

# **A STUDY ON INVENTORY MANAGEMENT AND CONTROL IN APOLLO TYRES**

## **PROJECT REPORT**

*Submitted to Mahatma Gandhi University in partial fulfillment  
Of the requirements for the award of the Degree of*  
**MASTER OF BUSINESS ADMINISTRATION**

Submitted by

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**Accredited by NAAC with 'A' Grade**  
**DEPARTMENT OF MANAGEMENT STUDIES**  
**MAR ATHANASIOS COLLEGE FOR ADVANCED STUDIES TIRUVALLA**

**2021**



# MAR ATHANASIOS COLLEGE FOR ADVANCED STUDIES TIRUVALLA

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## CERTIFICATE

*This is to certify that the project report entitled “A Study on Inventory Management and Control” is a bonafide report of the project work undertaken by Athira V, fourth semester MBA student of our college during a period of 8 weeks commencing from 1 st April to 30 th May,2021..*

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21<sup>ST</sup> JUNE 2021

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Ms. Athira V** , a 4<sup>th</sup> Semester MBA student of MACFAST College Thiruvalla , has successfully completed her project work in our Organization for a period of 60 days starting from 1<sup>st</sup> April 2021 to 31<sup>st</sup> May 2021 on the topic “A Study on Inventory Management & Control at Apollo Tyres Ltd” .

We found her performance as excellent good during the mentioned period with us and wish her all the success.

**For APOLLO TYRES LTD**

A handwritten signature in blue ink, appearing to read 'Maneesh MS', is written over the printed name.

**MANEESH MS**  
**MANAGER – Human Resources**



# DECLARATION

I hereby declare that this project report entitled “**A Study on Inventory Management and Control at Apollo Tyres Kalamassery** is a *bonafide* report of the study undertaken by me, under the guidance of **Neethu Ann Georgie** Department of Management Studies, MACFAST, Tiruvalla.

I also declare that this project report has not been submitted to any other University or Institute for the award of any degree or diploma.

Place : Tiruvalla  
Date : : 31/05/2021



Athira V

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*I would like to thank God almighty for giving me the strength and confidence for the internship work. With immense gratitude, I acknowledge all those who contributed with their valuable suggestions and timely assistance towards the completion of the project work*

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## **ABBREVIATIONS**

ERP: Enterprise Resource Planning

FMEA: Failure Mode and Effect Analysis

SRM: Supplier Relationship Management

QFD: Quality for Deployment



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**CHAPTER 1**  
**STATEMENT OF THE PROBLEM**

## **1.1 Background of the study**

Inventory management is the branch of business management that covers the planning and control of the inventory. “Inventory” means physical stock of goods, which is kept in hands for smooth and efficient running of future affairs of an organization at the minimum cost of funds blocked in inventories. The fundamental reason for carrying inventory is that it is physically impossible and economically impractical for each stock item to arrive exactly where it is needed, exactly when it is needed.

Inventory management is one of the major planning and control challenges facing managers today, especially in manufacturing facilities. While technically an asset on the balance sheet of a company, most accountants or financial managers will quickly tell you that holding inventory is also a major expense, and should be minimized if possible. Even most service organizations have some amount of inventory, and retail operations especially find the management of inventory has a major role in effectively managing the retail operation. This goal of low inventory investment to save inventory expense is often in direct contrast to the position of many sales and marketing personnel, who often want the firm to maintain a very high inventory position in order to service customers very quickly.

An organization is a power house of resources through which manufacturing and production operations are effectively carried out. It comes into existence when several minds are bound together through effective and efficient communication along with harmonious interpersonal relations for contributing towards a common endeavour. The problem of competition is increasing in global market place. It has forced the firms to consider ways of improving the inventory control system. Severe competition makes it necessary to continuously introduce new products and new designs of products. Now a day every company will face the competition, because of that every company maintains a flexible inventory system. It will depend on how the company will respond to the fast changing market needs, customer expectation and technological advancement. The company will focus on improvements on the following measures :-

- The Inventory Level and work-in-progress
- Quality of the Product and technological advancement
- Flexibility and responsiveness of the production process.

Inventory management is a component of supply chain management that involves supervising non-capitalized assets, or inventory, and stock items. Specifically, “inventory management supervises the flow of goods from manufacturers to warehouses and from these facilities to point of sale.” Thus, inventory management hinges on detailed records of products or parts as they enter and leave warehouses and points of sale. Inventory management is critical to the bottom line because inventory is a major asset that remains an investment until the products sell. Several costs are tied to inventory management because businesses must store, track, and insure inventory. Overall, best practices in inventory management involve sound purchasing plans to guarantee items are available when they are needed without having too few or too many on hand and the necessary tools for tracking existing inventory.

Possessing a high amount of inventory for a long time is usually not advantageous for a business because of storage costs, spoilage costs, and the threat of obsolescence. However, possessing too little inventory also has its disadvantages; for example, the business runs the risk of market share erosion and losing profit from potential sales. Inventory management forecasts and strategies, such as a just-in-time (JIT) inventory system, can help minimize inventory costs because goods are created or received only when needed.

Inventory is the term for the goods available for sale and raw materials used to produce goods available for sale. Inventory represents one of the most important assets of a business because the turnover of inventory represents one of the primary sources of revenue generation and subsequent earnings for the company's shareholders. When an inventory item is sold, its carrying cost transfers to the cost of goods sold (COGS) category on the income statement.

Inventory is generally categorized as :-

- Raw materials
- Work-in-progress and
- Finished goods.

Raw materials are unprocessed materials used to produce a good. Work-in-progress inventory is the partially finished goods waiting for completion and resale; work-in-progress inventory is otherwise known as inventory on the production floor. Finished goods are products that have completed production and are ready for sale. Retailers typically refer to this inventory as "merchandise".

There are generally five reasons companies maintain inventories:

- To meet an anticipated increase in demand;
- To protect against unanticipated increases in demand;
- To take advantage of price breaks for ordering raw materials in bulk;
- To prevent the idling of a whole factory if one part of the process breaks down; and,
- To keep a steady stream of material flowing to retailers rather than making a single shipment of goods to retailers.

Inventory can be valued in three ways. The first-in, first-out (FIFO) method says that the cost of goods sold is based on the cost of the earliest purchased materials, while the carrying cost of remaining inventory is based on the cost of the latest purchased materials. The last-in, first-out (LIFO) method states that the cost of goods sold is valued using the cost of the latest purchased materials, while the value of the remaining inventory is based on the earliest purchased materials. The weighted average method requires valuing both inventory and the cost of goods sold based on the average cost of all materials bought during the period.

## **1.2 Statement of the Problem**

The problem selected to the analysis is “to study the effectiveness of inventory management and control system” at Apollo Tyres. The effectiveness of the prevailed inventory system is analyzing simultaneously.

The variation of the prices of raw materials are also analyzing with their effects on the overall working of the unit.

The literary meaning of the word “Inventory” is stock of goods. Every enterprise needs inventory for smooth running of its activities. It serves as a link between production and distribution

process. The unforeseen fluctuation in demand and supply of goods also necessitates the need for inventory. It also provides a cushion for future price fluctuations.

The purpose of inventory management is to ensure availability of materials in sufficient quality and quantity as and when required and also to minimize investment in inventories. Thus it is very essential to have proper control and management of inventory.

Inventories play a vital role in operation of manufacturing industry. The inventory ensures operational smoothness. In almost all the organizations the substantial part of capital is invested in inventories. Inventory refers to stock of products a firm that is for sale and also the components that make up the product. Usually, inventories constitute a major portion, about 60% of total current assets. Hence, management of inventory becomes crucial to the successful management of overall working capital of a business enterprise.

The management of inventory is necessary for prevention of leakage, spoilage, deterioration, obsolescence, wastage of materials. It aims at improving material handling, saving in material cost, increased production and large profits. The inventory management is a part of planning budget, which often falls within financial area. The financial manager is playing an important role in determining the nature performance of inventories

In this context it is felt to undertake a study to highlight the inventory management and control.

### **1.3 Relevance and Scope of the Study**

Inventory is one of the most crucial aspects of any business model. A close tab on the movement of inventory can make or break your business and that's why entrepreneurs always emphasis on effective inventory management. While a few business owners do understand the significance and cruciality of tracking inventory on a regular basis, some fail to realize its importance making their business fall through the unseen cracks.

This project study is attempted to analysis inventory management of Apollo Tyres, Kalamassery. It focuses on the analysis of inventory management and control procedures. There can be substantial costs involved in staying above and below the optimal range, careful inventory

management can make a huge difference, in the right balance. It is a complex and time consuming task without the right technology.

Inventory Management is a very important aspect for the Apollo Tyres. It enables the business to meet or exceed expectations of the customers by making the readily available.

The scope of the study includes the Stock Review, Just in Time (JIT), ABC Analysis, Economic Order Quality, VED Analysis and SDE Analysis of raw material, work in progress and finished goods of one year.

This study provides insight to the management of high value items and also bring attention of management towards movement of A class items and the effect of inventory over last year.

### **1.4 Objectives of the Study**

The main objectives of the inventory management and control are operational and financial.

#### **➤ Primary Objectives**

- To analyse the inventory management systems of Apollo Tyres in Kalamassery.
- To understand and measure the economic order quantity of the raw materials.
- To perform ABC&VED Analysis with regards to the raw materials of Apollo Tyres.

#### **➤ Secondary Objectives**

- To check the purchasing activities of Apollo Tyres.
- To provide recommendations for efficient and effective inventory management.
- To analyse proportion of inventories, which need close supervision out of various inventories

**CHAPTER 2**  
**INDUSTRY AND COMPANY PROFILE**



## **2.1 Industry Profile**

### **TYRE INDUSTRY**

The origin of the Indian Tyre Industry dates back to 1926 when Dunlop Rubber Limited set up the first tyre company in West Bengal. MRF followed suit in 1946. Since then, the Indian tyre industry has grown rapidly. Indian Tyre Industry now provides direct and indirect employment to nearly 1 million persons, including dealers, retraders, growers of Natural Rubber, employment in raw material sector etc. The Indian tyre industry has become one of the most competitive markets in the world and with the help of new technology, ultra-modern production facilities and availability of raw materials at lower rate, the sector is set to grow further. At present, India has forty large and medium tyre manufacturing companies, of which the top 10 account for over 90 percent of the country's total tyre production.

During 2013-14, the Indian tyre industry witnessed a turnover of Rs 47,500 crore, producing 123 million tyres. The industry has witnessed muted growth during the period largely aided by the two wheeler and tractor segments. Overall demand from the replacement segment was modest, while original equipment makers (OEM) demand increased just by 2-4 percent. Industry-wide revenues during 2013-14 have been higher than before at around 6 percent on the back of the improvement in product mix, limited price discounting despite the falling input costs and higher realisations in the export markets.

### **NATURE OF INDUSTRY**

Tyre Industry is highly raw-material intensive. Raw materials cost accounts for approx. 63% of tyre industry turnover and 72% of production cost. The industry is a major consumer of the domestic rubber market. Natural rubber constitutes 80% while synthetic rubber constitutes only 20% of the material content in Indian tyres, 62% of total Natural Rubber consumption is by the Tyre Sector, balance by rubber based non-tyre industries. Interestingly, world-wide, the proportion of natural to synthetic rubber in tyres is 30:70. The Indian Tyre Industry is an

integral part of the Auto Sector – It contributes to ~3% of the manufacturing GDP of India and ~0.5% of the total GDP directly. Indian tyre industry has almost doubled from ~Rs 30,000 crores in 2010-11 to ~Rs 59,500 crores in 2017-18 of which 90-95% came from the domestic markets. The top three companies – MRF, Apollo Tyres and JK Tyres have ~60% of the market share in terms of revenue. In terms of segmentation tyres can be divided in two ways – based on end market and based on product.

Indian tyres have good acceptance in global markets. Compounded Average Growth Rate (CAGR) of tyre exports in the last one decade has been 8%. Exports to over 65 countries worldwide. 17% export to highly quality conscious US market. Other major export markets are - (countries in) Latin America; UAE, Bangladesh, Iran, Philippines, Vietnam, etc. Over 20% of truck and bus tyres (bias) produced domestically are exported. Emphasis now is on export of radial tyres, including Passenger Car radial tyres. All large tyre companies are exporting as a long term commitment.

### **2.1.1 Business Process of Industry**

Tires for most vehicles are pneumatic; air is held under pressure inside the tire. Until recently, pneumatic tires had an inner tube to hold the air pressure, but now pneumatic tires are designed to form a pressure seal with the rim of the wheel.

Scottish inventor Robert Thomson developed the pneumatic tire with inner tube in 1845, but his design was ahead of its time and attracted little interest. The pneumatic tire was reinvented in the 1880s by another Scotsman, John Boyd Dunlop, and became immediately popular with bicyclists.

Natural rubber is the main raw material used in manufacturing tires, although synthetic rubber is also used. In order to develop the proper characteristics of strength, resiliency, and wear-resistance, however, the rubber must be treated with a variety of chemicals and then heated. American inventor Charles Goodyear discovered the process of strengthening rubber, known as vulcanization or curing, by accident in 1839. He had been experimenting with rubber since 1830 but had been unable to develop a suitable curing process. During an experiment with a

mixture of india rubber and sulfur, Goodyear dropped the mixture on a hot stove. A chemical reaction took place and, instead of melting, the rubber-sulfur mixture formed a hard lump. He continued his experiments until he could treat continuous sheets of rubber.

