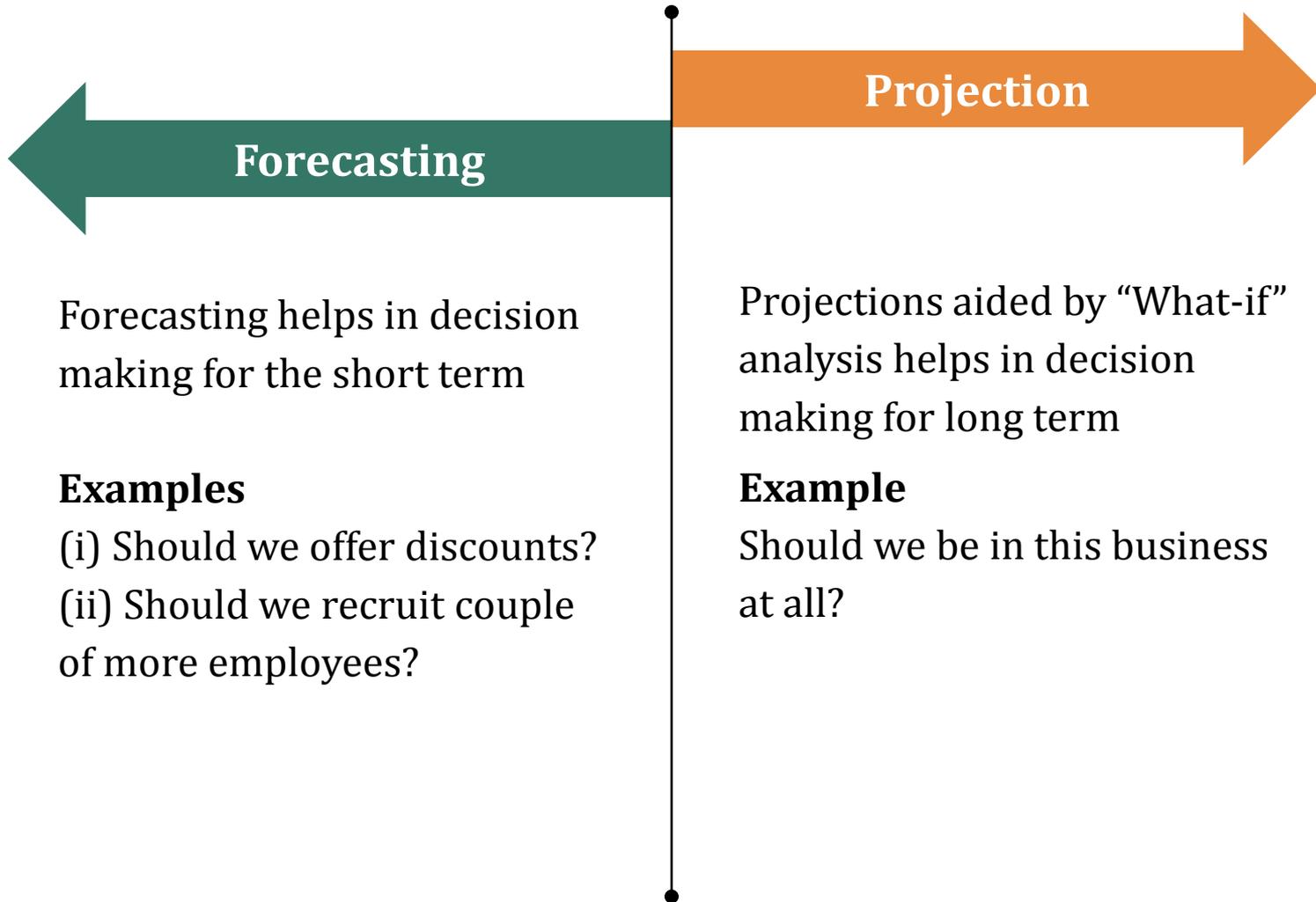
Uncertainty is the only certainty in the world

What is a Projection?



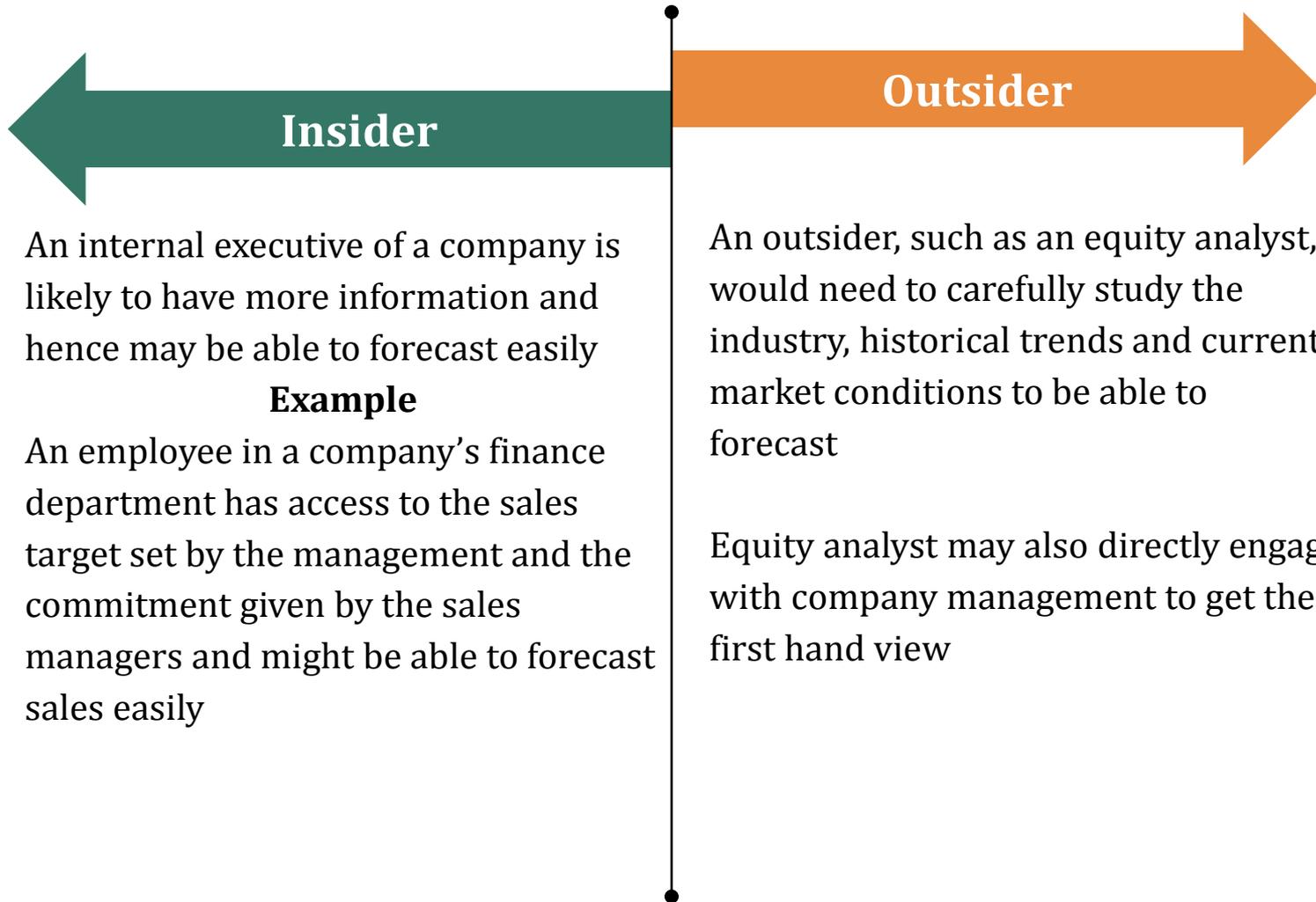
**Projection merely
makes an
assessment of
future based on
prevailing trends**

