Supply Chain Performance Measure

Indian Tyre Industry

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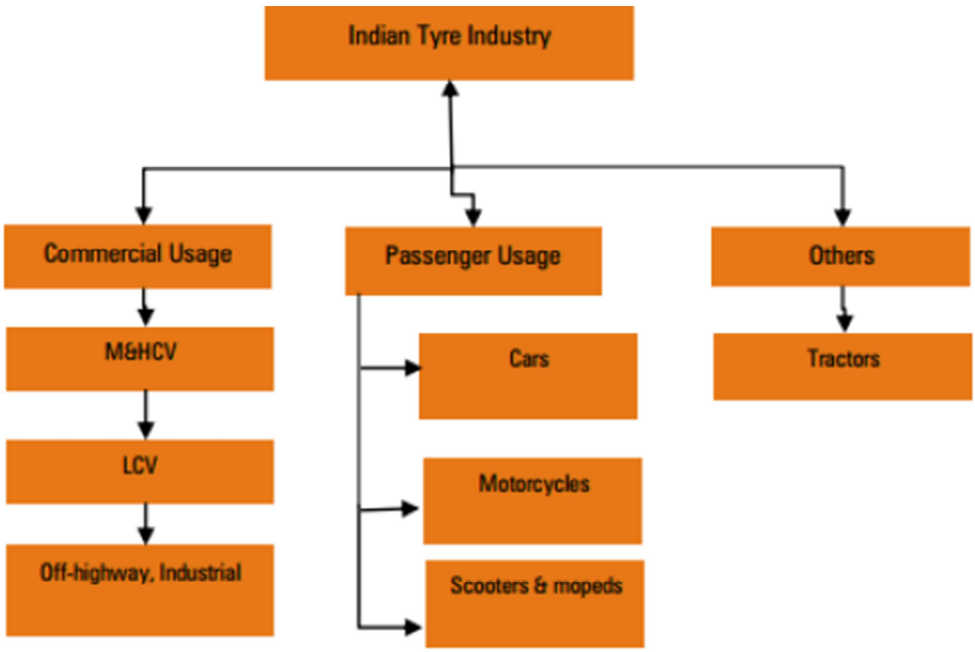
1. Introduction

Technology generation in the Indian tyre industry has witnessed a fair amount of expertise and versatility to absorb, adapt and modify international technology to suit Indian conditions. This is reflected in the swift technology progression from cotton (reinforcement) carcass to high-performance radial tyres in a span of four decades. Globalization has led to the linking of the economies of all the nations and therefore major Indian players in the tyre industry are pursuing global strategies to enhance their competitiveness in world markets. An overview of the Indian tyre industry through an examination of its growth trends with respect to production, exports and acquisition of technological capabilities is as below.



Key Features

- At present there are 40 listed companies in the tyre sector in India.
- Major players are MRF, JK Tyres, and Apollo Tyres & CEAT, which account for 82 per cent of the organized tyre market. The other players include Modi Rubber, Kesoram Industries and Goodyear India, Dunlop, Falcon, Tyre Corporation of India Limited (TCIL), TVS-Srichakra, Metro Tyres and Balkrishna Tyres with less share in the industry.

- While the tyre industry is largely dominated by the organized sector, the unorganized sector is predominant with respect to bicycle tyres.
- 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. Interestingly, world-wide, the proportion of natural to synthetic rubber in tyres is 30:70
- The sector is raw-material intensive, with raw material accounting for 70% of the total costs of production
- Current level of radialization includes 95% for all passenger car tyres, 12% for light commercial vehicles and 3% for heavy vehicles (truck and bus)
- Restrictions were placed on import of used /retreaded tyres since April 2006
- Import of new tyres & tubes is freely allowed, except for radial tyres in the truck/bus segment which has been placed in the restricted list since November 2008
- The major factors affecting the demand for tyres include the level of industrial activity, availability and cost of credit, transportation volumes and network of roads, execution of vehicle loading rules, radialization, retreading and exports.

2. Evolutionary Phases of Tyre manufacturing in India

Phase	Period	Characteristics	Policy Regime
Phase I	1920-35	No domestic production. Demand met through imports. Key players included Dunlop (U.K), Firestone & Goodyear (USA)	Liberal imports
Phase II	1936-60	Domestic production begins by erstwhile trading companies: Dunlop, Firestone, Goodyear and India Tyre & Rubber Company	Imposition of tariff & non-tariff barriers on imports
Phase III	1961-74	Indian companies-MRF, Premier & Incheck- enter manufacturing sector with foreign technology; licensing of additional production capacity	Regulation on capacity expansion and repatriation of profits of foreign companies; enforcement of export obligation on MNC; protection from external competition
Phase IV	1975-91	Entry of large Indian business houses like Singhania & Modi & technical collaborations with MNCs, introduction of radial tyres, vertical integration and exponential growth in tyre production & exports	Delicensing of production, placing of imports under OGL with tariff & non-tariff barriers
Phase V	1992 onwards	External trade liberalization & reduction in import duty; re-entry of MNCs either independently or in collaboration with Indian capital	Progressive reduction in import duty; liberalized imports

Source: *Mohanakumar & Tharian (2001)*

Radialisation has been a significant dimension in the acquisition of technological capability in the Indian tyre industry. The degree of radialisation is a clear indicator of the status of road development, vehicle engineering and the economy in general. Inspite of some constraints and limitations, the tyre companies in India have kept pace

with the technological improvements that radialisation signifies and offered state-of-the-art products, comparable to the best in the world. Radialisation is linked to factors such as road development, overload control and retreading infrastructure. Some of the advantages of radialisation are additional mileage, fuel saving and improved driving. However, attempts towards radialisation have not taken off at the expected pace due to factors like lack of suitability of Indian roads for plying of radial tyres, older vehicles not possessing suitable geometry in terms of fitment, unwillingness of the Indian consumer to pay higher prices for radial tyres etc. Nevertheless, the scenario is radically different for the passenger car tyre segment, where radialisation has crossed 95%. In the medium and heavy commercial vehicle segment, the level of radialisation is comparatively poor, i.e. merely 4% and in the LCV segment; it is 15%.

3. Technology Generation

Technology generation in the Indian tyre industry is essentially geared to development research, involving the change of tread design, reinforcement material etc. Most of the major players do not engage in basic research due to the high costs involved. The source of technology for the domestic firms has been through reverse engineering, joint ventures and collaborations.

The emphasis given by Indian tyre companies to applied research and the setting up of well-equipped in-house R&D centers by the companies, which are manned by experts and experienced professionals, have also helped in technology upgradation. Indian tyre technology has exhibited versatility in maintaining inflow of technology through foreign collaborations and tailoring the same to Indian needs. R&D is essentially business or market driven. However, raw material suppliers could also help in conceiving new projects. Compound development and in-process problems have been the main thrust of in-house R&D in the Indian tyre industry.

A significant proportion of R&D effort in the tyre sector is carried out by four or five top companies.

Tyre technology upgradation is an extremely difficult process, particularly in the Indian scenario, due to several factors. First, since tyre technology encompasses various disciplines such as polymer, chemical, steel etc. compromises have to be made in the upgradation of technology because of a) the conflict and complimentarity inherent in these disciplines, b) the usage pattern of the tyres and c) the cost factor. Further, a tyre's performance could be affected due to factors such as the weather, loading pattern etc. Despite these bottlenecks technology upgradation in Indian tyre industry during the last few decades has been significant. This has been possible to some extent due to government approvals of collaborations with MNCs in this sector. The emphasis given by Indian tyre companies to applied research, the setting up of well-equipped in house R&D centres by large tyre companies, manned by experts and experienced professionals have also helped in technology upgradation. Indian tyre technology has exhibited versatility in maintaining inflow of technology through foreign collaborations and tailoring the same to Indian needs.

4. Automation

Tyre production traditionally, is multi-stage, with significant inter-stage differences in the intensity of labour requirement, and a highly complex process involving the use of around 37 different materials including rubber, steel, fabrics and vulcanizing materials. The production system in the Indian tyre industry has been traditionally very labour intensive. The automation of manufacturing processes has increased gradually, which has slashed the size of the workforce to a considerable degree and has effected a change in its composition. The degree of automation has been greater in the area of radial technology, while cross ply technology is still labour intensive. The firms have been resorting to automation in order to tackle problems related to labour unionization and indiscipline in the sector. The rationale provided by the firms for the increasing drive towards automation of the manufacturing facilities has been that high

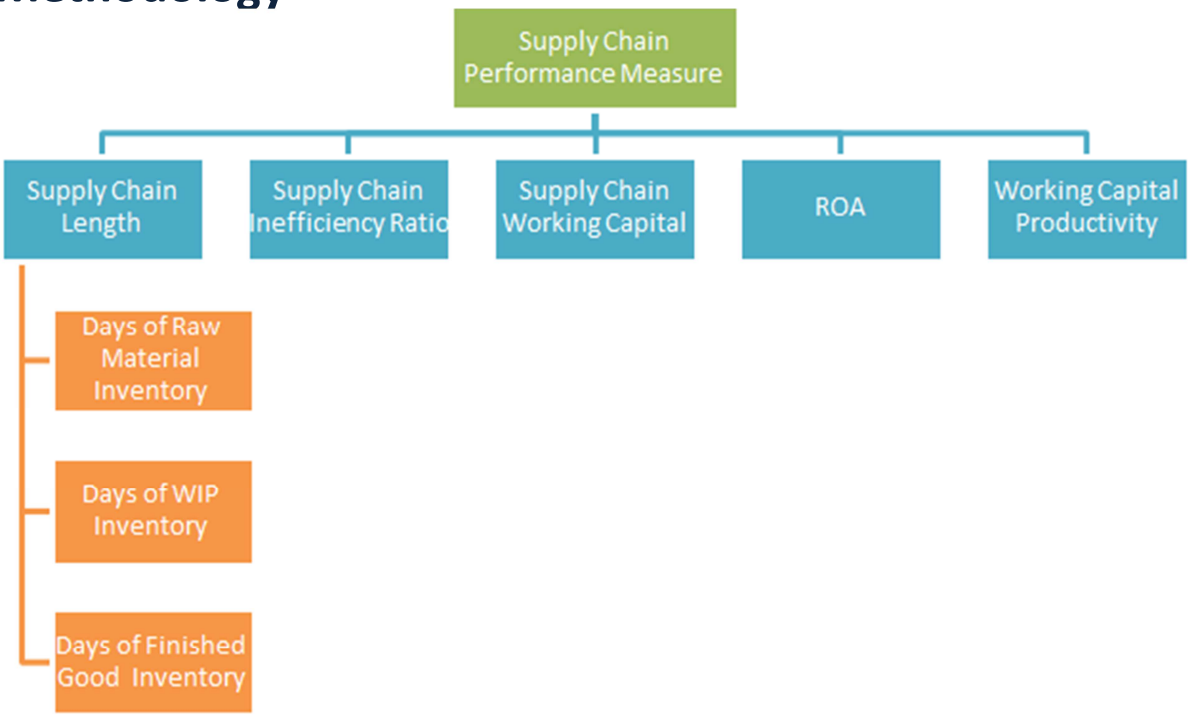
quality and uniformity of the final product usually cannot be guaranteed with a labour intensive process.

