A

PROJECT REPORT

ON

“SUPPLY CHAIN MANAGEMENT IN TATA MOTORS”

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POST GRADUATE DIPLOMA IN

MIT SCHOOL OF DISTANCE EDUCATION, PUNE.

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MIT SCHOOL OF DISTANCE EDUCATION PUNE-411 038

YEAR 2023-2024

DECLARATION

I hereby declare that this project report entitled “SUPPLY CHAIN MANAGEMENT IN TATA MOTORS” is a bonafide record of the project work carried out by me during the academic year 2023-2024, in fulfillment of the requirements for the award of POST GRADUATE DIPLOMA IN BIUSINESS ADMINISTRATION(PGDBA) of MIT School of Distance Education.

This work has not been undertaken or submitted elsewhere in connection with any other academic course.

Satyapal Singh Negi 

Student ID:MIT202101181

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I would like to take this opportunity to express my sincere thanks and gratitude to **Prof. Rohit Orke** of **MIT School of Distance Education, Pune** for giving me an opportunity to do my project work in your esteemed organization and it has indeed been a great learning and enjoyable experience.

I would like to express my deep sense of gratitude and profound thanks to all staff members of **MIT School of Distance Education, Pune** for their kind support and cooperation which helped me in gaining lots of knowledge and experience to do my project work successfully.

At last, but not least, I am thankful to my Family and Friends for their moral support, endurance and encouragement during the course of the project.

Satyapal Singh Negi 

Student ID:202101181

EXEMPT CERTIFICATE

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The Director
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Respected Sir,

This is to request you to kindly exempt me from submitting the certificate from my organisation for Project Work due to the reason mentioned below:

Tick the right option
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Thanking you in anticipation of your approval to my request.

Regards

Student Name – Satyapal Singh Negi
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ABSTRACT

This project explores the supply chain management (SCM) practices at Tata Motors, a leading player in the global automotive industry. The study aims to analyze the company's SCM strategies, focusing on sourcing, inventory management, transportation logistics, and the integration of information technology. It also examines the challenges posed by stringent environmental regulations and how Tata Motors addresses these through sustainable practices and compliance with global standards. By delving into the company's SCM framework, this project provides a comprehensive understanding of the factors contributing to Tata Motors' operational efficiency and competitive edge.

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CHAPTER 1

INTRODUCTION

Automobiles depend heavily on consumer trends and tastes. The large pool of skilled manpower and growing technology poses heavy demand for automobiles in India which will list our country one amongst the top five auto producers by the year 2015. The liberalization of the Indian industry saw significant growth in the Indian Automotive Industry. Today, the Indian Automotive Industry is a significant contributor to the Indian economy, contributing nearly 5% to the country's GDP and about 17-18% to the kitty of indirect taxes to the Government. Income and the cost of ownership are the two factors which are majorly affecting the demand for the automobiles.

With many new launches in the luxury and premium carmakers segment, the Indian market condition plays a catalyst role in the growth of the industry. The top-end carmakers have posted double-digit growth for the quarter ended June 30, 2013, with firms like Honda at 45 per cent and Audi recording higher sales and revenue growth of about 26 to 28 percent in this quarter itself.

India is emerging as an export hub for sports utility vehicles (SUVs), Global automobile majors are looking to leverage India's cost-competitive manufacturing practices and are assessing opportunities to export SUVs to Europe, South Africa and Southeast Asia too. India is also one of the key markets for hybrid and electric medium-heavy-duty trucks and buses.

The Tata Group, founded by Jamshedji Tata in 1868, comprises 96 companies across seven sectors: information systems and communications, engineering, materials, services, energy, consumer products, and chemicals. Aligning business with nation-building, the Group remains committed to integrity, excellence, unity, and responsibility, emphasizing corporate social responsibility and business ethics.

As one of India's largest conglomerates, Tata Group reported 2005-06 revenues of $21.9 billion (2.8% of India’s GDP) and a market capitalization of $46.9 billion, employing around 202,712 people. The Group's 28 publicly listed companies, including Tata Steel, Tata Consultancy Services, Tata Motors, and Tata Tea, have the highest market capitalization among Indian private sector enterprises and a

shareholder base exceeding 2 million. Tata operates in over 54 countries, exporting to 120 nations.

Notable achievements include Tata Steel’s acquisition of Corus, making it the sixth largest steelmaker globally; Tata Motors’ acquisitions of Jaguar and Land Rover; and TCS’s global delivery centers. Tata Tea, through Tetley, is the second largest branded tea company worldwide. Tata Chemicals is the second largest soda ash manufacturer, and Tata Communications is a leading wholesale voice carrier. The Tata brand is internationally recognized, valued at $9.92 billion by Brand Finance, ranked 13th among the '25 Most Innovative Companies' by Business Week, and 11th in the Reputation Institute’s list of reputable companies.

Tata’s pioneering spirit is evident in TCS, India’s first software company, and Tata Motors’ innovations like the Indica and Nano cars. Philanthropy is central to Tata’s ethos; two-thirds of Tata Sons’ equity is held by philanthropic trusts funding science, technology, medical research, social studies, and arts, and supporting NGOs in education, healthcare, and livelihoods. Tata's combined development expenditure is about 4% of net profits.

CHAPTER 2

TATA MOTORS- COMPANY BACKGROUND

Established in 1945, Tata Motors' presence cuts across the length and breadth of India. Over 8 million Tata vehicles ply on Indian roads, since the first rolled out in 1954. The Company's manufacturing base in India is spread across Jamshedpur (Jharkhand), Pune (Maharashtra), Lucknow (Uttar Pradesh). Pantnagar (Uttarakhand), Sanand (Gujarat) and Dharwad (Karnataka). The Company's dealership, sales, services and spare parts network comprises over 6,600 touch points. Through subsidiaries and associate companies, Tata Motors has operations in the UK, South Korea, Thailand, Spain, South Africa and Indonesia. Among them is Jaguar Land Rover, acquired in 2008.

Tata Motors Limited is India's largest automobile company. It is the leader in commercial vehicles and among the leaders in passenger vehicles in India with winning products in the compact, midsize car and utility vehicle segments. It is also the world's fourth largest bus and fifth largest truck manufacturer. Tata Motors in 2005 was ranked among the top 10 corporations in India with an annual revenue exceeding INR 320 billion. Tata Motors is committed to improving the quality of life of communities by working on four thrust areas employability. education, health and environment.

Highlights of the company (as a TATA Motor Group) in FY2012 -13

Market Capitalisation (as on 31st March 2013)	INR 79,274 crores
Total revenue	INR 1,89,629 crores
Consolidated Profit	INR 9,893 crores

Production Capability:

Domestic and International	Units produced	Units Sold
Commercial vehicle	606,983	589,897
Passenger Vehicle	580,334	598,082

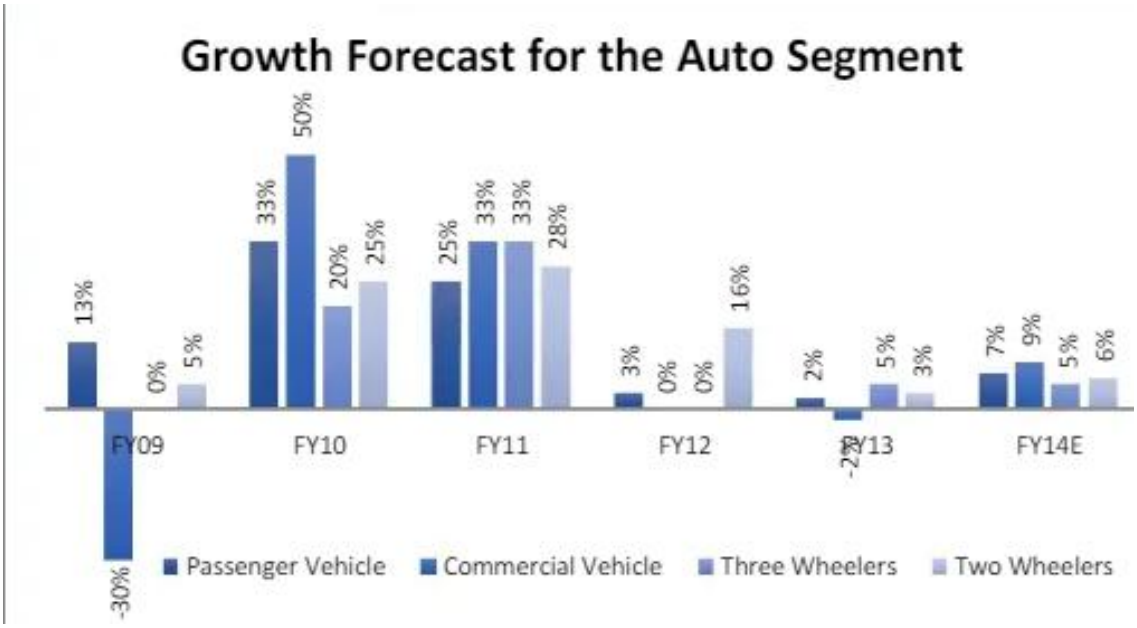
Key Statistics

The cumulative foreign direct investment (FDI) inflow into the Indian automobile industry during April 2000 to July 2013 was recorded at USS 8,932 million, amounting to 4.5 per cent of the total FDI inflows (in terms of USS), as per data published by Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce.

