

Industry Research Report for Precision Forged and Machined Components in the Automotive Industry

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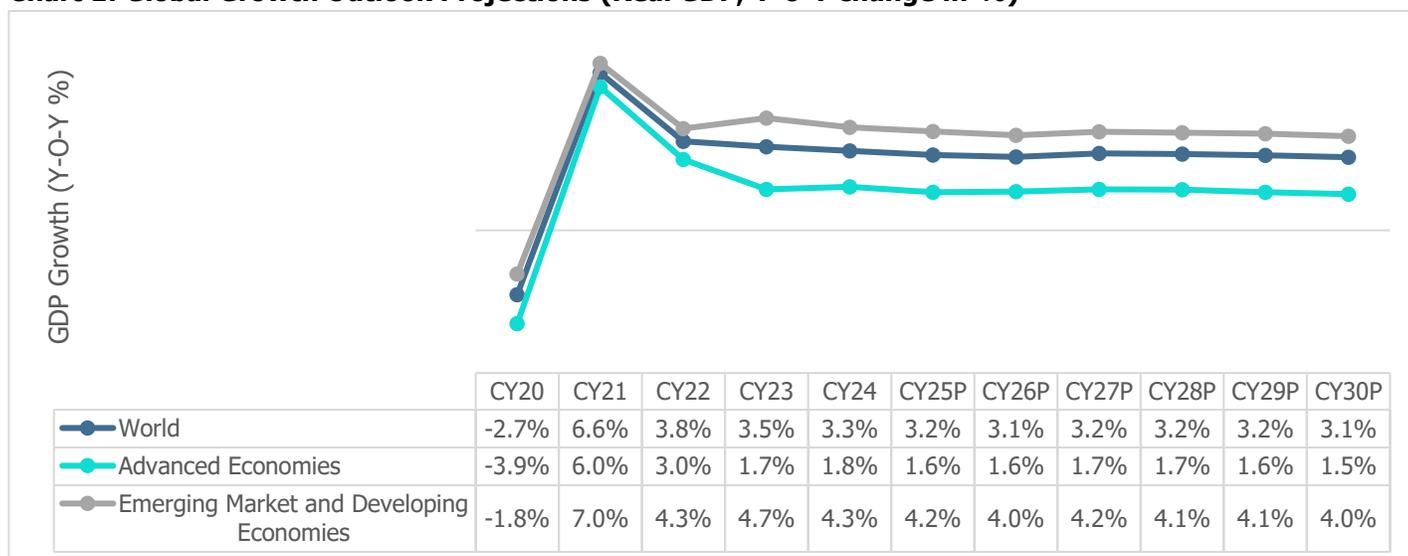
1 Economic Outlook

1.1 Global Economy

Global economic growth expected to sustain at ~3% in near term

Global growth, which reached 3.5% in CY23, stabilized at 3.3% for CY24 and estimated to have decreased at 3.2% for CY25. Global trade is expected to be disrupted by new US tariffs and countermeasures from trading partners, leading to historically high tariff rates and negatively impacting economic growth projections. The global landscape is expected to change as countries rethink their priorities and policies in response to these new developments. Central banks priority will be to adjust policies, while smart fiscal planning and reforms are key to handling debt and reducing global inequalities.

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %)



Source: IMF – World Economic Outlook, October 2025; Notes: P-Projection, E-Estimated

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %)

| | Real GDP (Y-o-Y change in %) | | | | | | | | | | |
|---------------|------------------------------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| | CY20 | CY21 | CY22 | CY23 | CY24 | CY25E | CY26P | CY27P | CY28P | CY29P | CY30P |
| India | -5.8 | 9.7 | 7.6 | 9.2 | 6.5 | 6.6 | 6.2 | 6.4 | 6.5 | 6.5 | 6.5 |
| China | 2.3 | 8.6 | 3.1 | 5.4 | 5.0 | 4.8 | 4.2 | 4.2 | 4.0 | 3.7 | 3.4 |
| Indonesia | -2.1 | 3.7 | 5.3 | 5.0 | 5.0 | 4.9 | 4.9 | 5.0 | 5.0 | 5.1 | 5.1 |
| Saudi Arabia | -3.8 | 6.5 | 12.0 | 0.5 | 2.0 | 4.0 | 4.0 | 3.3 | 3.3 | 3.3 | 3.3 |
| Brazil | -3.3 | 4.8 | 3.0 | 3.2 | 3.4 | 2.4 | 1.9 | 2.2 | 2.3 | 2.4 | 2.5 |
| Euro Area | -6.0 | 6.4 | 3.6 | 0.4 | 0.9 | 1.2 | 1.1 | 1.4 | 1.3 | 1.2 | 1.1 |
| United States | -2.1 | 6.2 | 2.5 | 2.9 | 2.8 | 2.0 | 2.1 | 2.1 | 2.1 | 1.9 | 1.8 |
| Middle East | -2.2 | 4.4 | 5.5 | 2.2 | 2.4 | 3.4 | 3.5 | 4 | 3.7 | 3.7 | 3.7 |
| Latin America | -6.9 | 7.4 | 4.2 | 2.4 | 2.4 | 2.2 | 2.4 | 2.7 | 2.7 | 2.7 | 2.6 |
| Germany | -4.1 | 3.9 | 1.8 | -0.9 | -0.5 | 0.2 | 0.9 | 1.5 | 1.2 | 1.0 | 0.7 |
| Hungary | -4.3 | 7.2 | 4.3 | -0.8 | 0.5 | 0.6 | 2.1 | 2.3 | 2.4 | 2.5 | 2.5 |

| | | | | | | | | | | | |
|--------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|
| France | -7.6 | 6.8 | 2.6 | 1.1 | 1.1 | 0.6 | 1.0 | 1.2 | 1.3 | 1.2 | 1.2 |
| Japan | -4.2 | 2.7 | 0.9 | 1.5 | 0.1 | 0.6 | 1.0 | 0.6 | 0.6 | 0.5 | 0.5 |
| Sweden | -2.0 | 5.9 | 1.5 | -0.1 | 1.0 | 1.9 | 2.2 | 1.9 | 1.7 | 1.7 | 1.7 |

Source: IMF- World Economic Outlook Database (October 2025); Note: E- Estimated, P- Projections, India's fiscal year (FY) aligns with the IMF's calendar year (CY). For instance, FY24 corresponds to CY23.

Emerging Market and Developing Economies Group

Emerging market and developing economies are estimated to have increased to 4.1% in CY25 and moderate to 4.0% in CY26, with a continued momentum till CY30. The economic forecast for emerging and developing Asian countries is estimated to increase to 5.1% in CY25 and fall to 4.7% in CY26.

In contrast, **India's** growth remains stable, with estimated rates of 6.6%, (increased from 6.2%) in CY25 and 6.2% in CY26. This growth is mainly supported by private consumption.

Despite the turmoil in the last 2-3 years, India bears good tidings to become a USD 5 trillion economy by CY27-CY28. According to the IMF dataset on Gross Domestic Product (GDP) at current prices, the nominal GDP is estimated to be at USD 4.2 trillion for CY25 and is projected to reach USD 5.1 trillion by CY27 and USD 6.8 trillion by CY30. India's expected GDP growth rate for coming years is almost double compared to the world economy. The Indian economy shows resilience amid global inflation, supported by a stable financial sector, strong service exports and robust investment driven by government spending and high-income consumer consumption, positioning it for better growth than other economies.

Besides, India stands out as the fastest-growing economy among the major economies. The country is expected to grow at a range of 6.2%-6.5% in the period of CY25-CY30, outshining China's growth rate. By CY27, the Indian economy is estimated to emerge as the third-largest economy globally, hopping over Japan and Germany. Currently, it is the third largest economy globally in terms of Purchasing Power Parity (PPP) with a ~7.9% share in the global economy, with China on the top followed by the United States.

1.2 Indian Economic Outlook

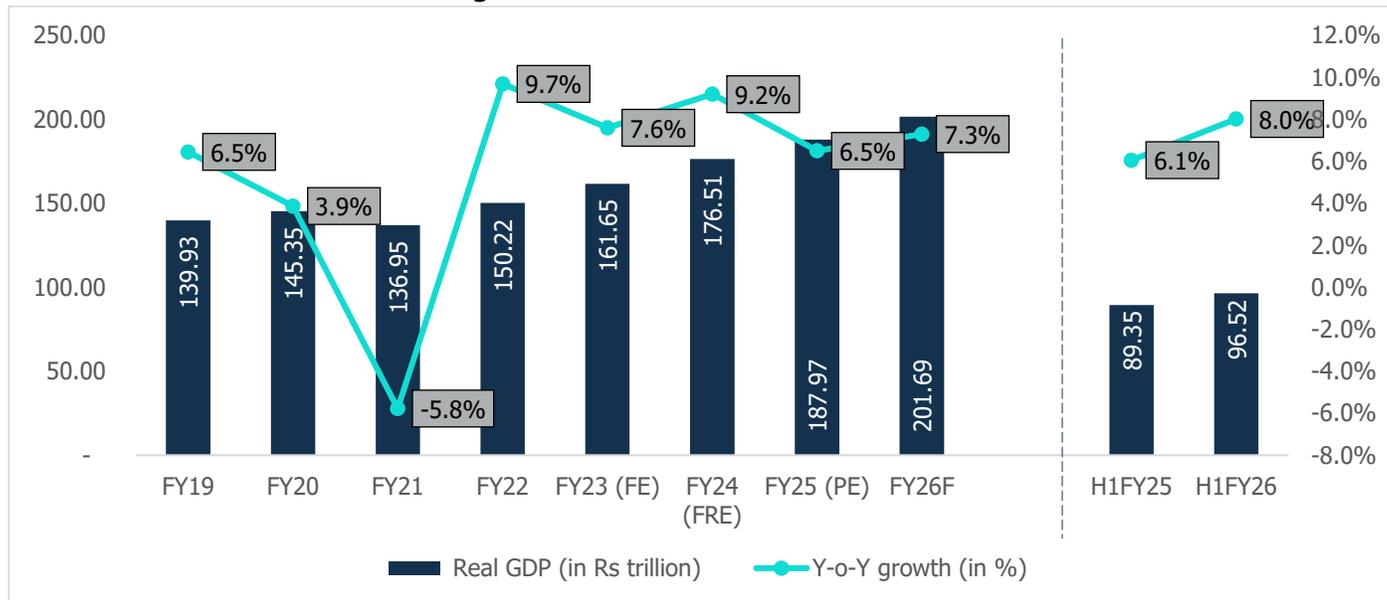
1.2.1 GDP Growth and Outlook

Resilience to External Shocks remains Critical for Near-Term Outlook

India's economy continues to show rapid growth. In H1FY26, the country's GDP grew by 8.0% compared to the same period last year, which saw a 6.1% increase. For the full year FY26, GDP is expected to grow by 7.3%, supported by rising rural demand, better job opportunities, and active business conditions.

In FY25, provisional estimates show a growth of 6.5% (Rs 187.97 trillion), led by robust performance in manufacturing, construction, and financial services. Consumer spending rose by 7.6%, and government spending increased by 3.8%, both contributing to the overall growth. In FY24, India's GDP grew by 9.2% (Rs 176.5 trillion), the highest in over a decade (excluding the pandemic year).

Chart 2: Trend in Real Indian GDP growth rate



Source: MOSPI, Reserve Bank of India.

Note: FE – Final Estimates, FRE- First Revised Estimates, PE – Provisional Estimates, F - Forecasted

GDP Growth Outlook (December 2025)

FY26 GDP Outlook: The RBI projects real GDP growth at 7.3% for 2025-26, driven by industrial and services sectors. The upward trajectory of growth is also due to income tax and goods and services tax (GST) rationalization, softer crude oil prices, increase of government capital expenditure, and facilitative monetary and financial conditions lower inflation rates.

However, risks from prolonged geopolitical tensions, global trade disruptions, and weather-related uncertainties remain. Taking these into account, the RBI has reaffirmed its growth projections.

Table 2: RBI's GDP Growth Outlook (Y-o-Y %)

| FY26P (complete year) | Q2FY26P | Q3FY26P | Q4FY26P | Q1FY27P |
|-----------------------|---------|---------|---------|---------|
| 7.3% | 7.0% | 6.5% | 6.7% | 6.8% |

Source: Reserve Bank of India; Note: P-Projected

Key growth drivers for Indian GDP Growth

- Improving Employment**

Employment generation remains a central pillar of India's growth strategy. Recent policy measures such as the Prime Minister's Rozgar Yojana aim to accelerate formalization in the labour market by extending benefits to previously informal workers while creating additional jobs across manufacturing, construction and services. These initiatives, combined with the gradual recovery in industrial activity, are expected to strengthen labour participation and support sustained household income growth.

- **Robust Business Activity**

India's business environment continues to demonstrate resilience, supported by deepening capital markets, expanding access to credit and steady inflows of foreign direct investment. Structural reforms in taxation, regulatory simplification and digitalization have enhanced the ease of doing business, enabling enterprises to scale operations more efficiently. Together, these trends underpin strong business activity, particularly in financial services, technology and professional sectors.

- **Improving Rural Demand**

Rural demand has shown steady improvement, driven by favorable monsoon patterns, agricultural productivity gains and stabilizing food inflation. Enhanced rural incomes, supported by government schemes and infrastructure development in semi-urban and rural areas, are contributing to higher discretionary spending. This momentum reinforces the role of the rural economy as a critical driver of overall consumption growth.

- **Sectoral Drivers**

Key sectors such as manufacturing, construction, financial services and real estate continue to provide a strong foundation for long-term growth. Construction and real estate not only contribute substantially to gross value added but also serve as major employment generators. Concurrently, initiatives like Make in India and Atmanirbhar Bharat are boosting domestic manufacturing competitiveness, while financial and professional services are benefiting from digital transformation and a growing skilled workforce.

- **Increasing Private Consumption and Government Spending**

Private consumption has rebounded as household confidence improves, supported by steady income growth and resilient rural demand. This has been complemented by strong public investment, with the government maintaining a high level of capital expenditure to stimulate infrastructure development and crowd in private sector participation. The dual impact of rising consumption and sustained government spending provides a balanced impetus for medium-term economic growth.

- **Digitalization and Technology Adoption**

Rapid expansion of digital infrastructure (UPI, Aadhaar, 5G, ONDC) is enabling financial inclusion, e-commerce penetration and productivity gains across services and MSMEs. This can be considered a major growth catalyst for the next decade.