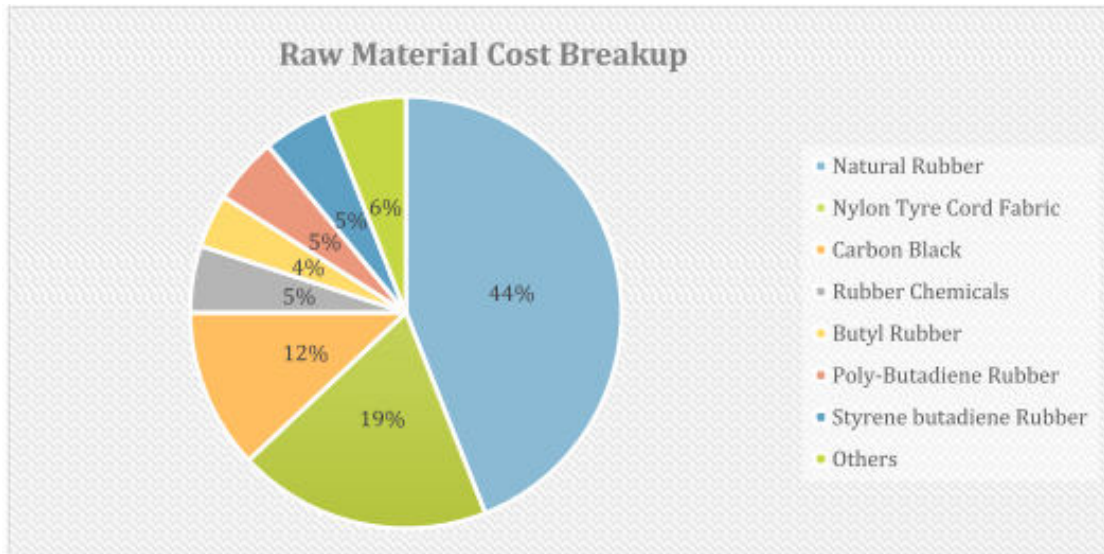
Today, large, efficient factories staffed with skilled workers produce more than 250 million new tires a year. Although automation guides many of the steps in the manufacturing process, skilled workers are still required to assemble the components of a tire.

### **Raw Materials**

The tyre is an assembly of numerous components that are built up on a drum and then cured in a press under heat and pressure. Raw material cost forms the largest cost head in the tyre industry accounting for about 65-70 per cent of the total. The main raw materials used to manufacture tyres are natural rubber, poly butadiene rubber (PBR), styrene butadiene rubber (SBR) and nylon tyre cord fabric.

Rubber is a major component in manufacturing of a tyre. There are three categories of rubber used in the manufacturing process viz natural rubber (NR), styrene butadiene rubber (SBR) and poly butadiene rubber (PBR).

Rubber including (natural and synthetic), nylon tyre cord fabric (NTC) and carbon black constitute a significant portion i.e. 60-65 per cent of the overall raw material cost of the industry, Care Ratings said, adding hence any change in the prices of these materials impact the overall industry's profitability.



Source: ATMA, TARI Estimates

Fig:2.1 Raw material cost breakup

The price of rubber is prone to fluctuations and in the previous fiscal year, domestic and international rubber prices increased by about 28 per cent. It had declined by 24 per cent and 15 per cent y-o-y for previous two consecutive years.

The reason for high natural rubber price in the domestic market is due to the demand-supply gap in production and consumption of rubber in the country. A competitive price in the international market also leads to high imports.

### **2.1.2 Market Demand and Supply – Contribution to GDP – Revenue Generation**

With the growing insistence to lower emission levels and enhance fuel efficiency in vehicles, besides reducing weight, the Indian tyre industry is embracing new trends in the manufacturing process to meet the changing market dynamics and cater to the latest demands of the OEMs (Original Equipment Manufacturers).

The heavy investment driven tyre industry contributes 3 per cent of the manufacturing GDP when the entire automotive sector accounts for 7.1 per cent of the GDP and almost 49 per cent to

the nation's manufacturing GDP (FY 2018-19).

The tyre makers in India are gearing up to intensify their role in the modernisation phase, largely driven by demand and supply conditions as also directly proportional to automobile sales to some extent.

Besides, with increasing focus on corporate average fuel efficiency (CAFE) norms to curb the alarming levels of pollution, companies have immense pressure to build products which have minimal friction and offers higher fuel efficiency.

In this direction, the tyre manufacturers have been grappling to alter manufacturing mechanisms to meet changing trends and demands.

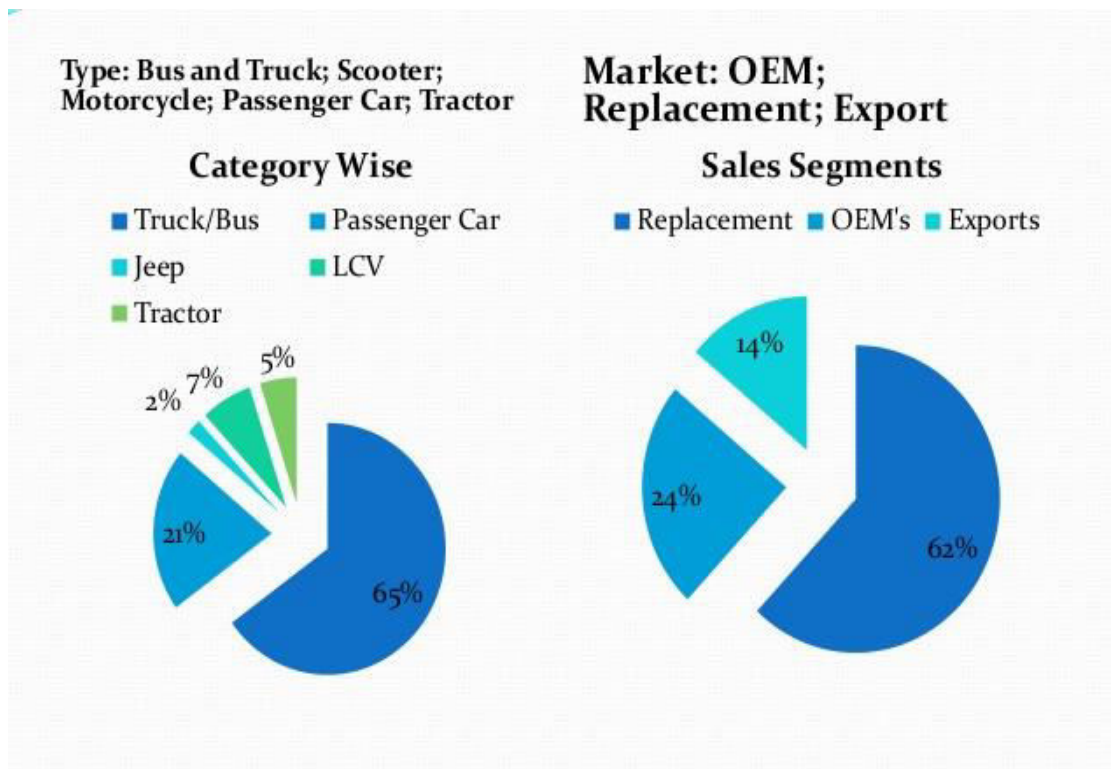
Latest trends in the industry include finer tolerances in the manufacturing process, inclusion of more radials which consume less fuel, low rolling resistance and focus on better traction and on road performance which increases fuel efficiency.

A radial tire allows the sidewall and the tread to function as two independent features of the tire. A bias tire consists of multiple rubber plies over lapping each other. The crown and sidewalls are interdependent.

The companies are stepping up the manufacturing facilities with technologies that improve heat development in tyres with effort towards less usage of carbon black, which in turn contributes in lowering emissions.

Other impactful trend in the manufacturing of tyres include usage of higher component of 'silica' which helps in the manufacturing process and in improving tyre performance by lowering the rolling resistance as well as improving cut and chip resistance. Tyre manufacturing and tyre performance are directly linked to the emission levels.

## **DEMAND FOR TYRES**



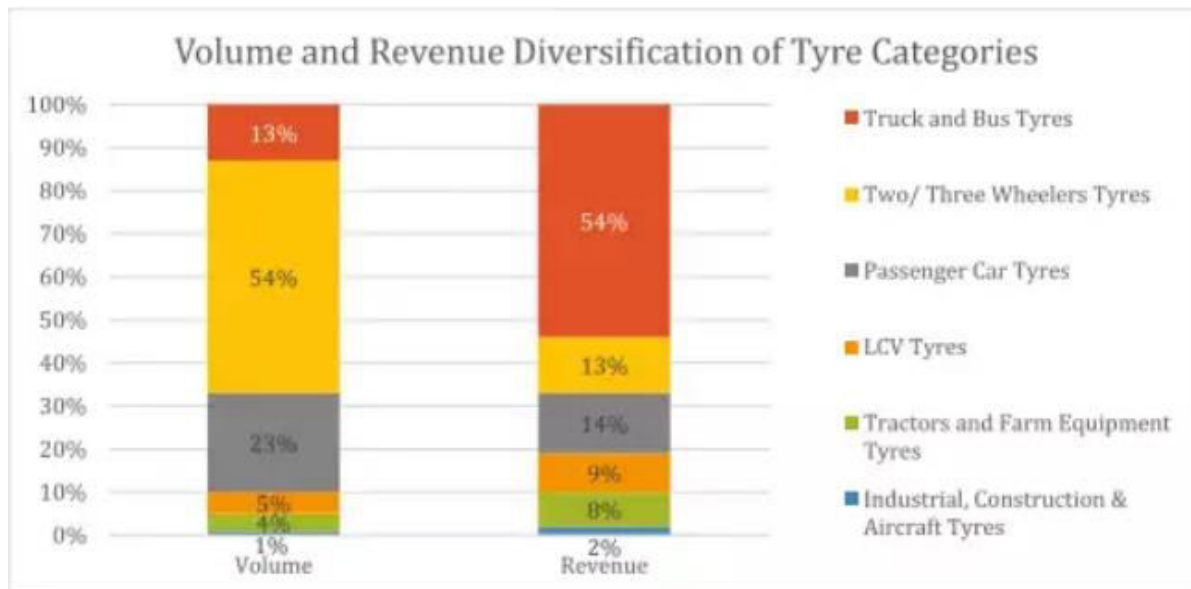
**Fig:2.2** Demand for tyres.

Tyre originates from two end-user categories -- OEMs and the replacement segment. Demand from the replacement segment dominates the Indian tyre market contributing about 56 per cent of the total volume, while the OEMs account for the rest 44 percent.

Consumption by OEMs is dependent on new automobile sales trend while the replacement segment is linked to usage patterns and replacement cycles.

In the overall sales of tyres in unit terms, the commercial segment contributes about 21 per cent while the remaining comes from sales of personal vehicles which includes passenger vehicles, two and three wheelers.

Under personal segment, two and three wheelers constitute about 55 per cent sales while the passenger cars made up for the balance sales.



Source: ATMA, Industry and TARI Estimates

Fig:2.3 Volume and revenue diversification of tyre categories.

T&B (Trucks&Buses) dominates overall commercial usage segment with followed by LCV segment. Tractor front and rear tyre segment constitute the remaining

Top 10 companies account for about 80 per cent of the market share. Top three companies -- MRF, Apollo Tyres and JK Tyres -- have 55 per cent of the market share of the Indian tyre industry and figure among the top 25 global companies in terms of revenue.

### Exports

Tyre exports are estimated to grow by 8-10 per cent over the next three years led by stable demand and increased acceptance of Indian tyres in overseas markets, both in terms of quality and pricing. It was around 9 per cent in FY 2018.

However, with rising penetration of low cost Chinese tyres in overseas markets, especially post the removal of anti-dumping duty (ADD) by the US on the Chinese tyres in February 2017, competition from China (both in terms of volumes and pricing) will remain a key challenge, as per and ICRA note.

For FY 2019, the unit and tonnage growth is pegged at 8-8.5 per cent and 6.5-7 per cent,

respectively.

Currently, India's contribution to the global tyre trade is USD 1.5 billion (1.72 per cent) out of the \$80 billion market. ATMA expects export share to increase to about 5 per cent given that the industry is highly competitive and there is headroom for tyre exports.

Top destinations for exports include US, Germany, France, UK, Italy, Spain, Turkey, Netherlands, UAE, Brazil and Australia.

The US and EU countries are the top potential markets for exports, and the driving factor would be the Government signing trade agreements with these countries which can provide concessional tariff for tyres.

### **2.1.3 Level and Types of Competition- Firms Operating in the Industry.**

#### ***Tyre industry: Oligopolistic Nature***

1. Very few producers, homogeneous market, pure oligopoly
2. Huge investment to start oligopolistic markets.

The established companies discourage the new entrants in various ways. The existing firms may have a number of advantages like access to inputs or processes, cost advantage, exclusive dealerships and arrangements to get inputs at lower prices. Moreover, the new firms will take time to establish their brand in the market. The barriers may take the form of technology patents. Even the Governments may put up barriers such as limits to the number of licenses issued. In these ways entry for new producers becomes difficult.

3. They face indeterminate demand curve

There is a lot of interdependence among the oligopoly producers. The decisions of producers depend on the decisions and strategies followed by other competitors. This interdependence makes it difficult to draw a definite demand curve like that of perfect competition and monopoly. For example, an oligopoly firm lowers the price of its product. It's not sure how the competitors will react. They may reduce the price to the



same extent or even lower to capture the market. Thus demand curve is indeterminate.

This is because these companies that are dominating the market have enough power and resources not to let new companies to steal their piece of the pie. They are competing among each other and there are huge amounts of money involved in this “fight“. Also it is very hard to exit the market for a company because exit of the company from this market can actually make lots of economic problems for economy in the country where company is situated. There are even other barriers for new companies to enter the market and one of them is legal barrier. Sometimes these companies that are the oligopoly collude in a cartel, that is a secret (against the law in most countries) cooperation with each other so they can control the market and keep prices high. When cartel is in action producing results are similar that to a monopoly, sometimes they are anti-competitive only by default, because they fear that direct competition would damage all of them. Their actions, therefore, try to take account of the reaction of other oligopolists; this usually happens when cartel is secret. Since it is uncertain, how will each company behave, whether they will cheat on cartel to make bigger profit or they will not, the behaviour of an oligopoly is hard to predict. If companies realize that cartel is not working and other companies are breaking the rules of the cartel and cheat a price war breaks out. Oligopolists will produce and price much as a perfectly competitive industry would; at other times they act very like a monopoly. Some small firms may operate at the periphery in national markets dominated by a few, with their actions failing to elicit any reactions, but a giant firm must anticipate reactions from its fellows when it introduces a change.

### ***How oligopolistic companies got into CCI Radar?***

The Competition Commission of India (CCI) has launched a probe by the director general to investigate alleged pricing collusion by the country’s top five tire makers. The order was issued in June 2015 in response to a complaint from the All India Tyre Dealers’ Federation (AITDF) in 2013. According to the eight -page order, AITDF accused Apollo Tyres, MRF, Ceat, JK Tyres and Birla Tyres of engaging in “price parallelism” in the replacement market. According to the AITDF, these five tire makers together contribute to 90% of India’s tire production. The federation also accused the All India Tyre Manufacturers’ Association (ATMA) of patronizing

such practices."