The overall automobile exports grew by 2.03 per cent during April-August 2013. Furthermore, the production of passenger vehicles in India was recorded at 3.23 million in 2012-13. Automobile's production increased at a compound annual growth rate (CAGR) of 12.2 per cent over FY05-13, while the export volumes increased at a CAGR of 19.1 per cent.

As per the SIAM's (Society of Indian Automobiles Manufactures) report, automobile sector is going to witness a strong growth in FY14.

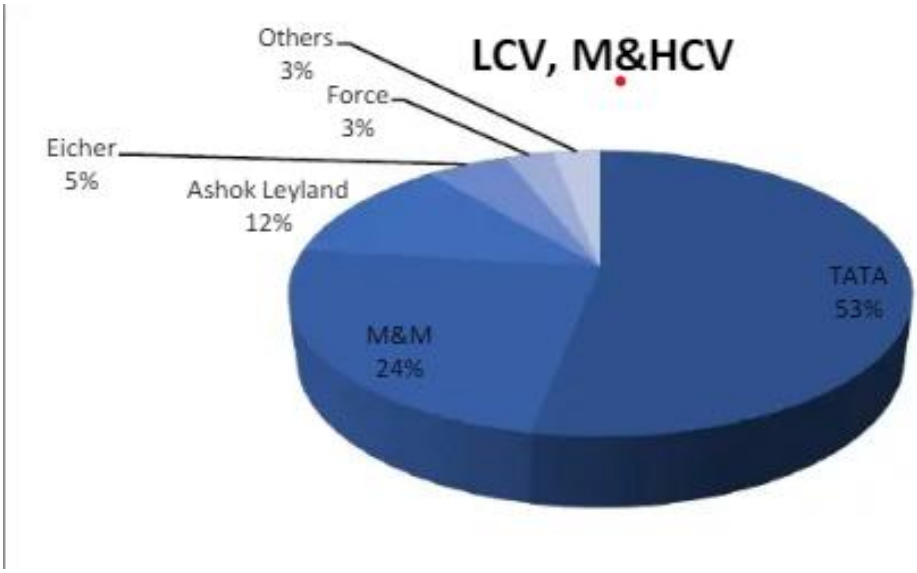
- Auto sales across categories are estimated to rise 6-8 per cent in FY14
- Passenger vehicles are projected to grow 5-7 per cent in FY14
- Commercial vehicles are forecast to rise 7-9 per cent
- MCVs and HCVs are projected to increase 1-3 per cent
- Three wheelers are estimated to rise 3-5 per cent in FY14
- Two-wheelers are expected to grow 6-8 per cent in FY14



Market players

Segments	Indian Origin	Foreign Origin
Cars/ SUVs	Hindustan Motors	Ford
	Mahindra & Mahindra	Hyundai
	Maruti Udyog Ltd	Suzuki
	Tata Motors Ltd	Honda
		Toyota
		GM
		Skoda
Commercial Vehicles	Ashok Leyland	Tatra
	Swaraj Mazda	Volvo
	Tata	Mitsubishi
	Mahindra & Mahindra	


Cars & Utility Vehicles
Other
22%
Maruti Suzuki
36%
Toyota
5%
M&M
9%
Hyundai
21%
TATA
7%


LCV, M&HCV
Others
3%
Force
3%
Eicher
5%
Ashok Leyland
12%
TATA
53%
M&M
24%

CHAPTER 3

SUPPLIERS AND OEM MANUFACTURERS

Tata Motors purchase Products from supplier, subject to supplier meeting system specifications, quality, reliability, performance, delivery, price requirements etc. of Tata Motors as detailed, in various sections in this General Terms and Conditions, RFQ, Drawings, fata Motors Standards, Purchase Orders and other agreements, such as Purchase Agreement, Supply Agreement etc. that may have been executed with the supplier.

- The supplier must accord Tata Motors the same status as that given to other important global customers and interact with Tata Motors in a similar manner. However, this status does not grant Tata Motors any legal rights, nor does it impose any legal obligations on the supplier.

- The supplier must obtain prior written consent from Tata Motors before supplying to any third party if the products in the Purchase Order are manufactured using Tata Motors' intellectual property rights, secret manufacturing processes, or dies, molds, models, patterns, jigs, tools, or accessory equipment provided or fully paid for by Tata Motors

- Products or their packaging supplied by the supplier to third parties shall not bear any marks or references to the intellectual property rights of Tata Motors or its promoters.

- Products or their packaging supplied by the supplier to third parties shall not bear any marks or references to the intellectual property rights of Tata Motors or its promoters.

- The supplier needs to supply components in reusable containers. Exceptions, if any, will have to be informed to buying agency in advance and mutually agreed upon.

3.1 PRICES

The initial price for each item will be determined jointly by Tata Motors and the supplier, based on the quotation and detailed cost breakdown provided by the supplier, and mutually agreed upon. Tata Motors will then issue a Purchase Order to the supplier for the settled price. Unless specifically agreed otherwise, any qualifying terms and conditions from the supplier's quotations, purchase order acceptance, or any other form of communication will not govern the business with Tata Motors.

The supplier, in collaboration with Tata Motors, is expected to offset inflationary cost increases through productivity gains and further cost reductions via value engineering, Six Sigma and Kaizen exercises, increased procurement volumes from Tata Motors leading to lower fixed costs per unit, higher productivity, learning curve effects, and other cost reduction measures. The supplier agrees to reduce prices according to the targets set annually using these measures.

- If changes to the product specifications are approved by Tata Motors to enhance quality, reliability, performance, and/or delivery requirements, the impact will be jointly reviewed. If deemed appropriate, Tata Motors will amend the Purchase Order accordingly.

- Price revision effected for an item, due to Value Engineering exercises or changes in supply conditions or specifications shall normally be considered only once a year, or at intervals mutually agreed upon.

- Any applicable development expense, such as Styling. Engineering. Integration, Validation, tooling etc., is settled with the Supplier considering the supplier delivers the product achieving the specified system level targets.

3.2 PAYMENTS

For local products, payment will be made according to the terms specified in the Purchase Order by the respective purchasing agencies at Tata Motors. Payments, made in Indian Rupees for all procurements within India, are typically processed within 30 days of satisfactory acceptance of the products at Tata Motors, i.e., 30 days after the Goods Inward Notification, against documents such as the lorry receipt/rail receipt, commercial invoice, and packing list.

For imported products, payment will also follow the terms specified in the Purchase Order. Generally, the payment terms involve an irrevocable letter of credit or cash against documents. Payments will be released within 30 working days from the submission of documents such as the bill of lading/airway bill, commercial invoice, packing list, and certificate of origin. For development costs paid in foreign currency, the agreed cost is always gross of the withholding tax as applicable under the Double Taxation Avoidance Treaty between India and the supplier's country of origin.

3.3 LOCAL FACILITY

The supplier should ideally establish its manufacturing facilities near Tata Motors' assembly locations to ensure Just-In-Time (JIT) supplies. If the supplier's manufacturing location is not close to Tata Motors' ordering plant, the supplier must set up a storage facility near the ordering plant to ensure an uninterrupted and streamlined supply of materials.

If the initial supplies are imported, the supplier should actively explore the possibility of setting up production facilities in the same country as Tata Motors' ordering plant to remain price competitive. The supplier should commit to a time-bound action plan for establishing a local production facility as soon as possible.

3.4 SERVICE AND REPLACEMENT PARTS

At Tata Motors' request, the supplier shall supply products to meet Tata Motors' past model service and replacement requirements for up to 15 years after completing current model purchases, at the prices specified in the purchase order plus actual cost differentials for packaging and transport. During the final year of this period, the supplier and Tata Motors will negotiate in good faith regarding the supplier's continued manufacture of service and replacement supplies. Additionally, the supplier must provide sale and after-sale service-related information as mutually agreed upon by the parties, including, but not limited to, parts catalogues, workshop manuals, training manuals, maintenance guides, and diagnostic equipment.

3.5 PRODUCT SPECIFICATION

The products supplied by the supplier to Tata Motors, as per the terms of the released Purchase Orders, must meet the specifications finalized and agreed upon in writing by both parties upon completion of the product development work. These specifications are typically documented in the form of drawings, which the supplier is expected to help prepare jointly with Tata Motors. However, the responsibility for the approval and release of these drawings and specification sheets rests solely with Tata Motors. The supplier cannot unilaterally change the specifications without prior written approval from Tata Motors.

3.6 FORECAST AND ORDERS

Actual purchase and supply of components will be made against specific purchase orders. Tata Motors will provide the supplier with an annual non-binding forecast, which the supplier may use for planning purposes only. Volume projections provided by Tata Motors, including those for spare parts, do not constitute a commitment to purchase the specified quantities. The supplier acknowledges that these volume projections, like other forward-looking projections, are based on various economic and business factors.

Initially, Tata Motors will release a purchase order or schedule as an open order. Once production of the product begins, Tata Motors will issue monthly supply schedules specifying the quantities to be delivered at a given time.

3.7 PACKING AND TRANSPORT

- For Local supplies, supplier shall supply components in reusable containers. Exceptions, if any, will have to be informed to buying agency in advance and mutually agreed upon.
- Supplier shall provide a mutually agreed Unique Identification mark including location of Identification (such bar code, color code etc) on each and every Product supplied, which shall be as agreed upon jointly before start of serial production supply.
- Unless agreed otherwise, product prices are inclusive of such marking fees.