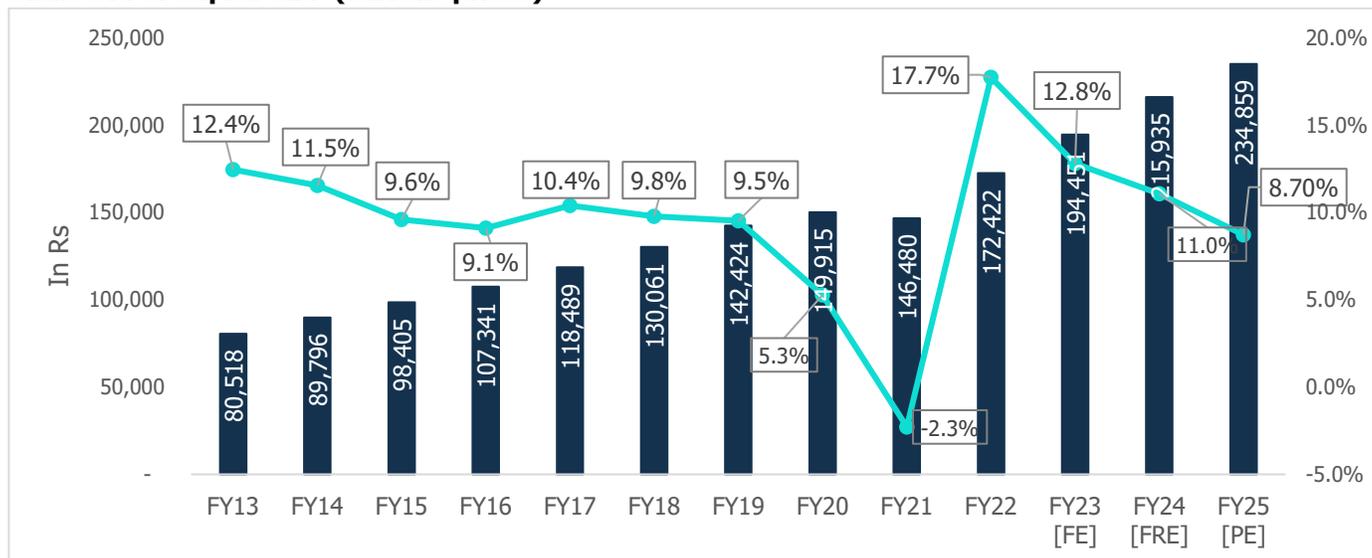
- **Infrastructure Expansion**

Ongoing government initiatives in transport corridors, logistics parks, ports, renewable energy and urban infrastructure are expected to enhance efficiency and reduce transaction costs, crowding in private investment.

1.2.2 India's GDP Per Capita

India's per capita GDP has shown a consistent upward trend over the past decade, reflecting steady economic growth. Rising per capita income, driven by robust economic development, enhances consumer confidence and discretionary spending, reflecting a higher standard of living and overall prosperity. From FY13 to FY25, the per capita GDP is expected to increase from Rs 80,518 to Rs 234, 859, with an average growth rate of around 9.% annually. Key drivers of this growth include structural reforms, digitalization, rising domestic consumption and increased foreign investment. However, there was a slight dip in FY20, primarily due to the economic impact of the COVID-19 pandemic. Despite this, the country has rebounded with strong growth rates in subsequent years, supported by economic recovery and continued expansion in various sectors.

Chart 3: Per capita GDP (current prices)



Source: MOSPI; Note: FE – Final Estimates, FRE- First Revised Estimates, PE- Provisional Estimates

1.2.3 Manufacturing Sector’s Contribution to GDP

Table 3: Manufacturing Sector’s Contribution to GDP

| Numbers in (Rs Million) | FY21 | FY22 | FY23 | FY24 | FY25 |
|----------------------------|--------------|--------------|--------------|--------------|--------------|
| GDP | 1,36,94,8690 | 1,50,21,8460 | 1,61,64,9130 | 1,76,50,5910 | 1,87,96,9550 |
| Manufacturing | 2,32,91,601 | 2,56,10,331 | 3,53,48,670 | 3,92,15,960 | 4,16,94,190 |
| Contribution to GDP | 17% | 17% | 22% | 22% | 22% |

Source: MOSPI, Numbers in Cr.

India’s manufacturing sector consistently made up around 17% of GDP, reflecting modest output growth amid initial backing from the early “Make in India”. In 2022–23, a significant policy boost arrived via Production-Linked Incentive (PLI) schemes and “Atmanirbhar Bharat” drives, leading to a sharp rise in manufacturing output that elevated its GDP share to 22%. A level sustained through the FY24 and FY25 projections. This jump came from targeted growth in sectors such as electronics, autos, pharmaceuticals and textiles, accompanied by higher FDI and improved infrastructure, signalling a structural shift toward a more industrialized economy poised to reach long-term manufacturing goals.

Government Policies towards the Manufacturing and Exports Sector: -

- Promoting Manufacturing:** The “Make in India” initiative, launched in 2014, aims to establish India as a global manufacturing hub by attracting domestic and foreign investment across various sectors. Central to this is the Production-Linked Incentive (PLI) Scheme, which incentivizes companies to boost local production, now expanded to sectors like textiles, auto components and advanced chemistry cell batteries, generating significant investment and employment.

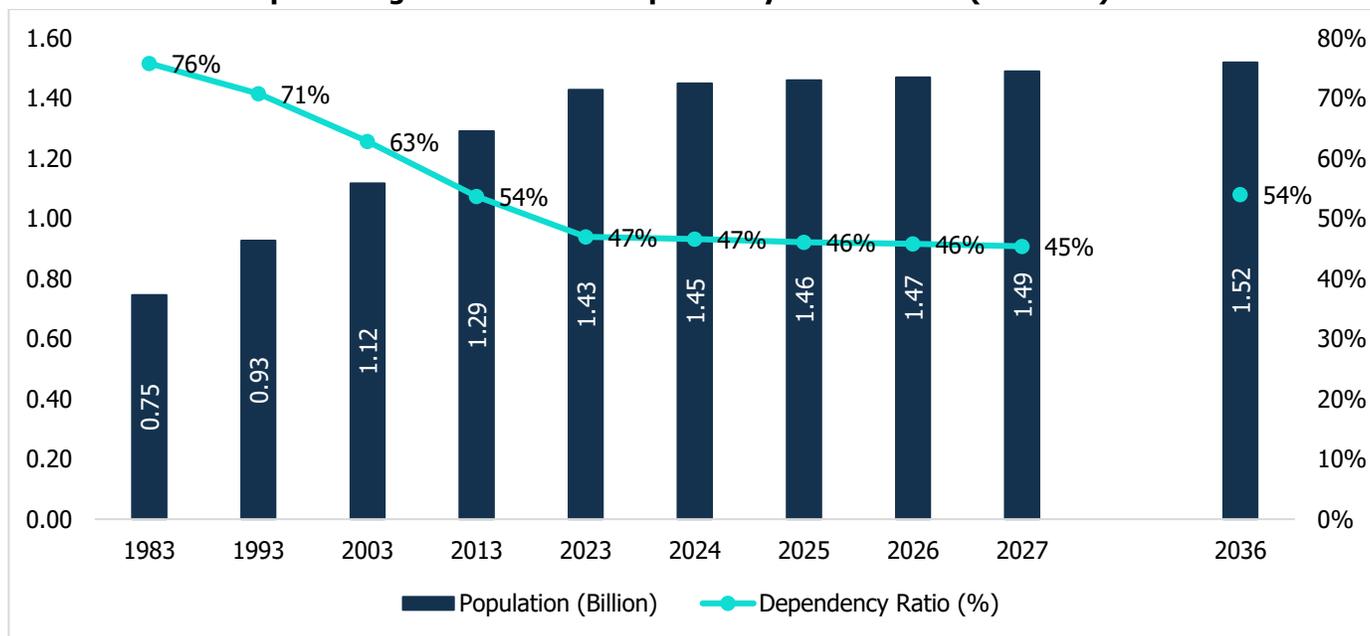
- **Blueprint for Growth:** The National Manufacturing Mission (2025–26) focuses on simplifying business, developing a skilled workforce and revitalizing MSMEs. The National Industrial Corridor Programme supports integrated industrial zones linked by advanced transport networks to foster planned industrial growth.
- **Liberalizing FDI Policies:** India has eased FDI rules across manufacturing sectors, allowing automatic approvals to attract foreign investment and facilitate technology transfer. Over the past two decades, reforms have helped India receive over USD 1 trillion in FDI, enhancing competitiveness and infrastructure.
- **Self-Reliance Campaign (Atmanirbhar Bharat):** This vision promotes building indigenous manufacturing capacity, reducing import dependence and strengthening self-sufficiency while encouraging global collaboration.

1.2.4 Overview of Key Demographic Parameters

- **Population growth and Urbanization**

The trajectory of economic growth of India and private consumption is driven by socio-economic factors such as demographics and urbanization. According to the world bank, India’s population in 2022 surpassed 1.42 billion, slightly higher than China’s population (1.41 billion) and became the most populous country in the world.

Chart 4: Trend in Population growth vis-à-vis dependency ratio in India (in Billion)



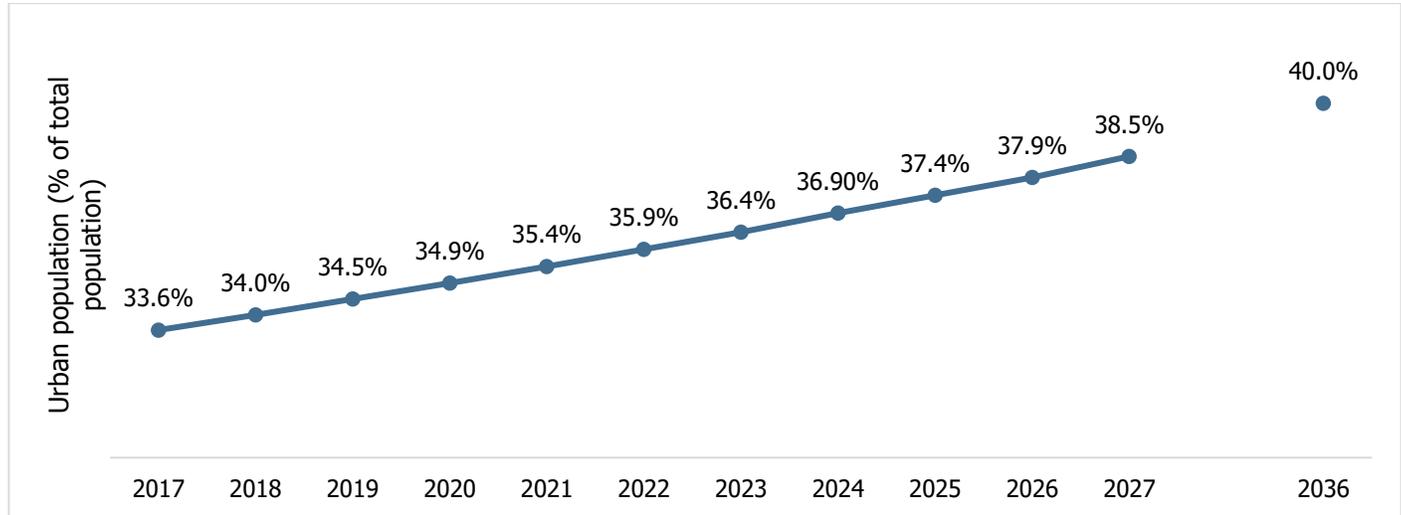
Source: World Bank Database, MOSPI

Despite a projected rise in the dependency ratio to 54% by 2036, India’s young and growing workforce, especially in newly urbanised towns, will continue to drive income growth and consumer demand. This presents strong opportunities for sectors like consumer electronics, transportation and railways. Rising employment, urbanisation and government investment in rural development and digital infrastructure will further boost demand, while increased tech adoption supports long-term consumption growth across both urban and rural markets.

The consistent increase in urban population shown in the urbanization trend as a positive indicator of economic growth and improved living standards. Urbanization often enables greater access to education, healthcare, and employment, driving upward mobility and innovation. As more individuals transition to urban centres, there is potential for enhanced

productivity and collaboration, which can accelerate development. The upward trend reflects that the country is embracing modernization and leveraging urban environments for progress.

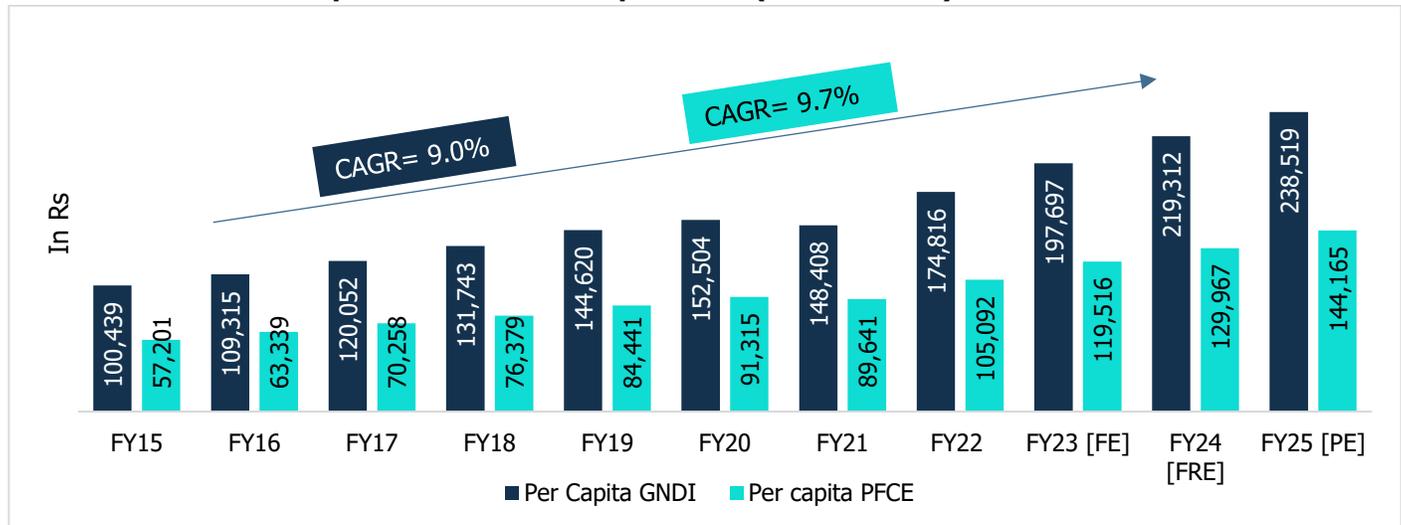
Chart 5: Urbanization Trend in India



Source: World Bank Database

The chart below demonstrates robust growth in both Per Capita Gross National Disposable Income (GNDI) and Per Capita Private Final Consumption Expenditure (PFCE) over the years. This positive trend indicates rising individual prosperity, greater disposable income, and an enhanced capacity for consumption among the population. With Compound Annual Growth Rates (CAGR) of 9.0% for GNDI and 9.7% for PFCE, the data reflects a healthy economic environment that supports increased consumer spending and wealth generation. Such sustained improvement is favourable for further economic development and is a strong signal for continued investment and confidence in the economy’s growth trajectory.

Chart 6: Trend of Per Capita GNDI and Per Capita PFCE (Current Price)



Source: MOSPI; Note: FRE – First Revised Estimates, FE – Final Estimates, PE- Provisional Estimates

1.2.5 Analysing GST Rate cutdown and its Implications for Indian OEMs

The GST rate cut from 28% to 18% on several auto components such as engine parts, braking systems, transmission assemblies, and electrical equipment directly lowers input costs for OEMs while also reducing replacement costs in the aftermarket.