5. New Policy Initiatives

The tyre industry in India has had to grapple with raw material price volatility, rupee appreciation and cheap Chinese imports. In this connection, some of the recent initiatives by the government to facilitate the growth of the sector include:

- No WTO bound rates for Tyres and Tubes
- No restrictions on the import of all raw materials required for tyre manufacture except carbon black, which has been placed in the restricted list
- Increasing thrust on development of road infrastructure

6. Methodology



- Total length of supply chain is arrived by adding up days of inventory for
    - raw materials
    - work in progress (intermediate products)
    - finished goods
- Firm with minimum total length of chain is the best performer.
- DRM, DWIP, DFG = Days of raw material, work in progress and finished products inventory respectively
    - DRM = Raw Material Inventory X 365 / Cost of Raw Material
    - DWIP = Semi Finished Good Inventory X 365 / Cost of Production
    - DFG = Finished Good Inventory X 365 / Cost of Sales
- Total length of supply chain in days = DRM + DWIP + DFG
- Supply Chain Inenefficiency Ratio = Supply Chain Management Cost/Net sales
- Supply Chain Working Capital = Total Inventory + Account Receivable – Account Payable
- Supply Chain Working Capital Productivity = Net Sales/SWC

7. Overview

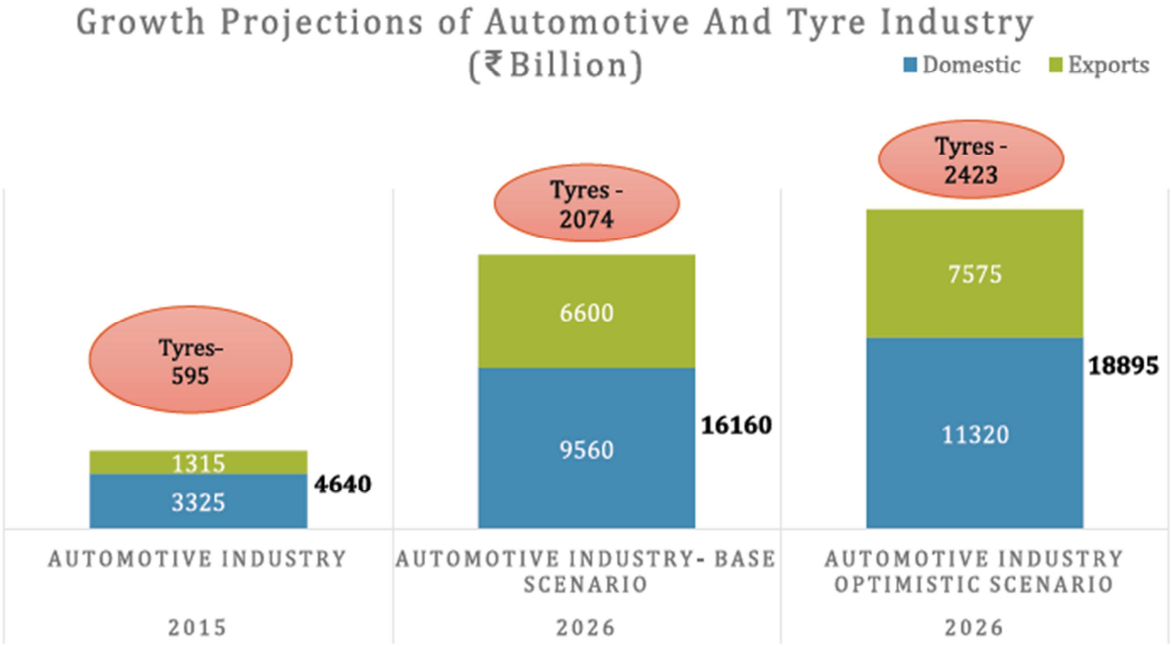
The origin of the Indian Tyre Industry dates back to 1926 when Dunlop Rubber Limited setup the first tyre company in West Bengal. MRF followed suit in 1946. Since then, the Indian tyre industry has grown rapidly.

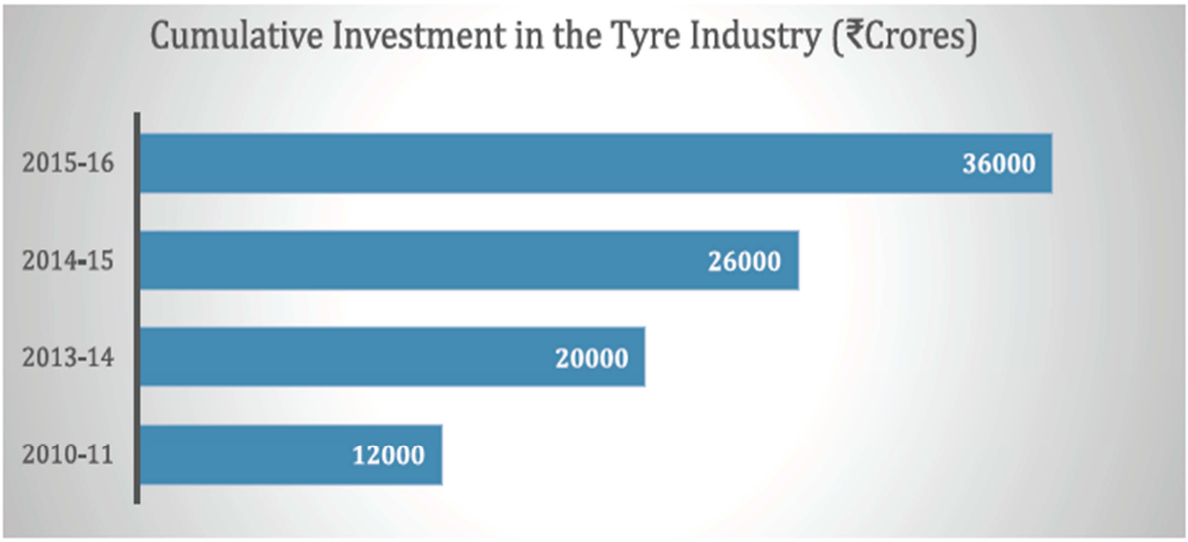
In the pre-Independence period, the tyre manufacturers were mainly foreign companies. Raw material in the form of natural rubber was easily available and labour was cheap. Some time in 1956, based on the recommendations of the Tariff Commission, the Government encouraged domestic companies to set up their manufacturing facilities. A number of companies set up their plants in India, usually with technical support from foreign companies.Over a period of time the tyre industry was dominated by Indian players. After the onset of liberalization a few foreign companies entered India. However, they were not able to make a dent in the market share of Indian companies. Some foreign companies like Michelin, Continental Tyres and Pirelli are planning to enter India in the near future. Over the last few years, import of tyres into India from countries like China, South Korea and Thailand has been on the rise. The tyre manufacturers feel that due to the inverted duty structure foreign tyre manufacturers have an unfair advantage.

The Indian tyre industry has grown over the last ten years. The reasons for growth are the robust growth of the economy and the automobile industry. Besides domestic growth, there has been a smart growth in the export of tyres also. The future is likely to see more growth in exports as the supply of natural rubber goes down. It is expected that the Indian tyre industry will have a very bright future.

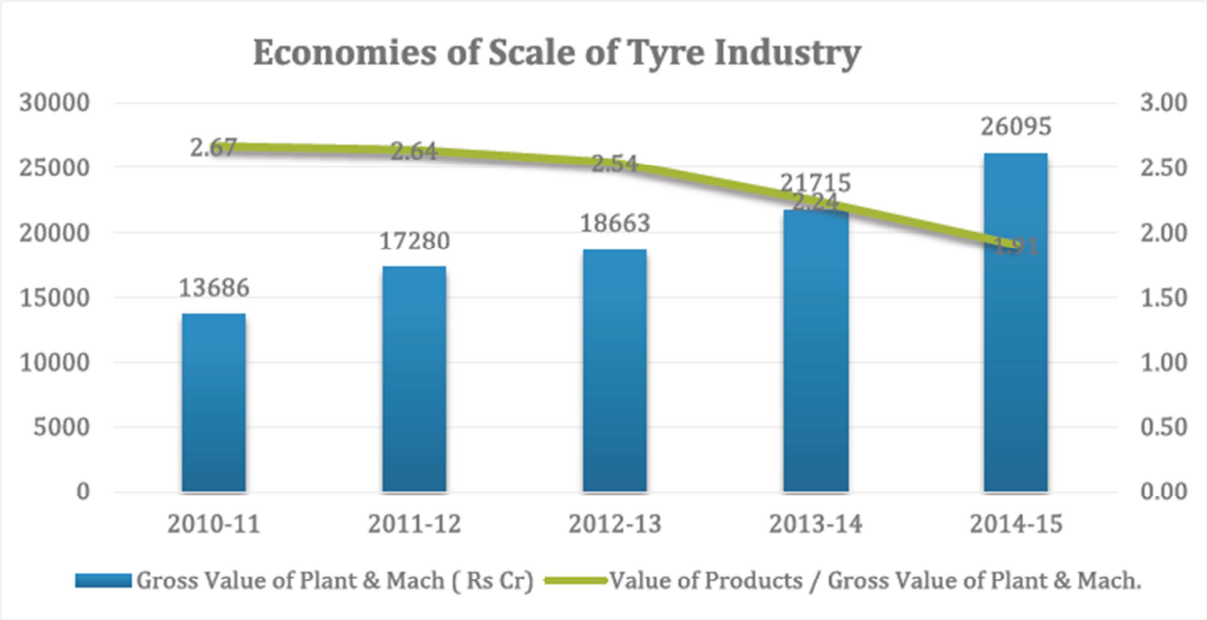
Transportation industry and tyre industry go hand in hand as the two are inter dependent.Transportation industry has experienced 10% growth rate year after year with an absolute level of 870 billion ton freight. With an extensive road network of 3.2 million km, road accounts for over 85% of all freight. Demand for tyres is derived from demand for automobiles. Therefore it is a derived demand product and its fortunes are very closely

linked to those of the auto segment. Within the tyre industry the trucks and buses (T&B) segment accounts for more than 70% of sales. Though scooters and motorcycle tyre demand also plays a vital role, in value terms, CVs gain significance.