3.8 DELIVERY CLAUSES

Supplier must supply products as per Tata Motors schedules as indicated in Purchase Order or as communicated from time to time. Supplier is expected to agree on a specific logistics protocol with Tata Motors prior to commencement of production.

CHAPTER 4

VALUE CHAIN

The concept of value chain analysis is crucial for every organization, as it divides the firm into distinct activities such as designing, manufacturing, and marketing. Originating from accounting practices, the value chain analysis helps assess the value added to the organization at each stage of manufacturing, services, or marketing (Cowe, 2008).

The value chain comprises two types of activities: Primary activities and Support activities. Primary activities, including inbound logistics, operations, outbound logistics, marketing and sales, and service, transform inputs into outputs and deliver them to customers. These primary activities are supported by firm infrastructure, human resource management, technology development, and procurement.

According to Porter (1985, in Cowe, 2008, p.178), "Every single activity in the value chain can contribute to the firm's relative cost position and create a basis for differentiation." Value chain analysis enables organizations to identify activities that add value and those that may diminish value rather than create it, thereby helping to pinpoint sources of competitive advantage.

As per TML, company's 24.000 employees are guided by the vision to be "best in the manner in which we operate, best in the products we deliver, and best in our value system, and ethics". TML considers adding value process which can help to improve work progress and in general supply chain. TML focus on development of, technical capabilities via training centers and association with technical institutes & management capabilities via training programmes at premier business schools. They also carry out career advancement schemes. Along with all this HR Management carry out various activities for their staff which results in increased efficiency, effectiveness, engagement, superior performance, productive and cordial relationship and thus increase organizational capabilities in performing various primary activities such as operations, marketing, sales etc.

4.1 INBOUND LOGISTIC

Establishing long-term contracts with service providers, transporters, and agents is crucial for ensuring consistent and reliable service. Personnel at regional offices are essential for overseeing the smooth transit of goods, ensuring that operations run efficiently. Transparency and monitoring are enhanced through the deployment of IT systems, specifically using SAP for all transactions. Daily Transport Logistics (DTL) supplies are prioritized for critical high-value items, ensuring timely and secure delivery. Additionally, efficient storage facilities are vital for easy storage and retrieval of goods, further streamlining the logistics process.

4.2 OPERATIONS

The Capital Equipment Manufacturing division excels in tooling development, adhering to global standards. To ensure a stable source of skilled manpower, the division offers an Apprentice Trainee Course. Efficiencies are continually improved through the efforts of the Kaizen and TPM (Total Productive Management) teams. The division employs automated manufacturing processes and has distributed assembly units in locations such as South Africa, Thailand, Bangladesh, and Brazil. Maintenance technical competence is a key focus, ensuring the reliability and longevity of equipment. Additionally, capacity utilization is optimized, with Mercedes Benz cars utilizing Tata Motors' paint shop facilities.

4.3 OUTBOUND LOGISTICS

Stockyards are strategically located all across the country to facilitate efficient distribution. Long-term contracts with transporters not only ensure higher volumes of business for them but also secure competitive pricing. The Regional Sales Office and Vehicle Dispatch Section are seamlessly linked through SAP, enhancing coordination and operational efficiency. Additionally, an efficient security system is in place to prevent any kind of pilferage, ensuring the safety and integrity of the goods.

4.4 MARKETING AND SALES

A structured approach is taken to understand the requirements of individual customers, with OFDs (On Field Diagnostics) conducted at regular intervals. This allows for clear identification of product requirements, leading to the development of innovative products such as the Tata 207 and Tata Ace. With a pan-India presence and a global footprint, Tata Motors ensures that its reach and influence extend widely. Independent teams are dedicated to addressing the needs of institutional customers, including various state transport units, ensuring tailored solutions and focused attention to their specific requirements.

4.5 SERVICE

Spare parts are easily available, ensuring minimal downtime and efficient maintenance. Data is collected efficiently from the field and communicated to the respective plants, enabling swift and informed decision-making. With a pan-India presence and a global footprint, the company maintains a large network of workshops, including dealer workshops and Tata Authorized Service Stations (TASS). Training facilities are provided for both dealer-end and TASS personnel, ensuring that staff are well-equipped with the necessary skills and knowledge to deliver high-quality service.

4.6 PROCUREMENT

The e-procurement initiative leverages technology to streamline the procurement process, with a Global Sourcing Team identifying key destinations for essential items, such as China for tires and power steering units, and Belarus for steel. Long-term relationships with a stable and loyal pool of suppliers are maintained, facilitated by technology-driven procurement systems like SAP and VCM. Strategic subsidiaries and joint ventures, including the TACO group of companies and Tata Cummins, play a crucial role in centralized strategic sourcing for key components like FIPs and steel. The company benefits from group resources, such as Tata Steel and Tata International, and maintains a localized supplier base at manufacturing locations to ensure low inventory levels and efficient operations.

4.7 TECHNOLOGY AND DEVELOPMENT

Approximately 2% of the company's annual profits are invested in research and development, demonstrating a strong commitment to innovation. Knowledge portal technologies help employees stay up-to-date with the latest advancements. The company boasts extensive prototype building and testing facilities and has established strategic partnerships with entities like MDI (France) and Fiat. A formal benchmarking process ensures continuous improvement, while "Technology Day" is organized across all plant locations to foster a culture of innovation and knowledge sharing.

4.7 HUMAN RESOURCE

The company boasts a vast pool of technically competent engineers and managers, with a strong focus on developing technical capabilities through its Technical Training Centers and alliances with technical institutes. Managerial capabilities are equally prioritized, with Management Training Centers (MTCs), Tata Management Training Centre (TMTC), and executive training programs at premier business schools. Career advancement schemes such as ESS (Employee Skill Set) and FTSS (Future Talent Skill Set) further support the growth and development of employees, ensuring a robust and skilled workforce.

CHAPTER 5

SUPPLY CHAIN

5.1 IMPLICATIONS OF SUPPLY CHAIN MANAGEMENT-WORLD MARKET

The recent emphasis on global climate change is increasing pressure on automobile executives to make the right decisions in many areas, including R&D and manufacturing. Emission-level targets, currently in question, threaten the entire structure of the auto industry.

These challenges hit an industry already plagued with high costs, low profit margins, and accelerated competition. New entrants from China and India are working aggressively to capture a share of the global market, following the path taken by the Japanese in the 1980s and the Koreans in the 1990s. Both of these earlier entrants went beyond their domestic market by focusing on the United States first, and then Europe later.

General macroeconomic and financial circumstances are not necessarily favorable. The cost of energy and raw materials continues to increase due to rising global demand. Strong fluctuations in exchange and interest rates pose another challenge and are difficult and costly to hedge against.

In this dynamic business environment, a superior supply chain is a critical element that helps automakers differentiate themselves from the competition. In fact, many of the trends in the auto industry are reinforcing the need to redefine supply chain strategies, layout, and operations.

The most complex challenges automakers face can be summarized as follows:

5.2 ENVIRONMENT OF SUPPLY CHAIN- TATA MOTORS Ltd.

Sourcing is a crucial function for Tata Motors, involving various agencies throughout the entire product life cycle. It begins with early vendor introduction during the product concept stage, where strategically important sources with the potential to develop into strategic alliances are identified and finalized. The extent of outsourcing and the nature of the technology to be developed determine the corresponding development agency. A specific nodal agency then oversees the development of parts and aggregates until they reach the regular procurement stage. Depending on the nature of the parts or aggregates, either the central materials agency or the sourcing group attached to the respective factory will initiate the regular procurement process.

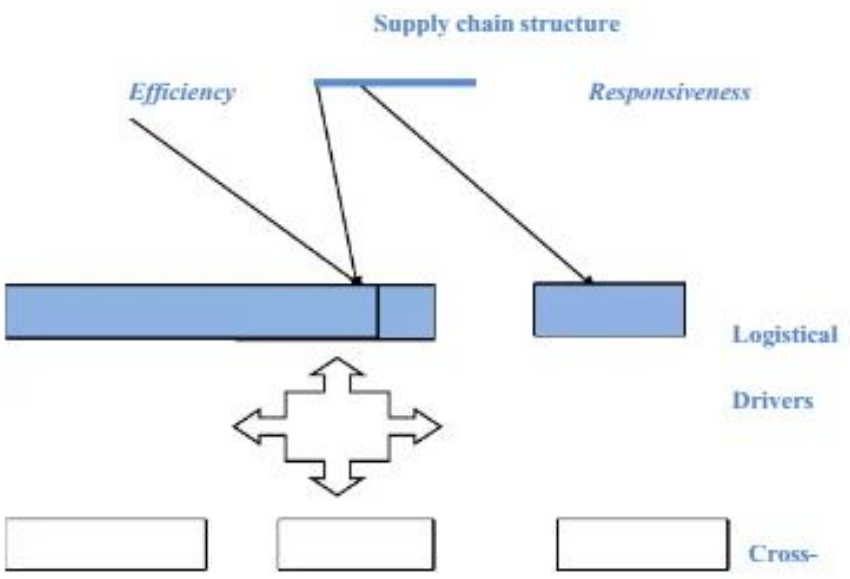
Quality assurance plays a critical role in establishing the quality of newly developed parts and maintaining consistency among regular suppliers. Cost management is a vital aspect of the business model, especially given recent macroeconomic challenges such as fluctuating commodity prices, oil prices,

foreign exchange rates, and domestic demand. A dedicated agency addresses cost increases or decreases by initiating and implementing cost-saving activities, utilizing e-sourcing tools to reduce procurement costs effectively.