Forecasting vs Projection



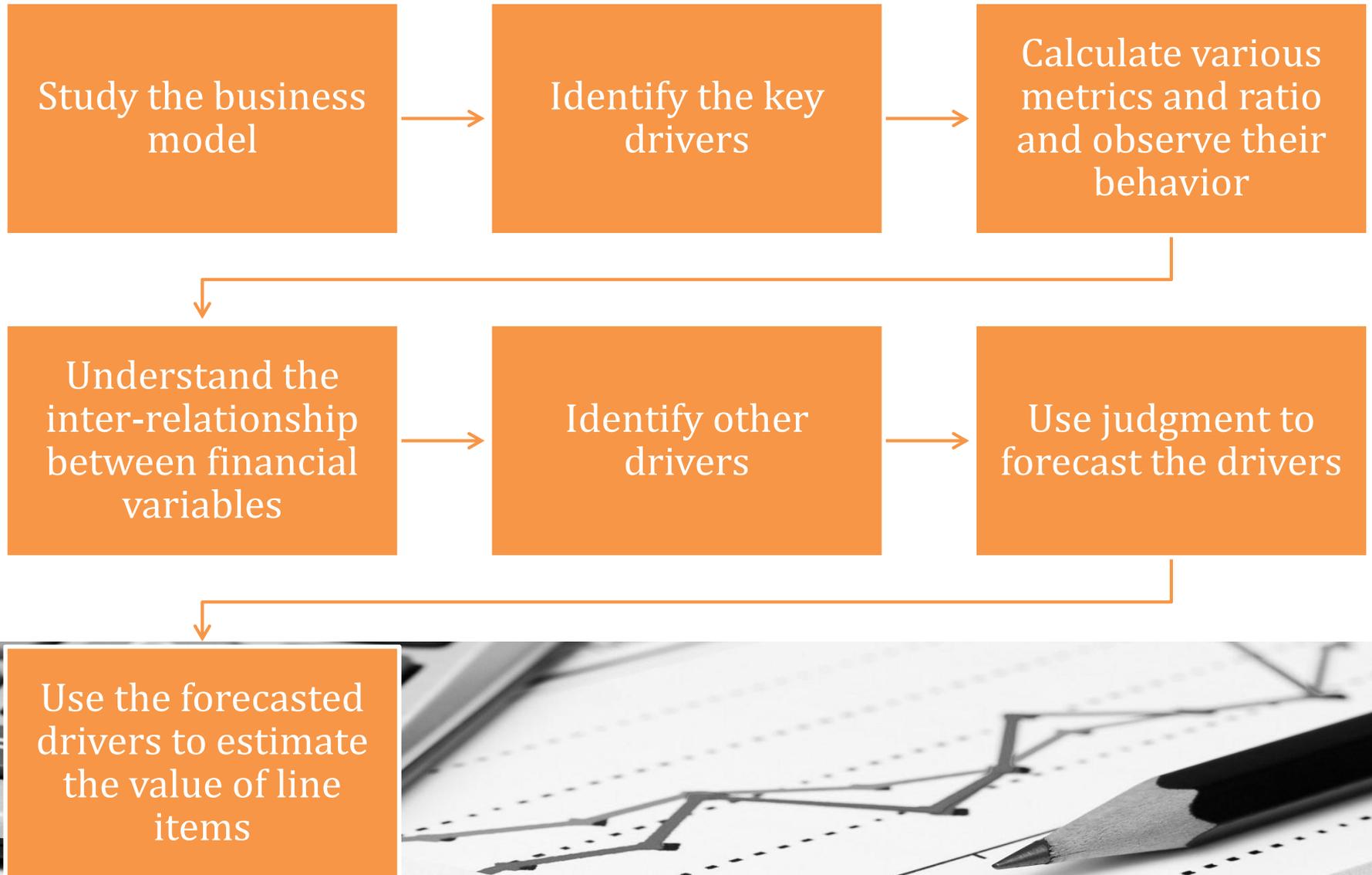
Projection relies a lot on statistical techniques like linear regression and moving averages rather than human judgment

Forecasting: Insider vs Outsider



Approaches to forecasting would vary depending on the level of information the forecaster has