### **Firms operating in the industry**

For the year 2010-11 the business has timed a turnover of very nearly Rs. 30,000 Cr. of which 90-95% has originated from the household market. While there are around 40 tire makers in India, the main 10 tire players represent around 90-95% of the aggregate tire creation in India. The tire business might be isolated into 6 classifications focused around the diverse auto sections that they are produced for.

Top Players in the tyre industry are:

1. MRF India Ltd
2. Apollo Tyres Ltd
3. JK Tyre & Industries
4. CEAT Ltd
5. Balkrishna Industries Ltd
6. Goodyear India Ltd
7. TVS Srichakra Ltd
8. Falcon Tyres Ltd
9. Kesoram Industries Ltd (Birla Tyres)
10. Bridgestone India Ltd



Even in these less than ideal times that we're facing, it's interesting to see how big the Indian tyre industry is. Take April – December 2019, and the number of tyres manufactured was staggering 13.65 crores. Considering that a year ago during the same period, the industry churned out 14.63 crore tyres shall give you a stronger idea. The major chunk of the tyres that are produced and sold in India are for motorcycles, followed by scooters, passenger vehicles, three-wheelers, LCVs, and trucks and buses. Let's take a look at the various tyre companies operating in the Indian market.

### **MRF – Madras Rubber Factory**

MRF is the **largest manufacturer of tyres** in the country. It is started as a balloon factory in Chennai in the mid-1940s, MRF has certainly come a long way. The brand isn't just known in the domestic market but also internationally — with presence in 65 countries. In India, MRF handles manufacturing at eight different plants: Goa, Ankenpally, Medak, Arkonam, Trichy, Tiruvottiyur, Kottayam, Puducherry, and Tiruchirapalli. In terms of the portfolio, MRF makes and sells tyres not just for passenger cars and motorcycles, but also for trucks and buses, farm machinery, OTR vehicles, LCV and SCV, Pickup, 3-Wheeler, etc. It's popularly seen as a brand with a wide variety of tyres on offer. The current range comprises everything from entry-level ones to high-performance and luxury-car radials. MRF has also been commissioned to make vehicle-specific tyres in the past, and while not a lot of brands can handle that, MRF has consistently delivered. *The brand is currently number 1 in overall sales*, but in the domestic car market, it's pipped to second by Apollo. As a replacement tyre brand, it's still ahead. Further cementing its position are the sales figures from 2018 – 19: the company recorded overall sales of Rs 15,837 crore, making an overall profit of Rs 1096.87 crore (after taxation).

### **APOLLO TYRES**

As per 2018 – 2019 data, Apollo has been the most solid performer in the OE segment, in addition to its supreme performance in the CV sector. It means Apollo sells the largest quantity of tyres in the country as original fitment on new vehicles in almost all categories. Headquartered in Gurgaon, Apollo Tyres came into being in 1972, and since then has consistently worked towards a numero Uno position. And by the looks of it, it's not too far behind in the race. It has a presence in over 100 countries and has manufacturing facilities across India (Chennai, Perambra, Limbda, Kalamassery), Hungary, and the Netherlands. It also has an

overseas office in Amsterdam, along with global R&D centres in India and Europe. The company produces tyres for all kinds of vehicles, under the banners Apollo, Vredestein, Kaizen and Regal. While the latter two focus on commercial vehicles (region- specific), Apollo has a wide variety of products: two-wheelers, passenger vehicles, commercial vehicles, off-road vehicles, etc. Apollo's range is budget-orientated but like MRF, it does offer some high-performance and luxury radials as well. In 2018 – 19, Apollo Tyres registered sales of Rs 12,089 crore, registering a net profit of 592.1 crore.

### **BRIDGESTONE**

Bridgestone has been in the Indian market since 1996 and is thus a well-known brand. But while its range isn't as wide as some of the others, the brand has certainly a great following in the Indian market. That's down to the quality of tyres, and the overall brand positioning after all these years. In the Indian market, Bridgestone sells passenger car and SUV tyres while under the Bridgestone Commercial banner, it sells tyres for trucks and buses as well. But that's not where Bridgestone stops, it's also looking at selling smart tyre solutions. These are going to be particularly helpful for fleet operators. Using a strain sensor, they'd be able to remotely check various aspects of the tyre: air pressure, load, and wear. Bridgestone has close to 3000 dealers spread across India and currently produces its passenger tyres at two facilities: Pithampur and Chakan. It has a presence in both the OE sector as well as the aftermarket sector. The current range has widened to accommodate more budget options but on the whole, you get a selection of world-class value tyres at fairly decent prices. The Indian arm of the company is now under its EMEA business unit, and it was just last year when an expansion budget of Rs 350 crore was announced. This was done to ramp up the passenger- car-tyre production to 20,000 units a day

## **CEAT**

Unlike what its popularity might suggest, CEAT is not a brand that was born in India. But over the years, it has perfected the value segment and also its offerings. It's a part of RPG Group, which was established in India in the year 1979. CEAT has been around since 1958 and currently offers a range of tyres for passenger vehicles, two-wheelers, SUVs and pickups, agriculture, earth-movers/construction and commercial vehicles. Currently, the company produces more than 15 million tyres a year. CEAT has a presence globally in about 130 countries and has its headquarters in Mumbai. In India, its tyres are produced at various plants in Ambernath, Halol, Bhandup, Nagpur, Chennai, and Nashik. The company has more than 4500 dealers across the country. And it's a fairly common brand in the OE segment.

During 2018 – 19, CEAT recorded sales of 6913.37 crores, resulting in consolidated earnings of Rs 663 crores (EBITDA; before taxation)

## **GOODYEAR TIRE & RUBBER COMPANY**

Goodyear might not be an Indian brand but it's a household name now. It's been in the country since the early 1960s and that in itself speaks a lot about the commitment it has towards the Indian market. Globally, it has a wide presence and manufacturing facilities in 21 countries. Locally, Goodyear India manufactures at two of its plants: one in Aurangabad and another in Ballabgarh. The range includes tyres for passenger cars as well as the farm segment. Goodyear is used as both OE and replacement tyres. The product portfolio for the Indian market includes some value offerings, high-performance radials, and rugged, off-road-ready tyres. Since it's been around for this long, Goodyear India also understands what the Indian customer wants — and delivers accordingly. In 2018 – 19, Goodyear India made a sale of tyres worth Rs 178,941 lakh, flaps for Rs 50 lakh, and tubes that generated Rs 9486 lakh. This led to a total sale of Rs 1911.9 crores and a profit of Rs 102.07 crores (profit after taxation).

### **TVS Euro grip – (TVS Tyres)**

TVS Srichakra/TVS Tyres was launched in the year 1982 has rebranded its entire range in favour of the new TVS Eurogrip brand. The company currently has about 3000 dealers across India, and exports to more than 70 countries. It handles production at two manufacturing facilities in India: one in Madurai (Tamil Nadu) and the other in Rudrapur (Uttarakhand). TVS has a decent presence in both OEM and aftermarket segments in the market. The current range of products includes two- and three-wheeler tyres, farm and implement tyres, and other specialist-use tyres like industrial pneumatic, skid-steer, multi-purpose, and floatation tyres. The TVS Eurogrip specialises in motorcycle tyres and includes everything from commuter tyres to off-road and high-performance ones. In 2018 – 19, TVS registered a net of Rs 2381 crore and a profit of Rs 103.17 crore (profit after taxation).

### **JK Tyre & Industries**

One of the more prominent names when it comes to Indian motorsports, along with MRF, is JK Tyre. The company has global presence (in 100 countries), both EM and aftermarket sections, and has a total of 12 manufacturing facilities around the globe. Nine of these are in India while the rest three are in Mexico. There are three plants in Mysore, one in Banmore, one in Kankroli, another in Chennai, and three more in Haridwar. Backed by 4000 dealers and 500 individual brand shops, JK Tyre seems to be in total control – much like how its tagline suggests. And it doesn't just cover the entire country physically but also has a presence in almost all market segments as well. JK offers passenger car tyres, motorcycle/scooter tyres, commercial tyres, farm tyres, off-road tyres, three-wheeler tyres, and also retread. JK Tyre launched its first radial in the year 1977, quite a big feat, considering that wasn't exactly common back then. Currently, the development is supported by the Raghupati Singhania Centre of Excellence, Mysore, Karnataka. The range is mainly leant towards the value segment, but there are ones for premium cars as well. And JK also has its very own Smart Tyre that comes equipped with sensors which let you monitor the tyre's health in real-time. In 2018 – 19, JK Tyre posted a revenue (from operations) of Rs 7613 crore and a resultant profit of Rs 204.4 crore (after taxation).

### **Ralco Tyres**

Ralco isn't as common a name as others here, because its parent company Ralson focussed solely on bicycle tyres until the turn of the millennium. This is when it entered the two- and

three-wheeler space under the name Ralco. Going forward in the early 2010s, the company announced its plans to enter the farm equipment and light commercial vehicle space as well. Now, after enjoying its position as one of the most successful bicycle tyre brand and a steadily increasing annual growth, Ralco has announced to enter the heavy commercial vehicle segment as well. And that's not all; Ralco is an original tyre supplier to a variety of EV brands as well. Ralson has been around since 1974 and it's safe to say they know a fair deal about making tyres. Ralco, on the other hand, might be newer but it's been around in the space for almost 20 years. It has close to 5000 dealers and manufactures tyres at its two plants in Ludhiana, Punjab. For the new heavy commercial vehicle project, the company is setting up a new facility in Indore, Madhya Pradesh. In 2018 – 19, Ralco's annual turnover touched Rs 800 crore. Ralco has been fairly strong in the OE market, with popular cars like the Renault Triber and Hyundai Venue being offered with Ralco radials.

### **Continental Tyres (Tires)**

Continental is a Germany-based tyre maker, usually present on a variety of cars in India. The company was set up in 1871 and since then has relentlessly produced high-quality tyres. In India, Continental has its plant in Modipuram. Been around for 50 years, the automotive technology company Continental (of which the tyre division is a part) announced a large investment in 2018, to increase its capacity in India. Globally Continental Tires are available across 12 countries, with 13 plants (including India), and headquarters in three locations (Hanover, Petaling Jaya, and Fort Mill). The Indian range of tyres from Continental includes products for hatchbacks and saloons, SUVs, and high-end cars. While Continental Tires doesn't have a unidirectional or high-performance tyre on offer, the ContiSport is one of the revered ones.

### **Michelin**

We've all seen and adored Bibendum (Michelin's mascot, the tyre man), but the brand's products are equally lovely. The headquarters is in France, but its presence isn't limited to one — Michelin currently serves 171 countries through 5000 of its tyre distribution and service centres. It has 69 R&D centres including one in India. In the country, the brand sells high-quality tyres for two-wheelers, passenger vehicles, commercial vehicles, and off-road vehicles. It also manufactures tyres for trucks and buses at a production facility in Chennai, while the rest is imported. The Indian office is in Gurgaon. For passenger vehicles, the tyre range has some neat energy-efficient tyres, ride-orientated ones, special off-road- ready products for SUVs, and class-leading high-performance tyres made to satiate the enthusiast's needs. For two-wheelers,

you get road-focussed ones for motorcycles and scooters, off-road-ready tyres, and products for use on high-end motorcycles.

### ***Industry snapshot, leading players***

Madras Road Factory (MRF), Apollo tyres, JK Tyre and Industry are the leading players in the tyre industry which also includes multinationals like CEAT and Goodyear India along with Indian players like Balkrishna Industries Ltd. MRF is a market leader in the Indian Tyre Industry with a market share of ~30%. It has total turnover of Rs. 8589.68 Cr. with average margin of 3.37% which is lower than industry average of ~4%. Its Net Sales has grown strongly with a 5 year CAGR of close to 18%. It also has one of the highest Net Profit growth rates with a growth of 68.3% CAGR over the last 5 years. However, in terms of net sales growth and highest profit margins, Balkrishna Industries Ltd. is far ahead from other industry players. Its Net Sales has grown strongly with a 5 year CAGR of 27.87%. It also has highest profit margin of 10.55% (5 year average) in the industry. This is because it operates in Off- the-Road tyres, a niche segment."

### **2.1.4 Pricing Strategies in the Industry**

Pricing is extremely important when it comes to selling tires as consumers continually look for the "cheapest tire in town." However, offering top-notch service and telling customers that paying just a little more for their tires will help ensure quality and durability can go a long.

Establishing price is based on three things:

- 1) Your costs
- 2) The profit you hope to make
- 3) The price your customers are willing to pay

Tyres are priced at a premium owing to their quality and brand image. The premium tyres are kept at a high price to assure quality. The other prices are maintained based on the market conditions. As the tyre market is very price elastic, the maintenance of the price has to be proper as the customers can switch easily. Most of the firms have followed a strategy of raising price and decreasing the cost which proved beneficial to them. Following this they could sell a lesser number of tyres but the profit margin was high. The pricing remained



stable with a decline in the raw material cost. The customers are very happy with the pricing of the company. Only the price in the European market has increased due to the Euro and US issues. Tires were ordered as needed and they take advantage of specials and seasonal trends.

**Here are several pricing strategies to consider:**

**Discounts** – Generally, businesses discount prices to introduce products, encourage early-bird buyers, reward prompt payment, extend the selling season, clear out slow-moving inventory, and promote volume sales. Base discounts on the return they will produce. Just be wary of discounting too much too often, training people to only buy when there's a sale.

**Price margins** – This strategy typically involves pricing products at a set percentage above cost, setting margins as a group rather than individually. For example, you might establish different margins for different tire brands. You may price one tire line low as a loss leader, then make up the revenue by spreading a price increase across the rest of your lines.

**Captive pricing** – Companies that use this strategy sell a basic item at a low cost, then make up for it by selling the necessary accessories and service at a higher profit. Tire dealers that use this strategy would presumably make their real profits on service, not just on tires.

**Bundled or a la carte** – Consider, also, whether your wisest pricing strategy is to sell a set of tires as one unit or separate tires as several units that are slightly more expensive. You need to weigh the benefit of making the buying choice easy for customers vs. giving them more choices.

No matter which pricing strategy you choose to implement, remember that settling on the “right” price is an ongoing process; it's not a task you handle once a year and then forget about it.

Costs, customer perceptions, market conditions and competitors' pricing change continually. That doesn't mean you should drop your prices immediately just because the tire dealer down the street does; in fact, taking a wait-and-see approach is often the best response.