The tooling division provides necessary tooling based on the policies and plans established by the project planning team. The sourcing team coordinates with these internal agencies to ensure smooth project execution and adherence to timelines. If suppliers request assistance, the productivity improvement cell helps vendors enhance productivity through a special task force that works at supplier locations.

At the appropriate phase, the respective sourcing agency coordinates to fulfill on-field spare part requirements, both locally and overseas. A centralized import cell manages all import-related activities, ensuring seamless integration and efficiency across the supply chain.

5.2 DRIVERS OF SUPPLY CHAIN



- **INVENTORY**

i. Inventory stockage is a ubiquitous feature in all supply chains due to the discrepancy between supply and demand. These discrepancies are often deliberate, such as when batch sizes are determined by cost-effectiveness or when immediate customer delivery is required despite uncertain future demand. Inventory is dispersed throughout the supply chain, encompassing raw materials, work in progress, and finished goods managed by suppliers, manufacturers/repairers, distributors, and retailers. Inventory levels also significantly influence the material flow time within a supply chain. A critical takeaway for inventory managers is that reducing inventory levels (without increasing costs or compromising responsiveness to customer needs) can lead to substantial improvements in supply chain performance and flow time.

ii. Inventory also holds a significant role in supporting a firm's competitive strategy within a supply chain. When a business prioritizes high responsiveness, inventory can be strategically used to achieve this by maintaining large stocks close to the customer. In a pull or just-in-time environment, suppliers may opt to position inventories within a customer's facility, scheduling shipments on an hourly or even minute-by-minute basis. An extreme example includes suppliers co-locating specialized manufacturing operations within their customer's factory, ensuring immediate responsiveness to customer demand. Conversely, businesses can leverage inventory to enhance efficiency by reducing stock through centralized stocking. This strategy involves a tradeoff between efficiency and responsiveness.

iii. Supply chain managers regularly face decisions aimed at enhancing the responsiveness and efficiency of their supply chains. These decisions commonly revolve around reducing procurement, repair, or delivery cycle inventory, safety inventory, and seasonal inventory.

- **TRANSPORTATION**

i. Supply chain managers regularly face decisions aimed at enhancing the responsiveness and efficiency of their supply chains. These decisions

commonly revolve around reducing procurement, repair, or delivery cycle inventory, safety inventory, and seasonal inventory.

ii. Quicker methods (modes of transport, different amounts) increase supply chain responsiveness but decrease efficiency.

iii. The choice of transportation also impacts inventory and facility location. For instance, international transactions are currently a commercial trend, requiring supply chain managers to consider factors such as travel time and customs processing in their planning.

iv. Transportation plays a pivotal role in a company's competitive strategy when addressing customer needs. If a firm's competitive strategy targets customers who require high responsiveness and are willing to pay for it, transportation can be utilized as a catalyst to enhance supply chain responsiveness.

v. The fundamental trade-off for transportation is cost (efficiency) versus speed (responsiveness). A transportation cost analysis must consider the effects of speed on inventory required.

- **FACILITIES**

i. Facilities include all locations in the supply chain to store, assemble, or fabricate inventory. In DoD, it is where personnel repair weapon systems and secondary items. The two major types of facilities are: (a) Manufacture/repair sites; (b) Storage(warehouse, distribution) sites

ii. Decisions concerning the location, capacity, and flexibility of facilities have a profound impact on supply chain performance regardless of the function. For instance, a company can enhance responsiveness by establishing warehouses close to its customers instead of relying solely on a centralized storage facility. This approach typically reduces costs while improving responsiveness. Facilities play a crucial role in driving supply chain performance, influenced by factors such as location, capacity, manufacturing/repair methods, and warehouse operations.

iii. In DoD, depot and field repair facilities are cornerstones of the supply chain.

- **INFORMATION**

i. Even though information does not have a physical presence, it is still a major supply chain driver. Information deeply affects every part of the supply chain in several ways.

ii. Information serves as the connection between the supply chain's various stages, allowing them to coordinate their actions and bring about many of the benefits of maximizing total supply chain profitability. Information is also crucial to the daily operations of each stage in a supply chain, such as the case for production scheduling, order status, and inventory status.

iii. An increasingly recognized trend is the significance of information and information systems in balancing responsiveness versus efficiency. The substantial expansion of information technology as both a functional discipline and a science underscores the profound impact that information has on the effective and efficient operation of a business.

iv. A crucial decision concerning information involves identifying which data is most valuable in reducing costs and enhancing responsiveness within a supply chain. This determination varies based on the structure of the supply chain and the market segments being served. For instance, companies focusing on customers who demand expensive customized products may discover that investing in information enables them to more swiftly address their customers' requirements.

- **SOURCING**

i. Set of business processes required to purchase goods and services in a supply chain.

ii. Supplier selection, single vs. multiple suppliers, contract negotiation

iii. Sourcing decisions are crucial because they affect the level of efficiency and responsiveness in a supply chain

iv. In-house vs. outsource decisions improving efficiency and responsiveness

- **PRICING**

i. Pricing determines the amount to charge customers'in a supply chain

ii. Pricing strategies can be used to match demand and supply Firms can utilize optimal pricing strategies to improve efficiency and responsivenes

iii. Low price and low product availability: vary prices by response times

CHAPTER 6

CASE STUDY- TATA NEXON EV

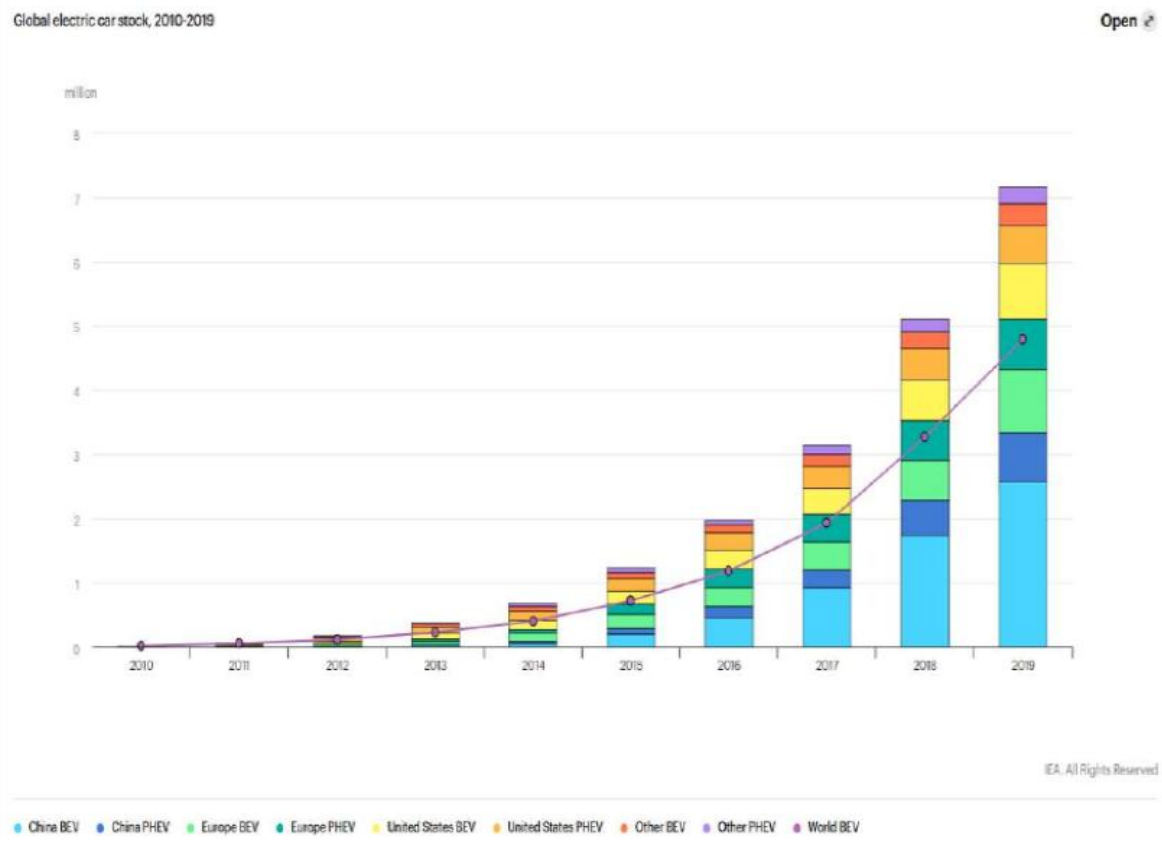
The exploitation and pollution of natural resources have underscored the necessity for renewable and eco-friendly products. Electric vehicles (EVs) have emerged as a viable alternative to petroleum-based vehicles, offering a means to reduce pollution and benefit consumers economically. In response to this shift, several Indian automobile manufacturers, including the Tata Group, have launched electric vehicles like the Tata Nexon. The adoption of innovative technology and the strong customer trust in Tata Motors position the company well to tap into this emerging market. Moreover, Tata Motors can expand its product range by integrating eco-friendly technology. However, the company may face challenges due to rising international prices, such as those of steel and aluminum, which could increase production costs. Additionally, Tata Motors will need to navigate the competitive landscape of green technology on the global stage.