For component manufacturers, this change is expected to stimulate demand not only through higher vehicle sales but also through increased consumption of spares and service parts. In particular, mass-market segments like two-wheelers and small passenger cars, which account for significant volumes of parts such as tyres, batteries, filters, and lighting systems, are likely to see faster inventory turnover.

At the same time, the reduction offers scope for deeper localisation as OEMs renegotiate supply contracts to capture savings across the value chain. Component makers can adapt quickly by aligning pricing, scaling production for fast-moving parts, and supporting dealer networks that may face transitional ITC challenges on older stock. While the concessional 5% GST on EVs continues, the 18% slab on batteries, chargers, and electronic control units keeps cost pressures intact in the EV ecosystem.

1.2.6 Implications of Geopolitical Developments on India's Auto Components Sector

Ongoing geopolitical tensions including conflicts in the Middle East, evolving trade protectionism, and supply chain realignments are creating a mixed impact on India's auto components sector. In the near term, volatility in energy prices and disruptions in critical inputs (such as rare earths and electronic components) may exert pressure on production costs and margins, particularly for MSMEs. Additionally, rising tariff barriers in key export markets like the US could weigh on external demand and competitiveness. However, these challenges are counterbalanced by emerging opportunities, as global OEMs increasingly diversify sourcing away from China under the "China+1" strategy, positioning India as a preferred alternative manufacturing hub. Coupled with strong domestic demand and policy support for localisation and EV ecosystem development, the sector is likely to witness a structural shift navigating short-term headwinds while strengthening its role in global automotive supply chains over the medium to long term.

1.2.7 Concluding Remarks

Global economic growth faces headwinds from geopolitical tensions, volatile commodity prices, high interest rates, inflation, financial market volatility, climate change and rising public debt. However, India's economy remains relatively strong, with an IMF forecast of 6.5% GDP growth in CY24 (FY25 according to the fiscal year), compared to the global projection of 3.3%. Key drivers include strong domestic demand, government capital expenditure and moderating inflation.

Public investment is expected to exhibit healthy growth as the government has allocated a strong capital expenditure of about Rs 11.21 lakh crores for FY26. The private sector's intent to invest is also showing improvement as per the data announced on new project investments and resilience shown by the import of capital goods. Additionally, improvement in rural demand owing to healthy sowing, improving reservoir levels and progress in south-west monsoon along with government's thrust on capex and other policy support will aid the investment cycle in gaining further traction.

The impact of U.S. tariffs on India's export trade is anticipated to be minimal. The key sectors which will have a potential impact are engineering goods, electronics, gems and jewellery, pharmaceuticals, textiles and automobiles, among others. The affected sectors represent a small fraction of India's total exports, with key industries such as steel industry

affected by the 25% tariffs although the impact is expected to be minimal given the volume of goods exported is less and textiles are potentially benefiting from reduced competition.

2 Automotive Market

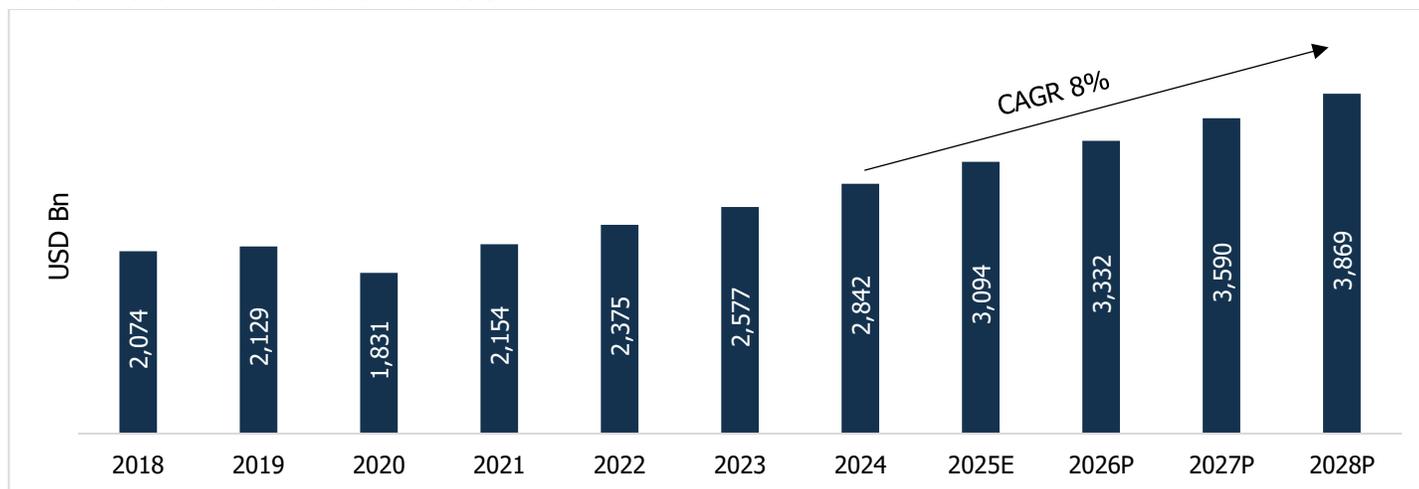
2.1 Global Automotive Market

2.1.1 Industry Overview & Market Size

The global automobile market constitutes a dynamic and multifaceted industry that encompasses the design, manufacturing, marketing and sale of motor vehicles. It plays a pivotal role in the global economy by influencing employment, trade and technological advancement. At present, the industry is undergoing a fundamental transformation, fuelled by, the rise of electric vehicles (EVs), advancements in autonomous driving technologies and shifts in consumer preferences towards sustainable and connected mobility solutions. The motor vehicles market is broadly segmented into three key segments which are two-wheeler, passenger vehicles and commercial vehicles. Each category serves distinct transportation needs across various regions and consumer groups. Two-wheeler is widely used for individual mobility, especially in densely populated and developing regions due to their affordability and fuel efficiency. Passenger vehicles remain the preferred choice for personal and group transportation, offering comfort, safety and technological integration. Meanwhile, commercial vehicles which include trucks, vans and buses are essential for freight movement, public transportation and industrial logistics. Collectively, these segments form the backbone of the global automotive landscape, catering to diverse mobility demands in both urban and rural settings.

The global automobile market continues to evolve rapidly, shaped by technological innovation, economic shifts and changing consumer demands. While traditional internal combustion engine vehicles continue to hold a significant share, there is a noticeable shift towards electric and hybrid models, driven by environmental concerns and supportive policies in various regions. Developed markets are experiencing a gradual transition, whereas emerging economies are witnessing rapid growth in vehicle ownership due to rising urbanization. Simultaneously, the industry is navigating challenges such as supply chain disruptions and evolving regulatory regimes. In response, manufacturers are intensifying their focus on innovation and diversification to remain competitive and cater to the dynamic expectations of a global consumer base.

Chart 7: Global Automobile Market Size



Source: Industry Sources, CareEdge Research; E: Estimated; P: Projected; Years refer to Calendar Year (CY)

Notably, the Asia-Pacific region remains the global leader in automotive production and sales, with countries such as China investing heavily in next-generation vehicle technologies and infrastructure. Additionally, India is emerging as a critical player in the global automotive landscape, driven by its growing manufacturing base and rising domestic demand. With strong government support through initiatives like PLI schemes and a skilled engineering workforce, India is positioning itself as a hub for both traditional and next-gen mobility solutions, contributing significantly to global supply chains and innovation.

Table 4: Key Trends and Growth Drivers of Global Automotive Market

| No. | Theme | Key Highlights (2021–2024) |
|-----|--|--|
| 1 | Post-Pandemic Recovery and Industrial Restart | Global vehicle production rose from ~80 million units in 2021 to 92.5 million in 2024 (+16%). Recovery was driven by resumed factory operations, improved semiconductor supply, pent-up demand and stabilised raw material logistics. |
| 2 | Emergence of India and China as Global Production Hubs | China and India saw strong growth due to domestic demand, export expansion, EV policies (China) and “Make in India” with PLI (India). Supply chain diversification and cost efficiency attracted global manufacturers. |
| 3 | Structural Transition in Developed Markets | Regions like Europe, the US, Japan and South Korea grew moderately (+13%) amid EV transition, emission regulations and labour shortages. Retooling of ICE plants and investment in EV technologies caused short-term disruptions. |
| 4 | Resurgence in Two-Wheeler Markets Globally | Global two-wheeler output hit a record 61.8 million units in 2024. India led with 14% growth, followed by Brazil, Mexico and Turkey. Urban demand, rising fuel costs, rural penetration and electric scooters drove the trend. |
| 5 | Rising Commercial Vehicle (CV) Demand | CV production rose from 2.3 million (2021) to 2.5 million (2023), then stabilised in 2024. Growth was driven by infrastructure, e-commerce and fleet replacement, especially in the US and India. |
| 6 | Export Push from Asia-Oceania | Asia-Oceania led global car exports with 47.26 million units. India and China expanded shipments, benefiting from trade conditions and surplus capacity. Latin America and Africa became key emerging destinations. |
| 7 | Electrification Disrupting Traditional Production in West | In Europe and the US, EV transitions led to output volatility. Europe peaked in 2023 but dipped in 2024 amid inflation and energy cost pressure. US car production peaked at 5.14 million units in 2023, declining in 2024 due to retooling delays and cost hikes. |

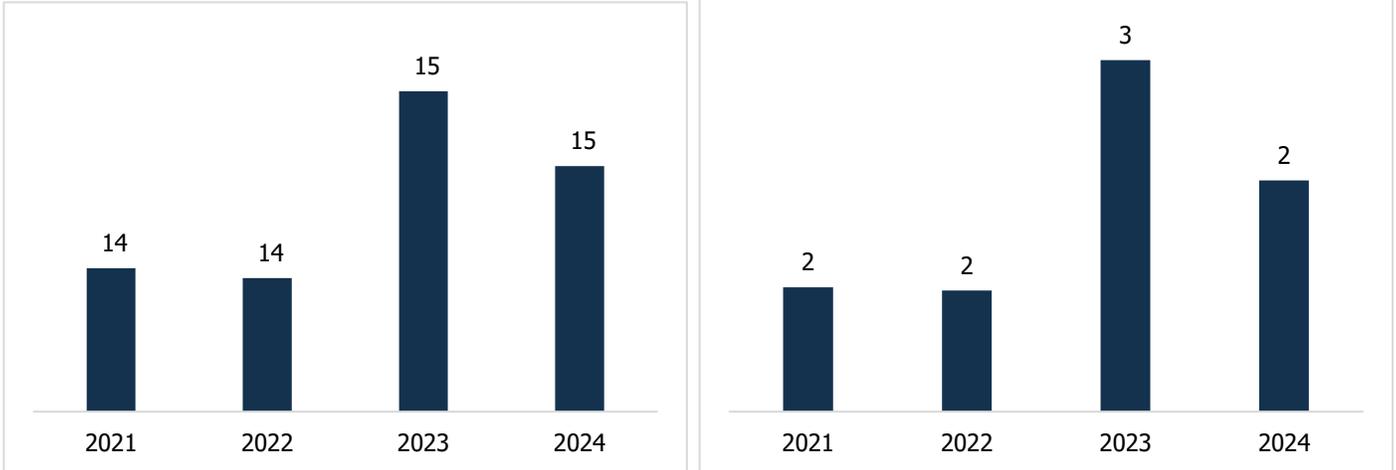
2.1.2 Vehicle Penetration Trends in the USA and Europe and Their Underlying Drivers

Automotive Sector in Europe

Europe’s passenger car production remained relatively stable, gradually increasing from 14 million units in 2021 and 2022 to 15 million units in 2023 and 2024. This slow but steady growth reflects the region’s recovery from pandemic-induced supply chain disruptions, especially semiconductor shortages that had severely impacted automotive output. The improvement in 2023 and 2024 can also be attributed to rising consumer demand, the ramp-up of electric vehicle (EV) manufacturing and policy incentives promoting green mobility. However, the overall growth rate remained modest, indicating persistent structural challenges such as high energy costs, evolving emission regulations (e.g., Euro 6/7) and competition from Asian manufacturers. Still, Europe’s consistent output underscores its strong manufacturing base and transition toward more sustainable automotive technologies.

Chart 8: Vehicle Production Market in Europe (In Mn)

Total Passenger Car Production in Europe (In Mn) Total Commercial Vehicle Production in Europe (In Mn)



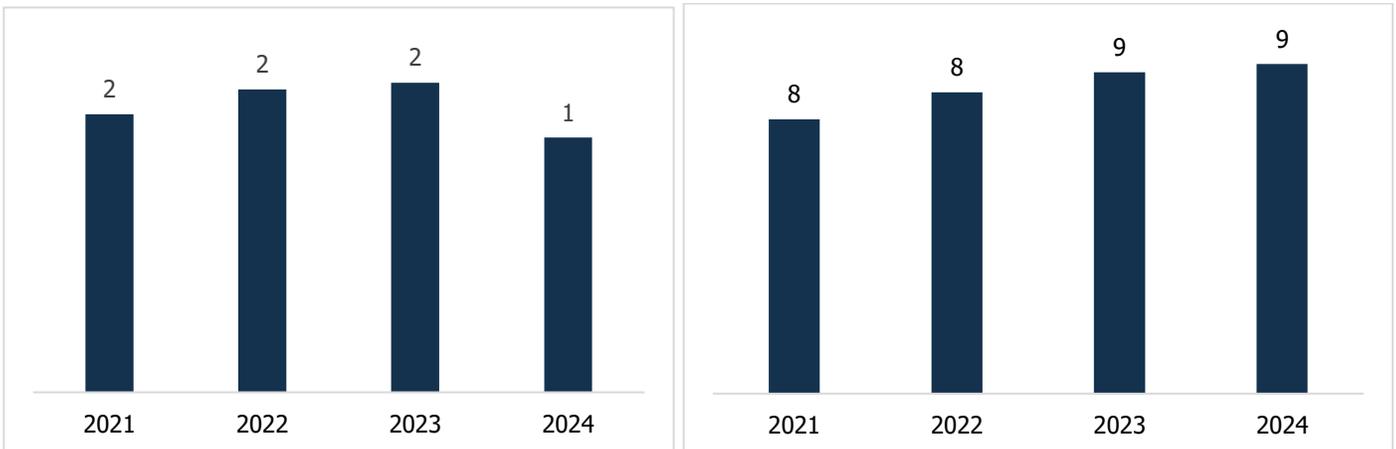
Source: Industry Source, CareEdge Research; Years refer to Calendar Year (CY)

Automotive Sector in USA

The U.S. automotive sector has demonstrated resilient growth and adaptability in recent years, driven by significant investments in electric vehicle (EV) technology and advanced manufacturing. Despite earlier disruptions caused by the pandemic and supply chain challenges, production levels are nearing pre-pandemic benchmarks, highlighting a robust recovery. The shift toward electrification is supported by substantial capital flowing into battery production and EV assembly plants, creating hundreds of thousands of jobs and strengthening the domestic industrial base. Additionally, consumer acceptance of EVs continues to rise, aided by improved infrastructure and more affordable models. This transformative phase underscores the industry's commitment to innovation, sustainability, and economic vitality, positioning it well for continued growth and global leadership.

