financial measures of Performance

Supply chain Performance impacts financial performance of each member of supply chain

Supplier → Mfg → Distributer → Retailer → Customer.

- Return on Equity is the main summary measure of firm's performance

- It measures the return on investment made by firm's shareholder.

$$ROE = \frac{\text{Net income}}{\text{Average shareholder Equity}}$$

Higher value of ROE is desirable.

Dupont (Return on Assets).

RoA (Return on Assets).

measures the return earned on each investment (dollars / rupee) invested by the firm in assets.

$$RoA = \frac{\text{Earning before interest}}{\text{Average total assets}}$$

$$RoA = \frac{\text{Net income} + (\text{Interest Expence} \times (1 - \text{Tax rate}))}{\text{Average total assets}}$$

Higher value of RoA is desirable for good SC performance.

RoA can be written as product of two ratio: profit margin & Assets turnover.

$$RoA = \frac{\text{Earning before interest}}{\text{Sale revenue}} \text{ (i.e profit margin)} \times \frac{\text{Sale revenue}}{\text{Total assets}} \text{ (Asset turnover)}$$

Total assets

ratio that define financial leverage is

APT (Accounts payable turnover)

for eg. APT = 3

weeks

$\frac{52}{3}$ = 17 week on an average

APT = $\frac{\text{Cost of goods solds}}{\text{Account payable}}$

ART (Account receivable Turnover)

= $\frac{\text{Sale revenue}}{\text{account receivable)}}$

for eg. ART = 20 = $\frac{52}{20}$ = 2.6 week.

ART = 25 = $\frac{52}{25}$ = 2.1 or 3 weeks

Inventory → raw material
- WIP or
- Semi finished
- finished good

Inventory turnover := Cost of Goods sold / inventories

for eg. Inventory turnover = 9

52 / 9

= 5.8 weeks

6 weeks

VMT

+ PPET Plant, Property & Equipment turnover

= Sales revenue / PP&E (Property, Plant & equipment)

for eg. PPET = 20

this means that each dollers | Rupees invested in property, plant or equipment supported about 2o dollers/rupees of sales.

high value of PPET is desirable -

- Cash-to-cash (C2C) cycle

is used to roughly measure the avg. Amount of time from when cash enters the process to when it return collected revenue.

C2C = - day payable (1/APT)

+ days in Inventory (1/InvT)

+ day receivable (1/ARTI)