6.1 INTRODUCTION

Over the years, the exploitation and pollution of natural resources have highlighted the need for renewable and environmentally-friendly products, such as electric vehicles (EVs), which serve as replacements for petroleum-based vehicles. The transition to EVs is crucial for the Indian automotive industry to maintain its foothold and expand into this emerging market. Although the market for electric vehicles is still in its early stages, it is poised to transform businesses and networks worldwide, with the global electric car fleet surging to 5.1 million, up from 2 million, and sales nearly doubling. China currently holds the position of the world's largest electric car market, closely followed by Europe and the United States, driven by generous subsidies, stringent regulations, and exemptions from license-plate lotteries and auctions in some Chinese cities. Norway is a global leader in the current electric car market share. Policies are essential to ensure that electric mobility has positive effects on the adaptability of power systems.

6.2 OBJECTIVE

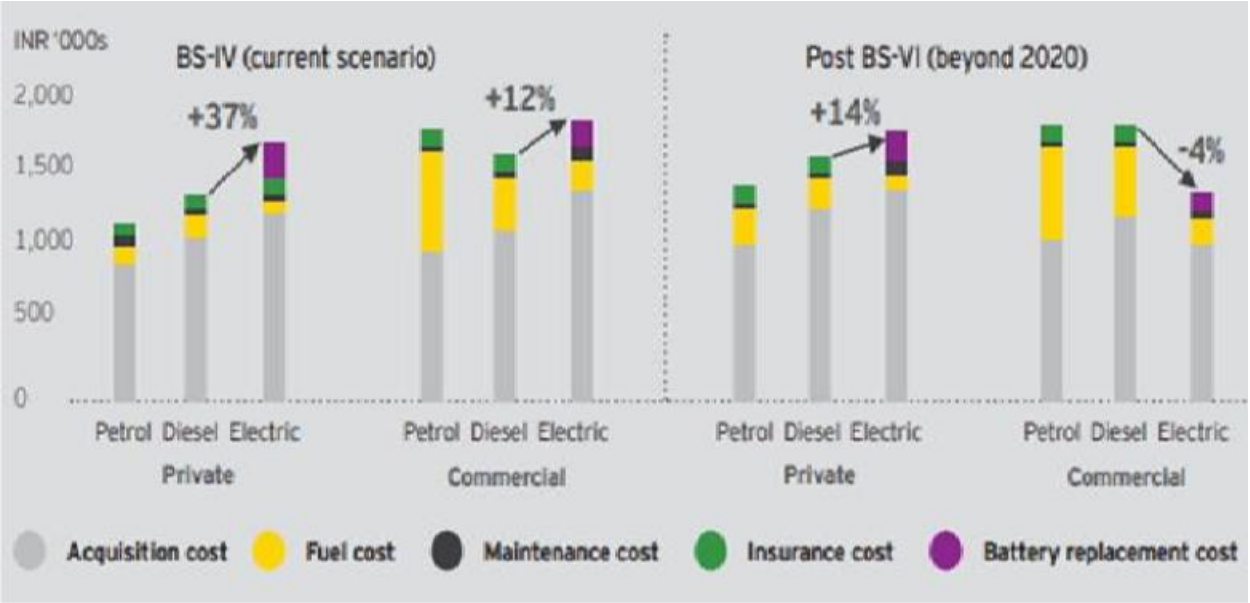
The Tata Nexon is navigating a rapidly evolving regulatory landscape, with laws, policies, and regulations impacting vehicle production and manufacturing facilities, including those related to fuel economy, CO2 emissions, and air quality emissions. There is a persistent negative public perception of diesel-fueled vehicles, largely driven by media and government policies, resulting in declining sales. Another challenge the company faces is brand positioning. With the automotive market dynamics swiftly changing due to electrification, digital connectivity, and automated driving, Tata faces significant competitive pressure from established manufacturers and new, technologically innovative, and disruptive entrants. The rapid pace of technological advancement, coupled with a shortage of skilled resources, is driving significant changes in the automotive industry and increasing the risk of meeting the demands for superior products from current and future customers.



Electric Car deployment in selected countries

6.3 ELECTRIC VEHICLE SCENARIO IN INDIA

To transform India into a comprehensive electric vehicle market by 2040, it is crucial to provide incentives for EV development similar to the 2015 Faster Adoption & Manufacturing of Electric Vehicles (FAME) Scheme, which incentivized the production of eco-friendly vehicles, including Hybrid Electric Vehicles (HEV). Currently, the Indian electric vehicle market is in its early stages, with only two electric car manufacturers, three to four OEMs in electric buses, and over ten players in two-wheelers. Many other auto OEMs are now planning to introduce EV models in India. The government aims to stimulate demand for EVs by making bulk purchases, which could significantly increase the demand for automakers.



Price Differential- EV Vs. ICE in India

6.4 STRENGTH AND MARKET STRATEGIES

Tata Motors Limited is a leading firm in the vehicle segment, possessing various strengths that enable it to excel in the marketplace and penetrate new markets. Tata is a well-known brand in India, having established itself as a trusted name with high levels of customer satisfaction. The company's dedicated client relationship management team has achieved significant consumer loyalty and high brand value

among both current and potential customers. According to the JD Power India Customer Service Index for 2019, Tata Motors ranked second with a score of 870 out of 1000, surpassing the industry average for the fourth consecutive time.

Tata Motors benefits from strong support from reliable raw material suppliers, helping the company overcome supply chain bottlenecks. The firm has cultivated a culture among dealers and distributors that emphasizes product promotion and substantial investment in training the sales team to maximize the benefits from the products. This robust dealer network enables Tata Motors to maximize profits. The company's dealership, services, sales, and spare parts network includes more than 3,500 touchpoints.

Tata Motors invests heavily in the development and training of its employees, creating an environment that boosts morale, motivation, and achievement. The company has successfully entered various new markets, diversifying its revenue sources and spreading risks. Confident in its management policies, Tata Motors partners with companies that have similar management systems, resulting in a reliable supply chain and successful integration with numerous innovative technological partners.

6.5 CONCLUSION

Tata Motors Limited, renowned for its trust and quality, is a robust company supported by its parent organization, the Tata Group, through various acquisitions and mergers. The company's significant investment in R&D highlights the expertise of its skilled workforce. In an era where reducing the global carbon footprint is crucial, Tata Motors has taken an appropriate step by launching the electric version of the Nexon. The market potential for electric vehicles in India is substantial, given the country's large population and rising income levels, which could be a game changer for the newly launched Tata Nexon.

However, the company faces several challenges. A primary challenge is the lack of innovation in the electric vehicle segment. Major competitors like General Motors, Mitsubishi Motors, Ford, and Fiat have been quite innovative recently, and Tata must adopt a more innovative approach. Another challenge is the high cost of electric vehicles. Despite the market potential, India is classified as a lower

middle-income nation by the World Bank, and most of the population cannot afford an electric vehicle. The high price of the Tata Nexon is primarily due to the cost of the battery required to run the vehicle. Since these batteries are manufactured in only a few countries, there is a limited supply, driving up the price. Additionally, the shortage of charging stations in India is a significant issue that both the company and the government need to address. The success of any industry depends on the people, and there is a pressing need to educate the public for the betterment of society.

CHAPTER 7

ECONOMIC OVERVIEW AND IMAPCT OF COVID-19

According to the National Statistical Office (NSO), India's GDP is projected to contract by 8.0% in FY 2020-21. The severe lockdowns imposed in April and May 2020 to control the spread of COVID-19 led to a significant reduction in economic activities, resulting in a 24.4% contraction in GDP during the first quarter of FY 2020-21. However, as lockdown restrictions were gradually eased starting June 2020, the economy began to recover robustly, showing a strong V-shaped recovery. This recovery is evident from the sustained improvement in most high-frequency indicators, such as the Purchase Manager's Index, which rose to 55.4 in March 2021 from 51.8 in March 2020. The NSO estimates that gross value added at basic prices for the manufacturing sector declined by 6.4% in FY 2020-21 compared to FY 2019-20. While agriculture has remained a positive factor, sectors such as contract-based services, manufacturing, and construction were hit hardest but are now recovering steadily. Government consumption and net exports have also supported this recovery. According to IMF projections in March 2021, Indian economic growth is expected to reach 12.5% in FY 2021-22 and 6.9% in FY 2022-23.

India has been significantly impacted by a second wave of COVID-19, with hospitals in several states still facing shortages of health workers, vaccines, oxygen, medicines, and beds. Many states have implemented varying levels of restrictions on economic activities and public movement to control the virus's spread, with these measures being reviewed and extended regularly. As a result, we anticipate a weaker first quarter for FY 2021-22 due to supply disruptions and the ongoing pandemic. However, we expect a gradual recovery as supply chains stabilize and the COVID-19 situation improves.

The Reserve Bank of India (RBI) introduced rate cuts in FY 2019-20 to stimulate growth and mitigate the economic impact of COVID-19. The repo rate remains at 4%, with the RBI maintaining an accommodative stance to support sustained growth and manage inflation. To enhance liquidity and support public health

efforts, the RBI announced "on tap liquidity" for various sectors, including vaccine manufacturers, medical device suppliers, and hospitals. Additionally, the RBI increased the overdraft (OD) limits for state governments to help manage their fiscal situation, extending the maximum number of OD days in a quarter from 36 to 50 and the number of consecutive OD days from 14 to 21 until September 30, 2021.