Chart 9: Vehicle Production Market In USA

Total Passenger Car Production in USA (Mn) Total Commercial Vehicle Production in USA(Mn)



Sources: Industry Sources, CareEdge Research; Years refer to Calendar Year (CY)

2.1.3 Global Two-wheeler Market

The global two-wheeler market, which includes motorcycles, scooters and mopeds, is steadily growing due to rising urbanization, affordable mobility needs and increasing demand for personal transportation especially in developing countries. The Asia-Pacific region dominates this market, with countries like India, China and Indonesia leading both in production and consumption.

In 2024, the global motorcycle industry achieved a historic high with 61.8 million units sold. This marked a 2.7% increase over the previous year and represented a significant rebound nearly 10 million additional units compared to the sharp downturn experienced in 2020 due to the pandemic and related disruptions. The resurgence reflects not only a recovery in consumer demand but also a structural shift toward affordable and accessible mobility solutions, especially in densely populated and developing regions where two-wheelers remain a primary mode of transport.

India, now the world's largest two-wheeler market, posted double-digit growth, supported by rising urban demand and improving economic conditions. Likewise, markets across Latin America and Eastern Europe saw record-breaking performances, with countries like Mexico, Brazil and Turkey leading the charge. Western Europe, including the UK, also experienced its strongest sales figures of the century. Together, these developments point to a dynamic realignment in the motorcycle industry, with growth increasingly concentrated in South Asia, Europe and the Americas, as these regions embrace two-wheelers for their cost-efficiency, versatility and growing range of electric options.

2.1.4 Global Two-Wheeler Sales in Europe, America and other Countries

In East Europe sales boomed 34%, pulled up by the Turkish outstanding performance (+34.0%). Western Europe, including the UK, saw its strongest sales in decades with a 7.2% increase. In North America, while the U.S. and Canada remained stable, Mexico's exceptional 20.1% surge pushed the region to an all-time high.

Latin America also hit a new record, with Brazil growing 17.4% and Central American countries like Nicaragua, Costa Rica, Honduras and Panama showing exceptional gains between 28% and 44%, establishing the region as a new hotspot for two-wheeler demand. The market's growth was largely propelled by strong momentum in India the world's largest two-wheeler market which posted a robust 14.1% increase, while several other regions also witnessed rapid expansion, reinforcing the global upward trend. These trends highlight a geographic shift in the industry's growth focus from a declining China, down 13.7% and a sluggish ASEAN region, where half the countries posted declines to fast-expanding markets across Europe, the Americas and South Asia.

2.2 Indian Automotive Market

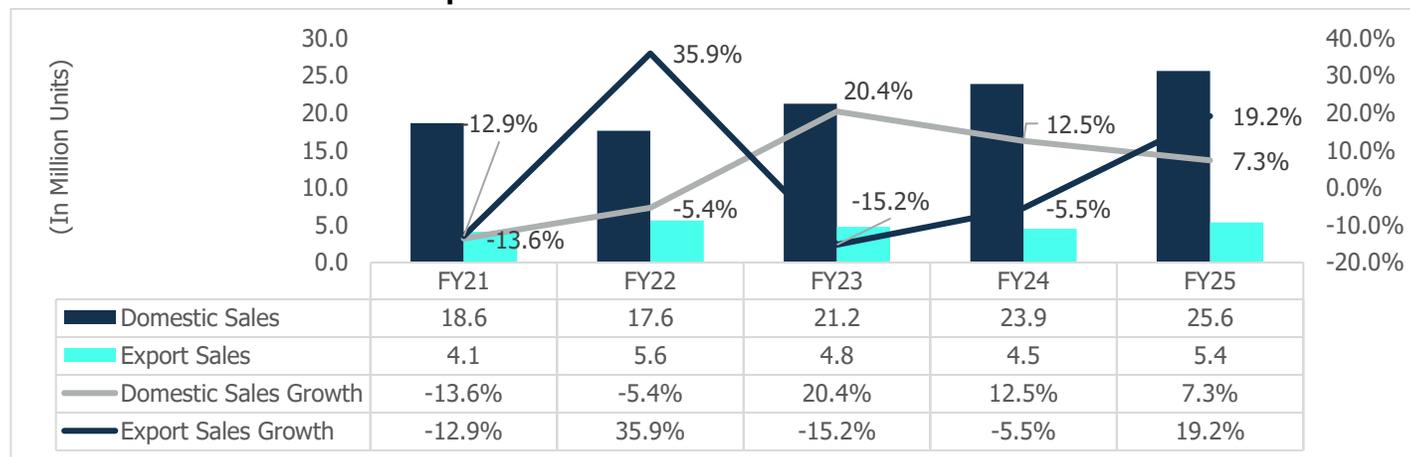
2.2.1 Industry Overview

India's automotive market stands as one of the largest and most dynamic sectors, playing a critical role in the country's economic development. With a diverse range of segments from two-wheelers and passenger vehicles to commercial and electric vehicles, the sector serves as a key employment generator and a significant contributor to GDP. Rapid urbanization, rising income levels and a growing middle class have fuelled demand over the past decade, while government initiatives like the Production-Linked Incentive (PLI) scheme and scrappage policy continue to shape its evolution.

Table 5: Domestic and exports sales segment wise.

| Vehicle Segment | Domestic Sales YoY Growth (FY25) | Export Growth YoY (FY25) |
|---------------------|----------------------------------|--------------------------|
| Two-Wheelers | 9% | 21% |
| Passenger Vehicles | 2% | 15% |
| Three-Wheelers | 7% | 2% |
| Commercial Vehicles | -1% | 23% |

Chart 10: Domestic Sales and Export of Automobiles in India



Source: CMIE, Society of Indian Automobile Manufacturers (SIAM)

India is the largest manufacturer of two-wheelers, three-wheelers and tractors. Domestic automobile sales increased by 7.3% year-on-year (y-o-y) in FY25. The growth in sales volume across segments was supported by healthy demand in the urban areas, increasing replacement demand, growing demand for utility vehicles in the passenger vehicle segment and vehicle scrappage policy. However, exports increased by 19.2% in FY25 due to ongoing driven by a robust demand for passenger vehicles, two-wheelers and commercial vehicles in overseas markets, however it marks an improvement compared to 5.5% decline in FY24.

Overall, the domestic automobile industry sales are expected to grow with a CAGR of around 7%-9% over the period of FY26-28. Exports are expected to remain robust in FY26 building on the healthy performance of recent years due to stable macroeconomic conditions, proactive government policies and Infrastructure spending by the Government.

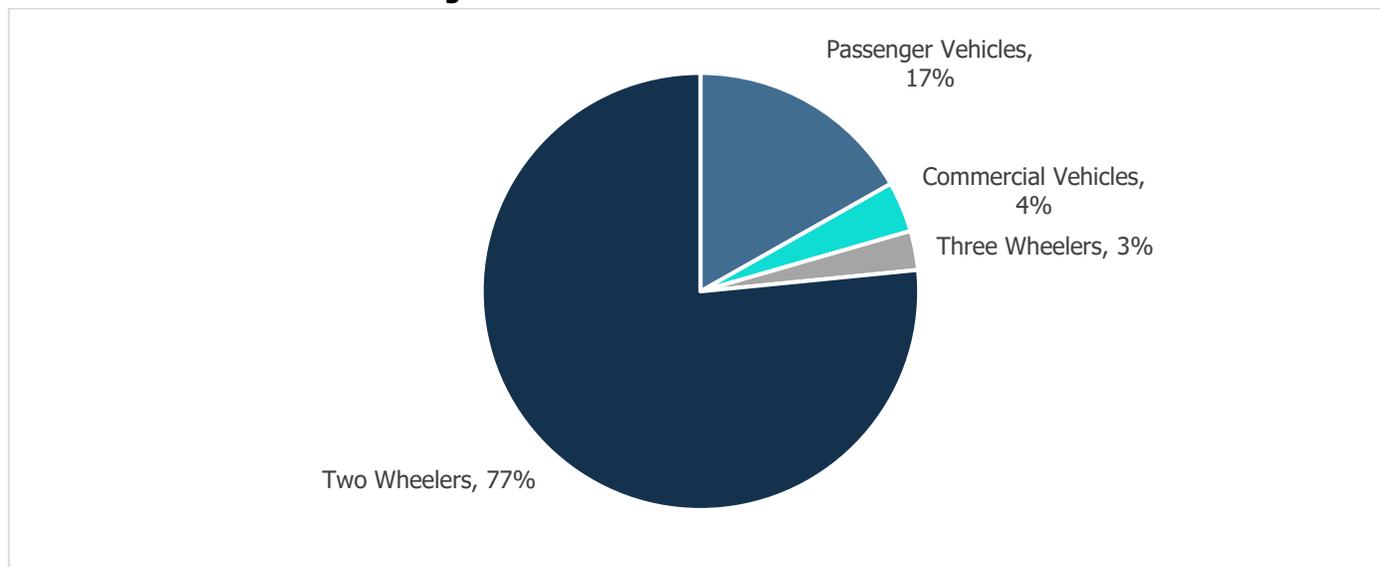
India is likely to be the third largest by volume by FY26. It is also among the top 5 manufacturers of passenger and commercial vehicles. Across the industry segments, India is ranked amongst the world's leading markets. The key drivers for the growth of the automobile sector in India are increasing household incomes, favourable demography with a high percentage of the youth population, growing R&D centre and government initiatives. Apart from growth opportunities, India's encouraging Foreign Direct Investment (FDI) policy with 100% FDI under automatic route, comparatively low cost of manufacturing and suitable manpower pool has drawn several foreign OEMs of the sector to make investments in India and establish a manufacturing presence.

2.2.2 Indian Automobile Market Segments

The Indian automobile market can be categorized into four segments, two-wheelers, three-wheelers, passenger vehicles and commercial vehicles. Two-wheelers and passenger vehicles dominate the domestic Indian auto market. Two-

wheelers and passenger cars contributed about 77% and 17% respectively of total automobile sales in FY25. The share of various segments in automobile sales in India in FY25 is depicted below:

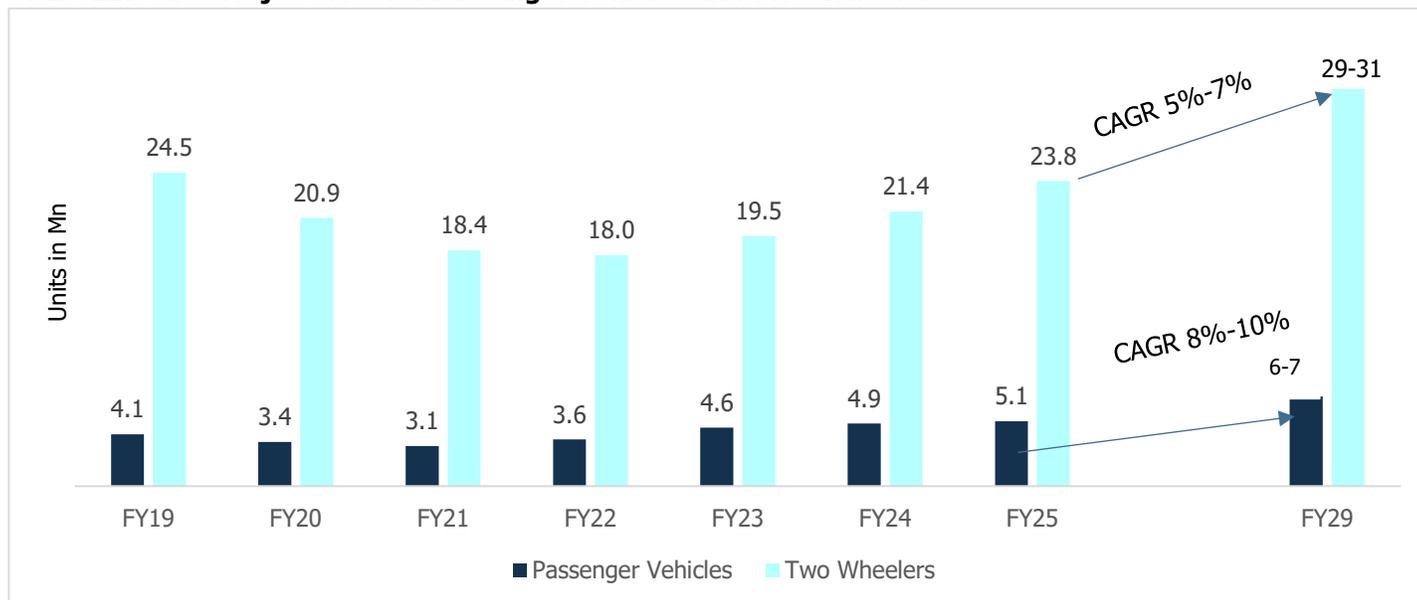
Chart 11: Share of different categories in domestic automobile sales in FY25



Source: SIAM

2.2.3 Indian Market for Two-Wheeler, Three-Wheeler and Passenger Vehicle

Chart 12: Sales Trajectories for Passenger Vehicles and Two-Wheelers



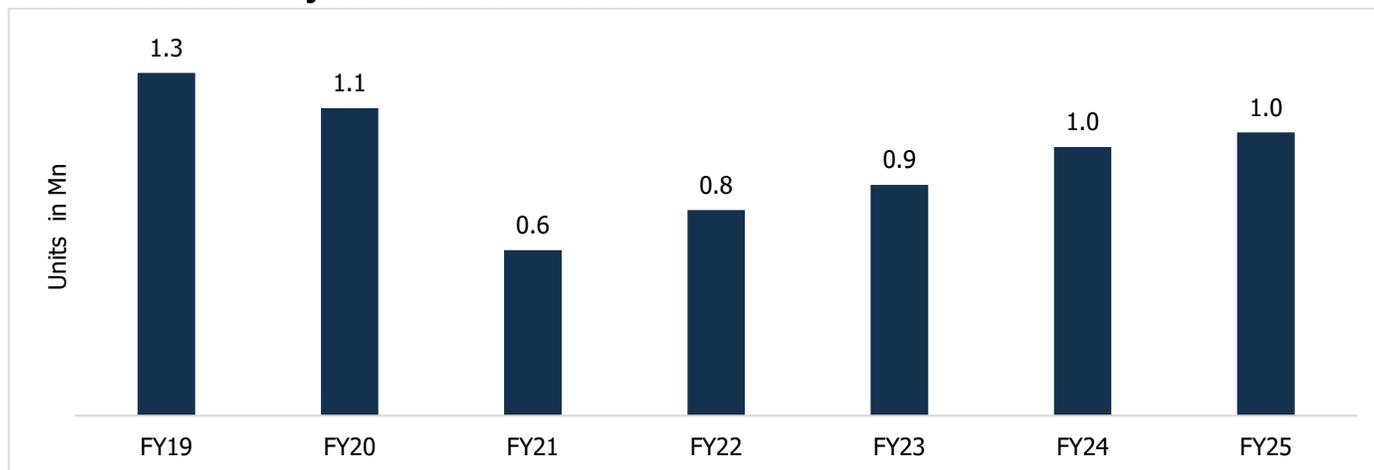
Source: CIME, CareEdge Research

By FY25, passenger vehicle sales are solidly pegged at 5 million units, with two-wheeler volumes at 23.8 million units. Applying a 5–7% CAGR for passenger vehicles, yields projected till FY29 sales would be of a range 6–7 million, supported

by rising household incomes, expanding portfolio of SUVs and EVs, government PLI incentives and improved financing and road infrastructure.

