A STUDY AND COMPARISON OF RISK FACTORS IN SUPPLY CHAIN MANAGEMENT FOR DIFFERENT SCALE INDUSTRIES

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ABSTRACT

Today there is cut-throat competition in the market. There are a number of brand names for same product & for same quality also. Hence it is difficult to companies to maintain its market & satisfy its customer. Managing supply chain is a complex issue for manufacturing industry. With the advancement of technology & information system, the inventory reduces & hence cost has been decreased. But it also increases the risk in business & affects its services level. In this paper Supply(Procurement), Implementation lead –times Risk, Market Risk, Demand Risk, Strategy Risk, factors of supply chain causing disruption & loss is studied. The aim of this paper is to compare the risk factors associated with small, medium & large scale industry. A questionnaire is made by selecting important factors. Response is received from NCR companies as which factors are responsible for loss/high cost. Hence we can conclude that every industry has different risk factors that are causing disruption. Hence different industry concentrates on different factor to minimize the disruption.

Keywords—*Industrial Risk, Supply Chain, External Risk, Internal Risk, Demand, Procurement, Inventory*

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I. INTRODUCTION

A supply chain is the system of organizations, people, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform raw materials and components into a finished product that is delivered to the end customer.

SCM as the strategy through which the integration of the various nodes along the supply chain can be achieved. Examples of such nodes include the marketing, distribution, planning, manufacturing and purchasing departments of a firm, as well as those of the firm's suppliers, their suppliers' providers, and the firm's customers, all the way to the end user. Traditionally, each of these nodes would locally optimize their own processes, usually at the expense of the entire chain due to conflicting objectives of each of these nodes along the chain.

Fig1. System of Supply Chain Management

Information Sharing in a Supply Chain

SCM Technology using several types of information sharing: inventory, sales, demand forecast, order status, and production schedule. In inventory level, if the retailer and the manufacturer independently manage their respective inventories without sharing inventory status information, they may end up having duplicate safety inventories at both locations. A solution to this inefficiency is to coordination the management of inventories at the two sites. In sales information sharing by the retailer enables the supplier to be better prepared for volatile market demand forecast sharing involves a downstream site sharing the information

with the supplier, as it is closer to the market and is thus better positioned to forecast future market demand.

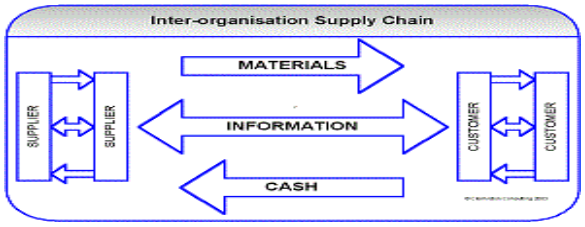


Fig2. Information Flow Diagram of Supply chain management

What is risk?

Risk is the effect of uncertainty on objectives. Uncertainties include events (which may or not happen) and uncertainties caused by ambiguity or a lack of information. It also includes both negative and positive impacts on objectives.

Risk versus uncertainty

Uncertainty: The lack of complete certainty, that is, the existence of more than one possibility. The true outcome/result/value is not known.

Measurement of uncertainty: A set of probabilities assigned to a set of possibilities. Example: There is a 60% chance this market will double in five years.

Risk: A state of uncertainty where some of the possibilities involve a loss, catastrophe, or other undesirable outcome.

Measurement of risk: A set of possibilities each with quantified probabilities and quantified losses. Example: There is a 40% chance the proposed oil well will be dry with a loss of $12 million in exploratory drilling costs.

Uninsurable risk: Those risks are called insurable risk the losses caused by cannot be minimized by insurance.