## **2.1.5 Prospects and Challenges of the Industry**

India holds certain prospects and opportunities which are crucial for the growth of the tyre industry. However, there are a number of roadblocks to its growth which need to be overcome, as the industry looks to contribute to the Government's "Make in India" programme. This section focuses on these prospects, and the challenges of tyre industry.

### **Prospects of tyre industry**

The Indian Tyre industry is expected to show a healthy growth rate of 9-10% over the next five years, according to a study by Credit Analysis and Research Limited (CARE). While the truck and bus tyres are set to register a compounded annual growth rate (CAGR) of 8%, the light commercial vehicles (LCV) segment is expected to show a CAGR of about 14 %. However, we have to also take account of the effect of the global recession on the sector in making these assessments. The growth of the sector is closely linked to the expansion plans of the automobile companies, the government's thrust on development of road infrastructure and the sourcing of auto parts by the global Original Equipment Manufacturers (OEMs). Some significant hurdles towards attaining these projected growth rates could be raw material related price volatility, rupee appreciation and the looming threat of cheap Chinese imports. The Indian tyre companies need to make active efforts to explore newer markets as the existing markets for bus-truck tyres, which account for about 45 % of the total export volume, is nearing saturation. There is also an urgent need to increase the degree of radialization in order to safeguard their share in the export market. Global tyre manufacturers have been making constant efforts to innovate and offer a diverse range of products such as tyres with pressure warning systems, run flat tyres, eco-friendly tyres and energy efficient tyres. In this context, the Indian domestic companies have to pursue a growth strategy of continuous innovation and increasing emphasis on product differentiation.

### **Rising Income Levels**

A study by the McKinsey Global Institute suggests that if India continues on its current high growth path, over the next two decades, the Indian market will undergo a major transformation. Average household incomes will triple over the next 20 years and India will become the fifth largest consumer economy in the world by 2025. Another report by PwC

estimates that by 2021, India's emerging and middle-class segments combined will comprise nearly 900 million people. India is one of the most attractive markets with the rising incomes of the middle class. Emergence of the middle class will drive the passenger car industry which will subsequently fuel the growth of the industry.

### **Penetration Levels of Passenger Cars**

Passenger car penetration levels in India are in a very nascent stage compared to the emerging and developed countries. India has only 10 cars per 1,000 population compared to the world average of 125. For China, this figure is 50 and for other emerging and developed countries it is more than 200. Coupled with the rise of the middle and upper middle classes in the coming years, the penetration levels of passenger cars among the Indian population are expected to increase manifold. This will be a key driving factor for the Indian tyre industry.

### **Increasing Urbanisation**

India is witnessing an increasing rate of urbanisation with a large number of people shifting to the cities and towns for better livelihoods. According to Census 2011, the current rate of urbanisation in India stands at 31.16% in 2011 rising from 27.86% in 2001 and 25.72% in 1991. According to a McKinsey report, it is estimated that by 2030, the share of the urban population will reach 40%. With urbanisation, families are becoming single and nuclear. Female participation in the workforce is increasing rapidly with growing realisation among urban families and among women themselves that women should work, contribute to the family income and secure their financial future. With increasing income, lack of good public transport and safety of women, there is perceptible inclination towards passenger cars and two-wheelers which again is a push factor for the tyre industry. Moreover, a large section of the working population in these new age cities is expected to be young as more than 50% of India's population is below the age of 25, and more than 65% is below the age of 35.<sup>4</sup> This young population has a great propensity for passenger cars and two wheelers that have a strong potential to drive the growth of the automobile and tyre industries.

### **Faster Economic Growth**

India is among the fastest growing economies in the world and is witnessing sustained economic activity in various sectors. Infrastructure development, construction and the housing sector are some of the key areas for which the Government of India has formulated various policies and given certain incentives to drive this sector. In addition, the Make in

India programme will attract investment in the manufacturing sector and spur higher industrial activity. All this will result in a greater demand for industrial and construction tyres. The growth of the agricultural sector and opportunity for farm mechanisation can drive agricultural tyres. The aviation sector in India is still at a nascent stage and the Government of India is planning to push it in the second and third tier cities. This will drive demand for aircraft tyres in the coming years.

### **Growing Radialisation of Tyres**

Radialisation has emerged as a key factor contributing to the Indian tyre industry growth. The passenger cars tyre segment has radialisation to the extent of 98%, while only 36% vehicles in truck and bus (T&B) segment and 40% in light commercial vehicles (LCV) have radialised tyres. Backed by a growing awareness of the cost benefits, continuous improvement in the road infrastructure and stringent implementation of overloading norms and new radial capacities going onstream, radialisation levels in the commercial vehicle space are likely to reach 65-70% over the next four years. Sector Outlook- Tyres, [www.indiatrader.com](http://www.indiatrader.com), Sep 30, 2015 Source: Industry Estimates and ATMA Given the global phenomenon of radialised tyres, there is an enormous scope for radialisation in India and increased investments in radial capacities are expected to yield significant benefits for this industry moving ahead.

### **Challenges**

The global tire market is expected to witness significant growth over the forthcoming years. At the same time, it has become more complex than ever. The increasing number of car types calls for a greater variety of tires. In addition, automotive trends such as eMobility and autonomous driving increase the demand for innovative concepts in tire design and tire production. That's why competitive tire production needs to be highly flexible and able to react swiftly to meet volatile market developments. At the same time, it needs to meet today's high requirements in terms of quality, safety, environmental standards and increasing internationalization. Tire manufacturers require consistent solutions that help them optimize their plants' availability, reduce their TCO and improve time to market. Taking full advantage of digitalization and making use of new business models make it possible to get there.

The tyre industry in India, as discussed above, has several opportunities to grow; however, it

still has a long way to go in order to compete in the global marketplace. This section analyses key challenges faced by the Indian tyre industry that sway growth and competitiveness in the global marketplace.

A DIPP report highlights that rubber (tyres) is one manufacturing industry that has been affected by large imports from China. Due to a slowdown in the Chinese economy, their tyre manufacturers often dump their products in the Indian market which affects the domestic industry.

Although the government has imposed anti-dumping duty, but that is based on loss of profit and is not a deterrent.

Besides, reports suggest that illegal or illicit imports are also a cause for concern. The share of imports from China has gone up to over 50 per cent from just about 20 per cent in the last five years, as per the data available with Automotive Tyre Manufacturers Association (ATMA). Due to rising imports, the domestic industry has been lingering with decline in production and the capacity utilisation of plants has remain subdued.

Other challenge in India is the inverted duty structure for the tyre industry which adds pressure to the players. Analyst said the duty structure needs to be corrected by increasing the customs duty on tyres to keep it at par with the duty attracted by natural rubber, which will help the domestic industry to be competitive. Inverted duty structure is where the key raw material attracts higher customs duty than the finished product. In this case natural rubber attracts more customs duty than the completely built tyres. Also, import of natural rubber needs a prior license and declaration, which increases holding costs making the tyre industry non-competitive.

Furthermore, trade agreements have affected the domestic industry as concessions are

| Duty Structure on Tyre/Natural Rubber |       |                                |
|---------------------------------------|-------|--------------------------------|
| Country                               | Tyres | Natural Rubber                 |
| China                                 | 50    | Lower of 20% or 1,500 yuan/ton |
| Czechia, EU                           | 4.5   | 0                              |
| India                                 | 10    | 25% or ₹ 30/Kg                 |
| Indonesia                             | 15    | 5                              |
| Japan                                 | 0     | 0                              |
| Korea, Republic                       | 0     | 0                              |
| Thailand                              | 10    | 0                              |
| Turkey                                | 4.5   | 0                              |
| Vietnam                               | 37.5  | 4.5                            |

Source: WITS database

### Fig:2.1 Duty structure on tyre

provided on customs duty on finished tyres from countries with which India has an FTA (Free Trade Agreement) but not on natural rubber. Natural rubber falls under the negative list and therefore it increase the cost of tyres made in the domestic market.

Besides, the corporate income tax in India is higher than many other countries, which reduces competitiveness in the Indian tyre industry. In terms of raw material, both natural rubber and crude are controlled by the external environment and little can be done to control the raw material price movement.

#### **Inverted Duty Structure**

Inverted duty structure is a key challenge for the Indian tyre industry. Inverted duty structure is where the key raw material (natural rubber) attracts higher customs duty than its finished product (tyres). The table below shows that India is the only country that has an inverted duty structure for the tyre industry. Even when basic customs duty is 10% for tyres, it is actually much lower than that under various trade agreements for the duty (on tyres) when compared with the basic custom duty of its principal raw material, natural rubber.

Negative Impact of Trade Agreements Foreign trade agreements (FTAs) and regional trade agreements (RTAs) of India will negatively affect the Indian tyre industry and add to its challenges. Trade agreements affect the domestic tyre industry by providing concession on customs duty on finished tyres. Although tyres can be imported to India at preferential/concessional duties under various FTAs/RTAs, they practically provide no concession on import duty of the natural rubber.

#### **High tariff rates on Indian exported tyres**

India has few trade agreements such SAARC preferential trade agreement (SAPTA), India-MERCOSUR Pref. Trade Agreement among its top destinations. Most of the key destinations of Indian tyre exports attract the highest general duty tariff. Absence of any trade agreements with these countries reduces the competitiveness of the Indian tyre industry in relation to other countries.

#### **Greater Import Dependence on Raw Materials**

Greater import dependence on raw material and volatility in the prices imposes challenges for the Indian tyre industry. The tyre industry is a raw material intensive industry. Raw materials account for nearly 72% of the total production cost. Natural rubber is the primary raw material in the production process of tyres and results in 44% of the total raw material cost. However, the Indian tyre industry has to depend upon the imported natural rubber due to a mismatch between production and consumption of domestic natural rubber. India consumes more than 80,000 tons of natural rubber, out of which the tyre industry consumes about two-thirds of the natural rubber. In relation to this, only 40,000-50,000 tons of natural rubber is produced in India. <sup>77</sup>In addition, both natural rubber and crude prices are controlled by the external environment and little can be done to control the raw material price movement internally.

### **Price Arbitrage of the Natural Rubber**

The price of natural rubber in India is quite volatile and is higher than world rubber prices (Bangkok benchmark). The prices of natural rubber are about 10-20% higher than the prices in the international market which is a challenge for the tyre industry. Price arbitrage of natural rubber reduces the competitiveness of the Indian tyre industry in the international market.

### **Quality of Infrastructure**

The Global Competitiveness Report of 2014-15 depicts India poorly among the BRICS and other developing countries on the quality of infrastructure with a score of 3.7 (out of 7), and ranks it 90 among 144 countries. Lack of adequate physical infrastructure (roads, ports, airports, railways, water and energy, etc.) has been identified as one of the biggest challenges that India faces. The mid-term appraisal of the 11th Five-Year plan noted that the country has been adversely impacted on an average by 1-2% points due to infrastructure bottlenecks. An empirical study by Gupta et al. reveals that the manufacturing sectors that are largely dependent upon the availability of infrastructure are hurt. Indian states with poor infrastructure have not performed well in the manufacturing sector.

### **Growth of the tyre industry is constrained by some challenges faced by the industry:**

- Inverted duty structure reduces the competitiveness of the domestic industry and

encourages volumes of cheap imported tyres despite adequate domestic capacity already in place.

- Negative impact of trade agreements where tyres can be freely imported whereas natural rubber is in the negative list across all FTAs/RTAs except with Sri Lanka.
- Most of the key destinations of Indian tyre exports attract the highest general duty tariff and the absence of any trade agreements with these countries reduces the competitiveness of the Indian tyre industry in relation to other countries.
- Greater import dependence on raw material (natural rubber and crude oil) and volatility in their prices imposes challenges for the industry.
- Due to an increase in the cheap imports of tyres from China, the production of tyres in India has declined and the capacity utilisation of plants has remained subdued.
- Lack of adequate infrastructure (India ranks 90 among 140 countries) in comparison to other countries reduces the competitiveness of the manufacturing industry.
- 

#### ***New challenge offered by 2020 and 2021: Tyre Industry affected by COVID-19***

The COVID-19 pandemic has wreaked havoc in every other manufacturing industry across the globe. And with the automotive industry facing temporary suspension, the tyre industry in India predicts a loss of nearly Rs 5000 crore in the coming months. As per the tyre sector experts, prior to the Corona virus crises, the industry was gaining momentum and performing somewhat better around January this year compared to the same period last year. Infected cases in India are rising on a daily basis forcing established auto and tyre manufacturers to close down their production facilities to a certain or indefinite period. So let's see how the lockdown leading tyre manufacturers in the country are complying with the state and central government's attempt to ensure social distancing of their staff and workers.

#### ***Apollo Tyres Ltd.***

The leading tyre manufacturer for cars, SUVs and Truck & Bus Radials (TBR), etc., Apollo Tyres' manufacturing units across India are under suspension. Its plants in the states of Kerala, Gujarat and Tamil Nadu are shut till March 31, 2020. Apollo has taken many precautionary approaches to ensure the safety and well-being of its employees. During the COVID-19 outbreak, the staff members of various departments are instructed to work from home during the lockdown period. Owing to the grave impact of the pandemic on the automotive industry, the leadership team and senior management of Apollo Tyres has



declared a voluntary reduction in their pay. The Gurugram-based tyre giant sees 25 percent cut in the salary of the leadership team, while the senior management comes forward with the voluntary cutback of 15 percent in their salaries. “Apollo Tyres has a diversified and multinational presence and the pay cuts will affect all senior management at the global level. Coronavirus is impacting sales and profitability across the automotive industry as anticipation builds that the worst is yet to come with COVID-19”, Chairman & Managing Director, Onkar S Kanwar said in a statement.

### ***JK Tyre & Industries***

Following Apollo, JK Tyre was the second tyre maker to announce a pay cut for its senior management. Showcasing solidarity in the times of deteriorating market conditions due to COVID-19 pandemic, JK Tyre directors and others see a salary cut of 25 percent, while the senior management opts for a voluntary cut back of 15-20 percent. This pay cut, due to unfavourable effects of Corona virus, is applicable throughout JK Tyre conglomerate in India and across its global operations. According to JK Tyre statement, “Tyre Industry has been passing through difficult times owing to unprecedented slow down and disruption in the supply chain. This has been aggravated by the impact of COVID-19 pandemic. It is anticipated that the situation may worsen further”.