Meanwhile, with a stronger 8–10% CAGR, two-wheelers are expected to grow to 29–31 million by FY29, driven by urban congestion prompting demand for nimble, affordable transport, rising middle-class purchasing power, favourable borrowings post RBI rate cuts, expansion of EV and charge-station networks and policy support. CAGR helps smooth annual fluctuations and encapsulate long-term structural growth trends. Taken together, these figures reflect a robust auto sector trajectory, anchored by both economic fundamentals and sector-specific policy and demographic tailwinds.

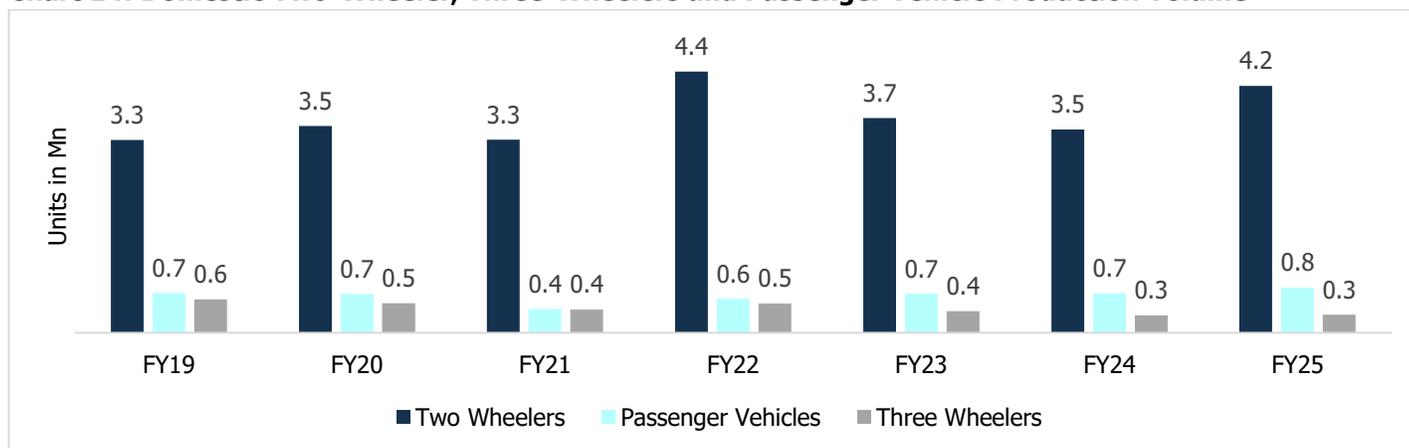
Chart 13: Sales for Trajectories Three-Wheelers



Source: CMIE, CareEdge Research

India's three-wheeler domestic sales have shown a steady recovery from FY21, with sales increasing from 0.6 million units to 1.0 million units in FY25. This growth can be attributed to factors such as the resurgence of economic activities post-pandemic, rising demand for affordable urban mobility solutions and the government's support for electric vehicle adoption. Additionally, the increasing popularity of electric three-wheelers has contributed to this upward trend, offering cost-effective and eco-friendly transportation options. Further, the three-wheeler is projected to increase with a CAGR of 7-9% in FY26.

Chart 14: Domestic Two-Wheeler, Three-Wheelers and Passenger Vehicle Production Volume



Source: CMIE, CareEdge Research

India's two-wheeler production has shown a steady recovery from FY21 to FY25, with volumes increasing from 3.3 million units in FY21 to 4.2 million units in FY25. This growth is attributed to factors such as improved consumer confidence, rising rural demand and the introduction of electric two-wheelers, which contributed to over 6% of total two-wheeler wholesales in FY25. The passenger vehicle segment also experienced growth, reaching 0.8 million units in FY25, driven by strong demand for utility vehicles and increased exports. Conversely, three-wheeler production declined to 0.3 million units in FY25, influenced by factors such as the early exhaustion of subsidies under the PM E-Drive scheme and a shift towards electric variants.

2.2.4 Key trends and Growth Drivers:

- **Supportive Government Policies and Incentives:** The Indian government has launched comprehensive measures to bolster automotive manufacturing and innovation. The 'Make in India' initiative and the Atmanirbhar Bharat Abhiyaan emphasize self-reliance by promoting indigenous production. Production Linked Incentive (PLI) schemes offer financial incentives to manufacturers investing in advanced technologies, fostering a competitive ecosystem. These policies reduce barriers to entry, simplify regulations and provide a favourable investment climate, encouraging both domestic and foreign players to expand their presence.
- **Expanding Research & Development (R&D) and Engineering Capabilities:** India is fast becoming a global R&D hub, accounting for 40% of the worldwide USD 31 billion engineering and R&D expenditure in the automotive sector. This focus on innovation helps domestic companies and global manufacturers develop new technologies, such as electric drivetrains, connected vehicles and autonomous systems. The expanding R&D ecosystem not only enhances product quality but also strengthens India's export potential by offering cutting-edge solutions.
- **Technological Advancements and New Model Launches:** Continuous innovation in vehicle design, mileage, safety and features across segments has made two-wheelers and PVs more appealing. From fuel-efficient motorcycles to feature-rich compact cars, the variety and quality of offerings have expanded, drawing more consumers to the market.
- **Growing Youth Population and Lifestyle Aspirations:** India has the largest youth population in the world, with about 65% of its people under the age of 35 that views two-wheelers and cars as not just necessities but also lifestyle upgrades. This aspirational demand is further fuelled by marketing, brand variety and a growing trend of individual ownership, especially in the 18 to 35 age group.
- **Expanding Road and Transport Infrastructure:** Government investment in road development, highways and rural connectivity is making personal transport more viable across the country. The increase in expenditure coupled with timely maintenance, has significantly expanded the National Highways (NH) network in the country, growing from about 91,287 km in March 2014 to about 1,46,126 km, as on July 25, 2024. Better infrastructure supports both two-wheeler penetration in smaller towns and PV usage for long-distance and intercity travel, encouraging ownership across income groups.
- **Rising Income Levels and Vehicle Penetration:** India's per capita Net National Income (NNI) grew by over 35% between 2014-15 and 2023-24, reaching INR 106,744, which has increased consumer purchasing power. As incomes rise, more people can afford personal vehicles, driving vehicle ownership and sales. The expected vehicle penetration of 72 vehicles per 1000 people by 2025 indicates a growing market with significant room for expansion, supporting sustained industry growth.

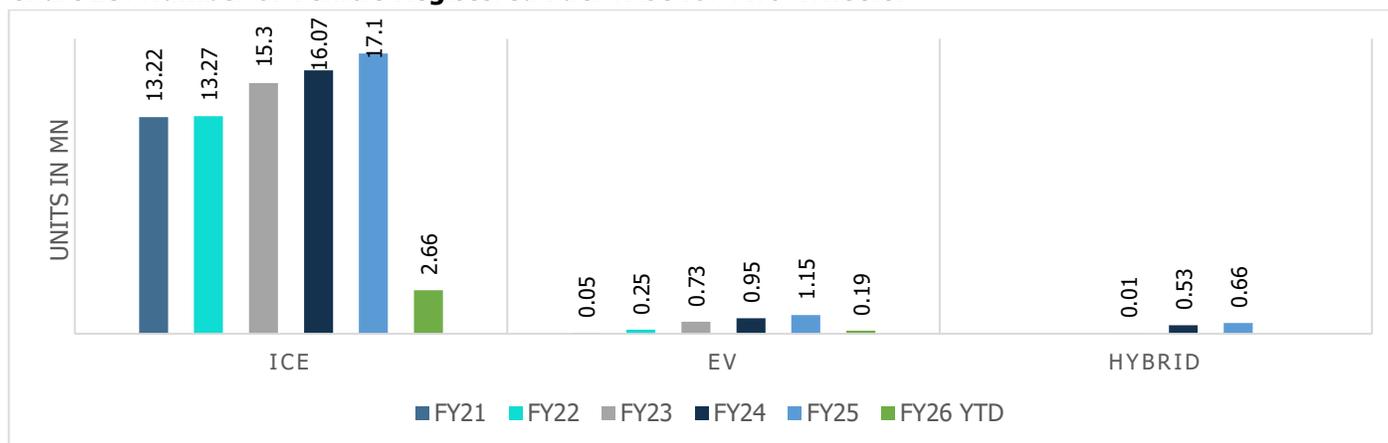
2.2.5 Indian Internal Combustion Engine Market Focused on Two-Wheeler Segment

India's internal combustion engine (ICE) two-wheeler market has historically been the backbone of the country's mobility landscape, particularly in rural and semi-urban regions. These vehicles are known for their affordability, widespread service network and familiarity among consumers, making them the preferred choice for many. However, the market is currently at an inflection point, with growing environmental concerns, evolving consumer preferences and supportive government policies accelerating a shift toward cleaner mobility solutions.

Despite the rising interest in electric vehicles (EVs) and the implementation of stricter emission norms like BS6, the penetration of EVs in the two-wheeler segment remains limited, especially in rural areas. Factors such as high upfront costs, limited charging infrastructure and inadequate road conditions contribute to this slow adoption. For instance, rural India accounts for a significant portion of two-wheeler sales, but the lack of reliable electricity supply and maintenance services hinders the transition to EVs. Additionally, the scarcity of charging stations and inconsistent charging standards further discourage potential EV buyers.

While the government has introduced schemes like FAME-II and EMPS 2024 to promote EV adoption, the reduction in subsidies and the need for infrastructure development pose challenges. Consequently, ICE two-wheelers continue to be the preferred choice due to their widespread availability, lower upfront costs and strong rural demand. In conclusion, while the adoption of electric two-wheelers is on the rise, the transition is gradual and ICE components will likely remain in demand for the foreseeable future. The pace of this shift will depend on addressing infrastructure challenges, reducing costs and enhancing consumer awareness and confidence in EV technology. In urban and semi-urban India, enhanced infrastructure, subsidies and growing environmental consciousness have driven an uptick in EV two-wheeler adoption. In contrast, rural regions lag due to inadequate charging facilities, higher upfront costs and limited awareness, resulting in sustained dominance of ICE two-wheelers.

Chart 15: Number of Vehicle Registered Fuel Wise for Two-Wheeler



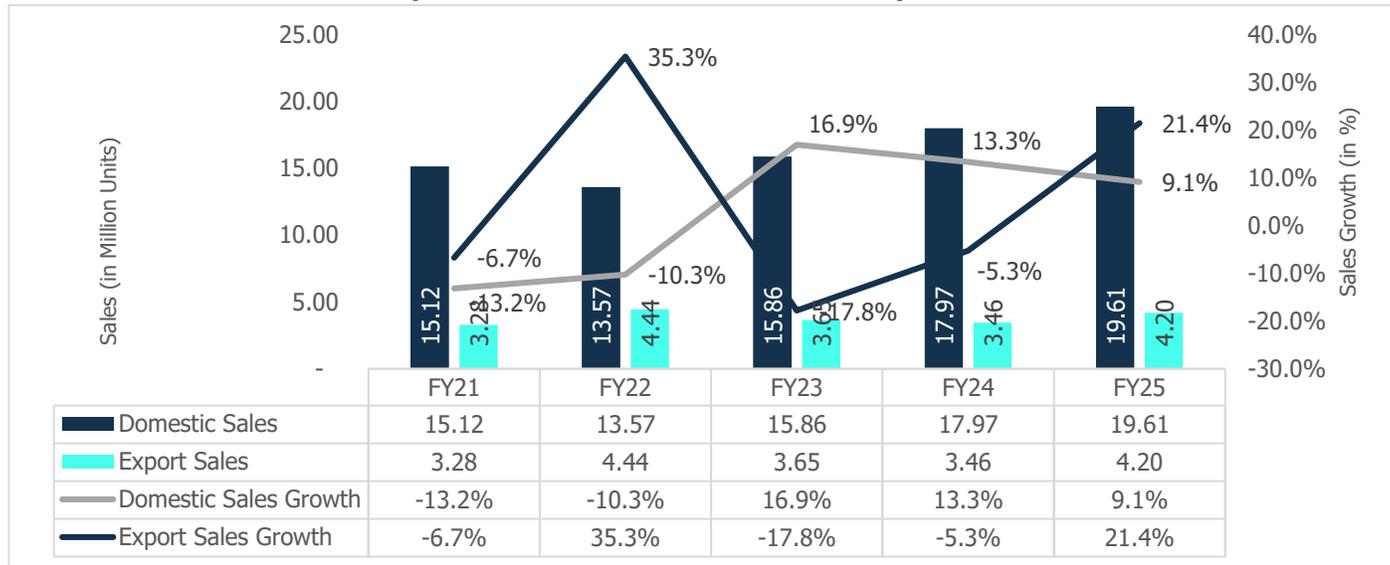
Source: Vahan Dashboard, Note: The data indicates number of vehicles sold YTD as of June 2025

2.3 Indian Two-Wheeler Industry

The Indian economy had showed various moderations across domains of economies, geopolitics and environment in the last few years. The two-wheeler (2Ws) segment takes the largest chunk of the pie in the Indian automobile industry, with around 77% share in the total domestic sales volume. The two-wheeler industry has three sub-segments namely, Motorcycles, Scooters and Mopeds.

The two-wheeler industry experienced a robust domestic sales growth of 9.1% year-on-year in FY25 compared to FY24. The two-wheeler segment is expected to grow by 6-9% in FY26, driven primarily by strong demand for scooters, due to increasing urbanization and a growing preference for premium motorcycles. Demand from both rural and urban markets, along with increased interest in electric two-wheelers, is expected to drive this growth. The distribution of harvest payments to farmers (Kharif season) and the festive season will also contribute to higher purchasing power.

Chart 16: Domestic Sales & Exports Trend of Two-Wheeler Industry



Source: SIAM (Society of Automobile Manufacturers), CMIE

India's two-wheeler industry in FY25 experienced a broad-based resurgence, led by strong domestic demand especially from rural and semi-urban regions and a vibrant export market. This recovery was fuelled by new model launches, including a surge in scooter popularity and growing consumer confidence. The export sector also picked up pace, driven by expanding footprints in regions like Africa and Latin America. Supportive macro conditions such as rate cuts, stable economic sentiment and favourable agricultural trends further reinforced the market's upbeat trajectory. The two-wheeler segment is expected to grow by 6-9% in FY26, driven primarily by strong demand for scooters, due to increasing urbanization and a growing preference for premium motorcycles.

2.3.1 Market Segment for Two-Wheeler Industry

The two-wheeler segment takes the largest chunk of the pie in the Indian automobile industry, with around 75% share in the total domestic sales volume. The two-wheeler (2W) industry has three segments namely, Motorcycles, Scooters and Mopeds.