Source: ATMA, Industry Estimates



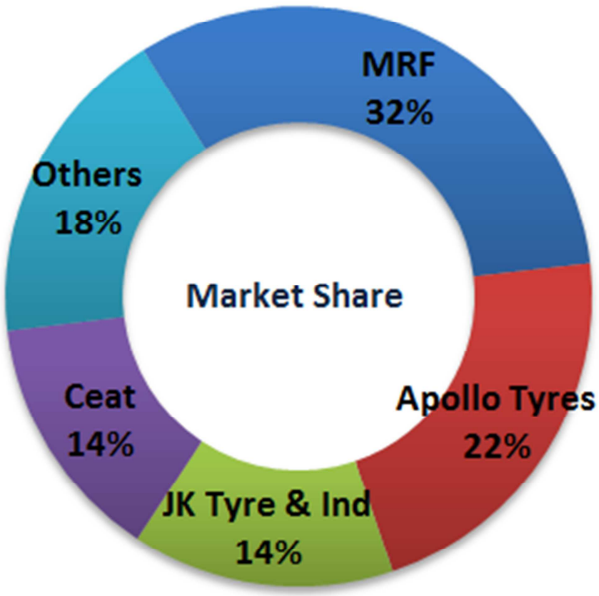
Source: Annual Survey of Industry, MOSPI, Authors' Calculation

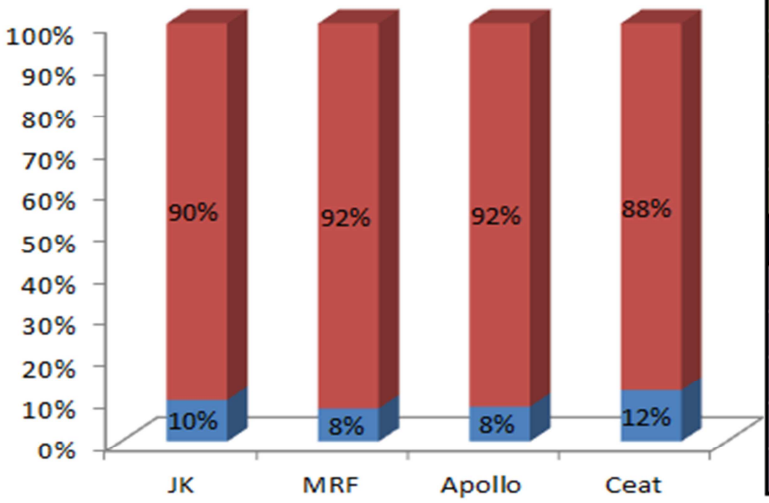
The ASI data shows asset utilisation by the industry is coming down over the years as the new installed capacity is not utilised to the maximum. Going forward, the increased capex will put pressure on the utilisation levels and hamper the operational margins of the players. The industry operates currently at 60-70% of
utilisation, which is expected to fall as additional facilities are added in 2016-17.

Segmentation for tyre industry can be as follow

1. Replacement Market (Aftermarket)
2. Original Equipment manufacturers (OEM) i.e. Vehicle manufacturers
3. Export
4. State transport undertakings. (STUs) Primarily for bus tyres
5. Govt. purchases.

Market Share – Tyre Industry - India:





Company Name	MRF
Headquarters	Chennai, Tamilnadu, India
Date of Establishment	1946
Industry	Tyres,Rubber products
Product	Tyres,Toys,Sports equipment, Conveyor belt,Paints,Coats
Sales (2016-17)	INR 14743 Cr
Company Name	**JK Tyre & Inds Ltd**
Headquarters	New Delhi, India
Date of Establishment	1874
Industry	Tyres, Tubes, Mudflaps
Product	Tyres, Tubes, Mudflaps
Sales (2016-17)	INR 6568 Cr
Company Name	**Apollo Tyres Ltd**
Headquarters	Gurgaon, Haryana, India
Date of Establishment	1972
Industry	Tyres
Product	Tyres
Sales (2016-17)	INR 9842 Cr
Company Name	**Ceat Tyre**
Headquarters	Mumbai, India
Date of Establishment	1924
Industry	Tyres & Tubes
Product	Tyres & Tubes
Sales (2016-17)	INR 6377 Cr

APOLLO TYRES

Apollo tyres Ltd. is leading player in Indian tyre industry and also contributes major part in global tyre industry. Apollo tyres Ltd. got established on 1976 in state of Kerala, southern India.

Company Snapshot:

- Turnover of the company- US$ 1.74 billion
- 16000 Employees are working currently
- They manufacture 9 facilities of tyre in 3 continents Asia, South Africa and Europe, with 3 headquarters at India, South Africa and the Netherlands.

Brand Portfolio of Apollo tyre can be given as follows:

1.Apollo- Global brand catering to Vehicle across categories.2.
2.Vredestein- Global niche brand for passenger and speciality tyres.3.
3.Dunlop - Brand for 32 African countries across categories4.
4.Kaizen Tyres - Global challenger brand for trucks tyres.5.
5.Maloya Tyres- Global challenger brand for passenger car tyres.6.
6.Regal Tyres - Global brand truck- bus and passenger car types.

Product Portfolio of Apollo tyres:
1.Passenger car
2.4x4
3.Light Truck
4.Truck and Bus
5.Bicycles
6.Agriculture.
7.Off the Road & Earthmover.
8.Speciality tyres.

MRF TYRES:

MRF Limited is one of India's world class manufacturing companies. The company, established in 1946, progressed into manufacturing tread-rubber and entered into the manufacture of tyres in 1961. MRF now enjoys the distinction of being the largest tyre company in the Indian subcontinent and

12th largest in the world. The Far Eastern Economics Review's annual 'Review 200' has consistently rated it amongst India's top 10companies.

MRF operates six grant tyre manufacturing plants in India. Relevant ISO quality certification has been awarded to its entire tyre manufacturing plants. The company manufactures the largest range of tyres in India-heavy duty truck/bus tyres, light commercial vehicle tyres, passenger car tyres, off-road industrial tyres, two-wheeler tyres, farm service tyres and motor-sport tyres to cater to every segment of the tyre market. MRF is the only Indian company to put its expertise into the manufacturer of F3 tyres for the motor racing circuit. Maintenance of high quality standards and constant innovation has become synonymous with the organization, giving all products the unique status of highest brand preference in India for their superior quality and performance.

In a fitting tribute, MRF has been rated by JD Power Asia Pacific, as #1 in customer satisfaction for tyres in India for the year 2002.The MRF R&D team has made great strides in developing radial tyre technology for Indian roads based on its Cross-Ply technical competence. MRF has laid great emphasis on strong R&D and continuous product up-gradation, which has led to the successful development of the unique tyre technology for Cross-Ply Tyres to suit the tough service conditions of Indian roads.MRF tyres are today acknowledged as premium products in overseas markets where they compete with international tyre majors. With its focus on exports, the company plans to increase market share and start operations in several new countries. The company has recently opened representative offices in Dubai, Vietnam, Bangladesh and the USA to help increase its market share and also intends to make forays into several new markets

Products

- MRF is the leading manufacturer of tyres in almost all segments

- Being driven by technology and product innovation, every tyre that comes out is of the highest standards and tested to weather the toughest conditions take on any road.

-
- MRF has diverse business interests which also include Pre treads, Paint and Coats and Toys.

Services

- MRF offers a whole host of services to its customers, ranging from helping them pick the tyre of their choice to helping them maintain their vehicle.

Exports

- MRF exports tyres and conveyor belts to over 65 countries in America, Europe, Middle East, Japan and the Pacific region.
-
- These markets are serviced by our offices in Dubai, Vietnam and Australia.

JK TYRES

The company was incorporated as a private limited company in West Bengal in 14thFebruary, 1951. Until 31st March 1970, the company was engaged in the managing agency business. There after the company decided to undertake manufacturing activities and obtained a letter of intent in February 1972 for the manufacture of automobile tyres and tubes. The letter of intent was converted into an industrial license In February 1974 for the manufacture of 4 lakh nos each Automobile tyre and tubes per annum. The company was converted into a public limited company on 1st April 1974. The manufacturing project was promoted by Straw Products Ltd and J.K. Synthetics Ltd. The company entered into technical collaboration with General Tyre International Co., U.S.A.(a subsidiary of General Tyre Rubber Co., U.S.A.) for technical services for a period of 5 years and sales agreement for the supply of technical know-how, engineering and documentation for

operational facilities (for A period of 8 years from23.8.73). Under the collaboration agreement, the Company has the right to use on its products the wording Made in collaboration with General Tyre International Co., USA.

J K tyres is economical Jetar mile is one of the best mileage tyres in JK, LCV of JK is also better .Four wheeler tyres of JK is best customer prefer JK tyres than any other tyres in four wheeler segment JK is best in 4w tyres Services 4 wheeler tyres is better than any other branded tyres product of Four wheeler is costly steel customer prefer JK due to their service. Other CEAT is ahead in giving consumer scheme and offer CEAT is also ahead in adverting sector. Apollo focus on seminar conduct seminar time to time and occasionally give parties to particular class also Birla - is new in Akola market and their carrying and forwarding agent isalso new JK is behind in all the aspect regarding seminar adverting parties.