Steps in Forecasting as an Outsider



Understanding Business Model

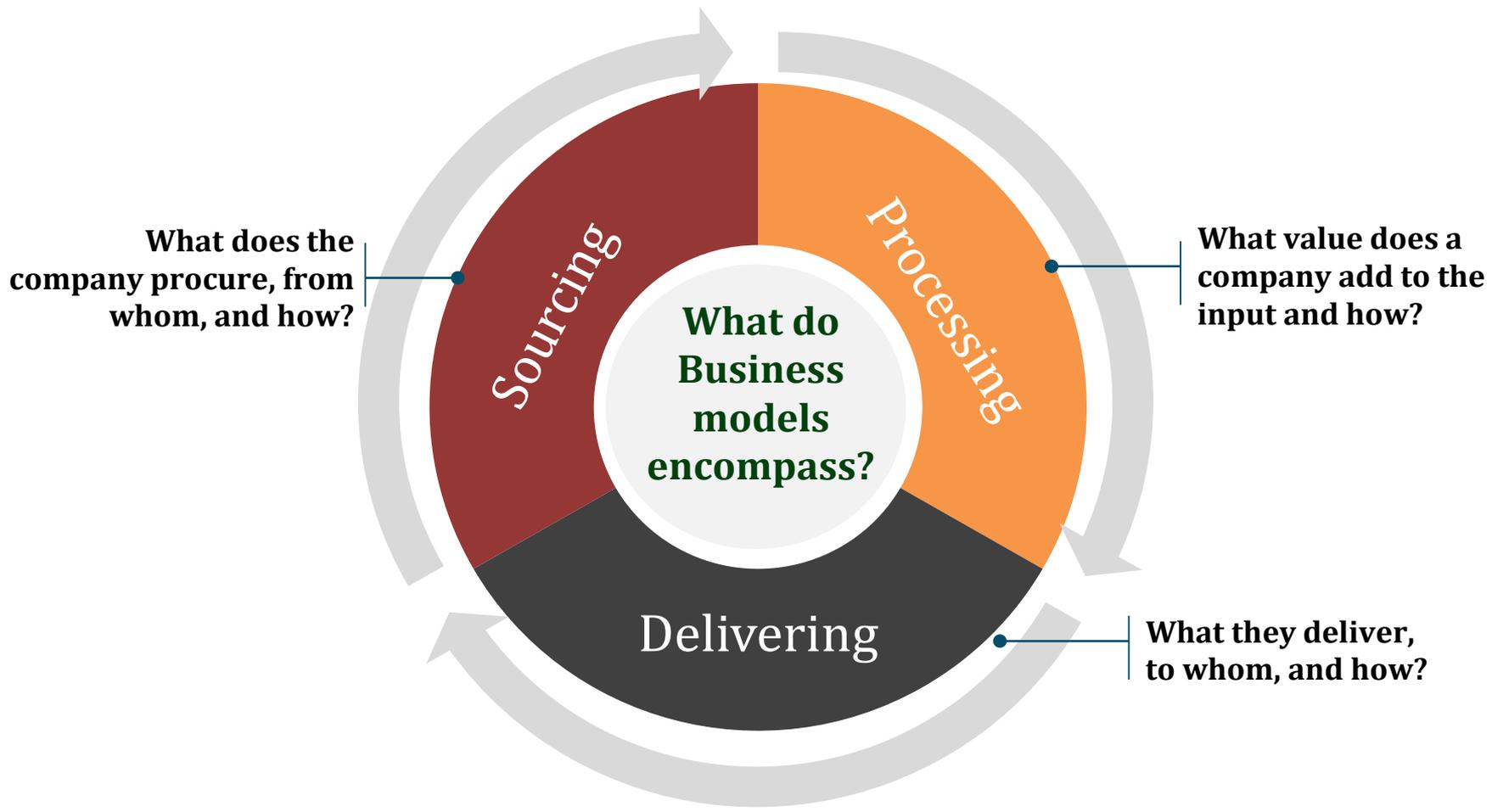


What is a Business Model?

A Business model focuses on **how a business obtains, adds and delivers value** through the various set of activities it carries.



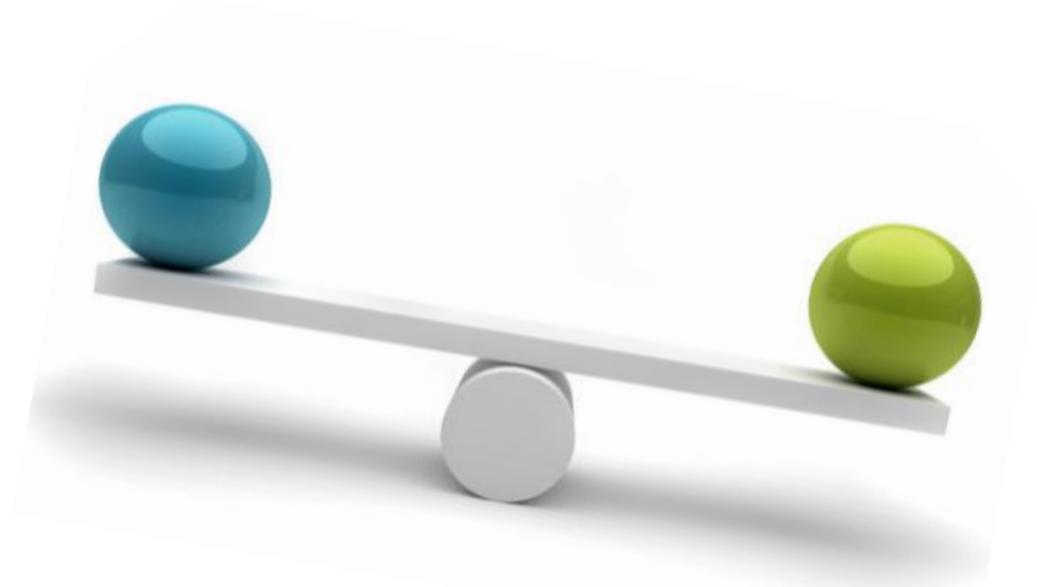
Components of Business Model



In most cases, the concern is more about revenue



Certain industries, the concern is also about cost

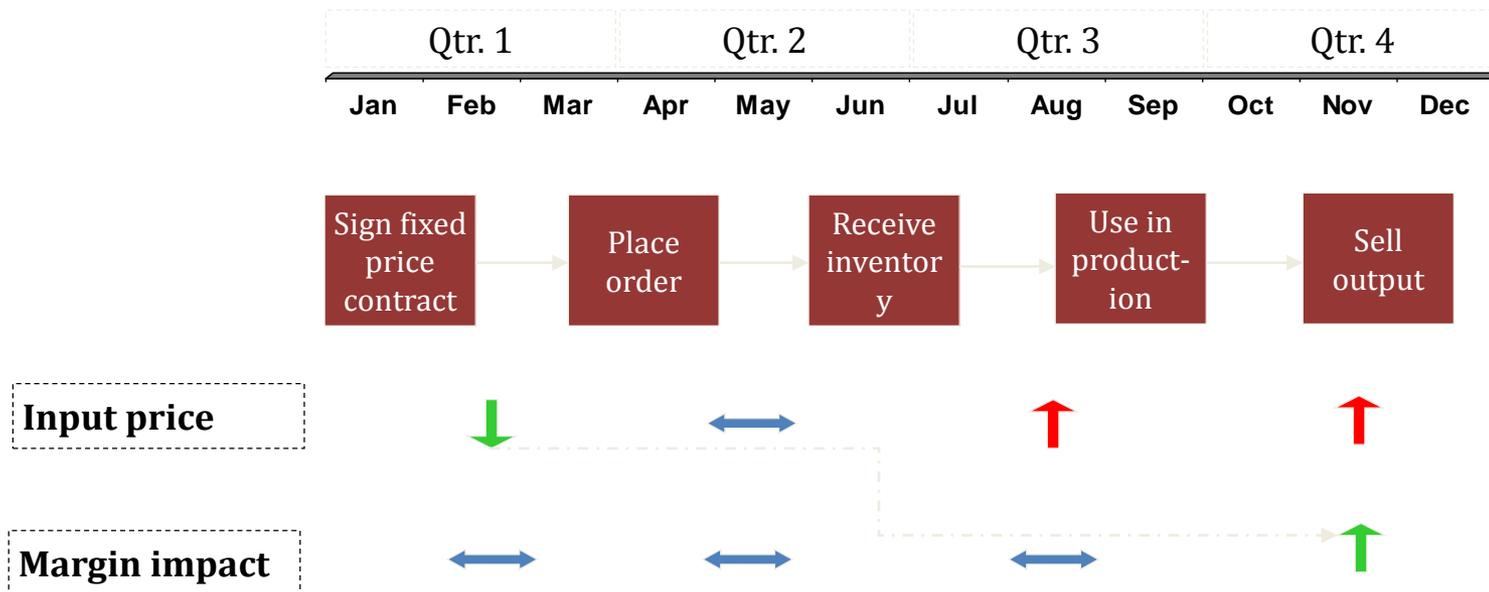


Why is a Business Model Important?