(a) **Supplier non performance**

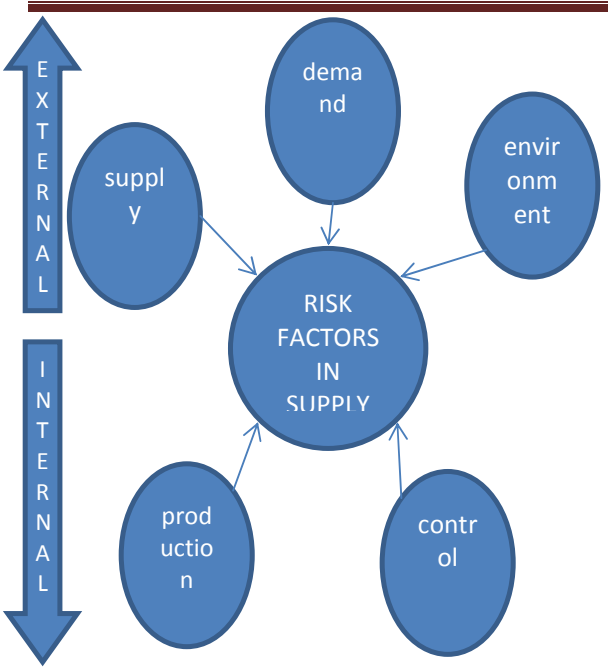
(b) **Customer demand volatility**

(c) **Partner work stoppages**

(d) **Product recall/ defects**

(e) **Emerging risks**

Insurable risk: Those risks are called insurable risk the losses caused by can be minimized by insurance. For this a definite amount per year is paid to the insurance agency.



(a)**Catastrophic disasters**

(b) **Property damage / loss**

(c) **Product liability**

(d) **Business interruption**

RISKS –

A. EXTERNAL FACTORS

1. Supply: It is the probability of loss occurring due to unavailability of raw materials.

1.2. Strategy Risk Strategy Risk - Choosing the right supply management strategy. **Discussion**-Know that what's right for one business might not be right for yours.

Control: Define the right up-front strategy, and identify and qualify the right suppliers, using reliable market intelligence to drive decisions.

1.3. Market: Brand, compliance, financial and market exposer.

Discussion-When outsourcing part production or even entire product lines, you're putting your company at the mercy of your suppliers.

Control: Pinpoint the product line's quality standards tolerance, and determine the possible impact of a compromise.

1.4. Implementation lead –times Risk - Supplier implementation lead-times and production/performance ramp.

Discussion-Know who you're working with and what their capacity issues are before signing on with them.

Control: Ramp new suppliers quickly to gain early visibility into any risk factors that might hinder production, lead-times, initial performance, etc.

1.5. Demand Risk -Demand and inventory fluctuations and challenges. **Discussion**-While some suppliers jump at the chance to take on new opportunities, enthusiasm doesn't necessarily mean they're in the best position to excel. **Control**: Watch your suppliers carefully for signs that they are overwhelmed with new business. Don't let their desire to grow their business affect your commitments.

(2) DEMAND: A risk that a demand forecast may not meet the actual consumer demand.

The risk for a company that demand for a product will either exceed their expectations and ability to meet the demand or fall short of their expectations or leave them with product they cannot sell.

Name of the industry	***Demand uncertainity***	***Order change by customer***	***Loss of customer***	***Level of competition***
Jai Bharat Maruti ltd	1	2	1	4
ABB limited	1	1	2	3
Samsung Engineering India pvt ltd	1	1	1	4
Kobe Suspension Co. P. Ltd.	2	1	2	5
M.R. Steel Forgings P. Ltd.	2	1	2	5

2.1 Volatility of demand- Demand volatility, defined as inconsistent, unstable or high-variance demand for a company's goods and services, is a particularly important industry dynamic.

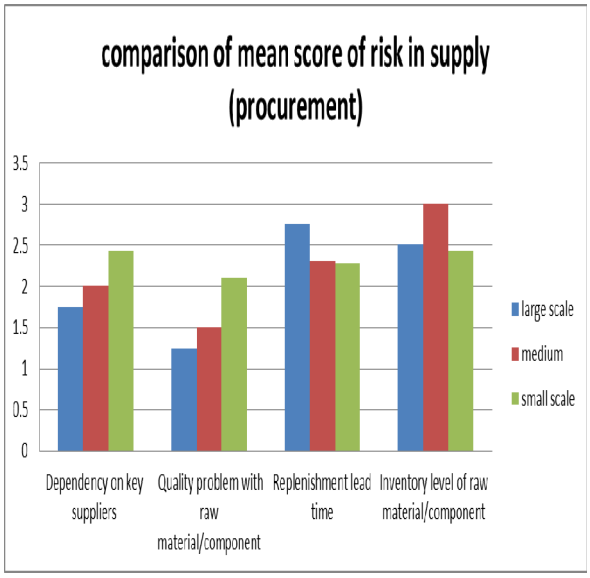
Effect on supply chain - Volatility results in uncertainty for a firm and can lead to several adverse effects. For example, volatility can degrade customer service levels, reduce product revenues, increase stock outs and lower profit margins, and increase risks associated with

over-production capacity and under-production capacity. It can also result in a bullwhip effect as demand variability impacts are amplified across the supply chain