### ***MRF Limited***

The Chennai-based tyre maker has suspended the activities of all its manufacturing plants across India due to the fight against COVID-19. In addition to the facilities, MRF has also shut down its head office and sales offices under the ongoing 21-day lockdown. The prominent tyre maker owns nine manufacturing plants that include four in Tamil Nadu, two in Telangana and one each in Kerala, Puducherry and Goa. The four sales networks of MRF are also facing a similar fate during the lockdown announced by the Prime Minister.

### ***CEAT Tyres***

Going with the various advisory directives issued by the Central & State Government of India during the novel Coronavirus, CEAT has suspended all its manufacturing operations pan India. The Mumbai-headquartered tyre and tube manufacturer issued a statement which said

that the company is taking all the suggested preventive measures to safeguard the health of its personnel and to evade the spread of the fatal disease. Given the critical situation, CEAT is practising the work from home policy for all its offices.

### ***Current Outlook of the Leading International Tyre Brands***

#### ***Michelin***

French tyre maker Michelin has temporarily stalled its tyre manufacturing units in North America, Canada, and other regions sighting the adverse effects of COVID-19. After the phased suspension of two weeks, the production of some critical tyre products will commence, which includes the manufacturing of critical tyres. Meanwhile, the distribution of Michelin products will remain intact through logistic activities and will support customers with available inventories. On the suspension of production Michelin stated, “While we are facing some supply chain disruption, our components, semi-finished and finished products are still able to circulate. As the situation changes we will make adjustments to our production accordingly. It is still too early to assess any possible impact this situation could have on our industry long-term.”

#### ***Bridgestone***

One of the world’s largest tyre manufacturers, Bridgestone has shut down its production factories in Latin America and North America. The temporary lockdown will continue for the next 3 weeks, which will affect the lives of more than 15,000 employees at its tyre facilities. The Japanese tyre giant’s facilities will remain closed till April 12, 2020. The tyre giant has asked its headquarter workforce to work remotely for a period of one month due to the spread of coronavirus pandemic. Moreover, Bridgestone has also limited the domestic and international business travel of its employees.

#### ***Nokian Tyres***

The Finnish tyre maker has slashed the number of staff members at its Finland factory. And more than 1600 employees working at the plant are sent on temporary leave, as a

precautionary measure. The representative of Nokian Tyres cleared the air stating that besides the COVID-19 pandemic, another main reason for the shrink in the workforce was the sluggish demand in the European car and tyre market.

### ***Goodyear Tyre & Rubber Co.***

The American tyre major halts operations across all its production units in the United States (US). Goodyear facilities will be shut till April 3, 2020, or until further notice during the critical corona virus pandemic. In a phased manner, the company will wind down its factories in Brazil, Canada, Chile, Colombia, Mexico and the United States in the coming times. As per Goodyear, the shutdown is resulted due to, "the sudden decline in market demand resulting from the rapid spread of the COVID-19 pandemic". Society of Indian Automobile Manufacturers (SIAM), the auto industry body, stated that the shutdown of the production factories of various automakers and component manufacturers during COVID-19 pandemic will trigger a loss of over Rs 2,300 crore per day.

The tyre industry in India was already in a quandary with depriving automotive sales owing to the BSVI transition and global slowdown in the international automotive industry. And with the spread out of Corona virus pandemic, the situation has only worsened for the tyre companies. As per a study, the tyre demand is anticipated to keep low even post lockdown and will take some months to get the business on track.

## **2.1.6 Key Drivers of Industry**

### **Performance drivers**

#### ***1) Riding on India's automobile sector's growth: A global auto manufacturing hub***

With increasing per capita income, infrastructure development and growing urbanization in India, the automobile industry has grown significantly in this decade. The outlook for the domestic automobile industry in India remains robust supported by India's growing importance as an automotive export hub for small cars. Most of the overseas automobile players are planning to set up their manufacturing plants in India. Therefore, the growing demand for automobile products is expected to fuel the growth in the tyre industry.

## ***2) Increasing radialisation level on back of infrastructure development***

Based on their construction, tyres are of two types – ‘cross-ply or bias tyres’ and the fuel-efficient ‘radial tyres’. The Indian tyre industry was mainly a cross-ply/bias tyre industry. Now, the market has been shifting towards radial tyres. While bias tyres are sturdier and better suited for extreme road conditions, radial tyres provide better mileage and have a higher life.

(The table given below gives the radialisation levels in different segments in India.)

|   |            |
|---|------------|
| <b>Passenger Car tyres</b>              | <b>98%</b> |
| <b>Light Commercial Vehicles</b>        | <b>18%</b> |
| <b>Heavy Vehicles (Truck &amp; Bus)</b> | <b>12%</b> |

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The low level of radialisation in the truck and bus segment in India is mainly due to poor road conditions. The Indian T&B tyres are expected to perform, under different and extreme road conditions, from zig-zag village roads to newly constructed national highways, prevailing in different geographical parts of the country. As a result, while the world average radialisation for this segment is 68%, in India it is just 12%. The Government has been focusing on improving the roads and has proposed huge investments in roads development (for ex- 35,000 km of highways during FY 2008-09 – FY 2013-14) to improve connectivity. Hence, we expect that such future road development projects will gradually increase the radialisation level in T&B segment and overall tyre demand.

## ***3) Robust capacity expansion: A key growth driver***

The Indian tyre manufacturers had a total installed domestic tyre capacity of 122 million tyres

in FY10-11. According to a research report by ICRA, with good demand from both OEM and replacement market, the total installed domestic tyre capacity is expected to increase by more than 47% to around 180 million tyres by 2012-13. Considering the demand for T&B tyres and its low radialisation level, the TBR segment is expected to attract the highest share of

| Players          | Investment (In Crore) | Products        | Expected date of Completion |
|------------------|-----------------------|-----------------|-----------------------------|
| MRF Ltd.         | 1372                  | PCR & 2W        | Sep-11                      |
| JK Tyre          | 1000                  | TBR & PCR       | Mar-12                      |
| JK Tyre          | 500                   | TBR & PCR       | Mar-13                      |
| Balkrishna       | 1200                  | Speciality Tyre | Dec-12                      |
| Falcon Tyres     | 870                   | 2W & 3W         | Mar-12                      |
| Kesoram Industry | 1000                  | TBR & PCR       | Mar-13                      |

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investments (over 50%) over the next three years followed by the passenger car segment. The total capital expenditure is expected to be around Rs. 17,500 Cr. over the period of 2010-2013. Below given table shows the planned expenditure of the major players. With this expansion plan, the tyre industry' revenue will grow significantly in the future but margins would be under pressure due to an increase in debt, competition and higher raw material cost.

#### **4) Vast distribution network**

The tyre companies have built a vast distribution & marketing network in India. The distribution system consists of distributors, followed by large dealers and then small/sub dealers. There are more than 5000 dealers across India. As a result of that all categories of tyres are readily available in all parts of the country including villages. The distribution network is primarily needed for the replacement market.

***So, is there anything to be concerned about?***

##### **1) Volatile raw material prices**

The key raw material for the tyre industry is natural rubber. Rubber prices have been very volatile over the years. This volatility affects the margins of the company. In FY10-11, due to

lower production and higher demand for rubber, rubber prices had surged from Rs 160/kg in April 2010 to Rs 240/Kg in March 2011, which resulted in losses to many of the players. Prices will remain a key concern for the industry in the near future as well due to lower production and higher demand.

### ***2) Inability to pass on price rise to OEMs***

The ability to pass on sharp rises in raw material prices to OEMs remains a challenge for industry players. Generally, many tyre manufacturers are unable to pass on higher raw material prices to OEMs, due to bulk demand fearing loss of market share. In contrast, tyre players enjoy better pricing power in the replacement market. But now, the pricing power in the replacement markets has also been affected, due to competition from lower-priced Chinese imports. Hence, the competition will increase in the future due to the import of lower-priced tyres and possible backward integration from OEMs. This will lead to lower growth for many players.

### ***3) Stagnant Export due to competition from low cost manufacturing tyre countries***

The Indian tyre industry is dominated by a domestic market which contributes around 90-95% of the total industry turnover. The export market share to the total tyre industry turnover has been stagnant over the years. This is because of capacity constraints and intense competition from China and other South East Asian countries in tyre exports to other countries. The quality of Indian tyres is better and has wider acceptance. However, due to lower prices and higher tyre production, Chinese tyres are cutting into the share of the Indian tyre exports.

### ***4) Rising interest rates make finance expensive***

The tyre industry is a capital-intensive industry. Many tyre players have planned huge investments in India to expand their tyre production capacity which will be funded largely by debt. However, the government in its bid to counter inflation has been steadily increasing interest rates and is expected to continue with this in the near future. Hence, rising interest rates may affect the profitability of the tyre players.

## *Demand Drivers of the Industry:*

### 1) **Industrial and freight activity**

The truck and bus tyre segment accounted for 19% of tyres produced in India. Every truck/bus manufactured generates a demand for seven tyres. In addition, the price of a truck tyre is significantly higher than that of a passenger car tyre (roughly 10 times). Thus the demand multiple emanating from the commercial vehicle segment is highest in value terms.

### 2) **Personal purchasing power**

As the economy booms and disposable incomes in the hands of the Indian middle-class burgeon, the sale of passenger cars has been witnessing an upward swing over the past decade. Since tyre sales are directly linked to car sales, both through OEMs and the replacement market, the tyre industry has witnessed a corresponding increase in its sales figures.

### 3) **Automobile sales**

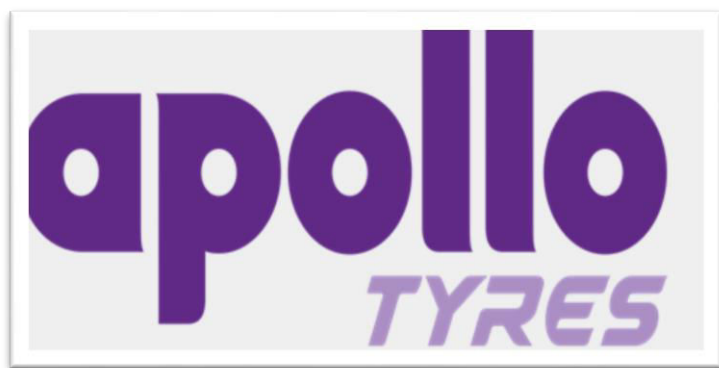
The demand from the OEM segment is a derived one and directly correlated to the level of automotive production. The recent Slowdown in automotive industry and global economic in general negatively impacted the Indian tyre industry. Competition: Indian tyre industry is facing intense competition from China and other South East Asian countries in tyre exports to other countries. Though the quality of Indian tyres is better and has wider acceptance, due to cheaper pricing, higher volumes and aided by Government support and subsidies, Chinese tyres are cutting into the share of Indian tyre exports. There is a need to promote India Brand for tyres as one which spells quality and higher standards.

## **Outlook on key drivers of tyre industry:**

- ❖ **Replacement demand**
- ❖ **Rising automobile sales**
- ❖ **Scope in radialization**
- ❖ **Increasing exports**

## ❖ Road projects in the pipeline

### 2.2 Company Profile



Apollo Tyres Ltd is the world's seventh largest tyre manufacturer, with annual consolidated revenues of ₹172.76 billion (US\$2.46 billion) in March 2018. It was incorporated in 1972. Its first plant was commissioned in Perambra, Thrissur, Kerala, India. The company now has four manufacturing units in India, one in Netherlands and one in Hungary. It has a network of nearly 5,000 dealerships in India, of which over 2,500 are exclusive outlets. It gets 69% of its revenues from India, 26% from Europe and 5% from other geographies.

Apollo announced its entry into the two-wheeler tyre segment with contract manufacturing in March 2016. In November 2016, the company signed a MoU with the Government of Andhra Pradesh to set up a new factory in Andhra Pradesh to manufacture tyres for two-wheelers and pick-up trucks. The company's second plant in Europe, was inaugurated by the Hungarian Prime Minister, Viktor Orban, in April 2017. Apollo Tyres opens its first service centre in Malaysia.

Apollo Tyres Ltd. was incorporated on 28 September 1972 as a Public Limited Company and obtained certificate of Commencement of Business on 24 October, 1972. The company was promoted by Bharat Steel Tubes, Ltd., Raunaq International Pvt. Ltd., Raunaq & Co. Pvt. Ltd., Raunaq Singh, Mathew T. Marattukalam and Jacob Thomas. In 1975, the company made its Initial public offer of equity shares and its first manufacturing facility was commissioned in Perambra Plant, Thrissur, Kerala, India in 1977,<sup>[1]</sup> followed by its 2nd plant at Limda, Gujarat, India in 1991. The company acquired Premier Tyres Limited- PTL in 1995, which became its 3rd plant at Kalamassery, Kerala, India. In 2008, it started a new plant at Chennai, Tamil Nadu,



India. A year later in 2009, the company acquired the Netherlands-based tyre maker Vredestein Banden B.V. (VBBV) for an undisclosed sum

The company focused on the production of truck tyres in India and introduced its first truck tyre, Rajdhani in India. The company expanded its operation across India and in 1996, it expanded operations outside India by acquiring Dunlop's Africa operations. In 2013, it disposed of the Dunlop brand in Africa along with most of the South African operation in a sale to Sumitomo Rubber Industries of Japan. The very same year, it started its Global R&D Centre, Europe in Enschede, the Netherlands.

In 2015, Apollo Tyres bought Germany's Reifencor for €45.6 million. It shifted its corporate office for Europe region to Amsterdam from Enschede, the Netherlands and opened a Global R&D Centre, Asia in Chennai, India a few months later.

In 2016, the company signed an MoU with the government of Andhra Pradesh to set up a new factory in the state. In 2017, it inaugurated its plant in Hungary. On 9 January 2018, the Chief Minister of Andhra Pradesh, N Chandrababu Naidu laid the foundation stone for Apollo Tyres' ₹1,800-crore tyre factory in Andhra Pradesh.

The plant will come up over a 200-acre site in Chinnapanduru village near Sri City in Chittoor district and produce passenger car radial (PCR) tyres with an initial capacity of 5.5 million tyres per year and will serve both domestic and export markets.