Helps understand the **relationship** between non-financial variables and financial variables

Example: Modeling the impact of a fall in input prices on margins requires understanding of the company's procurement model

Illustration: Business model and modeling considerations



Substance Matters Over Form

Example

Telecom sector

Form

- Telcos charge customer based on voice / message / data services used.
- Revenue equals sum of amount charged for (i) voice (ii) message and (iii) data services

Substance

- Customers use their telecom spend budget across voice / message / data services
- Revenue equals numbers of customers multiplied by average revenue per customer



Focus on the type of **target** the company management sets **the sales and operations** teams



Sources of Information to Understand Business Models



**Company
presentation**

**Press
Release**

**Earnings call
transcripts**

Exercise

Discussing Company Revenue Models

- Maruti Suzuki
- Coffee day enterprises
- Amazon
- Google



Understanding Financial Variables - Revenue



Revenue refers to the income a company earns from **core business operations**

The **nature of revenue** a company earns **can vary** business to business

- **Product** companies manufacture a product and sell them
- **Service** companies provide a service and receive money against it
- **R&D companies**, sell license and earn royalties

For most businesses in a liberal economy, **revenue is the key** constraining factor

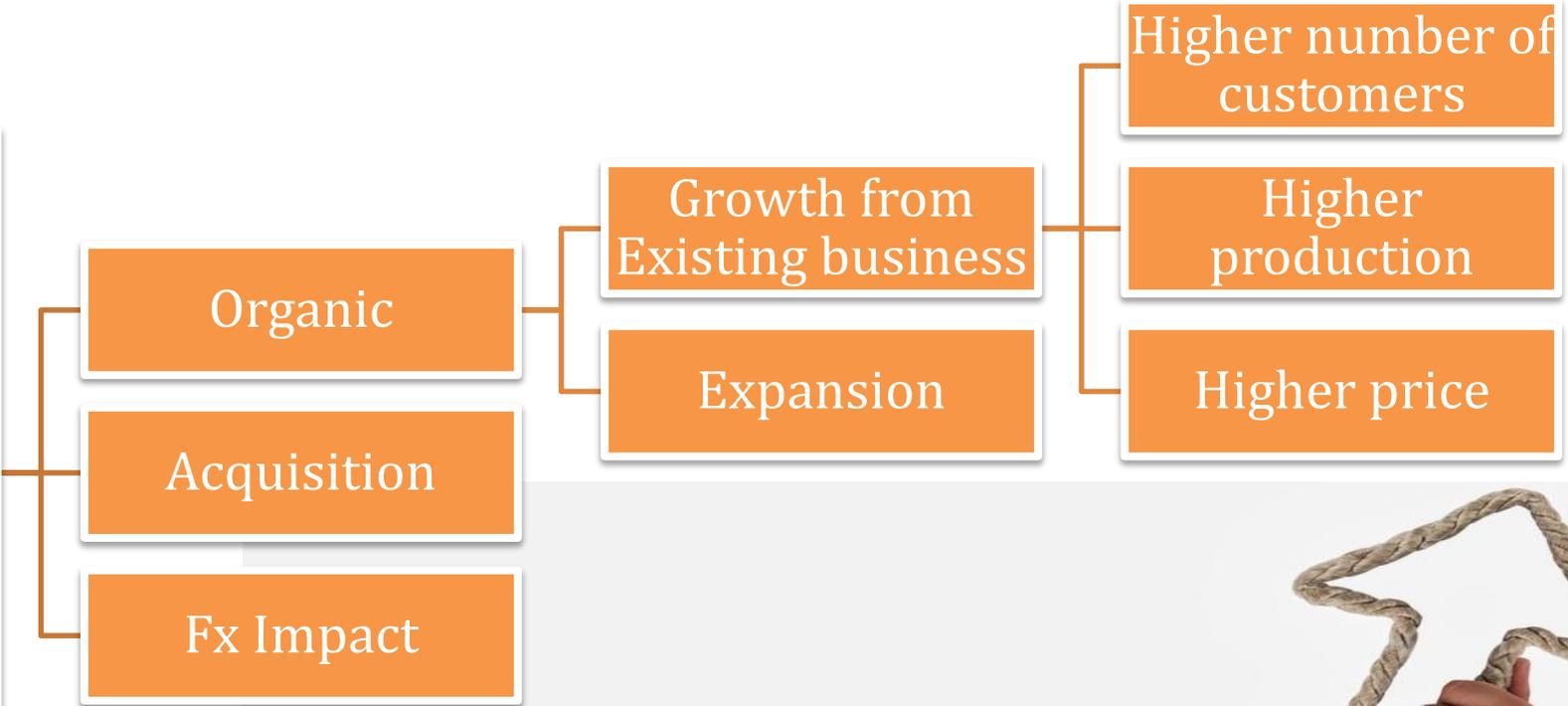
- If revenue can be achieved, necessary capex and opex can be decided easily



Most models start from revenue or revenue growth

Revenue Growth Can Come in 3 Ways

Revenue Growth



Indicative list

The Level of Detail can Vary to Case-to-Case

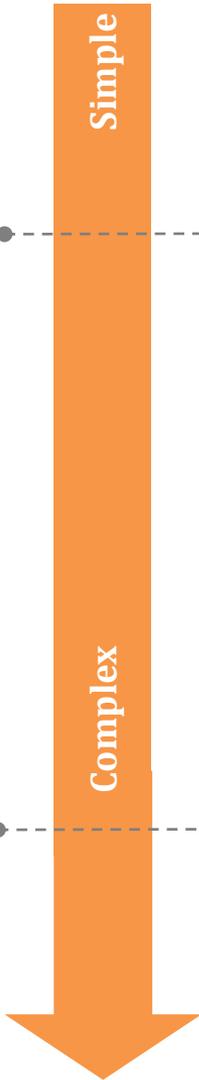


Simple

Revenue	$\text{Revenue (Y}_{-1}) * (1 + \text{y-o-y growth rate})$
y-o-y growth	Organic growth + M&A impact + Fx impact

Complex

Revenue	$\text{Volume} * \text{Price per unit}$
Volume	$\text{Capacity} * \text{capacity utilisation rate}$
Capacity	$\text{Capacity (Y}_{-1}) + \text{capacity added}$
Capacity utilisation rate	$\text{Capacity utilisation rate (Y}_{-1}) + \text{bps change in utilisation rate}$
Price per unit	$\text{Price (Y}_{-1}) * (1 + \text{y-o-y growth} + \text{fx impact})$