Percentage of Industries in the data analysis:

(a) Large Scale= 16 (b) Medium Scale= 27

(c) Small Scale= 57



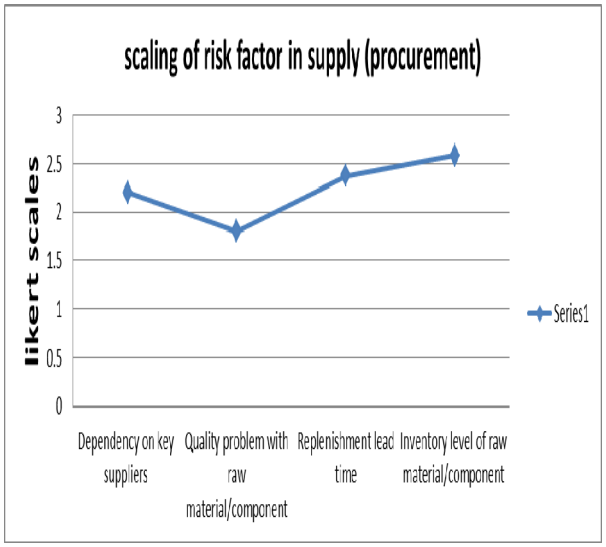


Fig 3. Risk factor in supply

Name of the industry	***Depen-dency on key supplie-rs***	***Quality problem with raw material/component***	***Repleni-shment lead time***	***Inventory level of raw material/component***
Jai Bharat Maruti ltd	2	2	3	3
ABB limited	1	1	3	3
Samsung Engineerin-g India pvt ltd	1	1	3	2
Kobe Suspension Co. P. Ltd.	2	3	2	2
M.R. Steel	2	3	2	2

Forgings P. Ltd.				

Fig. 4. Risk factors (external) associated with demand

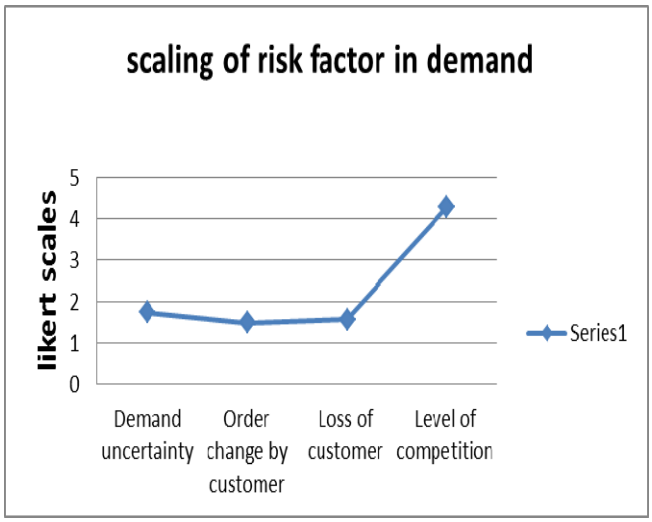


fig.5. Risk Factor associated with supply (Procurement)

fig.4 showing effect of risk factors on large,medium & small scale industries in demand (market) is given. Chart shows that score of level of competition is very high (above 4) in all size of industry. While all other factors are below average.

CONCLUSION:

It is concluded that External risk like strike-out, global & local recession, war etc.distrupt the whole supply chain as industries are linked to each other & hence these risk are unavoidable.

Internal risk can be maintained up to certain limit by systematic planning, good co-ordination with supplier/customer, keeping up to date with the market.

Internal risks (production) can be minimized by applying new technology, training manpower providing good infrastructure& proper production planning, connecting all the activities by a software package.

New trend in manufacturing like lean manufacturing, JIT approach although no doubt reduce the inventory & related cost & finally increase the profit to the company but also increase the risk level.

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