## HISTORY OF THE COMPANY

| YEAR | EVENTS  |
|------|---|
| 1976 | Apollo Tyres was registered                       |
| 1977 | 1st plant established at Perambra, Kerala, India. |

|      |  |
|------|--|
| 1991 | 2nd plant at Limda, Gujarat, India.  |
| 1994 | Started selling tyres for 2-wheelers.  |
| 1995 | 3rd plant at Kalamassery, Kerala, India  |
| 2000 | Exclusive radial capacity established in Baroda.   |
| 2004 | Launch of Apollo Aclere-‘H’ Speed Rated Car Radials.   |
| 2005 | April 13, Perambra plant completes 30 years.   |
| 2006 | Expanded operations outside India by acquiring Dunlop's Africa operations.                                   |
| 2008 | New plant at Chennai, Tamil Nadu, India.   |
| 2009 | Apollo Tyres acquired the Netherlands-based tyre maker Vredestein Banden B.V. (VBBV) for an undisclosed sum. |
| 2015 | Apollo has bought Germany’s Reifencom for €45.6 million.   |
| 2017 | Started its first Greenfield Plant in Hungary with advanced technology.                                      |

## VISION

A significant player in the global tyre industry and a brand of choice, providing customer delight and continuously enhancing stakeholder value.

## **OBJECTIVE**

Apollo Tyres believes that to truly move up the value chain, it is critical to use fewer natural resources to produce more. For a growing organization, with a long-term focus and commitment, it is critical to safeguard resources for the future even as it creates value today. At Apollo, emphasis is laid on using natural resources cautiously and with care.

## **GOAL**

As an organization, Apollo Tyres is committed towards creating values for its stakeholder. And the crucial link here is building a sustainable business, driven by strategic growth and responsible actions.

## **VALUES**

- Customer First
- Business Ethics
- Care for Society
- Empowerment
- Communicate Openly
- One Family

## **MANUFACTURING CENTERS**

Plants located In India:

- Apollo Tyres Ltd, Perambra, Kerala.
- Apollo Tyres Ltd, Kalamassery, Kerala.
- Apollo Tyres Ltd, Baroda, Gujarat.

- Apollo Tyres Ltd, Chennai, Tamil Nadu.

Plants located abroad:

- Apollo Tyres, Bulawayo, Zimbabwe.
- Apollo Tyres, Ladysmith, South Africa
- Apollo Tyres, Vredestein B V, Netherlands.
- Apollo tyres, Hungary.

### **PERAMBRA PLANT**

Apollo Tyres, Perambra plant is the single largest truck tyre plant in India. Since the company started its first plant in Perambra, Apollo Tyres, Perambra is the mother plant of Apollo family. The company is spread over 95 acres of land. Perambra unit is having a turnover of 2200 crore. It employs 3000 employees out of which 2043 workers are permanent workers, 677 are contract workers and 280 are apprentice who have come for one year of training. The total plant capacity of Perambra plant is 3.3 metric tonnes per day.

### **CORPORATE STRATEGY**

The strategic factor that the company satisfies is the strength of having a wide range of products. They must be able to continue to maintain many products varieties and build on them efficiently. Using R & D to overcome the problem of pasteurization as well as satisfying growing global demand is not an easy task and hence requires time and efficiency to meet the needs globally. Apollo Tyres Ltd, with its corporate headquarters in Gurgaon, India, is in the business of manufacture and sale of tyres since its inception in 1972. Over the years, the company has grown manifold, establishing its footprint across the globe.

### **MARKETING STRATEGY**

Apollo Tyres has plans on increasing their market share significantly in the passenger vehicle segment in India with the launch of the 4G range of tyres. The company also has ambitious plans to be a strong contender in the global markets as well. Reiterating their focus on the passenger vehicle tyre segment. Apollo Tyres is the largest producer of passenger vehicle tyres in India with a capacity of 35000 tyres per day. In the last one year, the company has managed to increase their market share in the replacement tyre market from 13.5 per cent to 16 per cent.

With the addition of these three new tyres aimed at a wider market ranging all the way from the Maruti Suzuki Alto to the Audi A4, Apollo is definitely looking at a larger share of the passenger tyre pie.

## **FINANCE AND FUTURE**

### **1.Raw material price volatility**

Natural rubber is an agricultural commodity and subject to price volatility and production concerns. Most other raw materials are crude linked and are affected by the movement in crude prices. Any increase in crude oil prices may impact prices of some of the raw materials.Both natural rubber and crude prices are controlled by external environment and little can be done to control the raw material price movement internally.

### **2.Ability to pass on increasing cost in a timely manner**

Demand supply situation must remain in favour of the industry to enable it to undertake price increases.This is further impacted by competitive activities and a general reluctance as seen in the past, particularly in India, to make quick and significant price hikes.

### **3.Continued economic growth**

Demand in the tyre industry is dependent on economic growth and/or infrastructure development. Any slowdown in the economic growth across regions impacts the industry fortunes.In Europe, the company's winter tyre sales are subject to seasonal requirements, which can be adversely impacted in case of a mild winter season.

### **4.Radialisation levels in India**

Slower increase in radialisation level in truck tyre segment, than expected, may impact Indian operations. Excess capacity may result in competitive pressures and decline in profit.At the same time, an unexpected quicker increase in the level of radialisation can result in faster redundancy of cross ply capacities and create a need for fresh investments.

### **5. Future Growth**

Lower profitability due to some of the above factors impacts the ability to invest in future growth . Increased competition from global players like Michelin, Bridgestone and Continental in India.

## **SWOT ANALYSIS**

### **STRENGTHS**

- Apollo Tyres has the advantage of a diversified market base across geographies and is therefore, not dependent on a single domestic market. Furthermore, the company is working to establish and grow operations in other large international markets as well.
- The company is powered by strong global product brands in its markets – Apollo and Vredestein.
- Apollo Tyres enjoys an extensive distribution network for its key brands across its key home markets. • In Europe, the company’s brand ‘Vredestein’ has an established presence and enjoys premium positioning in ultra-high performance (UHP), winter and all season passenger car tyre segments.
- The company is a leading player in the Indian commercial vehicle segment – which accounts for the bulk of the industry’s revenue. Since the company assumed an early lead, Apollo is best positioned to maintain its leadership position in the truck-bus radial segment and drive growth through the same.

### **WEAKNESSES**

- India has a large and growing 2-3 wheeler tyre segment. However, Apollo does not manufacture tyres for this category and has continued to focus on other product segments.
- At times in the past, the company has been unable to timely pass on raw material cost escalations to consumers, due to intense competition and various market dynamics. This has a direct impact on the margins.
- The company is currently not present in the European OEM market for regular passenger car tyres which to a certain extent drives the replacement market sales.

### **OPPORTUNITIES**

- In India, Apollo Tyres enjoys early mover advantage in the truck-bus radial segment and has a healthy lead over its competition in terms of capacity and market share. This implies healthy growth prospects with increasing radialisation.
- The company's Apollo branded passenger vehicle tyres are being sold in Europe and this could develop into a sizable market for the same, leveraging its already existing network in Europe.
- With the announcement of Apollo's Greenfield plant in Hungary, the company is positioned to grow in the European market through an added cost competitive manufacturing facility.
- The company continues to increase its focus to new geographies like South America, Middle East and South East Asia. These would be growth avenues for the future.
- The company can convert excess bias capacity into industrial tyres capacity and tap into a new product segment.
- The company is talking to auto majors for OEM fitments in Europe. This would establish the brand even more strongly and drive significant growth in European market.
- The company would look to introduce products and make an entry into the European Truck, Bus & OHT segments.

## **THREATS**

- Economic downturn or slowdown in the key markets – Europe and India – can lead to decreased volumes and capacity utilisation.
- Increased competition from global players like Michelin, Bridgestone, Continental in India.
- Increased competition from truck radial imports from China resulting in a quicker than expected decline in volumes within the truck-bus cross ply segment, creating redundant capacities requiring investment to convert into other product segments.
- Continued threat of raw material price volatility translating into pressure on margins during a rapid rise in raw material prices.
- Weak currency resulting in pressure on margins, since the company is a net importer.

- Growing influence of budget tyres, mainly tier 2 and 3 brands from established European manufacturer.

### **PRODUCTS OF THE COMPANIES**

- Passenger car tyres.
- Alloy wheels.
- Sports utility tyres.
- Van tyres.
- Passenger winter tyres.
- Heavy commercial tyres.
- Small commercial tyres.
- Agricultural tyres.
- Tube less tyres

### **CURRENT MARKET STATUS**

Apollo Tyres Ltd is the world's 17th biggest tyre manufacturer, with annual consolidated revenues of Rs 117.1 billion (US\$1.8 billion) till March 2016. It's the 3rd biggest tyre manufacturer in India after MRF & CEAT. The company now has four manufacturing units in India, and 1 in Netherlands i.e. the Vredestein Banden B.V. (VBBV). With 16,000 plus employees from 20 nations it's running flexibly with a network of 70 plus countries for the export purpose.

### **FUTURE EXPANSION**

The practice of re-treading, which is gaining increasing acceptance, could pose a challenge to replacement demand in the medium term. The ability of the re-treading sector to capture potential Replacement demand would depend on the awareness among customers (of benefits re-treading) and also the quality of re-treading done. Given the low levels of Penetration of Two-Wheelers and passenger cars in the country, OE manufactures demand is likely to increase, which in tum would



push up Replacement demand with a lag.

The prospects of tyre exports on India appear healthy, following efforts by Indian Companies to increasingly enter into outsourcing agreement with tyre producers in Southeast Asia, Eastern Europe and Latin America. Overall tyre manufacturers are likely to tap the export market in an effort to boost sales. The Increasing exports of bus and truck tyres (Cross ply variety) from India to developing countries is because of the fact that developing countries are unable to source them from developed countries as these are no more produced there. Tyre imports are unlikely to pose a threat to the domestic industry, given that domestic prices are lower than International tyre prices. In the domestic market, Tyre manufacturers are expected to increasingly focus on expanding their dealership networks and explore possibilities of tie ups among themselves to penetrate the growing customer base. They are also likely to peruse innovative measures (Such as "dial-a-tyre service and road shows) to improve customer awareness.

The consolidation of the Indian Tyre Industry likely to continue in the coming years through mergers among existing players. The industry is likely to expand through a Combination of Organic and inorganic growth. They also expand the production of tyres into "OH" Tyres (06 Highway Tyres). While Organic growth would come from raising efficiency levels, inorganic growth would be achieved through alliances and Mergers & Acquisitions. Apollo is one of the largest corporate investors in developing sporting talent through its Mission 2018, which is focused on nurturing and training youngsters in the sport of tennis to enable an Indian to win a Singles Grand Slam Championship by the year 2018.

## **CORPORATE SOCIAL RESPONSIBILITY(CSR)**

The key element of CSR is the development of community around. Without their support the company cannot function smoothly.

Apollo TyresLtd'sCorporate Social Responsibility (CSR) stem from its vision statement of "... continuously enhancing stakeholder value". The overall aim is to add value to the lives of stakeholders, through not-for profit initiatives, with the objective of ensuring that all programmes and initiatives remain sustainable and relevant. The company believes that if CSR are undertaken in the right spirit and process, social initiative can be a long-term risk mitigator and help manage key business and operational changes.

The framework clearly revolve around the principle of 3I's, i.e. Involve, Influence and Impact stakeholders. Apollo Tyres foundation is the body which works dedicatedly towards achievement

of these goals. CSR initiatives taken by Apollo is normally longterm (3-4 years), to work out to sustainable model and to create an impact on the society. Apollo Tyres mainly concentrates on 2 verticals, i.e. social and environmental. Some programs are as follows:

- Health awareness (HIV- AIDS, Malaria and other diseases)
- Environment Programmes (Habitat at Apollo)
- Water conservation
- Climate change mitigations
- River conservation programme
- Water shed management program
- Dead pond restoration
- Ground water recharging
- Mangrove conservation
- Waste management
- Skill development programme
- Vision care programme
- Road safety awareness programme
- Paper recycling
- Cancer awareness and detection programme

**CHAPTER 3**  
**REVIEW OF LITERATURE**

Review of literature is the part and parcel of the scientific investigation, which would enable the researcher to understand the research gap, which will justify the study. A brief review of available literature on various topics related to the study is attempted to add in this section. The objective of the review is to get acquainted with ideas, concepts and methodology covered in the existing literature and to develop an analytical framework based on past studies and reviews.

Inventory is a list for goods and materials, or those goods and materials themselves held available in stock by a firm. It is also used for a list of the contents of a household and for a list for testamentary purpose of the possessions of someone who has died. In accounting inventory is considered an asset.

### **3.1 Brief Theoretical Construct related to the Problem**

Inventory management is the supervision of non-capitalized assets (inventory) and stock items. A component of supply chain management, inventory management supervises the flow of goods from manufacturers to warehouses and from these facilities to point of sale. A key function of inventory management is to keep a detailed record of each new or returned product as it enters or leaves a warehouse or point of sale.

#### **Importance of Inventory Management and Control**

For any goods-based businesses, the value of inventory cannot be overstated, which is why inventory management benefits your operational efficiency and longevity. From SMBs to companies already using enterprise resource planning (ERP), without a smart approach you'll face an army of challenges, including blown-out costs, loss of profits, poor customer service, and even outright failure. A good inventory system will provide high visibility of all items right down to the shelf and bin in multiple locations, if necessary. It will prevent stockouts, allow for ample lead-time to replenish stock, and give you an idea of the value tied up in your stock at any given time. The importance of inventory management are :-

- Inventory management helps in maintaining a trade off between carrying costs and ordering costs which results into minimizing the total cost of inventory.
- Inventory management facilitates maintaining adequate inventory for smooth production and sales operations.

- Inventory management avoids the stock-out problem that a firm otherwise would face in the lack of proper inventory management.
- Inventory management suggests the proper inventory control system to be applied by a firm to avoid losses, damages and misuses.