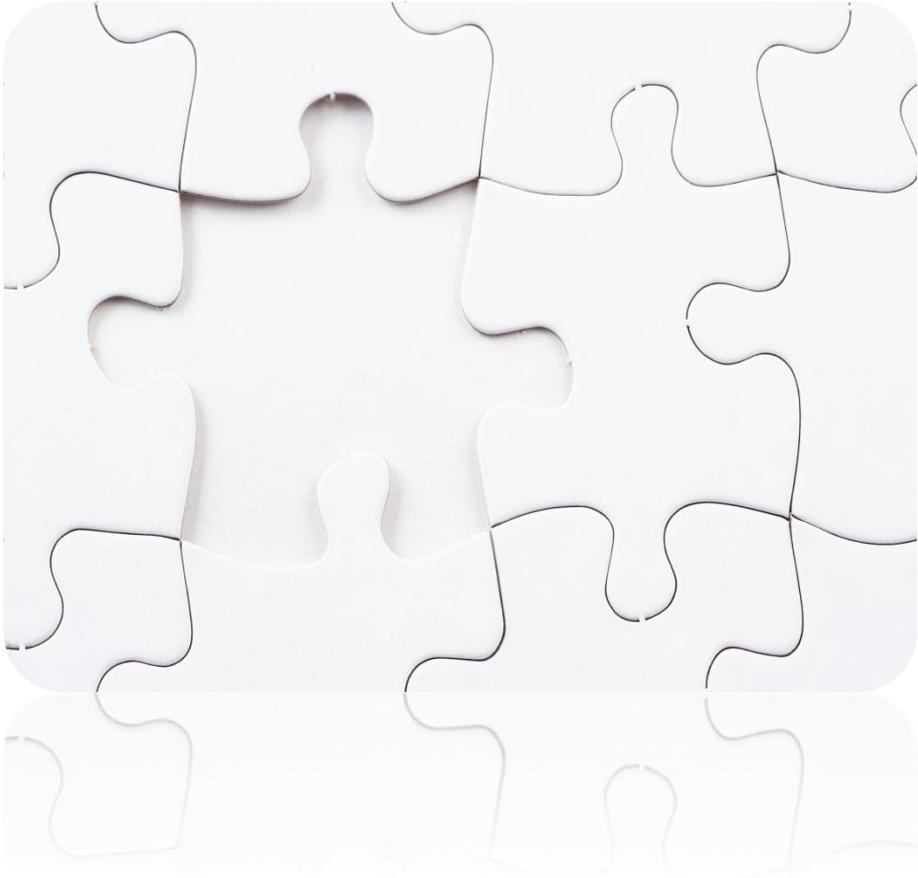


The Level of Detail can Vary to Case-to-Case



Revenue	$\text{Volume} * \text{Price per unit}$
Volume	$\text{Min} (\text{Total orders in hand}, \text{orders execution capacity})$
Total orders in hand	$\text{Total orders in hand (Y}_{-1}) + \text{New orders received}$
New orders received	$\text{New orders received (Y}_{-1}) * (1 + \text{y-o-y growth})$
Execution capacity	$\text{Orders execution capacity (Y}_{-1}) + \text{Increase in capacity}$
Price per unit	$\text{Price (Y}_{-1}) * (1 + \text{y-o-y growth} + \text{fx impact})$

Sometimes, We Have to Work with Missing Details



Companies may **not** necessarily **disclose all information** related to revenue model

- For example, it is very common to not give break up of revenue exposure to different currencies

At times, we might be able to **back work** missing information

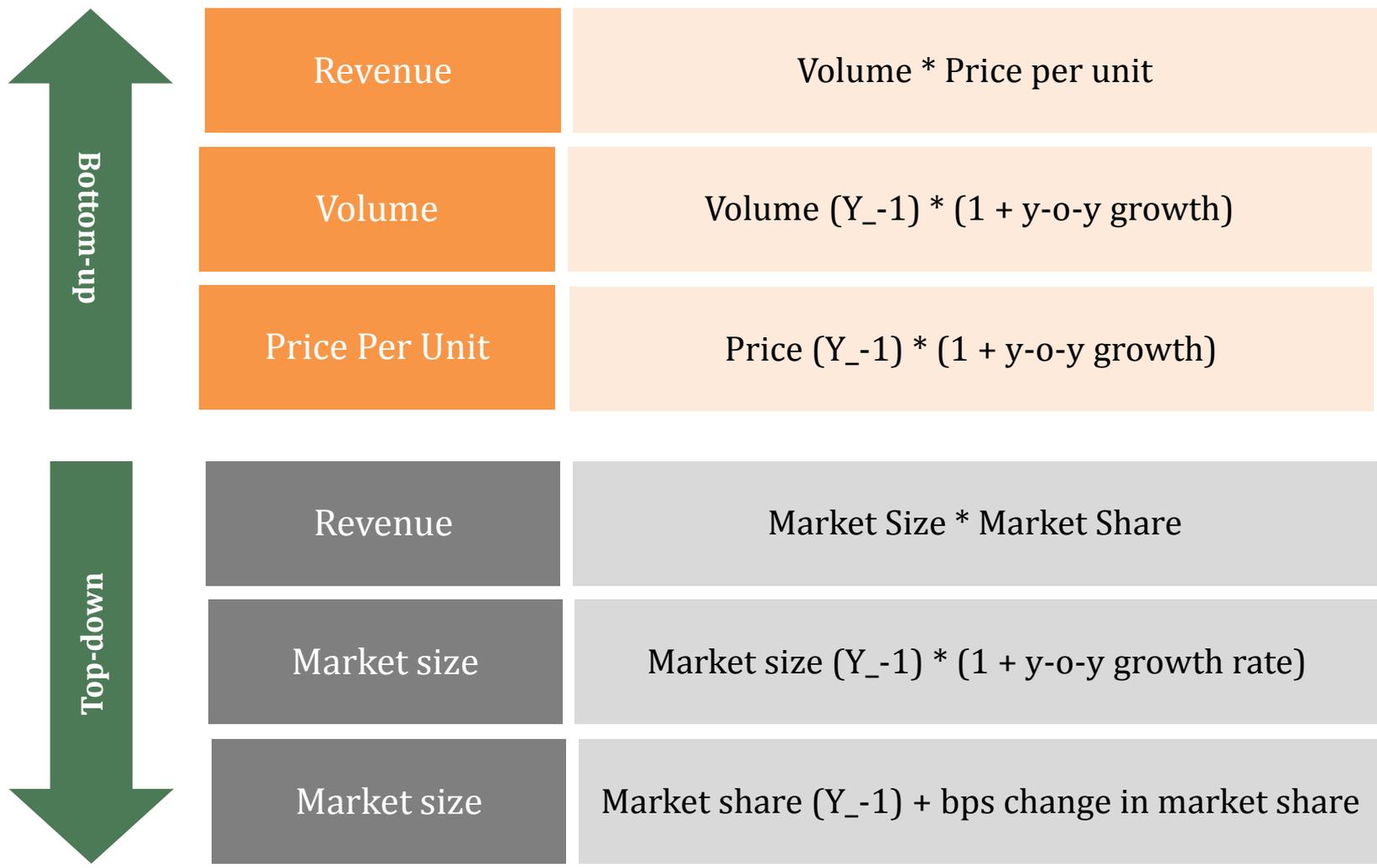
- For example, if company has give total sales and volume, average price can be calculated as total sales/volume

In other cases, we may have to work using **composite growth rates**

- For example, if we don't know volume and price, but expect volume to increase 5% and price to increase by 10%, the combined growth will be $(1+5\%)*(1+10\%)-1$

In certain cases, we may be forced to Work with Guesstimates

It Could also be Built Top-down



Top down models are more preferable for major players in established industries – Discuss!

In certain cases, booking and billing are different

Certain business have significant **time gap** between the time they receive an order and the time they deliver on that

We refer to these businesses as “Order book driven” businesses

In such cases, the **time** when they **acquire** a customer and then time when they **recognize** the revenue are **different**

Such industries include

- i. Construction
- ii. Infrastructure
- iii. Technology services and
- iv. Shipping and Aerospace

Why does it matter?