CEAT

CEAT Limited is a tyre manufacturing company based in Mumbai, India. CEAT standards for Cavi Electric Affini Torino(Electrical Cables and Allied Products of Turin).

CEAT is one of largest tyre manufacturers in India and Srilanka with an annual turnover of Rs 2,760 crores and has about 20% of the local truck and light truck tyre market. CEAT manufactures a wide range of tyres for various customers radials for Indian vehicles and caters to various user segments including:

- Heavy-duty Trucks and Buses
- Light commercial vehicles
- Earthmovers
- Forklifts
- Tractors
- Trailers
- Cars

- SUVs
- Motorcycles and Scooters
- Auto-rickshaws

It exports to over 110 countries across the world in April 2007 the de-merger of its investment business to a separate investment and finance company was approved .CEAT is only tyre company to be awarded the ISO/TS 16949:2002 certification. It is also the 1st Indian tyre company to get a TUV certificate.

Market share:

In 2009 CEAT manufacturer has market share 428.86 crores (4.3048%) and in 2010 market share 414.13 crores (4.336%) in 2011 market share 403 crores (4.226%).By observing this, we can say that market share decreases (negligible portion)

Nature of competition:

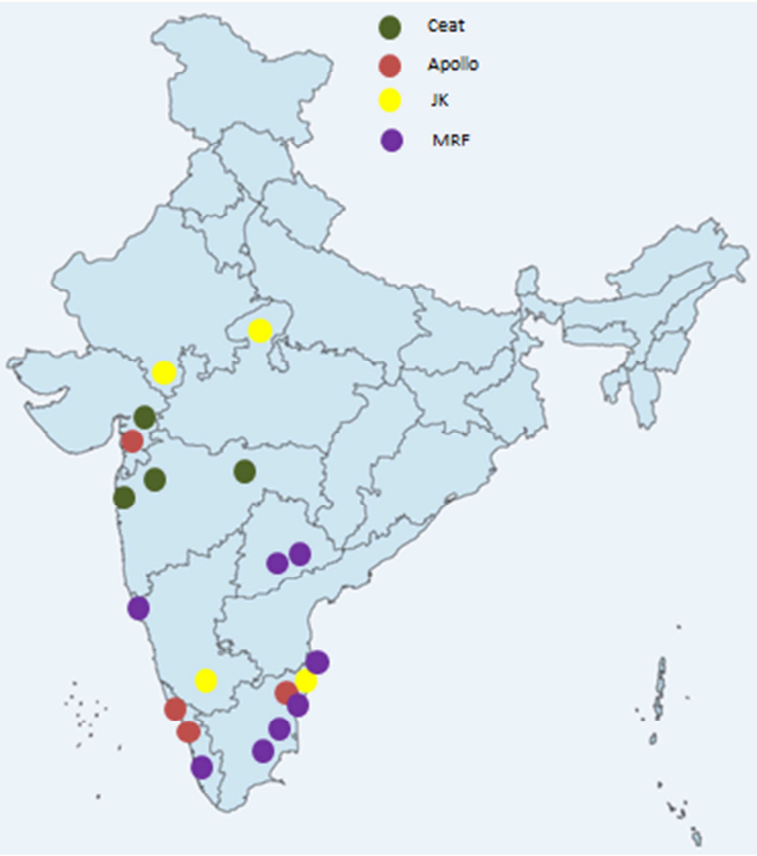
CEAT company have many features than other companies in market. In terms of tyre trade in world, china has become the world largest tyre export country in 2004.Tyre industry has more demand this leads to more competitors. This can be given as follows:

- Most of the players have their respective areas of strength
- HHI indicated diversity in player concentration ratio between segments and industry
- Apollo continued to dominate T&B category
- Apollo surpassed MRF to become leader in car & jeep category
- MRF continued to hold leadership position in LCV category
- MRF dominated two and three wheeler category tyres

8. National and International Foot Print

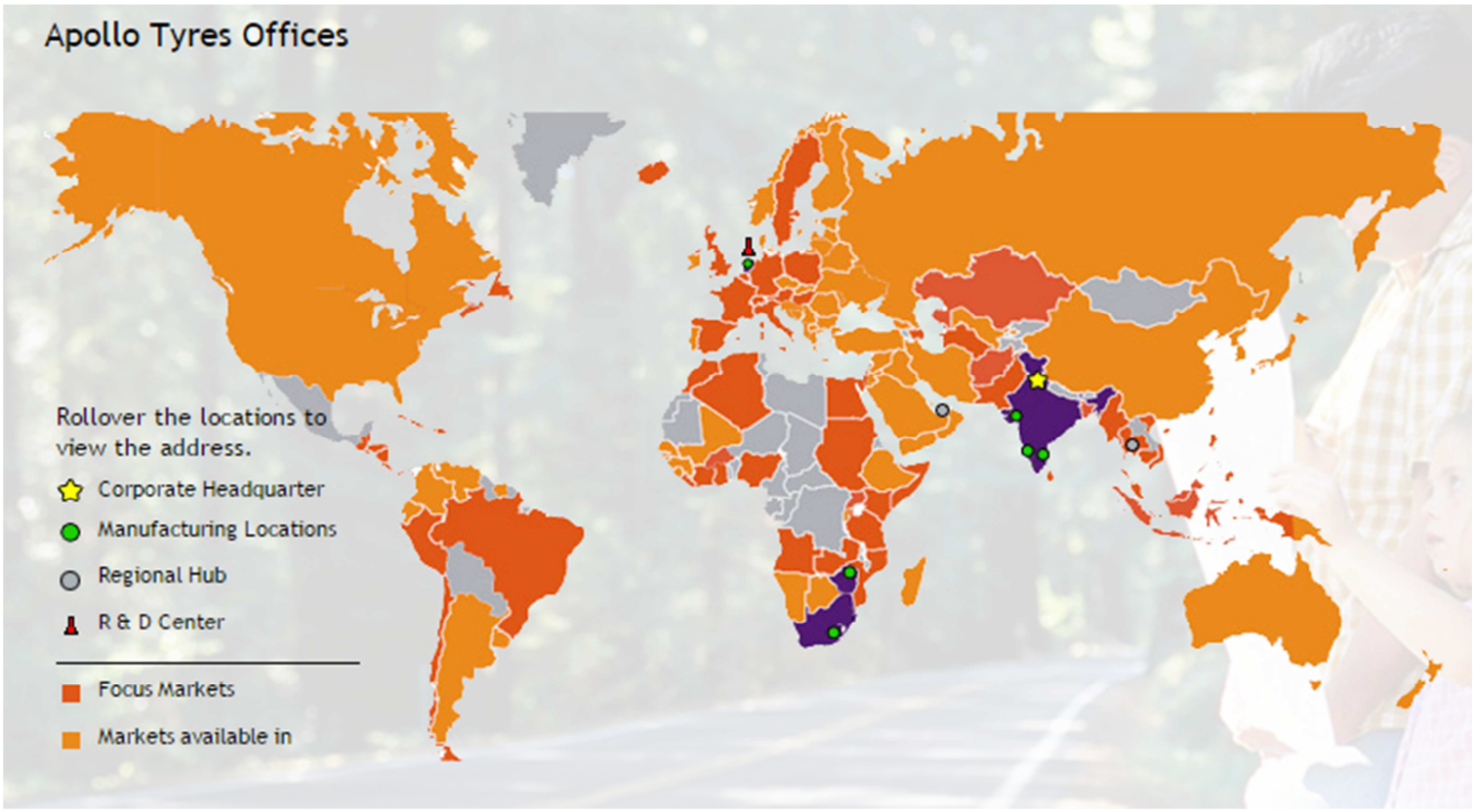
Domestic:

Ceat	Nasik	Maharastra
	Mumbai	Maharastra
	Panchmahal	Gujarat
	Nagpur	Maharastra
Apollo	Ernakulam	Kerala
	Vadodara	Gujarat
	Kancheepuram	Tamil Nadu
	Thrissur	Kerala
JK Tyre	Morena	Madhya Pradesh
	Chennai	Tamil Nadu
	Udaipur	Rajasthan
	Mysore	Karnataka
MRF	Vellore	Tamil Nadu
	Medak	Telangana
	Perambalur	Tamil Nadu
	Puducherry	Puducherry
	Medak	Telangana
	Kancheepuram	Tamil Nadu
	North Goa	Goa
	Kottayam	Kerala



International:

Apollo Tyres:



JK Tyres:

JK Tyre has also enhanced its global reach by taking over, a renowned Mexican company, which has 3 plants in Mexico. All of these plants are equipped with the world's most advanced manufacturing and testing machines.

Export JK Tyre:

CEAT Tyres:

SRILANKA:

CEAT and Kelani Tyres, have since the year 1992, combined their passion for innovation in tyres to become the largest domestic manufacturers of cross-ply and radial tyres in Sri Lanka. The joint venture has, today, established itself as a key source of tubeless tyres in local as well as international markets.

Its cutting-edge technologies, processes and practices produce high quality and economically advantageous automotive and industrial tyre solutions. The joint venture has also introduced vibration-free tyres with noise-free running. These tyres ensure efficient transmission of lateral forces to guarantee excellent driving stability and handling.

The organisation dominates Sri Lanka's overall domestic tyre market with over 50% share in truck, light truck, radial, three wheeler and agriculture

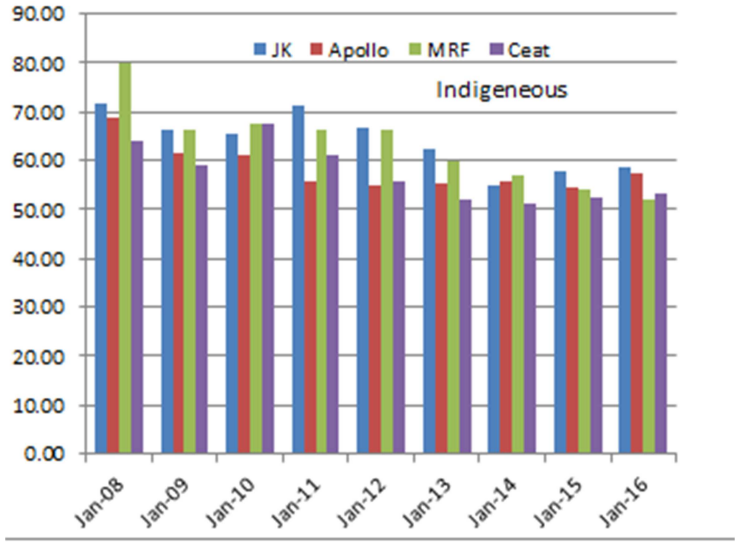
segments. It is also an emerging dominant player in the Motor Cycle segment. It has one of the largest dealer networks across the island with more than 450 dealers.