Table 6: Category Wise Production of Two-Wheeler

| Category-wise Production of Two-Wheelers | | | | |
|--|------------------|-------------|-----------|---------|
| Year | Total Production | Motorcycles | Scooters | Mopeds |
| FY20 | 21,032,927 | 14,356,051 | 6,027,198 | 649,678 |
| FY21 | 18,349,941 | 13,154,501 | 4,559,222 | 636,218 |
| FY22 | 17,821,111 | 12,890,149 | 4,457,790 | 473,172 |

| | | | | |
|-------------|------------|------------|-----------|---------|
| FY23 | 19,459,009 | 13,421,208 | 5,601,501 | 436,300 |
| FY24 | 21,468,527 | 14,589,393 | 6,391,272 | 487,862 |
| FY25 | 23,883,857 | 15,922,027 | 7,437,681 | 524,149 |

Source: CMIE, CareEdge Research

Two-wheeler production in India has shown a steady upward trend in recent years, supported by a strong recovery in domestic demand, a shift in consumer preference toward motorcycles for their fuel efficiency and increasing urban adoption of scooters due to their ease of use. The motorcycle segment continues to dominate, driven by high demand in rural and semi-urban areas where affordability and mileage are key considerations. Meanwhile, scooter production has risen steadily, reflecting greater acceptance among urban commuters, women riders and growing last-mile delivery services. Mopeds, while forming a smaller segment, have maintained consistent production levels due to their niche utility in certain markets. Overall, improved economic sentiment, government incentives for electric mobility and an expanding middle class have all contributed to the resurgence of two-wheeler manufacturing in India.

- **Motorcycle Segment**

The motorcycle segment has historically dominated the Indian two-wheeler market, accounting for more than two-thirds of the total volumes. Within the motorcycle product segment, the lower displacement entry sub-segment of motorcycles (<110-cc) dominates, accounting for nearly 70% of the total production volumes. The 110-125 cc and 125-150 cc sub-segments also contribute for a sizeable proportion to the total motorcycle volumes. The penetration of higher displacement premium motorcycles is currently gaining pace with improved features and availability of financing options.

- **Scooters Segment**

Over the last decade, 'scooterisation' has gripped the two-wheeler industry, with scooters overtaking motorcycles in terms of market share. Although motorcycles have traditionally overshadowed the scooter segment in terms of overall volumes, the latter has consistently outpaced the industry growth over the past several fiscals, resulting in a steady improvement in share in the overall two-wheeler mix. Earlier, the use of scooters was associated with men and was generally used for travelling to work, commuting for the family and running daily errands. Whereas motorcycles were preferred for better fuel efficiency and performance, enhanced ride quality and ruggedness for use in poor road conditions and for longer journeys. However, the demand pattern has changed in the last few years with multiple new offerings and changes in attributes in the scooter segment. The improved fuel efficiency of scooters, following technical advancements, besides OEM initiatives toward lightweighting has increased the attractiveness of this product segment in a price-sensitive market like India.

- **Mopeds Segment**

The moped segment remains a marginal segment in the overall two-wheeler industry, accounting for less than 3% of the total production volumes. Generally, the moped is preferred by those customer segments, where affordability, ease of handling and load-carrying capacity play a greater role in the purchasing decision of the vehicle as compared to other factors. Also, it is generally sold more in the rural areas. Further, the moped segment saw healthy growth following the launch of TVSXL100 extending the segment from merely having a 70-cc product, thereby attracting customers from the lower displacement categories of motorcycles and scooters alongside offering a competitively priced two-wheeler option. With customer preference moving towards scooters and the entry sub-segment of motorcycles, the share of mopeds in the overall two-wheeler pie is expected to shrink further.

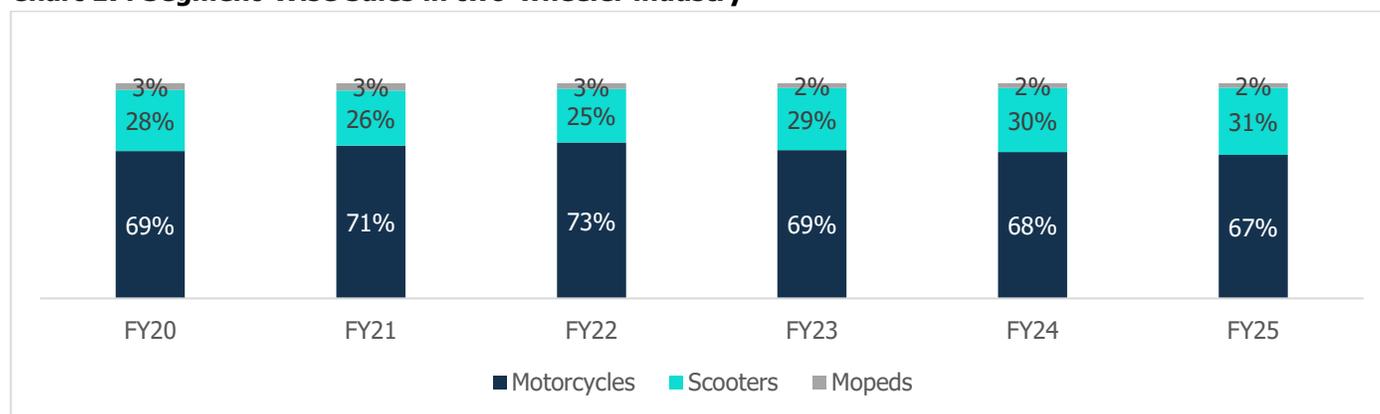
Table 7: Category Wise Sales of Two-Wheeler

| Category-wise Sales of Two-Wheelers | | | | |
|-------------------------------------|-------------|-------------|-----------|---------|
| Year | Total Sales | Motorcycles | Scoters | Mopeds |
| FY20 | 20,935,837 | 14,349,210 | 5,935,956 | 650,671 |
| FY21 | 18,403,569 | 13,063,684 | 4,714,325 | 625,560 |
| FY22 | 18,013,139 | 13,066,628 | 4,463,115 | 483,396 |
| FY23 | 19,514,893 | 13,461,483 | 5,607,637 | 445,773 |
| FY24 | 21,432,781 | 14,596,578 | 6,351,672 | 484,531 |
| FY25 | 23,805,735 | 15,873,191 | 7,422,307 | 510,237 |

Source: CMIE, CareEdge Research

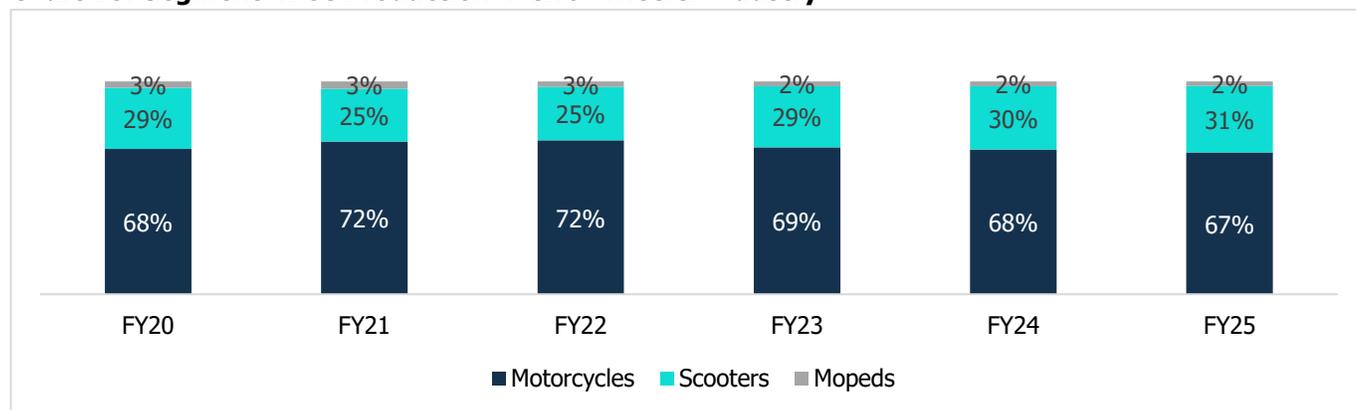
India’s two-wheeler market has shown a strong recovery post-pandemic, with total sales rising steadily from FY21 onwards. Motorcycles remain the leading segment, growing consistently and accounting for the bulk of volumes, while scooters have emerged as a fast-growing category especially in urban and semi-urban areas because of their convenience and rising popularity. Mopeds, in contrast, hold a modest share and have seen relatively stable and lower growth. This overall upturn reflects improving rural demand, renewed consumer confidence, stronger financing options and a wave of new model launches that appeal to evolving preferences in both traditional ICE and emerging electric two-wheeler segments.

Chart 17: Segment-Wise Sales in two-wheeler industry



Source: CMIE, CareEdge Research

Chart 18: Segment-Wise Production in two-wheeler industry



Source: CMIE, CareEdge Research

2.3.2 Key Growth Drivers

2.3.2.1 Drivers for Rising Adoption in Motorcycles

1. Market Growth Anchored by Motorcycle Dominance

India's overall two-wheeler market witnessed strong growth from FY20 to FY25, with motorcycle sales rising from about 14.35 million in FY20 to 15.87 million in FY25, while total industry volumes expanded from 20.94 million to 23.81 million over the same period. This trend shows the dominance of traditional motorcycles among Indian consumers. Against this backdrop, electric two-wheelers (e2Ws) crossed 1.14 million units in FY25 a strong headline number but accounted for just over 6% penetration of total two-wheeler sales. Notably, electric motorcycles remain a niche, holding less than 1% of the market, as movement in electric mobility continues to be largely driven by scooters.

2. Emerging Tailwinds: Urban Youth, Financing & Model Appeal

Several trends are supporting the gradual rise of electric motorbikes in India. Growing urbanization, rising disposable incomes and changing preferences among younger consumers are shifting demand. Attractive financing schemes, such as flexible EMIs and incentives under programs like FAME-II and EMPS, are lowering barriers to entry. Simultaneously, new models are being designed to bridge the performance gap with traditional 125–150 cc motorcycles. Matter Motor's "Aera" being a prime example targeting customers who value the feel and functionality of ICE bikes while embracing EV benefits.

3. Strategic Growth Despite Gradual Transition

While electric motorcycles are still in early stages, projections point toward significant long-term expansion. Industry forecasts suggest that by FY30, e-scooters could capture major part of their segment. Though this reflects a gradual shift, the combination of increasing urban demand, supportive incentives, expanding product choices and improved EV awareness offers a fertile ground for adoption growth. Manufacturers that balance ICE strength with compelling electric offerings can position themselves strategically for this evolving landscape.

2.3.2.2 Drivers for Rising Adoption in Scooters

The sharp rise in scooter sales, from 4,463,115 in FY22 to 7,422,307 in FY25, is primarily driven by urban mobility needs and changing consumer demographics. Scooters are particularly attractive for women, first-time buyers and younger consumers due to their ease of use, automatic transmission and comfortable ride quality. Rapid urbanization, coupled with increasing congestion in metropolitan and Tier-II cities, has also boosted scooter demand as they provide a convenient and fuel-efficient commuting option.

2.3.2.3 Drivers for Rising Adoption in Mopeds

Moped sales, though relatively smaller in volume compared to motorcycles and scooters, have remained stable, with a modest increase from 483,396 units in FY22 to 510,237 units in FY25. Their continued relevance is supported by affordability and low operating costs, making them a preferred choice in semi-urban and rural regions. Mopeds cater to cost-conscious consumers, daily wage earners and small traders who rely on them for both personal mobility and light cargo transport.

The resilience of the segment is also underpinned by fuel efficiency and utilitarian value. Mopeds offer easy maintenance, simple design and versatility, appealing to households seeking a secondary two-wheeler. Additionally, increasing last-mile delivery services in Tier-II and Tier-III towns are giving mopeds renewed utility, as businesses leverage their low

running costs for logistics. Although mopeds are a niche category, their affordability and practicality ensure steady demand in India's price-sensitive markets.

2.3.3 Affordability Trends in Personal Vehicle Ownership

- **Greater Affordability:** Two-wheelers have become genuinely more affordable in India because people are earning more and bike loans have gotten cheaper. The 2025 Union Budget raised the income tax exemption to Rs 12 lakh (Rs 12.75 lakh including standard deductions), effectively boosting take-home pay and freeing up household budgets. Meanwhile, the RBI cut key policy rates by about 1% since early 2025, which has lowered interest on two-wheeler loans, making EMIs easier to bear. Building on this, the Union Budget 2026 continued its focus on boosting consumption by rationalizing personal income tax slabs, increasing rebates for salaried individuals, and introducing targeted incentives to support rural income growth and consumption demand.
- **Accessible Two-Wheeler Financing Solutions:** Financing a two-wheeler in India has become increasingly accessible and affordable due to favourable lending terms offered by banks and NBFCs. According to BankBazaar, interest rates for two-wheeler loans start as low as 8.75% per annum, with many lenders providing up to 100% financing of the vehicle's on-road price. Loan tenures are flexible, typically ranging from 12 to 60 months, allowing borrowers to choose EMI plans that suit their repayment capacity. The minimum income requirement to be eligible for a two-wheeler loan is generally around Rs 10,000 to Rs 12,000 per month, making it viable for a large portion of the working population. Processing fees are relatively low, usually between 1% to 3% of the loan amount and in some cases, lenders waive them as part of promotional offers.
- **Government Incentives and the Future of Two-Wheeler Financing:** Government subsidies play a pivotal role in accelerating the adoption of electric two-wheelers in India. Under the PM E-DRIVE scheme, buyers of electric two-wheelers are eligible for demand incentives based on battery capacity. In the first year (FY25), the subsidy is Rs 5,000 per kilowatt-hour (kWh), capped at Rs 10,000 per vehicle. In the second year (FY26), the subsidy is reduced to Rs 2,500 per kWh, with a maximum limit of Rs 5,000 per vehicle.
- **Digital Transformation in Two-Wheeler Loan Processing:** The digitalization of the financial sector has significantly streamlined the two-wheeler loan application process. Instant loan approvals, digital sanctioning with minimal paperwork and fully paperless documentation have become standard practices. Banks and NBFCs leverage robust digital platforms to provide borrowers with a seamless and efficient experience.
- **Customised Two-Wheeler Financing Solutions:** The future of two-wheeler financing is increasingly defined by customized loan offerings tailored to meet the diverse needs of individual borrowers. Leading banks and NBFCs are now providing flexible loan structures with varied tenures, repayment plans and interest rate options. Innovative features such as step-up EMIs, balloon payments and variable interest rates are gaining traction, reflecting the dynamic trends in the 2024 lending landscape. These personalized solutions enable borrowers to select repayment terms that best align with their financial capacity, thereby improving accessibility and supporting more inclusive growth within the two-wheeler loan market.