It matters because, the **key focus** in such business should be the **order inflow and not sales**; sales is merely a function of order book and time

Illustration: Book vs Billing

	Year 1	Year 2	Year 3	Year 4
Apartments sold during	50 units	50 units	-	-
Total apartments sold	50 units	100 units	100 units	100 units
Amount received (in millions)	Rs.5000	Rs.5,000	-	-
Total amt. received (in millions)	Rs.5,000	Rs.10,000	Rs.10,000	Rs.10,000
No. of apartments completed	-	-	40	60
Percentage of completion	0%	0%	40%	100%
Revenue recognized (in millions)	-	-	Rs.4,000	Rs.6,000
Total revenue recognized (in millions)	-	-	Rs.4,000	Rs.10,000



Large companies tend to have **multiple business segments**

Example

- Tata motors has a **commercial vehicle division** and a **passenger vehicle division**;
- **Coffee Day** has a café business and logistics business

The segments can be either **business segments** or **geographical segments** or **both**

Example

- Toyota motors sells different category of cars (i.e entry level, premium and luxury) in different **geographies**

Multi Segment Models

Each segment may have their own individual drivers, risk and reward



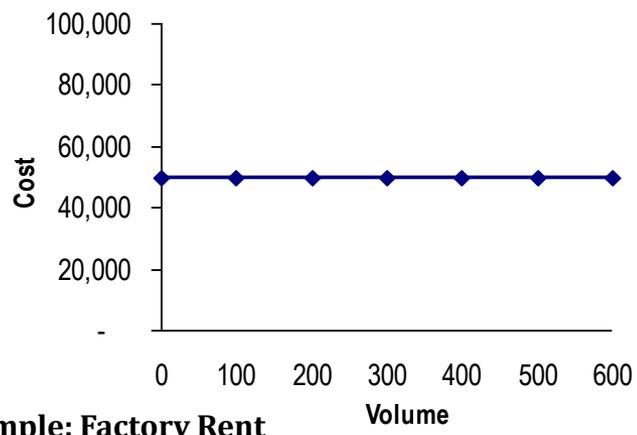
In such cases, **model each** of the segments **separately** and **sum them up** to get group revenue

Understanding Financial Variables - Operating Expenses



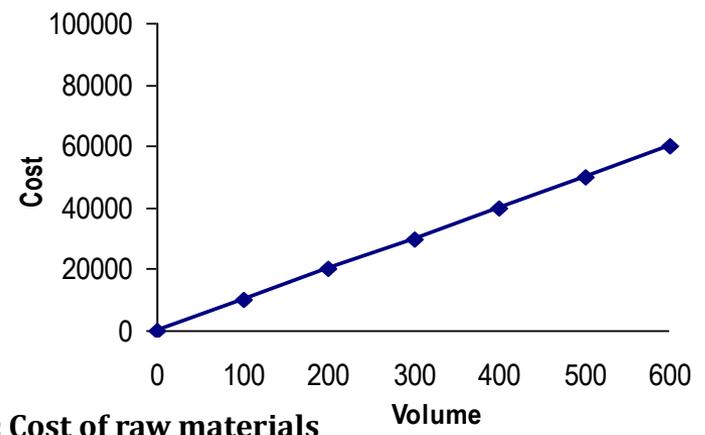
Costs Behave in 4 Ways

(i) Fixed Cost: Remains same irrespective of sales



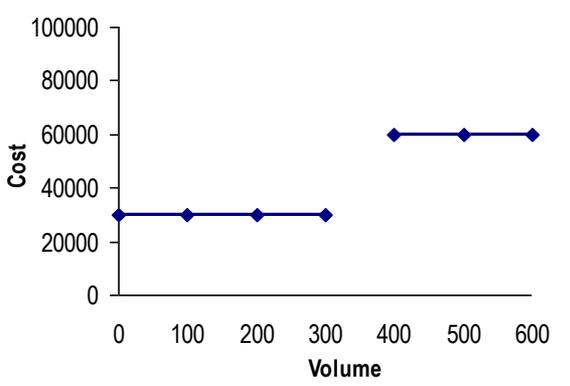
Example: Factory Rent

(ii) Variable cost: Increases as sales increases



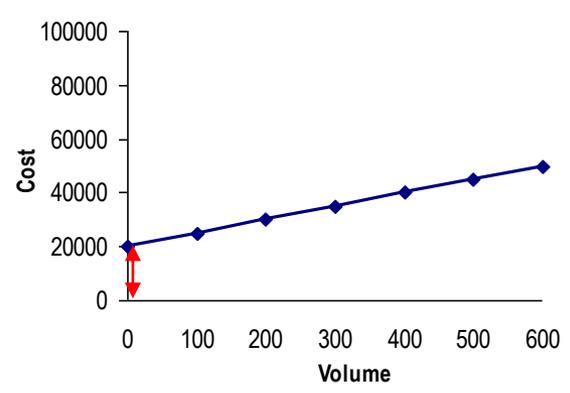
Example: Cost of raw materials

(iii) Step-fixed cost: Jumps if incr. in capacity reqd.



Example: Rent of an incremental production facility

(iv) Semi-variable cost: Part-fixed; part-variable



Example: Sales men remuneration

Cash or Non-Cash

Cash expenses

- Cost of raw materials
- Personnel expenses
- Operating lease payments
- Repairs and maintenance

Non-cash charges

- Depreciation
- Amortization
- Stock based compensation

Non-cash income

- Amortization of government grants



Model Should Reflect Cost Behaviour

Variable Costs

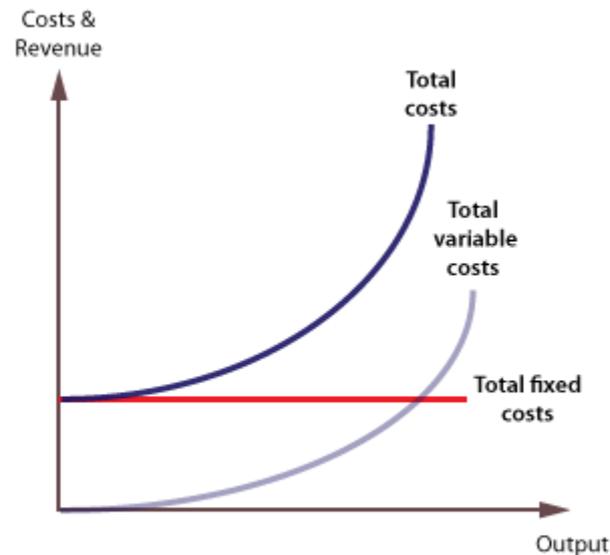
- As a percentage of sales (or)
- Per unit of sales volume

Fixed costs

- Increase cost using y-o-y growth rate

Not sure?