for C2C = -17 + 5.8 + 2.6

= -17 + 8.4

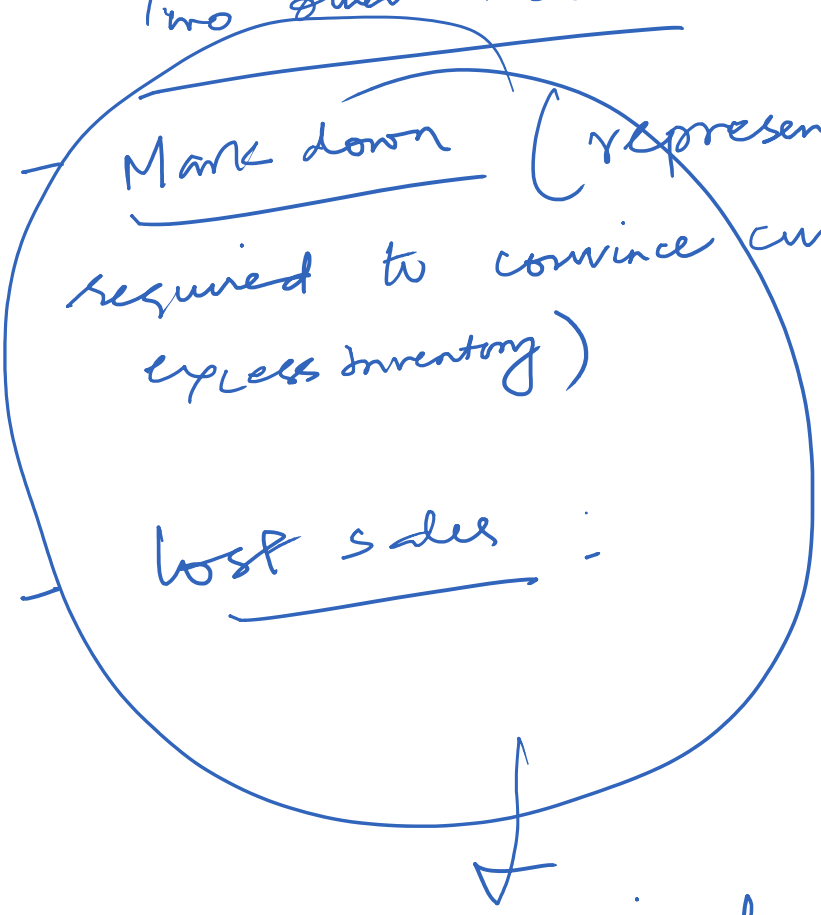
= - 8.6 weeks

that means firm collect money 8.6 weeks before it had to pay to its supplier

Two given measure

Mark down (represent the discount required to convince customer to buy excess inventory)

lost sales :



Better matching of supply & demand

reduce markdown & lost sales

Drivers of Supply chain

To achieve a strategic fit requires

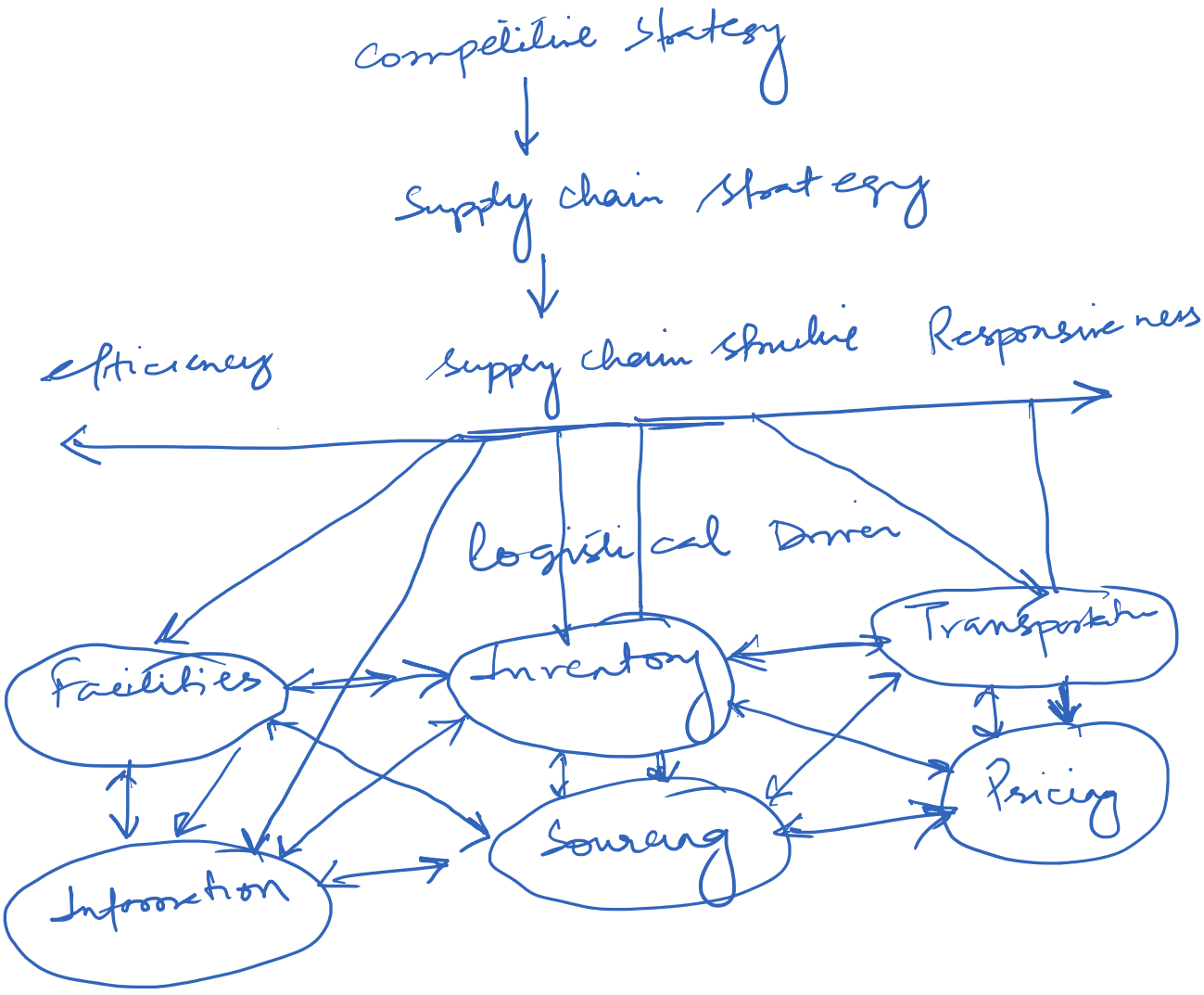
To achieve a strategic fit requires a "balance between the responsiveness & efficiency that best suited for the ~~competitive~~ Company's competitive strategy".