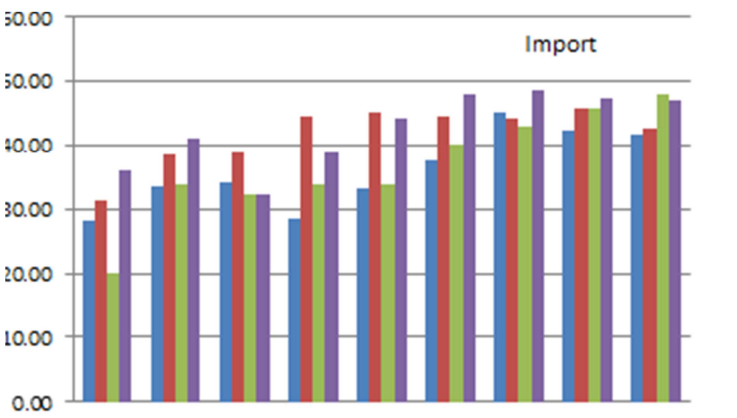
BANGLADESH:

CEAT in a joint venture with A.K. Khan & Co. is actively embracing Bangladesh with a mission to provide sustainable tyre solutions to its local customers. CEAT Bangladesh uses superior technology and innovation to manufacture world-class tyres for trucks and buses, light commercial vehicles, small commercial vehicles, motorcycles and auto rickshaws in its upcoming manufacturing plant in Bangladesh. The venture already has a strong network of dealers and distribution channels all over the country with regional offices in Dhaka, Chittagong, Bogura, Jessore and Sylhet.

9. Raw Material Dipankar

Raw materials consumed (%)									
Indigenous raw materials consumed (%)									
	Mar-08	Apr-09	May-10	Jun-11	Mar-12	Mar-13	Mar-14	Mar-15	Mar-16
JK	71.82	66.44	65.78	71.37	66.8	62.4	54.8	57.7	58.4
Apollo	68.77	61.41	61.15	55.64	54.9	55.5	55.9	54.3	57.4
MRF	79.93	66.27	67.82	66.20	66.2	59.8	57	54.1	52.2
Ceat	64.04	58.95	67.59	61.22	55.9	51.9	51.4	52.6	53.1
Imported raw materials consumed (%)									
JK	28.18	33.56	34.22	28.63	33.2	37.6	45.2	42.3	41.6
Apollo	31.23	38.59	38.85	44.36	45.1	44.5	44.1	45.7	42.6
MRF	20.07	33.73	32.18	33.80	33.8	40.2	43	45.9	47.8
Ceat	35.96	41.05	32.41	38.78	44.1	48.1	48.6	47.4	46.9



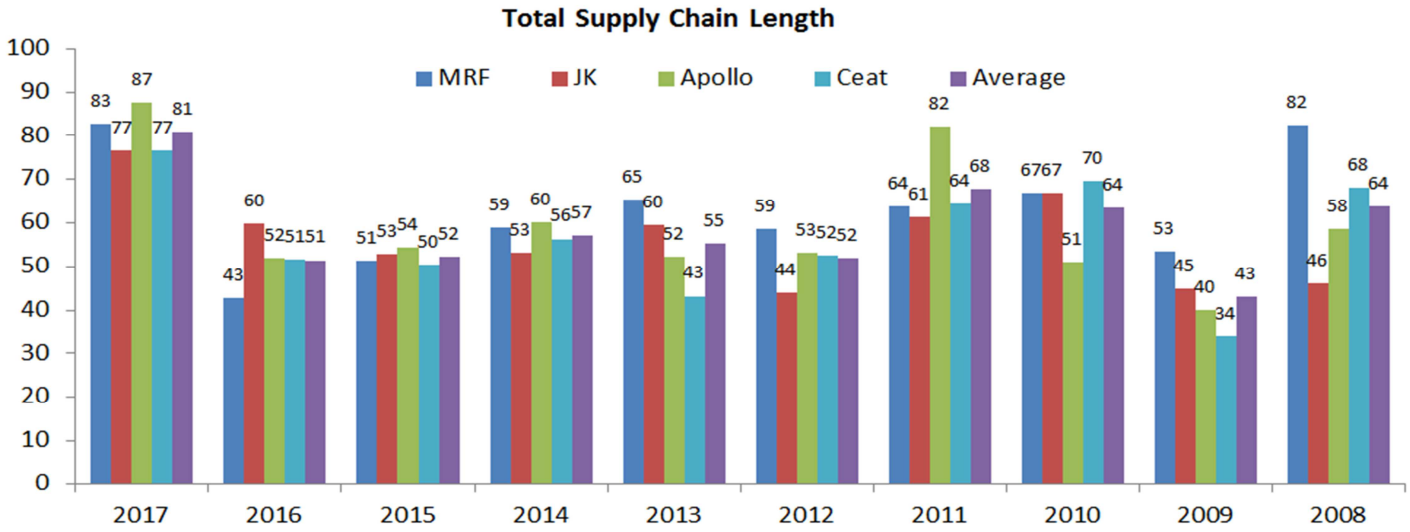


Domestic Raw material sourcing decreasing continuously & same is compensated by imported Raw material.

i.e global sourcing strategy is changing with time

10. Supply Chain Performance

10.1. Total Supply Chain length DIpankar

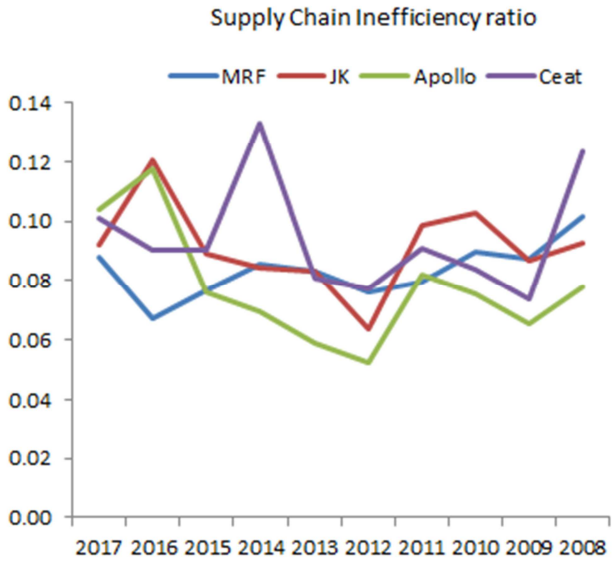


- Apollo>MRF>Avg>JK>CEAT
- Total supply chain length of Apollo & MRF is above industry average. This higher in length is because of higher finished goods inventories in case of Apollo & higher raw material inventories in case of MRF.
- In the other hand JK & CEAT are below the industry average with CEAT as a best performer. Both are able to manage their position in industry by lowering finished good & WIP inventories
- Inventory control is an important part of business operation. If a company does not have enough inventory, it may not be able to meet customers' required delivery time. If it has too much inventory, the cost of holding the inventory can be high. Hence it indicates

- Apollo is facing difficultly in selling product or they foresee some future demand

10.2. Supply Chain Inefficacy Ratio

Supply Chain Inefficiency ratio										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
MRF	0.09	0.07	0.08	0.09	0.08	0.08	0.08	0.09	0.09	0.10
JK	0.09	0.12	0.09	0.08	0.08	0.06	0.10	0.10	0.09	0.09
Apollo	0.10	0.12	0.08	0.07	0.06	0.05	0.08	0.08	0.07	0.08
Ceat	0.10	0.00	0.10	0.09	0.09	0.13	0.08	0.08	0.07	0.12



Supply Chain Inefficiency Ratio:

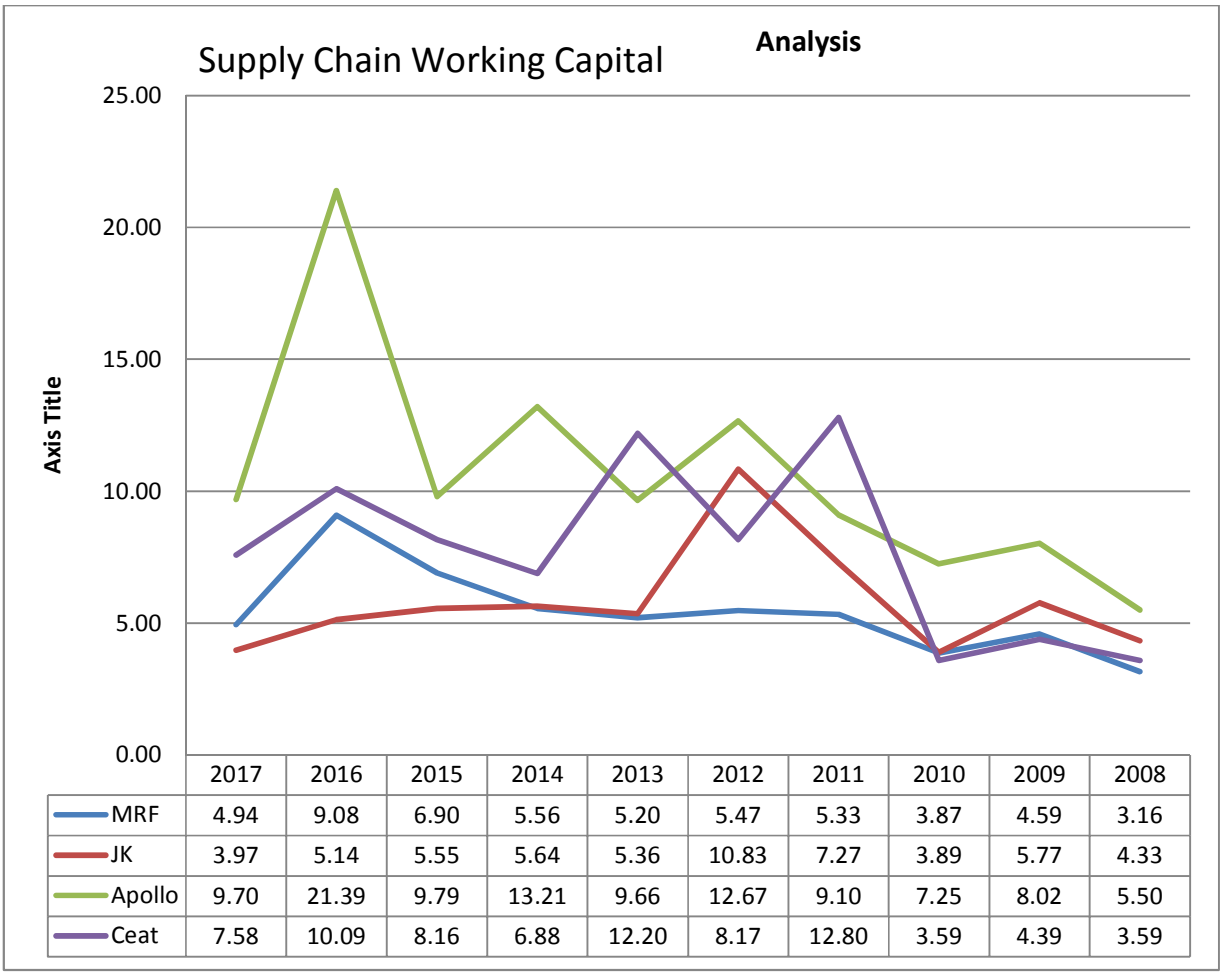
2008-09 Apollo<CEAT<MRF<JK

2016-2017 MRF<CEAT<Apollo<JK

MRF has improved it's supply chain efficiency with time. Fast & reliable network is a comparative advantages of MRF

10.3. Supply Chain Working Capital

Working capital is the firm's circulating funds required for meeting day-to-day operations. Effective management of working capital is therefore very critical to a firm's financial health. The challenge of working capital management is to strike a balance between the liquidity and profitability. Liquidity means ability of the business to meet its short term obligations, usually a period of one year. Liquidity is a prerequisite for the survival of the firm.



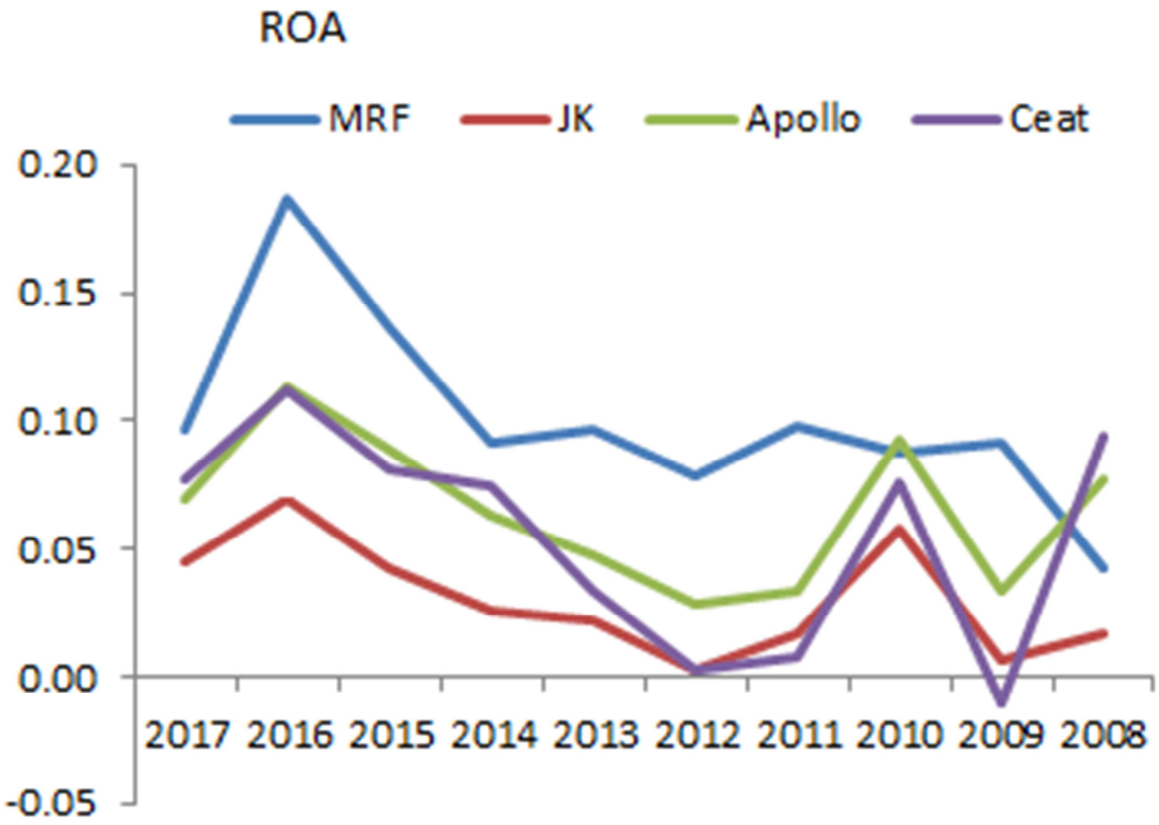
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
MRF	4.94	9.08	6.90	5.56	5.20	5.47	5.33	3.87	4.59	3.16
JK	3.97	5.14	5.55	5.64	5.36	10.83	7.27	3.89	5.77	4.33
Apollo	9.70	21.39	9.79	13.21	9.66	12.67	9.10	7.25	8.02	5.50
Ceat	7.58	10.09	8.16	6.88	12.20	8.17	12.80	3.59	4.39	3.59

From the above, graph it is seen that the supply chain working capital for every companies are very inconsistent. In case of Apollo, inventory is the main dominant factor for working capital, followed by loans and

advances. For CEAT, mainly the loan, advances, inventories and debtors contributes major shares in overall working capital. For MRF, the major dominant factor is debtor and inventory.

We have seen sharp increase in working capital during FY16 for Apollo. In FY16, Apollo's European operations largely faced challenges from its internal operations (implementation of SAP increased the inventory level & its working capital requirement). Further damage was also due to external factors like unfavorable winter & currency movement. (Report of ICICI Direct).

ROA										
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
MRF	0.10	0.19	0.14	0.09	0.10	0.08	0.10	0.09	0.09	0.04
JK	0.05	0.07	0.04	0.03	0.02	0.00	0.02	0.06	0.01	0.02
Apollo	0.07	0.11	0.09	0.06	0.05	0.03	0.03	0.09	0.03	0.08
Ceat	0.08	0.11	0.08	0.07	0.03	0.00	0.01	0.08	-0.01	0.09

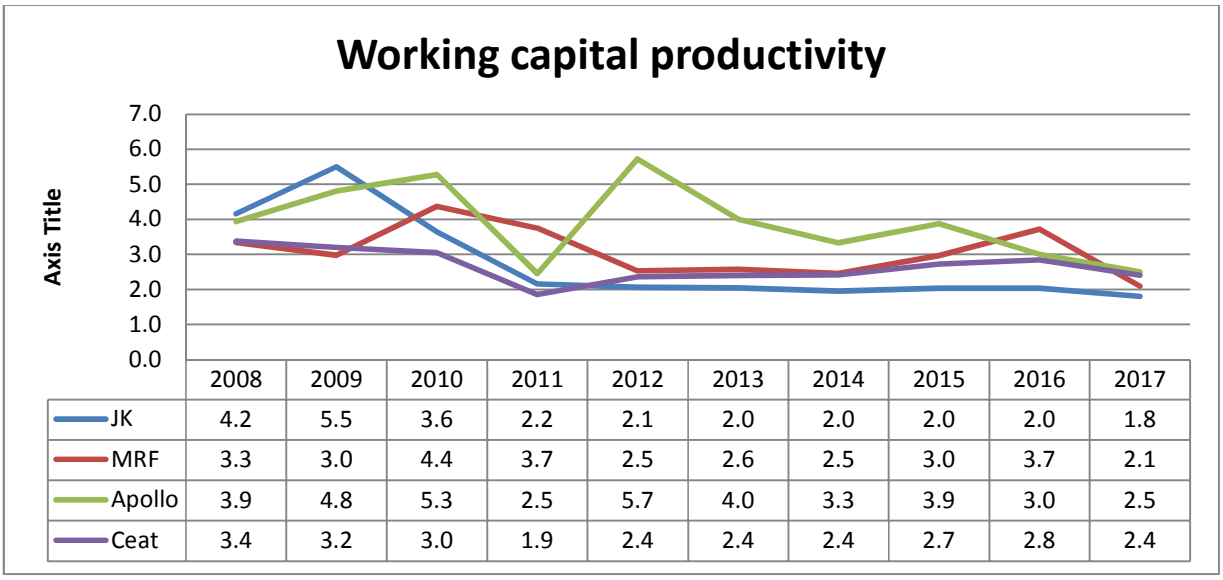


ROA of MRF>Apollo>CEAT>JK

ROA is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. MRF is in better place.