- Treat it as variable cost
- Remember: All costs are variable in the long run



A hand is visible on the left side of the image, holding a white rectangular sign. The sign is positioned in the lower-left quadrant of the frame. The text on the sign is centered and reads:

**Understanding Financial
Variables - Depreciation
and Capital Expenditure**

Capex vs Depreciation (1/2)



- Companies need long term assets to be able to produce goods and services
- Companies also need to continue to invest in their long term assets for two reasons:
 - Replace worn out or obsolete assets in order to maintain their current level of production (referred as maintenance capex)
 - Add additional capacity to grow their business (growth capex)
- Companies may also incur huge capex to expand their business or take it to a completely different scale
- Since capital expenditure are incurred to reap benefits in future, they are not considered as expenditure in income statement
 - Instead, Capex creates an asset in the balance sheet

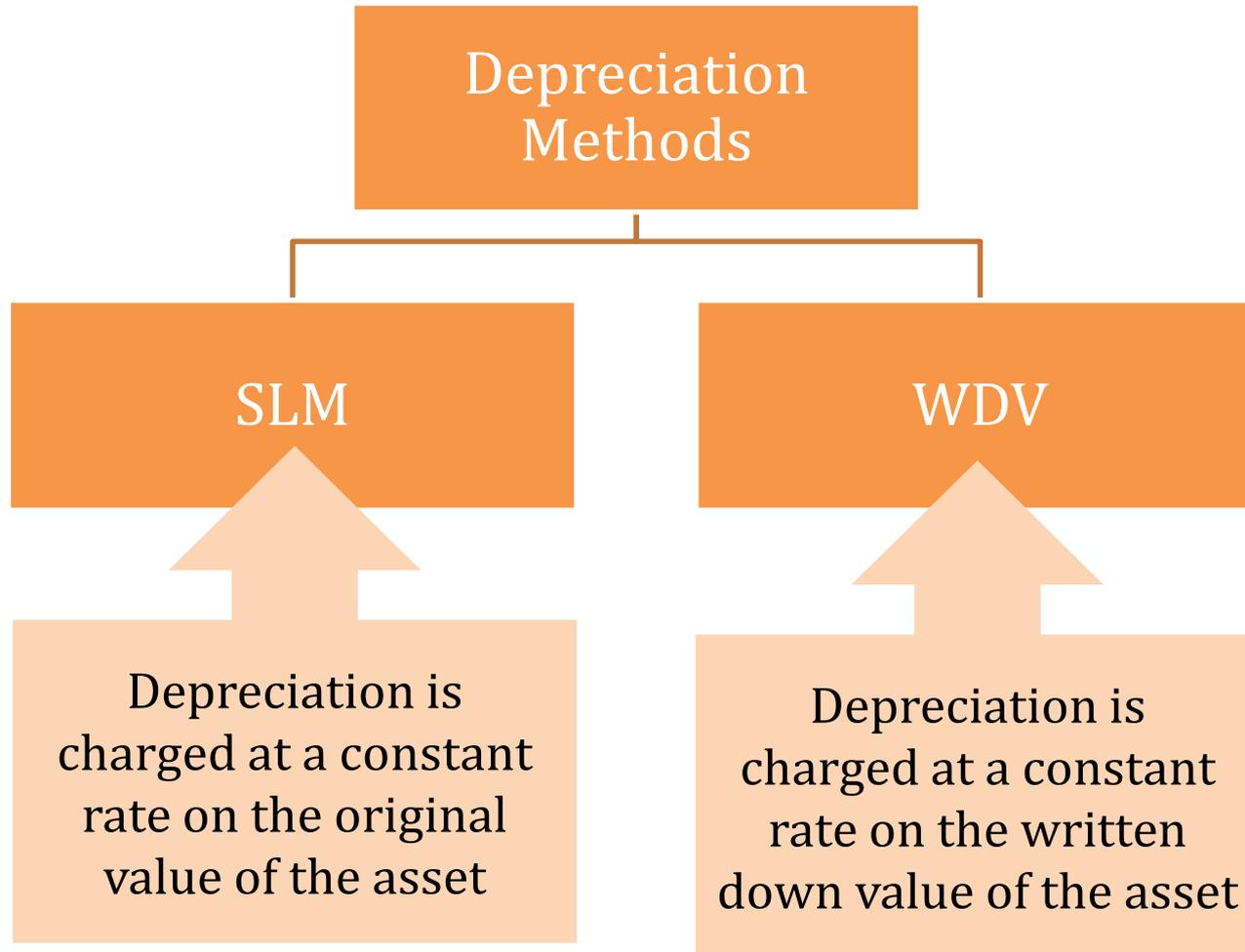
Capex vs Depreciation (2/2)

- Depreciation refers to reduction in value of an asset due to normal wear and tear, and obsolescence
- Assets purchased (Capex) by a company is gradually expensed in Income Statement, through its useful life, in the form of depreciation
 - Depreciation is charged through the useful life of an asset or until an asset is disposed
- The total amount of depreciation charged through the life of an asset is equal to the initial purchase value *minus* the expected salvage value at the end of the life of an asset



Depreciable Value

Initial Purchase Price – Salvage Value



Mining, Oil exploration and other related industries may also use depletion method for depreciating their exploration assets

Under depletion method, the value of exploration assets depreciated is **proportional to the amount of reserves** (oil reserves, gold reserves) extracted during the period



Other methods of depreciation such as the sinking fund method are seldom used

Under SLM, the depreciable value of an asset is split equally across the useful life of the asset. Thus, depreciation rate under SLM method is calculated as follows:

$$\text{Depreciation rate (SLM)} = \frac{(\text{Depreciable value} \div \text{Life of asset})}{\text{Initial value of asset}}$$

Under WDV, the depreciation on an asset is charged on the net value of an asset at the beginning of the period

$$\text{Depreciation rate (WDV)} = (1 - (S/I)^{\frac{1}{n}})$$

– Where

- » S represents salvage value
- » I represents Initial value
- » N represents useful life of the asset

The depreciation rate is applied on the written down value of the asset

SLM vs WDV (2/3)

Depreciation under SLM

Value of asset	10,000
Useful life	10 years
Salvage value	2,000
Depreciable value	8,000
Annual depreciation	800
Depreciation rate	8%

Year	Op. balance	Deprn.	Cl. Balance
Year 1	10,000	(800)	9,200
Year 2	9,200	(800)	8,400
Year 3	8,400	(800)	7,600
Year 4	7,600	(800)	6,800
Year 5	6,800	(800)	6,000
Year 6	6,000	(800)	5,200
Year 7	5,200	(800)	4,400
Year 8	4,400	(800)	3,600
Year 9	3,600	(800)	2,800
Year 10	2,800	(800)	2,000

Depreciation under WDV

Value of asset	10,000
Useful life	10 years
Salvage value	2,000
Depreciable value	8,000
Annual depreciation	N/ap
Depreciation rate	15%

Year	Op. balance	Deprn.	Cl. Balance
Year 1	10,000	(1,487)	8,513
Year 2	8,513	(1,266)	7,248
Year 3	7,248	(1,077)	6,170
Year 4	6,170	(917)	5,253
Year 5	5,253	(781)	4,472
Year 6	4,472	(665)	3,807
Year 7	3,807	(566)	3,241
Year 8	3,241	(482)	2,759
Year 9	2,759	(410)	2,349
Year 10	2,349	(349)	2,000

As you can notice, in the initial years depreciation under WDV is greater than SLM; however, in later stages, depreciation under SLM is greater

SLM Depreciation is calculated as a percentage of the average original value of asset during the year; however, balance sheet always reflect the net value of asset

Therefore, the following variables need to be tracked for the purpose of SLM Modeling

- Gross Block (Original value of fixed asset still in use)
 - Opening gross block + Capex – Assets retired during the year
- Accumulated Depreciation (depreciation charged till date on assets still in use)
- Net Block (Net value of assets still in use; gross block - accumulated depreciation.)