### **Benefits of Inventory Management and Control**

- **Accurate Order Fulfillment** – Imagine this scenario: A customer places an order and an E-Commerce brand receives the order. The brand sends it to the warehouse only to discover that the product is out of stock. Or just as bad, the E-Commerce brand ships the wrong item. This isn't an uncommon story if inventory is poorly managed. Taking the time to develop a more robust plan can help brands avoid inaccurately filled orders, high return volumes and a loss of customer base.
- **Better Inventory Planning and Ordering** – It's difficult to gauge which products are needed if there isn't a clear way to tell what products are already stocked. If online retailers don't properly manage the inventory they already have, they can easily overstock items, and some of these items might not be strong sellers. Detailed inventory management mitigates these issues, allowing warehouse managers to refresh inventory only when needed. It's both space and cost-effective.
- **Increased Consumer Satisfaction** – Customers that shop online are eagerly awaiting their orders, and there's nothing worse than when their orders arrive not-as-described, late or damaged. When that happens, buyers are less likely to purchase from the brand again. On the other hand, good inventory management leads to orders being fulfilled more quickly and shipped out to customers faster. The enhanced processes can help eCommerce and online retail brands build a strong repertoire with consumers – and keep them coming back.

### **Inventory Management Process**

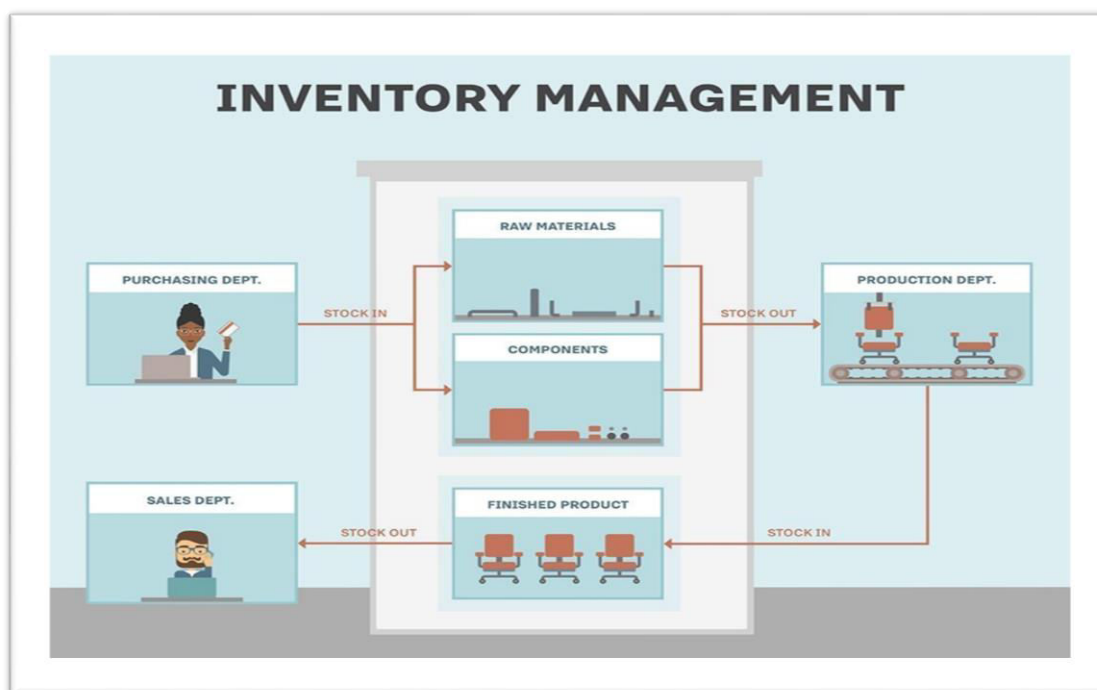
Inventory management is a complex process, particularly for larger organizations, but the basics are essentially the same regardless of the organization's size or type. In inventory management, goods are delivered into the receiving area of a warehouse in the form of raw materials or components and are put into stock areas or shelves. Compared to larger organizations with more physical space, in smaller companies, the goods may go directly to the stock area instead of a receiving location, and if the business is a wholesale distributor, the goods may be finished products rather than raw materials or components. The goods are then pulled from the stock areas and moved to production facilities where they are made into finished goods.

The finished goods may be returned to stock areas where they are held prior to shipment, or they may be shipped directly to customers.

Inventory management uses a variety of data to keep track of the goods as they move through the process, including lot numbers, serial numbers, cost of goods, quantity of goods and the dates when they move through the process.

### Inventory Management Software System

Inventory management software systems generally began as simple spreadsheets that tracked the quantities of goods in a warehouse, but have become more complex. Inventory management software can now go several layers deep and integrate with accounting and ERP systems. The systems keep track of goods in inventory, sometimes across several warehouse locations. The software also calculates the costs -- often in multiple currencies -- so that accounting systems always have an accurate assessment of the value of the goods.



Some inventory management software systems are designed for large enterprises, and they may be heavily customized for the particular requirements of those organizations. Large systems were traditionally run on premises, but are now also deployed in public cloud, private cloud and hybrid cloud environments. Small and midsize companies typically don't need such complex

and costly systems, and they often rely on stand-alone inventory management products, generally through SaaS applications.

## **Inventory Management Techniques**

Inventory management uses several methodologies to keep the right amount of goods on hand to fulfill customer demand and operate profitably. This task is particularly complex when organizations need to deal with thousands of stock keeping units (SKUs) that can span multiple warehouses. The methodologies include:

### **1. Stock Review**

Stock review, which is the simplest inventory management methodology and is generally more appealing to smaller businesses. Stock review involves a regular analysis of stock on hand versus projected future needs. It primarily uses manual effort, although there can be automated stock review to define a minimum stock level that then enables regular inventory inspections and reordering of supplies to meet the minimum levels. Stock review can provide a measure of control over the inventory management process, but it can be labor-intensive and prone to errors.

### **2. Just In Time(JIT)**

Just-in-time (JIT) manufacturing originated in Japan in the 1960s and 1970s; Toyota Motor Corp. (TM) contributed the most to its development. The method allows companies to save significant amounts of money and reduce waste by keeping only the inventory they need to produce and sell products. This approach reduces storage and insurance costs, as well as the cost of liquidating or discarding excess inventory.

Just-in-time (JIT) methodology, in which products arrive as they are ordered by customers, and which is based on analyzing customer behaviour. This approach involves researching buying patterns, seasonal demand and location-based factors that present an accurate picture of what goods are needed at certain times and places. The advantage of JIT is that customer demand can be met without needing to keep quantities of products on hand, but the risks include misreading the market demand or having distribution problems with suppliers, which can lead to out-of-stock issues.

JIT inventory management can be risky. If demand unexpectedly spikes, the manufacturer may not be able to source the inventory it needs to meet that demand, damaging its reputation with

customers and driving business toward competitors. Even the smallest delays can be problematic; if a key input does not arrive "just in time," a bottleneck can result.

### Advantages Of Just In Time

- Lower inventory holding costs
- Improved cash flow
- Less deadstock

### Disadvantages Of Just In Time

- Problems fulfilling orders on time
- Minimal room for errors
- Risk of stockouts

### 3.ABC Analysis

ABC analysis methodology, which classifies inventory into three categories that represent the inventory values and cost significance of the goods. Category A represents high-value and low-quantity goods, category B represents moderate-value and moderate-quantity goods, and category C represents low-value and high-quantity goods. Each category can be managed separately by an inventory management system, and it's important to know which items are the best sellers in order to keep quantities of buffer stock on hand. For example, more expensive category A items may take longer to sell, but they may not need to be kept in large quantities.

### Advantages Of Abc Analysis

- Aids demand forecasting by analyzing a product's popularity over time
- Allows for better time management and resource allocation
- Helps determine a tiered customer service approach
- Enables more accurate inventory optimization
- Fosters strategic pricing



## Disadvantages Of Abc Analysis

- Could ignore products that are just starting to trend upwards
- Often conflicts with other inventory strategies
- Requires time and human resources

## **4. Economic Order Quantity**

The economic order quantity (EOQ) model is used in inventory management by calculating the number of units a company should add to its inventory with each batch order to reduce the total costs of its inventory while assuming constant consumer demand. The costs of inventory in the model include holding and setup costs. The EOQ model seeks to ensure that the right amount of inventory is ordered per batch so a company does not have to make orders too frequently and there is not an excess of inventory sitting on hand. It assumes that there is a trade-off between inventory holding costs and inventory setup costs, and total inventory costs are minimized when both setup costs and holding costs are minimized.

## **5.VED Analysis**

VED analysis represents classification of items based on criticality. The analysis classifies the items into three groups called Vital, Essential, and Desirable. Vital category encompasses those items for want of which production would come to halt. Essential group includes items whose stock outs cost is very high. Desirable group comprises of items which do not cause any immediate loss of production or their stock-out entail nominal expenditure and cause minor disruptions for a short duration.

## **6.SDE ANalysis**

SDE analysis is based on problems of procurement namely:

- Non-availability
- Scarcity
- Longer lead time

- Geographical location of suppliers
- Reliability of suppliers, etc.

SDE analysis classifies the items into three groups called 'Scarce', 'Difficult' and 'Easy'. The information so developed is then used to decide purchasing strategies.

### **3.2 An Overview of Earlier Studies**

Every enterprise needs inventory for smooth running of its activities. It serve as a link between production and distribution process. Generally there is a time lag between the recognition of need and its fulfillment. The greatest time lag, the higher will be the requirements for inventory. The unforeseen fluctuations in demand and supply of good also necessitate the need for inventory. It provides a cushion for future price fluctuation.

Inventories constitute the most significant part of current assets of a large majority of companies in India. Thus it is very essential to have proper control and management of inventories. The purpose of inventory is to ensure the availability of material in sufficient quantity as and when required and also to minimize investments in inventories. The reduction in excessive inventories carries a favorable impact on a company's profitability.

#### **3.2.1 Disadvantages of Old Systems**

As we know the manual processing is quite tedious, time consuming, less accurate in comparison to computerized processing. Obviously the present system is not is exception consultant encountering all the above problems.

- Time consuming.
- It is very tedious.
- All information are not placed separately.
- Lot of paper work.
- Slow data processing.
- Not user-friendly environment.

- It is difficult to find records due to file management system.

### 3.2.2 Advantages of New Systems

In new computerized system I tried to give these facilities.

- Manually system changes into computerized system
- Friendly used interface
- Time saving
- Save paper work
- Connecting to database so we use different type of queries, data report
- Give facility of different type of inquiry
- Formatted data
- Data's are easily approachable

The chapter of the literature review is considered as the most critical chapter of a study as it directly contributes to enhancing the knowledge base of the researcher with regards to the subject matter. In this chapter, the researcher focuses on searching and evaluating differently available literature to gain a better understanding of the topic selected or investigation. The view points and work carried out by the researchers and the authors are taken into consideration in this chapter. Here, different themes are developed by the researcher to gain in-depth information about the topic chosen for the study. The key themes covered in the present section of the literature review are an overview of the tire industry, and its current inventory management and control system.

- **L.Vinesh** (1943) articulated the fact that based on the study how to plan an inventory management, says that we keep all of our sales histories by month, and this data is all we need to make good forecast for inventory planning.

- **Hari R. Swami**(1954) in his research work "Materials Management in Public Undertakings" has evaluated the performance of materials management in the central public undertakings in Rajasthan such as, Instrumentation Limited, Kota unit; HMT,Ajmer unit; Hindustan Zink Limited, Debari unit; Hindustan Copper Limited, Kerri unit and Sandbar Salts Limited. The study covered various aspects of materials management in these enterprises from 1977-78 to 1981-82. The research opined that,materials management should not cover the inspection function, as it requires an autonomous and independent status in the organization. The study revealed that the lead-time in the selected public enterprises was considerably long and suggested to reduce administrative lead-time by expediting purchase files. The study also revealed that the inventory of selected public enterprises had been accumulated due to the following reasons; faulty purchases, heavy rejections, high lead time, uncongenial organization, lack of scientific and modern techniques of materials management, defective inventory control and inflationary tendencies in the economy. He suggested that the inventory holdings could be reduced by adopting integrated system of materials management, appointing qualified and trained inventory managers, reducing lead time, setting and regulating consumption and stocking norms of raw materials and other goods, applying modern techniques of materials management and identifying slow and non-moving items
- **Krishnamurthy's study** (1964) was aggregative and dealt with inventories in the private sector of the Indian economy as a whole for the period 1948-1961. This study used sales to represent demand for the product and suggest the importance of accelerator. Short- term rate of interest had also been found to be significant.
- **Dcshayis study** (1965) a study on inventory management system explains. The more expensive a software system is, the better it will help us to control over inventory.

**Trinky.M** (1965) articulated the study that, inventory management is not limited to documenting the delivery of raw materials and the movement of those materials into operational process. The movement of those materials as they go through the various stages of the operation is also important. Typically known as a goods or work in progress inventory, tracking materials as they are used to create finished goods also helps to identify the need to adjust ordering amounts before the raw materials inventory gets dangerously low or is inflated to an unfavorable level.

- **Krishnamurthy and Sastry's** study in (1970) was perhaps the comprehensive study on manufacturing inventories. They collect the comprehensive manufacturing inventory data and consolidate balance sheet data of public limited company published by RBI they say that material management is needed both micro and macro levels of an organisation.
- **K.Rajakumar**(1976) in his study on sales data and inventory management. the sales data that we have in our company records, is all we needed for inventory management.
- **Rajesh Sharma** (1976) in his study ,Just-in-Time is an inventory management philosophy that aims to reduce inventories by implementing systems and processes to supply a product or service exactly when it is needed, and how it is needed in the production process.
- In the year (1976) **Shameela Raj** in his study "Inventory" to many small business owners is one of the more visible and tangible aspects of doing business. Raw materials, goods in process and finished goods all represent various forms of inventory.
- **Rosenblatt** (1977) says: "The cost of maintaining inventory is included in the final price paid by the consumer. Good in inventory represents a cost to their owner. The manufacturer has the expense of materials and labour. The wholesaler also has funds tiedup". Therefore, the basic goal of the researchers is to maintain a level of inventory that will provide optimum stock at lowest cost.
- **Paniswara** (1985) produced a research work entitled to inventory management in Andhra Pradesh State Road Transport Corporation. He mainly suggests the reclassification of stores items based on the criticality, the reification of reorder level and reorder quantities. The study also showed the wastage caused by maintenance of unnecessary stock records relating to items, which were no longer used.