The automobile industry showed some recovery in FY 2020-21, with a 6.1% decline in domestic sales compared to a 20.3% decline in FY 2019-20, according to data from SIAM. The Passenger Vehicle segment saw a smaller decline of 2.0% in FY 2020-21, compared to 17.3% in FY 2019-20. Despite overall lower industry sales, the shift towards personal mobility mitigated the impact of the slowdown. The Commercial Vehicle industry experienced a 21.7% decline in FY 2020-21, less severe than the 30.0% decline in FY 2019-20, due to factors such as the pandemic, lower freight utilization, financing difficulties, and rising costs for BS VI vehicles.

The demand for Passenger Vehicles grew in FY 2020-21 due to pent-up demand and a shift towards personal mobility following travel restrictions. Passenger car sales, particularly small and mid-sized cars, saw increased demand, while Commercial Vehicle demand was severely affected in the first half of FY 2020-21 due to the shutdown of non-essential services and liquidity issues.

Despite short-term challenges from the pandemic, the Commercial Vehicle industry is expected to rebound, benefiting from government initiatives aimed at reviving the economy. The Government of India has encouraged foreign investment in the automobile sector, allowing 100% foreign direct investment (FDI) under the automatic route. There is also a focus on electric vehicles to reduce emissions. The Union Budget 2019-20 included an income tax deduction of ₹1.50 lakhs on loans taken for the purchase of electric vehicles. The Government has shown strong intent to promote EV adoption through various policy measures.

At Tata Motors, the health and safety of our employees have always been our top priority. We have taken several proactive measures to ensure the well-being of our employees and their families while offering support during the COVID-19 pandemic. We transitioned our office operations to a work-from-home model, equipping employees with all necessary tools to maintain productivity. Additionally, we launched a health portal where employees can check in and

declare the health status of themselves and their families. This information has enabled our medical team to provide timely support to those in need.

Furthermore, we introduced the 'Employee Assistance Program,' a confidential counseling service for employees and their families to promote emotional well-being. During the Restart phase, dedicated ‘Restart’ teams at each location developed detailed guidelines and conducted intensive training on maintaining social distancing at workplaces, shop floors, and canteen facilities. We resumed operations at select plants and dealerships with limited, essential staff, adhering to all mandated safety norms while efficiently meeting operational requirements. Gradually, we scaled up our operations, ensuring that the entire ecosystem of suppliers, vendors, dealers, and customers kept pace.

At Jaguar Land Rover, the health, well-being, and safety of its people and partners remain a top priority. Working with Public Health England, JLR was one of the first businesses, and the largest in the UK, to introduce on-site COVID-19 testing. All of JLR’s facilities implement effective social distancing, hygiene, and health monitoring protocols, with every UK employee equipped with reusable face coverings. Additionally, Jaguar Land Rover participated in a groundbreaking pilot scheme in partnership with Public Health England, vaccinating approximately 4,500 JLR employees over a 10-day period at the Solihull manufacturing site in the West Midlands. Despite the inevitable impact on Jaguar Land Rover’s global retailer network during the pandemic, they maintained sales channels through innovative remote solutions such as 'click and delivery' arrangements.

7.1 IMPACT ON FINANCIALS

The COVID-19 pandemic has rapidly spread worldwide, including in India. Governments in India and across the globe have implemented significant measures to curb the virus's spread, such as imposing mandatory lockdowns and activity restrictions. As a result, the Company's manufacturing plants and offices had to close or operate under restrictions for a considerable period during the year and after the year-end. These lockdowns and restrictions have operationally impacted the Company, affecting commodity prices, supply chain issues (including semiconductor supplies), consumer demand, and loan recoveries under its vehicle financing business.

Recently, the next wave of the pandemic has hit India, and the Company is closely monitoring the situation, considering the rising infection rates in India and worldwide and government directives. Management believes it has accounted for all possible impacts of known events arising from the COVID-19 pandemic in preparing the financial results. This includes assessments of the Company's liquidity and going concern, recoverable values of its property, plant, and equipment, intangible assets, allowances for finance receivables losses, product warranties, residual value risk, lease payments, employee benefits, government grants, and the net realizable values of other assets, including inventory and deferred tax assets.

However, given the effects of these lockdowns and restrictions on overall economic activity, particularly in the automotive industry, the impact assessment of the COVID-19 pandemic on the financial statements is subject to significant estimation uncertainties due to its nature and duration. Accordingly, the actual impacts in the future may differ from those estimated as of the approval date of these financial statements. The Company will continue to monitor any material changes to future economic conditions and their consequential impact on its financial statements.

7.2 COMMERCIAL VEHICLES IN INDIA

Industry sales of commercial vehicles decreased by 21.7% to 5,69,307 units in FY 2020-21 from 7,26,762 units in FY 2019-20. The following table sets forth the breakup of the wholesale sales in various categories on standalone basis.

Category	Industry Sales	
	FY 2020-21 (in units)	FY 2019-20 (in units)
Medium and Heavy Commercial Vehicles	1,00,712	1,32,272
Intermediate and Light Commercial Vehicles	82,386	89,066
SCVs and Pick Ups	3,65,347	4,11,352
CV Passenger Vehicles	20,862	94,072
Total	**5,69,307**	**7,26,762**

Tata Commercial Vehicle Sales			
% change	FY 2020-21 (in units)	FY 2019-20 (in units)	% change
(23.9)	58,528	75,918	(22.9)
(7.5)	37,826	42,077	(10.1)
(11.2)	1,36,835	1,55,790	(12.2)
(77.8)	8,479	38,482	(78.0)
(21.7)	**2,41,668**	**3,12,267**	**(22.6)**

The Commercial Vehicle industry continued to be impacted in FY 2020-21, because of the COVID-19 pandemic, lower freight utilizations, difficulties in obtaining financing and some hesitation due to rising costs for BS VI vehicles.

MHCVs in India

Sales of TML in the MHCV category in India declined by 22.9% to 58,528 units in FY 2020-21, compared to 75,918 units in FY 2019-20. Similarly, Tata-brand vehicle sales decreased to 58,521 units in FY 2020-21, down from 75,848 units in FY 2019-20. The MHCV segment experienced a sharp decline in the first quarter of FY 2020-21, but saw sequential improvement quarter-on-quarter as the economy reopened and infrastructure projects, housing construction, and the mining segment gained momentum. Despite the initial challenges, we observed strong demand in this segment and increased our market share by 70 basis points to 58.1% in FY 2020-21.

ILCVs in India

Sales of TML in the ILCVs category in India decreased by 10.1% to 37,826 units in FY 2020-21 compared to 42,077 units in FY 2019-20 and Tata brand vehicle sales decreased to 37,826 units in FY 2020-21, from 42,052 units in FY 2019-20.

SCVs and Pickups in India

Sales in SCVs & Pick Ups category in India of Tata-brand vehicle decreased by 12.2% to 1,36,835 units in FY 2020-21 from 1,55,790 units in FY 2019-20. Amongst all segments in commercial vehicles, the SCV and Pick Up category witnessed a lower decline because of increased demand from e-commerce players and necessity for last mile distribution. TML received a significant order of 6,413 Tata Ace Gold vehicles from Andhra Pradesh State Civil Supplies Corporation.

CV Passenger Vehicles in India

Sales in CV Passenger Vehicles category in India of TML decreased by 78.0% to 8,479 units in FY 2020-21 compared to 38,482 units in FY 2019-20 and Tata-brand vehicle sales decreased to 8,479 units in FY 2020-21 from 38,478 units in FY 2019-20. CV Passenger segment was impacted the highest because of the COVID-19 pandemic, with work from home protocols, schools not reopening and lower demand from State Transport Undertakings.

7.3 COST AND EXPENSES

Material costs decreased by 5.3% to ₹1,58,292 crores in FY 2020-21 from ₹1,67,131 crores in FY 2019-20, aligning with the reduction in revenue. As a percentage of revenue, material costs were 63.4% in FY 2020-21, compared to 64.0% in FY 2019-20.

Material costs for Tata Commercial Vehicles and Tata Passenger Vehicles increased by 9.5% to ₹37,603 crores in FY 2020-21 from ₹34,353 crores in FY 2019-20 due to increased volumes. The material costs as a percentage of total revenue rose to 75.6% in FY 2020-21, up from 73.4% in FY 2019-20, primarily due to changes in product mix and increases in commodity prices, particularly steel and other precious metals.

For our India operations, material costs in the Passenger Cars segment increased to ₹5,274 crores in FY 2020-21, compared to ₹2,471 crores in FY 2019-20. Material costs for electric vehicles rose to ₹504 crores in FY 2020-21, from ₹142 crores in FY 2019-20, and Utility vehicles increased by 57.3% to ₹5,271 crores in FY 2020-21, from ₹3,354 crores in FY 2019-20. The increase in material costs is mainly due to higher sales volumes and the increased prices under BS VI regulations.