10.4. Working Capital Productivity

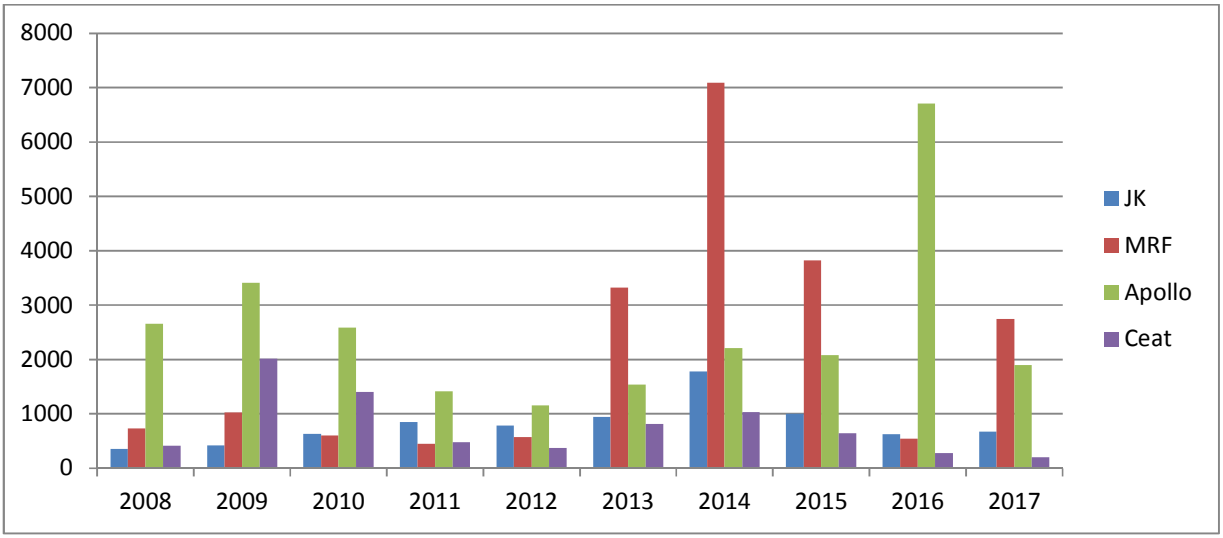
The working capital productivity has been estimated based on revenue generation w.r.t working capital attributes.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
JK	4.2	5.5	3.6	2.2	2.1	2.0	2.0	2.0	2.0	1.8
MRF	3.3	3.0	4.4	3.7	2.5	2.6	2.5	3.0	3.7	2.1
Apollo	3.9	4.8	5.3	2.5	5.7	4.0	3.3	3.9	3.0	2.5
Ceat	3.4	3.2	3.0	1.9	2.4	2.4	2.4	2.7	2.8	2.4

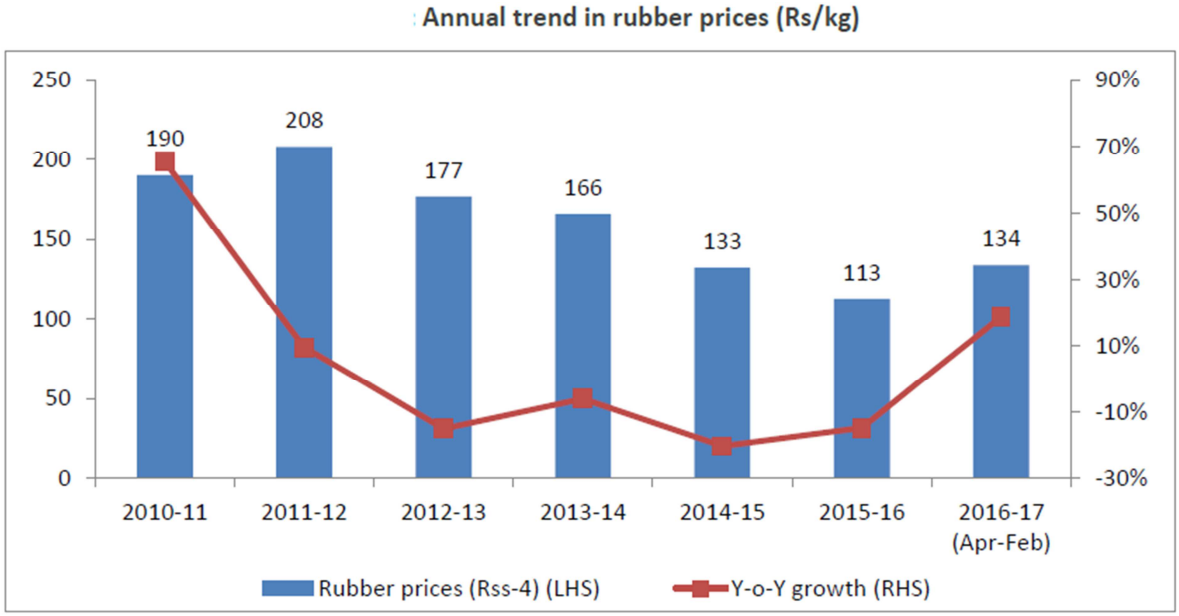
The average working capital productivity for each company is changing based on the average y-y basis sales.

Liquidity position: Value in Million



The liquidity position of MRF was improved in 2014 and 2015 so their working capital productivity also in better position during this two period. Similarly, during 2016 Apollo's liquidity position is outstanding wich helped to improve their working capital productivity.

It is observed that from 2014 onwards, every company has come to a stable working capital productivity ratio may due to their stable performance in sales and higher profit due to rubber price decrease.

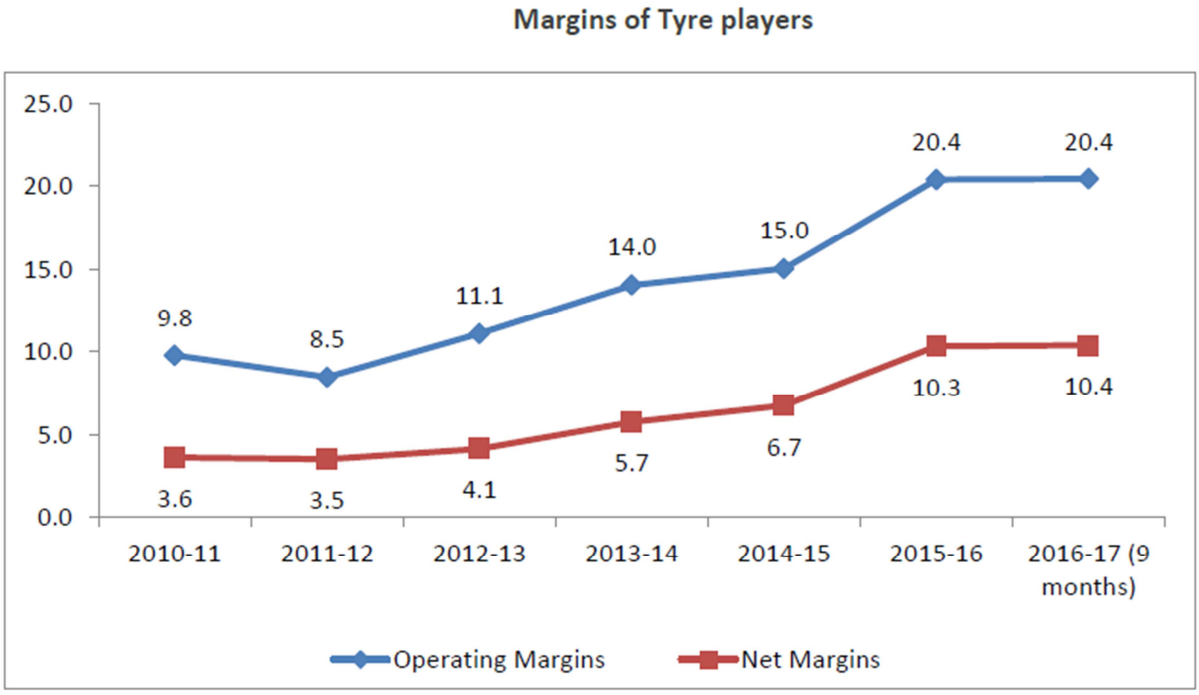


Source: Rubber Board of India

During FY 2015-16, US has imposed anti-dumping duty on imported rubber from China. This result mass incoming of Chinese raw material to India which directly gives benefits to the Indian tyre manufacturers although they are also facing stiff competition from Chinese tyre manufacturers. But Indian tyre consumers are very brand concerned which shows direct benefits to the domestic tyre producers.

In 2016-17, with surge in rubber costs, overall raw material costs are expected to increase. During April 2016 to Feb 2017 period, domestic natural rubber prices have increased by a sharp 19% y-o-y after declining

for two consecutive years. This led to a marginal decline of 1.2% in aggregate operating profits of the 9 companies for 9 month period in 2016-17. However, despite this increase in prices of raw materials and marginal decline in operating profits, the tyre industry's operating profitability remained range bound during the Apr-Dec 2016-17 on account of about 1.6% increase in sales during the period.



Note: The industry margins are based on the financial results of 9 listed tyre companies

Source: AceEquity

Also, with the significant capex in the industry, the industry's aggregate debt increased by about 7% to reach Rs 80.30 billion in 2015-16. However, with higher operating profit, the interest coverage of the industry has improved to 11.5 times in FY16 from about 7 times in FY15.

Key risks in Indian tyre Industry :

Unabated increase in Chinese imports :

Tyre imports from China to India may continue growing at 10-12% over next few years. Since the Chinese tyre market is facing challenges of overcapacity, slowing domestic demand and anti-dumping duties in the US, Chinese tyre manufacturers are flooding the Indian tyre market at distressed prices amid absence of any anti-dumping duties. This trend is more evident in the T&B radial (TBR) segment since 2W and PV consumers tend to be brand-conscious. Chinese tyre pricing lets fleet operators upgrade from TBB to TBR at the cost of TBB, and thus Chinese TBR imports have gained a healthy market share of ~35% in the TBR replacement market, impacting domestic players. CEAT is relatively insulated from this risk as it focuses on the passenger segment (2Ws and PVs) where Chinese competition is much lower.

Growing competition in 2W :

CEAT's strategic decision to focus on the highly profitable 2W segment has paid off, leading to improvement in operating margin and RoCE. However, competition in the segment is likely to intensify with the entry of new players like Apollo, Bridgestone and Balkrishna Tyres. CEAT shall have the early-mover advantage here as the company identified the B2C segment much ahead of others and has already captured significant mindshare via extensive marketing. The company also consistently launches unique products and brands them effectively, making it difficult for newcomers to gain meaningful incremental market share.

Volatile rubber prices :

Volatility in prices of key raw materials like natural and synthetic rubber can impact margins of the company if it is not able to pass on price increase due to weak demand. CEAT manages commodity price risk via strategies like market intelligence to better forecast RM prices for better inventory management, addition of new vendors, and R&D efforts to develop alternate materials that lower weight without affecting performance.