**Basel G.D.**, (1987) in his study on Material Management, A Case Study of Bharat Heavy Electrical Limited, Bhopal unit, (BHEL)', has evaluated the existing systems of inventory management. He emphasized the need for automatic replenishment system in the undertaking. He also studied the application of ABC analysis and EOQ technique of inventory control. He also pointed out the accumulation of surplus stores and non-moving items in the organization. He recommended that the surplus and obsolete stores, which are no longer required, should be disposed off as early as possible at the best available price. Further, he has suggested the preparation of monthly class wise statements on inventories for effective

control over them. And he suggested the introduction of reconciliation of stores' ledgers with account ledgers to avoid misappropriation of stores. The study also revealed that raw material, components and Stores, and spares for production and operation are above their actual consumption level. The inventories in general are found to be above their routine requirements. The holdings of stores and spares generally are of the order of two to three years requirements and these are considered as excess.

- **Rakhav** (1987) articulated the fact that Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer in of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. Competent inventory management also seeks to control the costs associated with the inventory, both from the perspective of the total value of the goods included and the tax burden generated by the cumulative value of the inventory.
- **Rama Krishna Rao B** study in (1987) articulated the fact that, in his thesis inventory management in Heavy Engineering Industry a case study of Bharath Heavy Plate and vessels limited evaluated the performance of inventory. He has evaluated the existing purchase system and lead-time involved in procurement of inventory and suggests that the long lead-time should be avoided.
- According to **K.Poli** (1989) from its article inventory management is a science primarily about specifying the shape and percentage of stocked goods. It is required at different location within a facility or within many location of a supply network to precede the regular and planned course of production and stock of material.
- **Keith** (1994) in their text also stated that the major objective of inventory management and control is to inform managers how much of a good to re-order, when to re-order the good, how frequently orders should be placed and what the appropriate safety stock is, for minimizing stock outs. Thus, the overall goal of inventory is to have what is needed, and to minimize the number of times one is out of stock.
- **Morris** (1995) stressed that inventory management in its broadest perspective is to keep the most economical amount of one kind of asset in order to facilitate an increase in the total value of all assets of the organization human and material resources

- **Sastry's study** (1996) was a cross-section analysis of total inventories of companies across several heterogeneous industries using balance sheet data of public limited companies in the private sector. The study brought out the importance of accelerator represented by change in sales. It also showed negative influence of fixed investment on inventory investment.
- **Drury** (1996) defined inventory as a stock of goods that is maintained by a business in anticipation of some future demand. This definition was also supported by Schroeder who stressed that inventory management has an impact on all business functions, particularly operations, marketing, accounting, and finance. He established that there are three motives for holding inventories, which are transaction, precautionary and speculative motives. The transaction motive occurs when there is a need to hold stock to meet production and sales requirements. A firm might also decide to hold additional amounts of stock to cover the possibility that it may have underestimated its future production and sales requirements. This represents a precautionary motive, which applies only when future demand is uncertain. The speculative motive for holding inventory might entice a firm to purchase a larger quantity of materials than normal in anticipation of making abnormal profits. Advance purchase of raw materials in inflationary times is one form of speculative behavior.

In the year (1996), **Pamela Devi** did a research work entitled "Materials Management in Public Sector Heavy Engineering Industry. A Case Study of Bharat Heavy Plates and Vessels Limited, Vishakhapatnam." She did a comparative study of inventory management practices of BHPV with the public sector heavy engineering units. She also observed that the number of items in the inventory is on the increase and she suggested that enforcing strict control on the delegation of powers should curb it. For determination of the appropriate quantity to be procured and minimum capital without any delay in the production is of importance, in satisfying the conflicting interests. For it, she gave some solutions like SIM (selective inventory management) which consists of Pareto analysis (ABC analysis), criticality analysis (VED analysis), movement analysis (FSN analysis) and availability analysis (SED, GOLF, SOS etc.). Adoption of inventory control methods like classification, codification, and standardization, variety reduction, value analysis, ABC analysis is not systematically implemented. Economic order quantity was not adopted. Vendor rating techniques and value analysis were not followed. Materials management manuals were not even prepared in BHPV. Buying cost or inventory carrying cost of materials was not worked out systematically. Computerization was not extensively done.

- According to **Keller** (2000), inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work-in-progress) and finished goods so that adequate supplies are available and the costs of over or under stocks are low.
- **Julius A. Sharma, Danish K. Sharma and Hari P** (2004) discussed Supply Chain (SC), which involves the configuration, coordination, and improvement of sequentially related set of operations in establishments, integrates technology and human resource capacity for optimal management of operations to reduce inventory requirements and provide support to enterprises in pursuance of a competitive advantage in the marketplace. This paper addresses the structures of supply chain management (SCM) and the activities involved in SCM decisions that help promote profound improvement in efficiency and effectiveness in business operations. In broader context, the paper examines the types of activities involved in SCM decisions; the dynamics of the traditional SCM, the complementarities of technology in achieving effective management of Operations through enablers of electronic data interchange (EDI) and quick response (QR) disciplines to implement Just-in Time (JIT) management techniques; and integrated SC and inventory control as it relates to capacity imbalances and transaction costs.
- **BJ. Grablowsky**, (2005) in his paper "Financial management of inventory" surveyed small business inventory management practices and compared with techniques commonly employed by large corporations. It appears that smaller firms rely on simple controls. Large businesses rely more on quantitative techniques, such as EOQ and linear programming, to provide additional information for decision-making, while small firms are more likely to use management judgment without the quantitative back-up. Of those small firms which did not use quantitative methods for determining inventory order and stock levels, the most common qualitative methods were "past experience" and "executive judgment,".

**Vikram Tiwari and SrinagcshGavirncni**, (2007) in their article "ASP, The Art and Science of Practice: Recouping Inventory Control Research and Practice: Guidelines for Achieving Synergy" focused on the widening disconnect between inventory control research and practice, people debate the value of incremental theory building. While practitioners make decisions in a complex and uncoordinated environment, researchers often adopt a simplistic environment for the sake of rigorous analysis. The stakeholders mismatched objectives and motivations may cause this lack of synergy. Controlling and reducing this disconnects would



benefit both practitioners and researchers. The existing empirical analysis of companies E3 business improvements based on academic inventory-management theories is inconclusive. Even so, some businesses have successfully implemented inventory theory; however in most cases, they have greatly modified the inventory models developed by academics.

- **Brent D. Williams and Travis Toker**, (2008) in their study "A review of inventory management research in major logistics journals: Themes and future directions", discussed that logistics researchers have focused considerable attention on integrating traditional logistics decisions, such as transportation and warehousing, with inventory management decisions, using traditional inventory control models. Logistics researchers have more recently focused on examining inventory management through collaborative models.

### **3.4 Uniqueness of Research Study**

This study is unique in its every aspect because through this study the need and capability of the organization to adopt Inventory Management system is thoroughly analysed. The study data is entirely online data based and the is collected from reliable sources. Most of the data from the company was collected over phone, emails and soft copies. The tools were uses for analysis are updates as well as have advanced techniques.

**CHAPTER 4**  
**METHODOLOGY OF THE STUDY**

## **4.1 Research Approach and Design**

Research design is a framework or the blueprint for conducting the research report. Research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

Here the research is analytical research. Analytical data based on the collection of secondary data published by Apollo tyres and the design of the research is based on the balance sheet and profit and loss account of the company.

## **4.2 Sources of Online Data**

Sources of online data in this study are:

- Company website
- Online journals
- Online magazines
- Online articles like blogs.

## **4.3 Sampling Design**

## **4.4 Data Analysis Tools**

### **ABC Analysis**

ABC = Always Better Control. This is based on cost criteria. It helps to exercise selective control when confronted with large number of items. It rationalizes the number of orders, number of items & reduce the inventory. About 10 % of materials consume 70 % of resources. About 20 % of materials consume 20 % of resources and 70 % of materials consume 10% of resources. ABC analysis does not stress on items those are less costly but may be vital

### **A ITEMS**

- Small in number, but consume large amount of resources

- Tight control
- Rigid estimate of requirements
- Strict & closer watch
- Low safety stocks
- Managed by top management

#### B ITEMS

- Intermediate
- Moderate control
- Purchase based on rigid requirements
- Reasonably strict watch & control
- Moderate safety stocks
- Managed by middle level management

#### C ITEMS

- Larger in number, but consume lesser amount of resources
- Ordinary control measures
- Purchase based on usage estimates
- High safety stocks

### **4.5 Report Structure**

*The report is presented in five chapters as given*

*below; Chapter 1- Introduction – Statement of the Problem*

*Chapter 2- Industry Profile*

*Chapter 3- Review of Literature*

*Chapter 4- Methodology of the study*

*Chapter 5- Discussion*

*Chapter 6- Findings of the*

#### **4.6 Limitations of the Study**

- As the study was mainly based on secondary information, informations provided over phone and email, the inherent limitations ofthe online data sharing might have affected the findings of the study.
- This study is a partial analysis based on online primary data collection.
- Accuracy of the result depends the accuracy of the online communications made to collect the data.
- Clarification on secondary data couldn't be able to discuss with companies authority
- The observation and analysis made in this study are relevant for the reference periodonly, no generalization can be made

**CHAPTER 5**  
**DATA ANALYSIS, INTERPRETATION AND INFERENCES**

## ABC Analysis

ABC analysis methodology, which classifies inventory into three categories that represent the inventory values and cost significance of the goods. Category A represents high-value and low-quantity goods, category B represents moderate-value and moderate-quantity goods, and category C represents low-value and high-quantity goods. Each category can be managed separately by an inventory management system, and it's important to know which items are the best sellers in order to keep quantities of buffer stock on hand. For example, more expensive category A items may take longer to sell, but they may not need to be kept in large quantities.

### Advantages Of Abc Analysis

- Aids demand forecasting by analyzing a product's popularity over time
- Allows for better time management and resource allocation
- Helps determine a tiered customer service approach
- Enables more accurate inventory optimization
- Fosters strategic pricing

### ABC Analysis on Apollo Tyres

| CATEGORY         | % OF MATERIAL CONSUMPTION | % OF MATERIAL CONSUMPTION | % OF MATERIAL CONSUMPTION | % OF USAGE VALUE | % OF USAGE VALUE | % OF USAGE VALUE |
|------------------|---------------------------|---------------------------|---------------------------|------------------|------------------|------------------|
|                  | 2017                      | 2018                      | 2019                      | 2017             | 2018             | 2019             |
| <b>A SEGMENT</b> | 3.08                      | 3.78                      | 3.78                      | 70.06            | 70.02            | 70.02            |
| <b>B SEGMENT</b> | 5.97                      | 6.34                      | 6.34                      | 19.95            | 19.99            | 19.99            |
| <b>C SEGMENT</b> | 90.95                     | 89.89                     | 89.89                     | 9.99             | 9.98             | 9.98             |
| <b>TOTAL</b>     | 100                       | 100                       | 100                       | 100              | 100              | 100              |

## **Usage of ABC Analysis**

The ABC analysis can be also be useful in several steps of the sourcing value chain: Demand Aggregation, to gather the annual spend of several sites. Opportunity Assessment, to identify leveraging opportunities. The ABC tool is used to identify the vital few from the trivial many, according to a defined set of criteria. Different decisions may be taken from the result of the ABC analysis.

## **Steps in ABC Analysis**

- Find out future use of each item of stock in terms of physical quantities for the review forecast period.
- Determine the price per unit for each item.
- Determine the total project cost of each item by multiplying its expected units to be used by the price per unit of such item.
- Beginning with the item with the highest total cost, arrange different items in order of their total cost as computed under step (iii) above.
- Express the units of each item as a percentage of total costs of all items.
- Compute the total cost of each item as a percentage of total costs of all items.

## **Interpretation**

About 4% of the material consumed has 70% of the usage value while 7% of the material consumed has 20% of the usage value and 90% of the material consumed has 10% of the usage value. Thus 4% of the material has highest usage while the others have less usage compared to the A segment. About 300 items are in A segment and about 600 items are in B segment while remaining items are in C segment.



**CHAPTER 6**  
**FINDINGS AND CONCLUSION**

## **Findings**

1. The company inventory turnover ratio is declining year by year indicating bad sales or surplus inventory.
2. The company is having good sales over the 3 years.
3. The plant has 3 stores. They are:-
  - Raw Material Store(RMS)
  - Engineering Store
  - Finished Goods Store(FGS)
4. From selecting the vendor to the purchase in RMS is conducted by head office. While all the functions in Engineering store is conducted in the Perambra plant itself .
5. The plant make safety stock for 10 day requirement.
6. The company also has a lead time of 30 days.
7. The items are classified into PR items and Stock items.
8. ABC analysis is done on the basis of consumption value

## **Conclusion**

Today's market is a customer oriented market and customer satisfaction is the most important goal of every organization therefore it is inevitable to adopt integrated Inventory Management approach for new product development strategy. Financial – Material management for any product is a dynamic decision making process involving a series of inter-related activities. In today's dynamic market "Every Bench marks are dynamic, challenge them for continual improvement". In order to remain in market any organization needs to define the process, Benchmark for the excellence, endeavor to achieve it by strategizing & creating environment, providing required resources & effective monitoring.

Inventory system is an extremely important problem area in the management of materials handling. It is quite susceptible to control and a very large amount of scientific models are available in the literature to enable us to choose an optimal inventory policy. Buying the optimal

quantity can result only from a sound inventory control system that is achieved by judicious reconciliation of conflicting costs and departmental objectives.

However, inventory is only an indicator of performance of materials management function and to cut down inventories we use not only scientific inventory management principles but also models along with it also take long-term measures to reduce inventories through strategies such as variety reduction and standardization, source development and optimization, and vendor rating, lead-time reduction through improvement in the systems and procedures of procurement.

It is obvious that scientific inventory management has to be practiced selectively rather than indiscriminately to make it cost-effective. It is also important to have informational inputs like demand forecast, lead-time estimate, and other cost estimates to be realistic to make effective use of inventory

## **BIBLIOGRAPHY**

- ❖ Donald Waters. (2009). Inventory Control And Management. Second edition. England :John Wiley & Sons Ltd
- ❖ Suresh Kumar Khatik. (1999) inventory management in public sector undertaking. First edition. New Delhi : Classical Publishing Co.
- ❖ Agarwal P.K. (2010). Inventory Management Practices. First edition. New Delhi : PHI Learning Pvt. Ltd.
- ❖ Muller Max. (2011) Essentials of Inventory Management. Second edition. New York : Amacom
- ❖ Chandra Boss. D. (1999). Inventory Management. First Edition Mumbai : PHI Learning Pvt Ltd.

## **WEBSITE**

- [https://en.wikipedia.org/wiki/inventory\\_control](https://en.wikipedia.org/wiki/inventory_control)