Material costs for the ILCVs category increased by 15.4% to ₹3,119 crores in FY 2020-21, from ₹2,702 crores in FY 2019-20, while for SCVs and Pickups, costs rose by 33.0% to ₹3,917 crores in FY 2020-21, from ₹2,946 crores in FY 2019-20, primarily due to higher volumes and rising commodity prices. Material costs for the MHCVs category decreased by 4.7% to ₹10,191 crores in FY 2020-21, from ₹10,688 crores in FY 2019-20, and for CV Passenger Vehicles, costs significantly decreased to ₹828 crores in FY 2020-21, from ₹3,222 crores in FY 2019-20, mainly due to lower volumes, partially offset by increased commodity prices. Material costs as a percentage of revenue increased to 77.4% in FY 2020-21, from 75.5% in FY 2019-20.

Material costs increased by 8.2% to ₹2,319 crores in FY 2020-21, from ₹2,144 crores in FY 2019-20 for TDCV, primarily due to higher volumes, especially in the domestic (South Korea) market. As a percentage of total revenue, material costs increased to 69.9% in FY 2020-21, from 68.1% in FY 2019-20, mainly due to product mix (introduction of LCVs).

At our Jaguar Land Rover operations, material costs decreased by 9.1% to ₹1,20,335 crores in FY 2020-21, from ₹1,32,408 crores in FY 2019-20. This decrease was partially offset by an unfavorable currency translation from GBP to Indian rupees of ₹9,102 crores. Excluding currency translation, material costs attributable to our Jaguar Land Rover operations decreased by 16.0% to £12,335 million in FY 2020-21, from £14,684 million in FY 2019-20, mainly due to a 27.0% decrease in sales volume and changes in product mix. Material costs at our Jaguar Land Rover operations as a percentage of revenue decreased to 62.5% in FY 2020-21, from 63.6% in FY 2019-20 (in GBP terms).

7.4 EMPLOYEE COST

Our employee costs decreased by 9.2% in FY 2020-21 to ₹27,648 crores from ₹30,439 crores in FY 2019-20, including the foreign currency translation impact from GBP to Indian rupees discussed below.

The permanent employee headcount decreased by 4.6% as of March 31, 2021, to 75,278 employees from 78,906 employees as of March 31, 2020, primarily due to voluntary early separations that commenced in the third quarter of FY 2020-21 at

Tata Motors and Jaguar Land Rover, and in FY 2019-20 at Tata Daewoo. The average temporary headcount increased to 28,291 employees in FY 2020-21 from 19,169 employees in FY 2019-20 due to increased production, mainly in the passenger vehicle segment.

Employee costs for Tata Commercial Vehicles and Tata Passenger Vehicles decreased by 4.3% to ₹5,517 crores in FY 2020-21 from ₹5,767 crores in FY 2019-20. For our India operations, employee costs decreased by 3.6% to ₹4,632 crores in FY 2020-21 from ₹4,807 crores in FY 2019-20, mainly due to a reduction in permanent employee headcount, a reduction in staff welfare expenses due to the nationwide lockdown in Q1, and lower production in the first quarter of FY 2020-21 at TML. The permanent headcount decreased by 4.4% as of March 31, 2021, to 37,301 employees from 39,012 employees as of March 31, 2020, mainly due to voluntary early separations that commenced in the third quarter of FY 2020-21 at Tata Motors. Employee costs at Tata Motors Limited, the parent company, decreased by 3.9% to ₹4,213 crores in FY 2020-21, compared to ₹4,384 crores in FY 2019-20. The employee cost as a percentage of revenue decreased to 9.0% in FY 2020-21 from 10.0% in FY 2019-20, mainly due to an increase in revenue.

Employee costs at TDCV decreased to ₹687 crores in FY 2020-21, compared to ₹759 crores in FY 2019-20, primarily due to the abolition of certain overtime and voluntary early separations granted during FY 2020-21.

Employee costs at Jaguar Land Rover decreased by 10.1% to ₹20,873 crores (£2,141 million) in FY 2020-21 from ₹23,206 crores (£2,568 million) in FY 2019-20, primarily due to an average headcount reduction of 5.8% (FY21 average of 37,500 vs FY20 average of 39,800) and a furlough grant of ₹1,824 crores (£188 million) received under the UK government's Coronavirus Job Retention Scheme. This decrease was partially offset by an unfavorable foreign currency translation impact from GBP to Indian rupees of ₹1,527 crores. Employee costs as a percentage of revenue decreased to 10.9% in FY 2020-21 from 11.2% in FY 2019-20 (in GBP terms).

7.4 OTHER EXPERIENCES

Other expenses decreased by 28.3% to `40,922 crores in FY 2020-21 from `57,087 crores in FY 2019-20. There was an unfavourable foreign currency translation of GBP to Indian rupees of `2,493 crores. As a percentage of total revenues, these expenses decreased to 16.4% in FY 2020-21 from 21.9% in FY 2019-20. The major components of expenses are as follows:

				Percentage of Total Revenue	
	FY 2020-21	FY 2019-20	% Change	FY 2020-21	FY 2019-20
	(₹ In crores)				
Freight and transportation expenses	5,716	6,484	(11.8)	2.3	2.5
Works operation and other expenses	14,230	17,847	(20.3)	5.7	6.8
Publicity	4,385	7,614	(42.4)	1.8	2.9
Allowance for trade and other receivables and finance receivables	979	763	28.3	0.4	0.3
Warranty and product liability expenses	7,609	10,885	(30.1)	3.0	4.2
Processing charges	965	1,070	(9.8)	0.4	0.4
Stores, spare parts, and tools consumed	1,279	1,501	(14.8)	0.5	0.6
Power and fuel	1,113	1,265	(12.0)	0.4	0.5
Information technology/computer expenses	2,720	2,372	14.7	1.1	0.9
Engineering expenses	3,308	6,598	(49.9)	1.3	2.5
MTM (gain)/loss on commodity derivatives	(1,382)	688	300.9	(0.5)	0.3
Total	**40,922**	**57,087**	(28.3)	**16.4**	21.9

- Freight and transportation expenses decreased by 11.8% to 5,716 crores in FY 2020-21. This is partially offset by anunfavourable currency translation of `370 crores from GBP to INR. At Jaguar Land Rover freight and transportation expenses decreased by 18.3% from GB£611 million in FY 2019-20 to GB£499 million in FY 2020-21, mainly due to lower sales volumes. At Tata Motors standalone level, expenses decreased by 26.2% from `1,066 crores in FY 2019-20 to `787 crores in FY 2020-21 on account of lower production, mainly for commercial vehicles in first quarter of FY 2020-21 due to nationwide lockdown.
- Our works operation and other expenses accounted for 5.7% of total revenue in FY 2020-21, down from 6.8% in FY 2019-20. These other expenses mainly pertain to volume-related costs at Jaguar Land Rover and Tata Motors Limited. In absolute terms, the expenses decreased to ₹14,230 crores in FY 2020-21 from ₹17,847 crores in FY 2019-20, primarily due to a reduction in miscellaneous contract job/outsourcing expenses caused by the COVID-19 pandemic lockdown.
- Publicity expenses represented 1.8% of our total revenues in FY 2020-21, down from 2.9% in FY 2019-20. At Jaguar Land Rover, publicity expenses

decreased to £397 million (2.0% of revenue) in FY 2020-21, compared to £733 million (3.2% of revenue) in FY 2019-20. Early in the year, marketing activity was limited due to the ongoing impact of the COVID-19 pandemic. However, routine product and brand campaigns increased expenditure through to March 31, 2021, particularly in China, the US, and the UK. In addition to routine campaigns, we incurred expenses for new product introduction campaigns in FY 2020-21, primarily for the new Land Rover Defender at Jaguar Land Rover and the new Safari at Tata Motors India operations.

- The allowances for finance receivables in the Vehicle Financing segment primarily reflect provisions for the impairment of vehicle loans, amounting to ₹958 crores for FY 2020-21, compared to ₹660 crores in FY 2019-20. This increase was mainly due to additional provisions necessitated by the uncertainty surrounding the second wave of the COVID-19 pandemic. The allowances for trade receivables were ₹21 crores in FY 2020-21, down from ₹104 crores in FY 2019-20, due to improved collections.
- Warranty and product liability expenses accounted for 3.0% of our total revenues in FY 2020-21, down from 4.2% in FY 2019-20. At Jaguar Land Rover, warranty expenses decreased to £706 million (3.6% of revenue) in FY 2020-21, compared to £1,131 million (4.9% of revenue) in FY 2019-20. This reduction was mainly due to enhanced retailer guidance, improved diagnostics, proactive issue detection, prioritization and resolution through Charge+ initiatives, significant vehicle quality improvements, and other business enhancement activities. For Tata Motors' Indian operations, warranty and product liability expenses represented 0.9% of revenue in FY 2020-21, down from 1.2% in FY 2019-20, due to quality improvements and changes in product mix.
- Engineering expenses decreased by 49.9% to ₹3,308 crores in FY 2020-21, compared to ₹6,598 crores in FY 2019-20. These expenses represented 1.3% of total revenues in FY 2020-21, down from 2.5% in FY 2019-20, primarily due to reduced expenditure at Jaguar Land Rover. A significant portion of these costs is capitalized and reported under the line item "expenditure capitalized," which is discussed below.