Six Drivers of SC

- 3 logistical driver
  - facilities
  - Inventory
  - Transportation
- 3 cross functional drivers
  - Information
  - Sourcing
  - Pricing

These six driver need to be structured to achieve desired level of responsiveness at a lowest possible price/cost in order to improve supply chain surplus & hence business performance of a firm.

A framework for structuring the Drivers of SC



1. Facilities :

- Physical location in the supply chain network where product is stored, assembled or fabricated.
- Two major types of facilities are
  - production (factory plants)
  - [illegible]

- storage site (warehouse)

- Decision regarding role, location, capacity & flexibility of facilities have significant impact on SC performance.

- In the financial statement

* facilities cost show up under (Property Plant & equipment) if facilities are owned by firm.

* if the property, plant & equipment are under leased. it is called as Selling, general & administrative.

for eg. Amazon increased no. of warehouse facilities to improve supply chain responsiveness.

Role of facilities in SC

- location of facilities is very important to transport the inventory from one place to other transferred

- both in facility, inventory is either to another state (mfg.) or it is stored in warehouse.

(2) Inventory: it can be - raw material
WIP
semi-finished
finished product

- it exist because of mismatch b/w supply & demand.
- In the financial statement inventory belonging to firm is reported under assets.
- Changing inventory policies can alter supply chain efficiency & responsiveness.
- high level of inventory may increase responsiveness but decrease efficiency.
- low level of inventory increase [illegible] but can lead to decrease [illegible] the

efficiency in response & increase chance of lost sales.

- Inventory level also effects "material flow time" in a supply chain.

"MFT (material flow time) is the time that elapses b/w the point at which material enter in the supply chain to the point it exists."

- little's law $\Rightarrow I = DT$ → flowtime
  - Inventory
  - throughput

Throughput is o/p per time period. In a supply chain context, it is the rate at which sale occur.

Relationship of Inventory & Competitive Strategy

- form, location, & quantity of inventory allows a supply chain to range from responsive

being to a very low cost to respo-
supply chain.

- The objective is to have a right location & right quantity of inventory the provides the high level of responsive at the lowest possible cost.

Types of Inventory

- Cycle Inventory
- Safety Inventory
- Seasonal Inventory.

3. Transportation

- Moving inventory from one point to another point in the supply chain.
- It can take form of many combination & modes each with its own performance characteristics
- Transportation have huge impact supply chain responsiveness & efficiency:

Role of transportation in the SC

- moves the product b/w stages in the SC
- Impact on responsiveness & efficiency.
- faster transportation allows greater responsive but lower efficiency.
- It also affects inventory & facilities.

for eg: High value, low demand items transported by air mode, low value, high demand items transported by cheaper mode (i.e by road, railway)

Transportation & Competitive strategy

it allows a firm to adjust the location of its facilities & level of inventory to find the right balance b/w responsiveness & efficiency.

Components of transportation decision

Design of transportation network

- Mode, location & route.
- Direct or with intermediate points
- One or multiple supply or demand points in a single run.

- Choice of transportation mode
- Air, truck, rail, sea, pipeline

(4) Information

Role of information in SC

Information & competitive strategy

- Better meet customer need at lower cost
- Improve responsibility of transaction & coordination of decision across supply chain

Enabling technologies of information

- EDI

- Internet
- ERP
- SCM software
- RFID.

(5) Sourcing

- Sourcing decision determine what function a firm performs & what function a firm outsource.
- These decision affect both responsiveness efficiency of SC.
- Globalization creates many more sourcing option both in considerable opportunity & potential risks.
- Pricing.

- Pricing affect the behavior of the buyer of goods or services e.g. Customer expectation & hence affecting the SC performance.
- Pricing is also employed to match supply & demand. for eg. Short term discounting is used to get rid of surplus or to move the demand forward & reduce demand peaks.