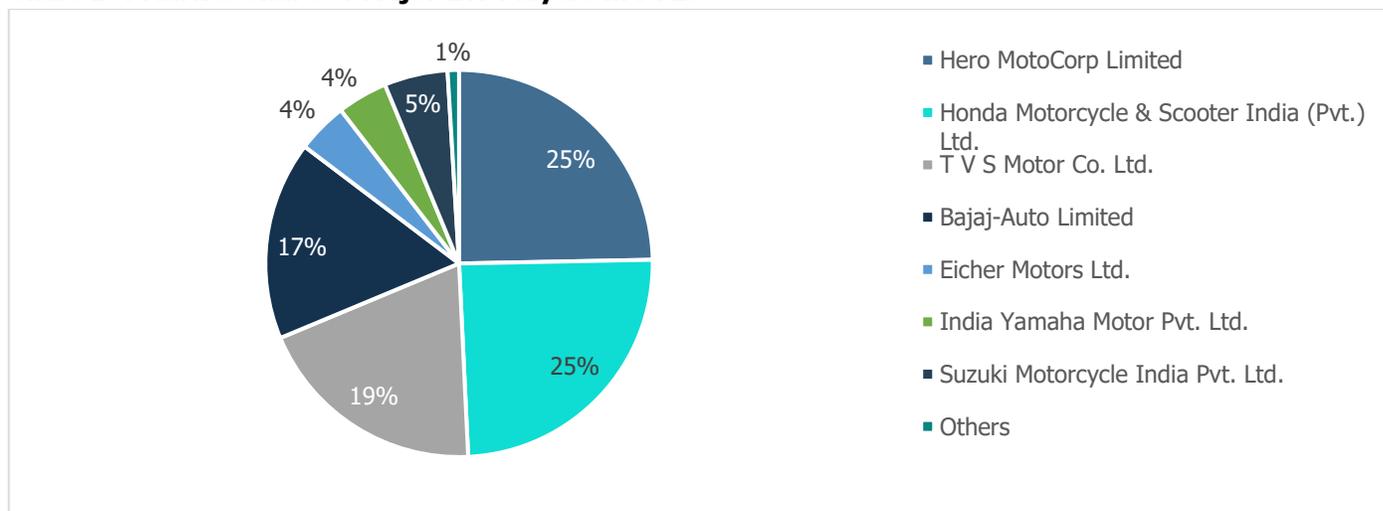
The future of two-wheeler financing is increasingly defined by customized loan offerings tailored to meet the diverse needs of individual borrowers. Leading banks and NBFCs are now providing flexible loan structures with varied tenures, repayment plans and interest rate options. Innovative features such as step-up EMIs, balloon payments (large, one-time payment made at the end of a loan term, after making smaller monthly payments throughout the loan period) and variable interest rates are gaining traction, reflecting the dynamic trends in the 2024 lending landscape. These

personalized solutions enable borrowers to select repayment terms that best align with their financial capacity, thereby improving accessibility and supporting more inclusive growth within the two-wheeler loan market.

2.3.4 Key players in Two-Wheelers Industry

The major players in the 2W industry include Hero MotoCorp Ltd, Honda Motorcycle and Scooters Pvt Ltd, TVS Motor Co. Ltd and Bajaj Auto Ltd. Hero Motocorp Ltd. has the highest market share at 29%, followed by Honda Motorcycle & Scooter India (Pvt.) Ltd at 27% in FY25. The market share of different players in the industry is depicted below:

Chart 19: Market Share of Major 2W Players in FY25



Source: CMIE, CareEdge Research

The market share of key two-wheelers players is categorized amongst motorcycles, scooters and mopeds for FY25 are listed below in the table: -

Table 8: Category-Wise OEM sales

| FY25 Sales (in units) | Motorcycle | Scooters | Mopeds | Total 2W | Market Share (in %) |
|--|--------------------|------------------|-----------------|--------------------|---------------------|
| Hero MotoCorp Limited | 54,77,649 | 4,20,174 | - | 58,97,823 | 25% |
| Honda Motorcycle & Scooter India (Pvt.) Ltd. | 27,02,995 | 31,61,353 | - | 58,64,348 | 25% |
| T V S Motor Co. Ltd. | 22,19,536 | 19,04,982 | 5,24,149 | 46,48,667 | 19% |
| Bajaj-Auto Limited | 36,89,134 | 2,77,826 | - | 39,66,960 | 17% |
| Eicher Motors Ltd. | 10,11,126 | - | - | 10,11,126 | 4% |
| India Yamaha Motor Pvt. Ltd. | 6,19,964 | 3,82,659 | - | 10,02,623 | 4% |
| Suzuki Motorcycle India Pvt. Ltd. | 1,85,370 | 10,80,037 | - | 12,65,407 | 5% |
| Others | 16,253 | 2,10,650 | - | 2,26,903 | 1% |
| Total | 1,59,22,027 | 74,37,681 | 5,24,149 | 2,38,83,857 | - |

Source: CMIE, CareEdge Research

2.3.5 Challenges in adoption of E-Motorcycles in India

The adoption of electric motorcycles in India is gradually gaining momentum, driven by several factors that align with the country's evolving mobility needs.

| Parameter | EV Bike | EV Scooter |
|---------------|----------------|----------------------------|
| Cost (INR) | INR 1–3 lakh | INR 70k–1.2 lakh |
| Model Variety | Less | More |
| Target Areas | City, Highway | Urban Commuter |
| Design Format | Still evolving | User-friendly, lightweight |

1. Cost (INR): EV bikes are priced between INR 1–3 lakh, while EV scooters are much more affordable, ranging from INR 70,000 to INR 1.2 lakh. This price difference makes scooters far more accessible to the average Indian consumer, especially those seeking affordable urban mobility. High upfront costs act as a significant barrier to the mass adoption of EV bikes.

2.Target Areas: EV bikes are positioned for both city and highway usage, but due to current limitations in range, battery capacity and charging infrastructure, they remain less viable for long-distance travel. EV scooters, in contrast, are purpose-built for urban commuting, where shorter distances, frequent stops and heavy traffic are the norm. Their ease of handling and lower maintenance needs make them particularly well-suited for city use. This is also why major last-mile delivery companies such as Zomato, Swiggy, Zepto and Blinkit have adopted EV scooters/mopeds for their fleets. These scooters/mopeds offer better practicality for short-range deliveries, quick acceleration in stop-and-go conditions and cost efficiency, giving them a clear edge over e-motorcycles in urban logistics. As a result, the dominance of EV scooters in commercial applications has further slowed the broader adoption of e-motorcycles in India's urban mobility landscape.

3. Model Variety: EV bikes currently offer fewer model options compared to the wide variety available in EV scooters. This lack of diversity in the EV bike segment limits customer choice and reduces the likelihood of meeting different consumer preferences in terms of design, performance and pricing. In contrast, the broader range of EV scooter models attracts a wider customer base.

4. Design Format: The design of EV bikes is still evolving, with many models' needing improvement in terms of aesthetics, performance and comfort when compared to traditional fuel-powered motorcycles. EV scooters, however, have seen rapid design improvements and now offer user-friendly, lightweight and stylish options that cater well to the urban youth and working professionals.

5. Declining Share of Low-Speed E2Ws Amid Stronger ICE Vehicle Performance: Sales of low-speed electric two-wheelers (E2Ws) remain higher than high-speed models; however, their share has been declining in recent years. This trend is driven by the absence of subsidies for the segment and the fact that internal combustion engine (ICE) two-wheelers offer better speed, range, and overall performance compared to low-speed EVs.

2.3.6 Outlook for Domestic Two-Wheeler Industry

Traditional internal combustion engine (ICE) vehicles will continue to remain the backbone of India's mobility sector, supported by their affordability, extensive fueling infrastructure and consumer familiarity. Two-wheelers, passenger cars and commercial vehicles powered by petrol and diesel continue to dominate sales, particularly in rural and semi-urban markets where accessibility and cost remain critical factors. Established supply chains, proven technology and

widespread servicing networks ensure that ICE vehicles retain their stronghold, even as the industry explores alternative mobility options.

Rising demand for personal mobility, strong replacement cycles and the increasing use of two-wheelers and small cars as affordable transport solutions will keep the ICE segment buoyant. Moreover, advancements in fuel efficiency, compliance with stringent emission norms (such as BS-VI Phase II) and the availability of CNG and hybrid variants are helping extend the relevance of traditional vehicles. For commercial applications, where payload, range and reliability are vital, ICE vehicles continue to be the preferred choice.

While the government is introducing incentives for EVs and their components, challenges around high upfront costs, dependence on critical mineral imports and underdeveloped charging infrastructure indicate that EV adoption will be gradual. In this transition period, ICE vehicles will not only maintain their dominance but also benefit from incremental technology upgrades that align with environmental and efficiency goals.

3 Automotive Component Industry

The automotive industry encompasses a vast network of companies and activities involved in the design, development, manufacturing, marketing and sale of motor vehicles. It includes the production of passenger cars, trucks, buses and their components, excluding certain parts like tires and batteries.

3.1 Global Auto-Component Market

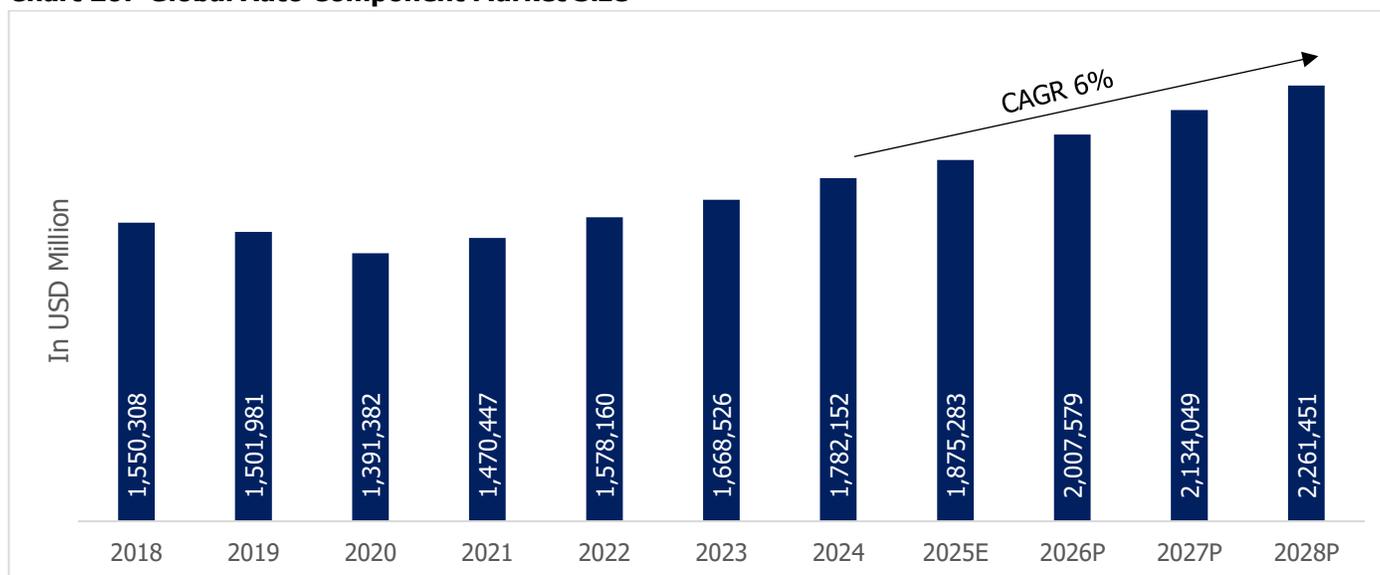
3.1.1 Industry Overview

The global auto components industry comprises auto component manufacturers, aftermarket parts manufacturers, suppliers, dealers and retailers in all its diversity. The production and demand of the auto component industry are directly proportional to that of the automobile industry.

China dominates the global manufacturing of auto components. However, the wind is shifting toward other Asian nations, including India, due to higher market potential and the availability of low-cost manufacturing options. Further, the global exports of auto components have grown over the past decade in most sub-categories. Gearboxes, drive axles, steering wheels, road wheels, suspension shock absorbers, clutches, bumpers, radiators & brakes and servo-brakes are the most globally traded auto components.

3.1.2 Global Auto Component Industry Market Size

Chart 20: Global Auto Component Market Size

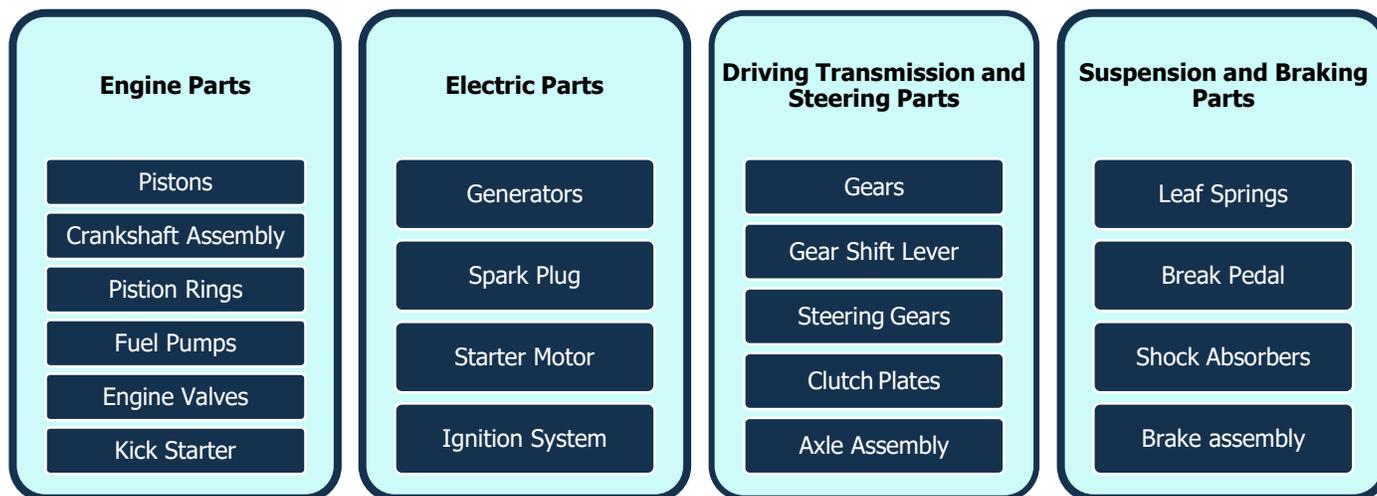


Source: Maia Research, CareEdge Research; E: Estimated, P: Projected

Note: The year mentioned in this chart and subsequent sections is Calendar Year

The increasing disposable incomes and rising inclination to buy vehicles are the primary factors contributing to increased demand for automotive components. Further, as the thriving automobile manufacturing market continues to expand, the market demand for automotive components continues to increase. In addition, with the continuous development of new energy vehicle technology, the scale of the new energy vehicle market continues to expand, driving the market demand for related automotive components.

3.1.3 Types of Automotive Components in the Market



Source: Automotive Component Manufactures Association of India (ACMA)

1. Engine Parts: These are the core components of an internal combustion engine that convert fuel into motion. Pistons, piston rings, valves, fuel pumps, ignition systems (spark plugs, carburetors) and bearings are the listed component under this. They work together to manage air, fuel and combustion processes inside the engine block. Crankshaft is a part of the engine components.