7.4 DEPRECIATION AND AMORTIZATION

Our depreciation and amortization expenses increased by 9.9% in FY 2020-21, the breakdown of which is as follows:

		(₹ in crores)
	FY 2020-21	FY 2019-20
Depreciation	10,873	10,610
Amortization	11,502	9,699
Amortization of Leased Assets (RTU)	1,172	1,116
Total	**23,547**	**21,425**

The increase in depreciation and amortization expenses is mainly due to an unfavourable foreign currency translation from GBP to Indian rupees of `1,420 crores. This is further increased due to Job 1 programs in the year, Velar and 20MY Range Rover & Range Rover sport at Jaguar Land Rover and at TML by 203 crores due to Capitalization of Altroz and BSVI projects.

7.5 FINANCE COST(INTEREST EXPENSES)

Our interest expense (net of interest capitalized) increased by 11.8% to ₹8,097 crores in FY 2020-21, up from ₹7,243 crores in FY 2019-20. As a percentage of total revenues, interest expense represented 3.2% in FY 2020-21, compared to 2.8% in FY 2019-20. For Jaguar Land Rover, net interest expense was £251 million (₹2,425 crores) in FY 2020-21, up from £209 million (₹1,880 crores) in FY 2019-20. This increase reflects interest accrued on higher indebtedness, including the RMB5 billion China loan completed in June 2020, the US$700 million 7.750% 5-year senior notes issued in October 2020, and the US$650 million 5.875% 7-year senior notes issued in December 2020. For Tata Commercial Vehicles and Tata Passenger Vehicles, interest expense increased by 5.4% to ₹5,669 crores in FY 2020-21, from ₹5,379 crores in FY 2019-20, mainly due to higher borrowings and reduced interest capitalization and warranty discounting. In contrast, interest expense for the Vehicle Financing business decreased by 7.4% to ₹2,851 crores in FY 2020-21, from ₹3,079 crores in FY 2019-20, primarily due to lower borrowing costs.

7.6 FOREIGN EXCHANGE

- Jaguar Land Rover reported an exchange gain of ₹1,787 crores in FY 2020-21, a turnaround from the ₹1,252 crores loss recorded in FY 2019-20. This gain includes a net exchange gain of £314 million on senior notes and other borrowings in FY 2020-21, compared to a £135 million loss in FY 2019-20, due to the strengthening of GBP against USD and EUR. Additionally, there was a gain of £182 million in FY 2020-21 from fluctuations in foreign currency exchange rates on derivative contracts not hedge accounted and natural hedges of debt, compared to a £137 million loss in FY 2019-20, reflecting a stronger U.S. dollar and Euro. This also includes a loss of £2 million on the revaluation of other assets and liabilities in FY 2020-21, down from a loss of £23 million in FY 2019-20.

- For our India operations, we recorded a net exchange loss of ₹25 crores in FY 2020-21, down from ₹237 crores in FY 2019-20. This decrease is primarily due to foreign currency-denominated borrowings.

- There was a net exchange loss on revaluation of foreign currency loans at our subsidiary TML Holdings Pte. Limited of `25 crores in FY 2020-21, compared to `253 crores in FY 2019-20.

7.8 TAX EXPENSES

Our income tax expenses is `2,542 crores in FY 2020-21, compared to 395 crores in FY 2019-20, resulting in consolidated effective tax rates of 24.3% and 3.7%, for FY 2020-21 and FY 2019-20, respectively. Tax rates applicable to individual entities decreased to 18.0% for FY 2020-21, compared to 25.7% in FY 2019-20, mainly on account of few subsidiaries and Joint Operations opting for lower tax regime. There is significant increase in tax expense as referred to above due to

the following reasons:

- In FY 2020-21, deferred tax assets not recognized totaled ₹3,682 crores, compared to ₹3,192 crores in FY 2019-20. This amount includes ₹2,719 crores for Jaguar Land Rover (up from ₹75 crores in FY 2019-20) and ₹788 crores for Tata Motors Ltd (down from ₹2,922 crores in FY 2019-20), primarily due to

uncertainty regarding future taxable profits. Additionally, the Minimum Alternate Tax credit of ₹72 crores (up from ₹22 crores in FY 2019-20) has not been recognized for certain subsidiaries and joint operations due to uncertainty about its realization.

- During the year, there is tax charge on Undistributed Earnings of Subsidiaries amounting to `311 crores as compared to tax credits of 86 crores arising out of losses in FY 2019-20.
- The additional deduction for patent, research, and product development costs was ₹2 crores in FY 2020-21, compared to ₹282 crores in FY 2019-20. This decrease was primarily due to the non-availability of the weighted deduction under Section 35(2AB) of the Act for R&D expenditure effective from April 1, 2020, which had been claimed by Tata Motors Limited on a standalone basis in previous years.
- During the year, Jaguar Land Rover has written down its tangible assets under construction of `430 crores, which does not qualify for tax relief.

7.9 PROFIT AFTER TAX

Our consolidated net loss in FY 2020-21, excluding shares of noncontrolling interests, is `13,451 crores, increased from net loss of 12,071 crores in FY 2019-20. However, profit before interest and tax of `7,144 crore in FY 2020-21, compared to loss before interest and tax 555 crores in FY 2019-20. This was mainly the result of the following factors:

- Earnings before other income (excluding incentives), finance costs, foreign exchange gains/(losses) (net), exceptional items, and tax for Jaguar Land Rover were ₹7,691 crores in FY 2020-21, a significant increase from a profit of ₹594 crores in FY 2019-20. In FY 2020-21, Jaguar Land Rover recorded exceptional items totaling ₹15,350 crores, with ₹14,994 crores attributed to the Reimagine strategy in the fourth quarter.
- Earnings before other income (excluding incentives), finance costs, foreign exchange gains/(losses) (net), exceptional items, and tax for Vehicle Financing totaled ₹2,794 crores in FY 2020-21, compared to ₹2,855 crores in FY 2019-20.
- Loss before other income (excluding incentives), finance costs, foreign exchange gains/(losses) (net), exceptional items, and tax for Tata Commercial

Vehicles was ₹305 crores in FY 2020-21, compared to a profit of ₹368 crores in FY 2019-20. This decline was primarily due to lower volumes and changes in product mix.

- Loss before other income (excluding incentives), finance costs, foreign exchange gains/(losses) (net), exceptional items, and tax for Tata Passenger Vehicles was ₹1,564 crores in FY 2020-21, down from ₹2,868 crores in FY 2019-20. This improvement was due to increased sales volumes in the cars and utility vehicle segments.

CHAPTER 8

REGULATIONS

The automotive industry faces stringent governmental regulations concerning vehicle emission levels, noise, safety, and pollutants produced by manufacturing facilities. The proposed tightening of vehicle emission regulations will incur substantial compliance costs. While the company is developing various technologies to meet the required standards in the countries where it sells its vehicles, these compliance costs can significantly impact operations and may negatively affect operational results.

- To meet current and future environmental standards, the company may need to incur additional capital and R&D expenditures to upgrade its products and manufacturing facilities. These upgrades will affect the company's production costs and operational results, costs that may be challenging to pass on to customers. If the company cannot develop commercially viable technologies within the time frames set by new standards, it could face significant civil penalties or be forced to drastically limit its product offerings to remain compliant. The company's product development plan is designed to ensure that it can develop vehicles that meet current and anticipated environmental regulations, particularly in the United States under CAF... and in other countries such as China.
- All manufacturing divisions are certified under the ISO 14001:2004 environmental management system standard and the OHSAS 18001:2007 safety and occupational health management system standard. Additionally, our Pantnagar, Dharwad, and Sanand plants are certified under the ISO 50001:2011 energy management system standard. To ensure reliable and responsible suppliers for automotive production and service parts, Tata Motors requires all its suppliers to adopt the ISO 9001 and IATF 16949 quality management system frameworks.
- Company also encourage its dealers to adopt quality, environmental and safety management systems. Concorde Motors, a wholly owned subsidiary of TML, is certified for all three management systems making it the only company in the auto retail industry in India to achieve this distinction. The Supplier is not

expected to start production intent supplies to Tata Motors till the time the PPAP (Production Part Approval Process), as per 059000 quality systems, is completed and formally approved by Tata Motors.

8.1 REWARDS AND RECOGNITION

- Tata Genuine Parts was conferred with 2 awards in the Sustainable Packaging Excellence and Supply Chain Technology Advancement in categories, at the 2nd Asia Manufacturing Supply Chain Summit. Tata Genuine Parts also won the Loyalty Award in the Best Technology used in a loyalty program category
- Tata Motors has been chosen in the ëAnnual Gartner Top 25 Asia Pacific Supply Chain organizations, at its Supply Chain Executive Conference held in Sydney (Australia).
- Tata Motors (Lucknow) has won Gold at the Indian Manufacturing Excellence Awards(IMEA) in the mega large business category (automotive sector).

CHAPTER 9

CONCLUSION

The supply chain management practices at Tata Motors demonstrate a robust and strategic approach to achieving operational excellence in the automotive industry. The company has effectively implemented advanced sourcing strategies, efficient inventory management, and optimized transportation logistics to enhance its supply chain performance. The integration of cutting-edge information technology has further streamlined operations, ensuring real-time data flow and informed decision-making. Tata Motors' proactive measures to comply with environmental regulations underscore its commitment to sustainability and corporate responsibility. The insights gained from this study highlight the critical role of strategic SCM in maintaining competitiveness and driving continuous improvement. Other automotive companies can draw valuable lessons from Tata Motors' practices to bolster their own supply chain efficiency and responsiveness, ultimately improving their market positioning and customer satisfaction.

CHAPTER 10

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