It is important to keep track of asset retirements and accumulated depreciation on retired assets

- Otherwise, model may forecast depreciation way beyond the asset value goes to zero

SLM Depreciation Modeling (2/3)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Gross Block										
Opening balance	550.0	620.0	627.5	660.0	647.5	722.5	797.5	872.5	947.5	1,022.5
(+) Additions (Capex)	207.5	145.0	170.0	195.0	220.0	245.0	270.0	295.0	320.0	345.0
(-) Deletions (Asseete retirals)	(137.5)	(137.5)	(137.5)	(207.5)	(145.0)	(170.0)	(195.0)	(220.0)	(245.0)	(270.0)
Closing balance	620.0	627.5	660.0	647.5	722.5	797.5	872.5	947.5	1,022.5	1,097.5
Useful life	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Accumulated Depreciation										
Opening balance	200.0	208.8	227.2	250.6	206.6	232.8	252.8	266.6	274.1	275.3
(+) Depreciation during the year	146.3	155.9	160.9	163.4	171.3	190.0	208.8	227.5	246.3	265.0
(-) Depreciation on disposla	(137.5)	(137.5)	(137.5)	(207.5)	(145.0)	(170.0)	(195.0)	(220.0)	(245.0)	(270.0)
Closing balance of accumulate	208.8	227.2	250.6	206.6	232.8	252.8	266.6	274.1	275.3	270.3
Depreciation rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Net block										
Opening balnace	350.0	411.3	400.3	409.4	440.9	489.7	544.7	605.9	673.4	747.2
Closing balance	411.3	400.3	409.4	440.9	489.7	544.7	605.9	673.4	747.2	827.2

Modeling Asset Retirals

If an asset is expected to last certain number of years, say n, then it is reasonable to expect that capex incurred n years ago would be retired this year

- Modeling asset retiral is possible using Excel's offset function

Offset function (non-array type):

Syntax: Offset(Reference cell, row_num, Col_num)

Purpose: Specifies the number of rows and columns from the reference cell from where value should be sourced

Example: Offset(G4,3,1)

The above example would fetch value that is 3 rows and one columns away from, G4 i.e. H5

	2018	2019	2020
Gross Block			
Opening balance	660.0	647.5	720.0
(+) Additions (Capex)	195.0	220.0	240.0
(-) Deletions (Assete retirals)	=-OFFSET(F17,0,-(F23-1))		
Closing balance	647.5	722.5	790.0
Useful life	4.0	4.0	4.0

The accumulated depreciation on asset retirals (which can be assumed to be value of asset retired) should be reduced from accumulated depreciation.

WDV Depreciation Modeling (1/2)

WDV depreciation is calculated as a percentage of average net value of an asset

For WDV depreciation, it is enough to track these variables

Net value of asset

Weighted average
depreciation rate

	2017	2018	2019	2020	2021	2022	2023	2024
Written Down Value								
Opening Balance	627.50	619.38	635.16	668.87	716.03	773.27	838.08	908.56
(+) Net Cap Ex	170.00	195.00	220.00	245.00	270.00	295.00	320.00	345.00
(-) Depreciation During the Year	-178.13	-179.22	-186.29	-197.84	-212.76	-230.19	-249.52	-270.26
Closing Balance	619.38	635.16	668.87	716.03	773.27	838.08	908.56	983.29
Depreciation Rate	25%	25%	25%	25%	25%	25%	25%	25%

- WDV depreciation is calculated as percentage of average assets
- In order to avoid circular reference, average asset is calculated as follows

Average asset balance

Opening balance + Net Capex/2

Circular reference in MS Excel arises when two or more cells are interdependent on each other.

Modeling Amortization

- Amount spent towards **intangible assets** are amortized **over the life of the asset**
- Amortization is typically calculated under the **SLM method**
- However, most companies have **negligible amount of intangible asset and amortizations** do not have material impact
- Therefore amortization can be modeled as **intangibles assets * amortization rate**
- However, if the company has **significant amortization** it can be modeled in the same line as that of **SLM depreciation**



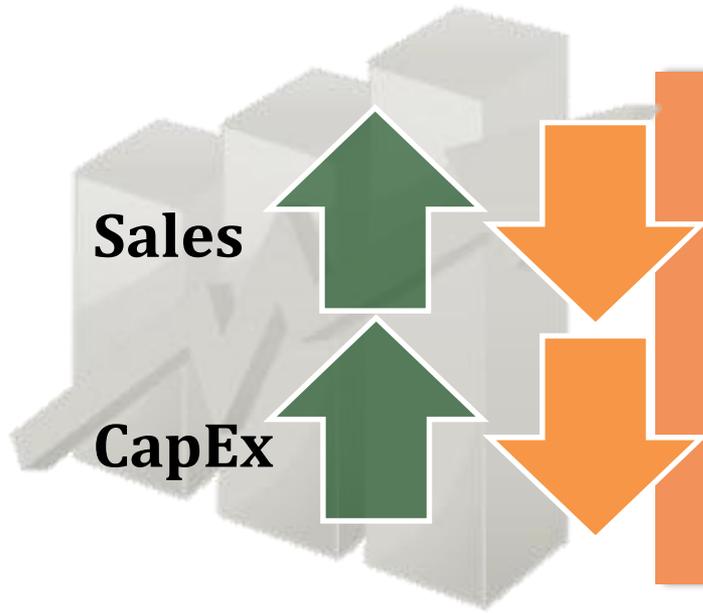
Factors to incur Capex

View about the
future



Availability of funds

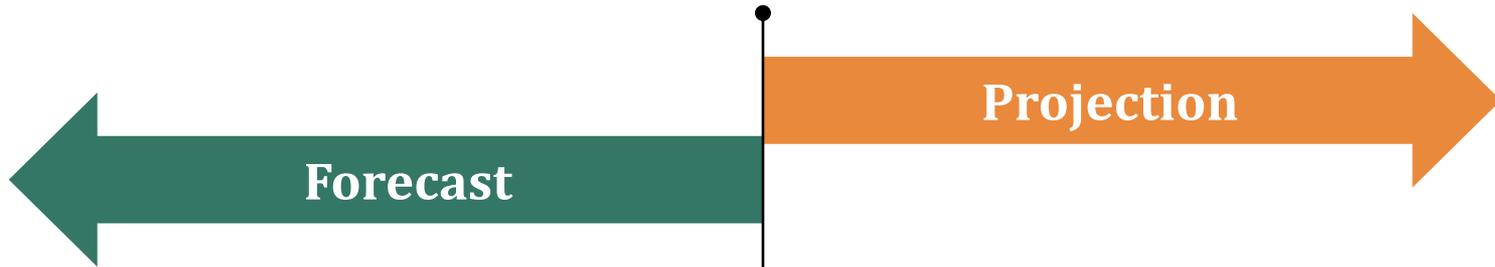




Sales and Capex are directly related. Thus, as sales for current year provide a reasonable view on future sales level as well as on amount of cash inflows during the year

At the same time, company have **little scope of discretion** with regard to maintenance capex and **have to incur it** as and when existing assets wear out





Since capex have strong correlation with sales

Capex modeled

$$\text{Capex} = \text{Sales} * \text{Capex turnover}$$

From a long term perspective, capex should at least be equal to depreciation

Capex modeled

$$\text{Capex} = \text{Maintenance capex} + \text{Growth capex}$$

$$\text{Maintenance capex} = \text{depreciation}$$

$$\text{Growth capex} = \Delta \text{Sales} * \text{Fixed Asset turnover}$$



Contact

info@imarticus.org

Thank you

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