Decline in auto OEM sales:

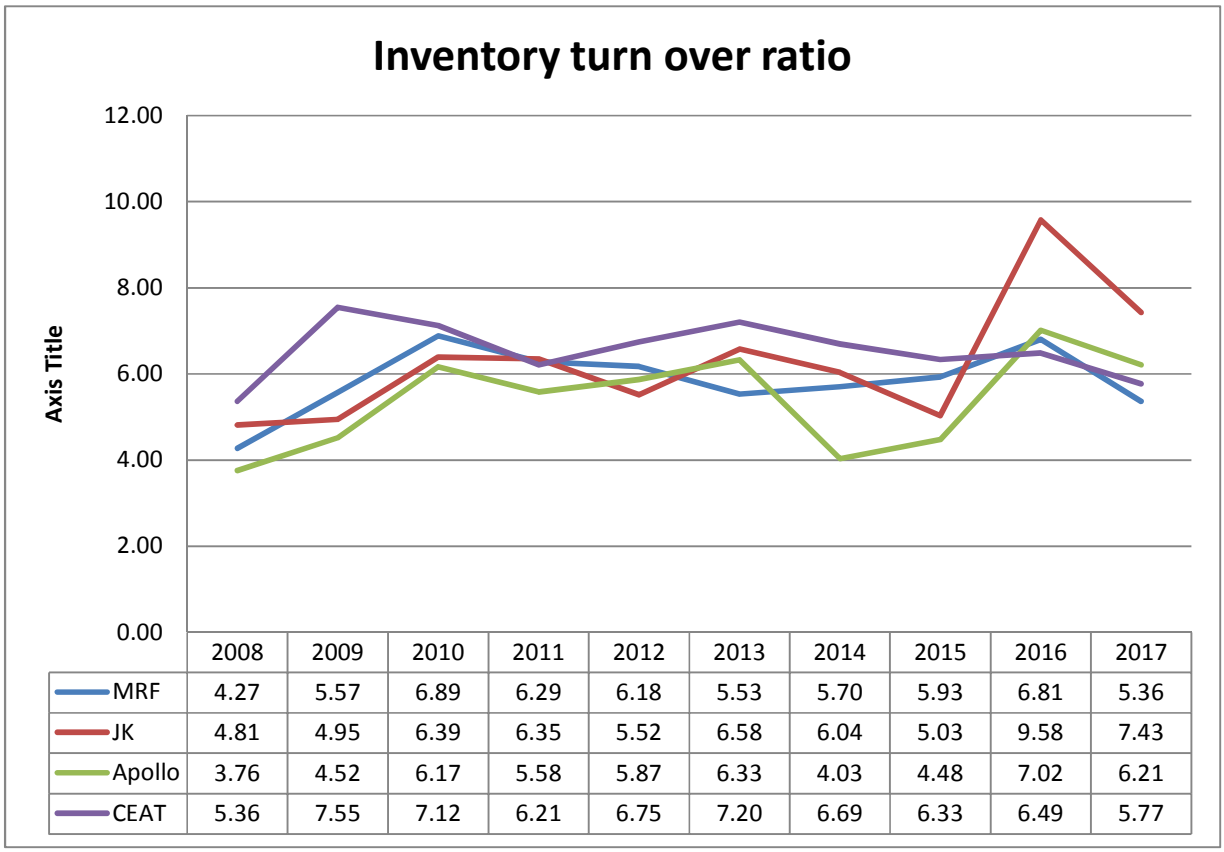
Any slowdown in the economy might directly impact demand, which leads to weaker consumer sentiment and decline in auto OEM sales. The company will be impacted due to it.

Radialisation in truck & bus segment :

Faster-than-expected increase in radialisation in the truck & bus tyre segment may impact margins. To mitigate this risk, the company is converting its truck & bus bias capacities into non-truck segments that have higher demand. The focus is also on penetrating the overseas markets, where acceptability for bias tyres is higher.

10.5. Inventory Turnover ratio

Managing inventory levels is important for companies since it can show whether sales efforts are effective or whether costs are being controlled. The inventory turnover ratio is an important measure of how well a company generates sales from its inventory. Inventory turnover is the number of times a company sells and replaces its stock of goods during a period.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
MRF	4.27	5.57	6.89	6.29	6.18	5.53	5.70	5.93	6.81	5.36
JK	4.81	4.95	6.39	6.35	5.52	6.58	6.04	5.03	9.58	7.43
Apollo	3.76	4.52	6.17	5.58	5.87	6.33	4.03	4.48	7.02	6.21
CEAT	5.36	7.55	7.12	6.21	6.75	7.20	6.69	6.33	6.49	5.77

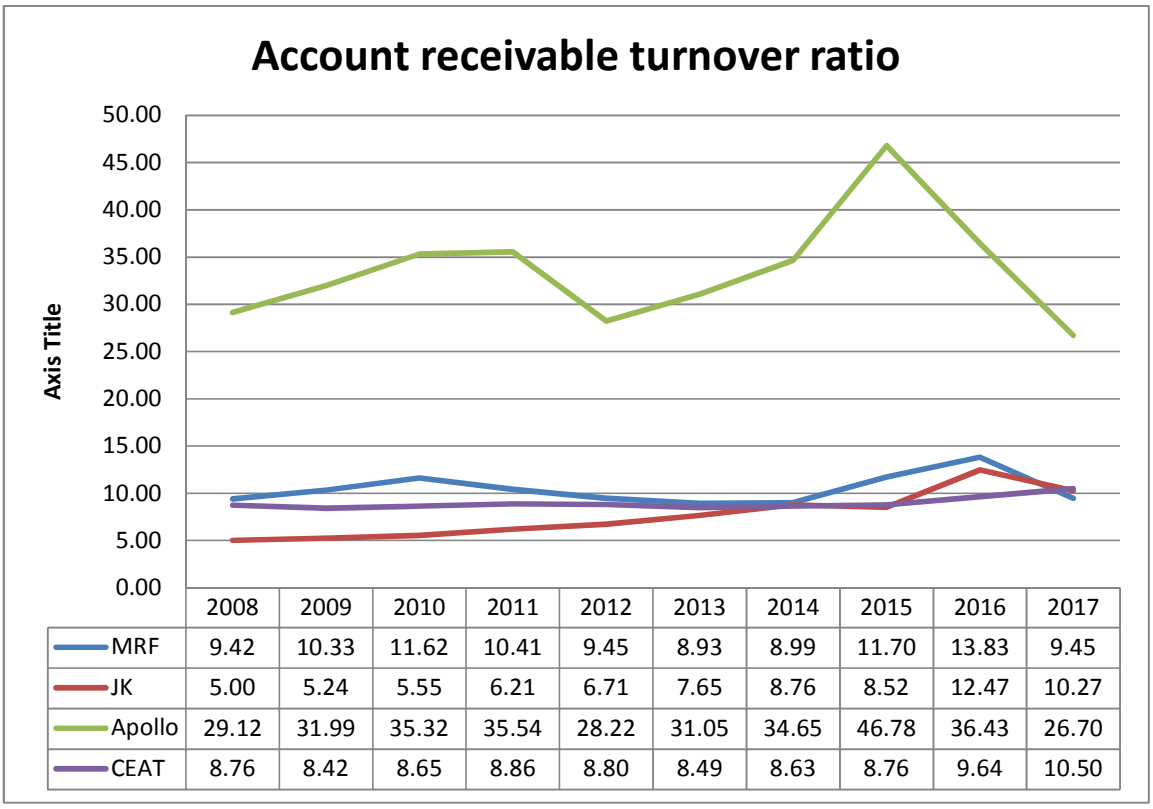
From the above graph, it is understood that inventory turnover ratio for all the companies are down from 2016 to 2017. The note ban happened on November 2016 which has brought a shadow in car market mainly in the segment of replacement tyre market in India. Therefore, the overall sales were down. On the other hand, all the tyre companies were bound to increase their sales price due to cost of raw material increase and margin pressure.

While prices of car and truck tyres have been raised by two-three per cent, those for two- and three-wheelers have been raised by two-five per cent. Retailers said the hikes came amid a 30-40 per cent decline in sales due to demonetisation.

As per Industry report, Rubber prices in January 2016 were Rs 97 a kg and this had increased to Rs 137 in January 2017 and in February 2017 it was Rs 160. Compared 2016, prices have climbed 50 per cent. This was a subsequent effect on overall tyre industry which made their inventory turnover ratio in down fall.

10.6. Account receivables Turnover ratio

Accounts receivable turnover is the number of times per year that a business collects its average accounts receivable. The ratio is intended to evaluate the ability of a company to efficiently issue credit to its customers and collect funds from them in a timely manner. A high turnover ratio indicates a combination of a conservative credit policy and an aggressive collections department, as well as a number of high-quality customers.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
MRF	9.42	10.33	11.62	10.41	9.45	8.93	8.99	11.70	13.83	9.45
JK	5.00	5.24	5.55	6.21	6.71	7.65	8.76	8.52	12.47	10.27
Apollo	29.12	31.99	35.32	35.54	28.22	31.05	34.65	46.78	36.43	26.70
CEAT	8.76	8.42	8.65	8.86	8.80	8.49	8.63	8.76	9.64	10.50

From the above graph, it is seen that Apollo is having always a much higher A/c receivable ratios compare to other three rivals. The customer segment of Apollo are more organized and reputed. The majority of Apollo tyre customer are in organized sector. Therefore, the credit recovery is more systematic in Apollo. However, JK, CEAT, MRF are more in retail business which has got uncertain payment period for which the a/c receivable turnover ratio is leser than Apollo.

It is also seen the rapid downfall of Account receivable ratio in 2017 from 2016 which indicates the slowdown in total car and tyre industry after demonitisation.

11. Conclusion & Future Prospects of Indian Tyre Industry

The Indian Tyre industry is expected to show a healthy growth 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.

The recommendation by the Directorate General of Anti Dumping (DGAD) in India to impose anti dumping duty on truck-bus radials from China, has vindicated our stand on the same, and which, once implemented, would be a boost for us in India.

Add few more related to supply chain

Bibliography

- CMIE Database
- Report of the Automotive Tyre Manufacturer's Association