2. Electric Parts: These handle power generation, ignition and electrical systems and the major components under this are starter motor (to crank the engine), alternator/generator (to charge the battery), ignition coils and spark plugs. They also power lighting, electronics and control units essential for vehicle function.

3. Driving, Transmission & Steering Parts: This group couples engine power to the wheels and allows directional control, gears, axle assemblies, clutch plates and discs, steering gears and linkage systems. Together, they enable torque transfer and precise steering via rack-and-pinion or column systems.

4. Suspension & Braking Parts: Designed to absorb shocks and stop the vehicle: leaf springs, coil springs, shock absorbers, brake assemblies (pads, discs, drums) and anti-lock braking systems (ABS). These parts ensure ride comfort, handling and safety by managing motion and preventing wheel lock-up during braking.

5. Equipment: This includes auxiliary components critical for visibility and interaction: headlights, wiper motors and systems, dashboard instruments and electric horns. They support driver awareness and comfort by enabling safe operations in various conditions.

6. Footrest (Dead Pedal): - The footrest, commonly known as the dead pedal, is a stationary component in vehicles, particularly beneficial in manual transmission cars. It provides ergonomic support by allowing the driver to rest their left foot, reducing fatigue during long drives. Additionally, it helps prevent accidental engagement of the clutch or brake pedals and promotes smoother gear transitions. In automatic vehicles, the dead pedal serves as a comfort feature, offering a stable surface for the driver's foot.

7. Gear Shift Lever: The gear shift lever, also known as the gear stick or gear selector, is a crucial component in manual transmission vehicles. It allows the driver to select different gear ratios within the transmission, enabling the vehicle to operate at various speeds and under different driving conditions. The lever is connected to the transmission via a linkage system, which transmits the driver's input to engage the appropriate gears.

8. Brake Pedal: The brake pedal is an essential component of a vehicle's braking system. When depressed, it activates the brake master cylinder, which pressurizes brake fluid to engage the brake calipers or wheel cylinders. These components apply friction to the brake pads or shoes, slowing down or stopping the vehicle. The brake pedal's design ensures that the braking force is appropriately modulated for safe and effective stopping.

9. Lever Kick: It refers to the kick-down lever in automatic transmissions, which allows the driver to accelerate quickly by shifting to a lower gear. This mechanism is typically activated by pressing the accelerator pedal firmly, prompting the transmission to downshift for increased power.

10. Crankshaft Assembly: The crankshaft assembly is a fundamental component in internal combustion engines. It converts the linear motion of the pistons into rotational motion, driving the vehicle's wheels. Made from materials like forged steel or cast iron, the crankshaft is designed to withstand high stresses and temperatures. Its precision engineering ensures the engine operates smoothly and efficiently.

Table 9: Mapping the Transition from ICE Components to EV Technologies

| Component | Impact by EV Shift | Component | Impact by EV Shift | Component | Impact by EV Shift |
|----------------------------|--------------------|--------------------|--------------------|------------------------|--------------------|
| Electric Motors | Positive | Seats | Neutral | Exhaust Systems | Negative |
| Batteries | Positive | Steering Systems | Neutral | Fuel Injection Systems | Negative |
| Power Electronics | Positive | Brake Linings | Neutral | Oil Filters / Pumps | Negative |
| Inverters | Positive | Suspension Systems | Neutral | Clutches | Negative |
| Thermal Management Systems | Positive | Wiring Harnesses | Neutral | Radiators | Negative |
| Infotainment Systems | Positive | Gears | Neutral | | |
| Lighting Systems | Positive | | | | |

Steering Systems (Steering Column Yokes) :-The shift from ICE to EV technologies has led to the adoption of Electric Power Steering (EPS) systems, which replace traditional hydraulic steering mechanisms. EPS systems use electric motors to assist steering, offering advantages such as reduced energy consumption, lower maintenance requirements and the potential for more precise control. This transition also paves the way for advanced features like steer-by-wire systems, which eliminate the mechanical link between the steering wheel and the wheels, allowing for more flexible vehicle design and enhanced integration with autonomous driving technologies. However, since ICE vehicles continue to make up the majority of the Indian automotive market, demand for traditional steering components tied to hydraulic mechanisms remains strong. Thus, while EPS is making inroads, ICE-related steering parts remain the mainstay for now.

Brake Linings: - In electric vehicles, regenerative braking significantly reduces reliance on friction-based braking, resulting in much slower wear of brake pads and rotors compared to internal combustion engine (ICE) vehicles, in which braking components undergo frequent mechanical wear. However, the infrequent use of friction brakes in EVs can lead

to issues like rust build-up, glazing and uneven wear challenges not as prevalent in ICE systems due to regular brake usage. EV brake components therefore require thoughtful material choices (such as ceramic or rust-resistant linings) and periodic use of conventional braking to prevent degradation and ensure safety

Engine Parts (Crankshaft Assembly for 2 Wheelers, Kick Starter, Gear Blanks):- Modern automotive engineering has embraced a streamlined approach by reducing the number of mechanical components in vehicle powertrains. This design philosophy enhances efficiency and reliability, leading to smoother operation and increased durability. By minimizing the complexity of engine components, vehicles benefit from improved performance and reduced maintenance needs. This approach not only contributes to a more efficient energy conversion but also results in quieter and more comfortable driving experiences. Additionally, the simplified design facilitates easier maintenance and potentially lower long-term ownership costs, making vehicles more accessible and convenient for consumers.

Gears (Gear Blanks, Gear Shift Levers):- Even as EVs streamline drivetrain complexity by favoring single-speed gearboxes, the automotive gearbox market continues to be anchored by ICE vehicles, which still dominate global production and sales. Regions with slower EV adoption such as areas lacking charging infrastructure or in developing economies continue to drive steady demand for traditional multi-speed transmissions. Notably, OEMs are repurposing EV-focused facilities back to ICE transmission production in response to current market needs. This enduring demand underscores that while EVs are redefining transmission technology, ICE remains a backbone of automotive manufacturing and gearbox and drivetrain innovation remains relevant across both powertrain paradigms.

3.2 Indian Auto-Component Market

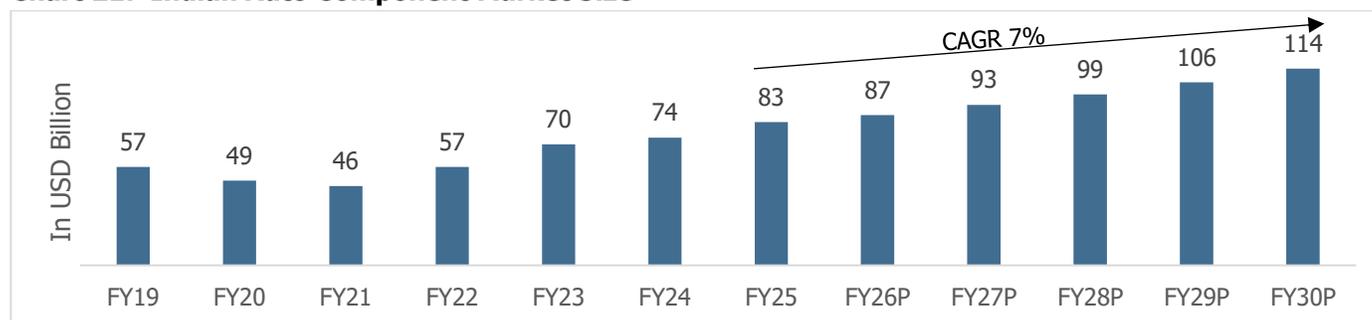
3.2.1 Industry Overview

The Indian auto component industry is critical to the automobile OEM value chain. The organized segment of this industry mainly includes OEMs engaged in the manufacturing of high-value precision component parts. While the unorganized segment mainly comprises low-valued products catering to after-market services. The industry is highly fragmented with most firms being Indian-originated and a relatively lower number of foreign firms and joint ventures operating in the segment.

3.2.2 Indian Auto Component Industry Market Size

The Indian automotive component industry has experienced significant growth, driven by several key factors. The sector has witnessed a steady increase in domestic vehicle production, supported by a robust aftermarket segment and a growing export market.

Chart 21: Indian Auto Component Market Size



Source: ACMA; CareEdge Research; E: Estimated; P: Projected

In FY24, the Indian automotive component industry posted a turnover of USD 74.1 billion, reflecting steady growth from USD 57.1 billion in FY19 despite interim fluctuations in the intervening years (USD 49.3 billion, USD 45.9 billion, USD 56.6 billion and USD 69.7 billion). Growth was supported by strong aftermarket demand and a consistent trade surplus, with exports outpacing imports. Higher passenger vehicle output and the rebound in two-wheeler production boosted OEM supplies, while an increasing share of electric vehicle components highlighted the industry’s alignment with evolving mobility trends. Looking ahead, the market is projected to expand from USD 83 billion in FY25 to nearly USD 114 billion by FY30, registering a CAGR of around 7%, supported by domestic demand recovery, technology adoption and rising export competitiveness.

Growth was driven by several key factors:

OEM Supplies: Domestic supplies to Original Equipment Manufacturers (OEMs) accounted for USD 62.4 billion, marking a 5.3% growth. Notably, the electric vehicle (EV) sector contributed 6% to this total.

Exports: Exports grew by 5.5% to USD 21.2 billion, with North America, Europe and Asia being key markets.

Imports: Imports increased by 3% to USD 20.9 billion, resulting in a trade surplus of USD 0.3 billion.

Aftermarket: The aftermarket segment reached USD 11.3 billion up 6.7% from the previous year, driven by increased vehicle usage and a shift towards organized retail.

Table 10: Indian Auto Component Industry Sales Performance and Outlook

| Categories | 2018 | 2022 | 2024 | 2025 | 2028(P) | CAGR | CAGR |
|---------------|---------------|---------------|---------------|---------------|---------------|-------------|-------------|
| | (USD Mn) | (2018-2022) | (2024-2028) |
| Sales to OEMs | 28,670 | 32,105 | 35,055 | 37,649 | 46,618 | 2.9% | 7.4% |
| Aftermarket | 9,126 | 9,690 | 10,585 | 11,305 | 13,768 | 1.5% | 6.8% |
| Exports | 13,418 | 14,708 | 16,186 | 17,384 | 21,515 | 2.3% | 7.4% |
| Total | 51,214 | 56,502 | 61,825 | 66,338 | 81,901 | 2.5% | 7.3% |

Source: Maia Research

Note: - The value for each segment is in Calendar Year (CY), Projected (P)

Further, the auto component industry witnessed a steady growth of 23% in FY23, both in the domestic and international markets. This was primarily led by growth in vehicle sales due to a shift in market preference toward premium vehicles and increased value-added components contributed to the increased turnover of the auto-components sector. There has been steady growth in exports despite recessionary trends in Europe and the US which are key export destinations for the auto components industry. A strong rebound in vehicle sales in the domestic market also led to an acute rise in imports. The aftermarket showed a growth of 6% in FY23 over FY22. Increased movement of vehicles post-pandemic and a surge in demand for used vehicles led to buoyancy in the aftermarket across all segments.

Digitization is rapidly changing the face of manufacturing alongside raising the domestic demand for vehicles in the premium segment with the transition toward electric vehicles and biofuels. Automation, robotics and artificial intelligence are becoming central to production processes, enhancing productivity, quality and cost-effectiveness. The traditional cost advantage based on labour is diminishing, necessitating investments in advanced technologies and upgradation. Also, sustainability is serving as a potent catalyst for driving innovation, especially in designing vehicles and components.

Moreover, the adoption of 5G and connected vehicle technologies will aid the growth of future mobility. Investments in innovative programs focusing on emerging technologies like Industry 4.0, AI, Machine Learning, data analytics and

cybersecurity will further empower the Indian auto component industry to seize global opportunities and enhance design & manufacturing capacities. Also, sustainability and energy efficiency through cleaner technology, aligned with India’s ambitious energy transition plan, will lead to core growth opportunities in the auto component industry. With the commitment to becoming net zero by 2070, India’s drive toward clearer fuels and EVs is rapidly shaping the industry’s future.

3.2.3 Segment Wise Industry Sales

The auto component industry has various segments such as the engine, the body, the interiors, etc. The engine components contribute the highest to the sales of the industry, facilitated by the vehicle sales across segments. The percentage of component sales under each category are depicted below:

Table 11: Automotive Component Industry Sale

| Sr. No. | Categories | 2018 | 2022 | 2024 | 2025 | 2028 P | CAGR |
|---------|---|----------|----------|----------|----------|----------|-------------|
| | | (USD mn) | (2024-2028) |
| 1 | Engine Components | 16,204 | 18,058 | 19,888 | 21,340 | 26,402 | 7.30% |
| 2 | Interiors | 3,641 | 3,870 | 4,309 | 4,649 | 5,840 | 7.90% |
| 3 | Electric systems | 4,763 | 5,255 | 5,845 | 6,242 | 7,617 | 6.80% |
| 4 | Chassis | 1,178 | 1,362 | 1,531 | 1,652 | 2,074 | 7.90% |
| 5 | Suspension & Braking | 6,356 | 7,023 | 7,810 | 8,349 | 10,199 | 6.90% |
| 6 | Transmission (Motor and Motor Controller-EV) | 1,880 | 1,921 | 1,991 | 2,126 | 2,595 | 6.80% |
| 7 | Cooling Systems | 497 | 610 | 696 | 755 | 965 | 8.50% |
| 8 | Consumables | 5,111 | 5,520 | 6,005 | 6,419 | 7,839 | 6.90% |
| 9 | Die Cast Components | 1,091 | 1,119 | 1,182 | 1,255 | 1,501 | 6.20% |
| 9.1 | Zinc | 48 | 53 | 59 | 64 | 80 | 7.90% |
| 9.2 | Aluminium | 538 | 559 | 595 | 634 | 769 | 6.60% |
| 9.3 | Other Die Cast Components | 504 | 506 | 527 | 556 | 652 | 5.50% |
| 10 | Ignition Switches | 6 | 7 | 8 | 9 | 11 | 7.40% |
| 10.1 | Steering Column Ignition Lock | 4 | 5 | 6 | 6 | 8 | 8.30% |
| 10.2 | Other Ignition Switch Components | 2 | 2 | 3 | 3 | 3 | 5.30% |
| 11 | Switches | 128 | 136 | 137 | 149 | 190 | 8.50% |
| 11.1 | Handlebar Switches | 92 | 97 | 98 | 106 | 132 | 7.70% |
| 11.2 | Others Switch Components | 36 | 38 | 40 | 44 | 58 | 9.70% |
| 12 | Others | 10,360 | 11,621 | 12,423 | 13,367 | 16,670 | 7.60% |

Source: Maia, CareEdge Research

The Engine Components segment led with a 26 % share, driven by rising vehicle production, localization of powertrain modules (capturing 6% of EV component supply) and robust domestic OEM demand. As global vehicle production continues to rise, there is a corresponding increase in the demand for high-quality engine components. This growth is particularly evident in regions like Asia-Pacific, where countries such as China and India are leading the way in manufacturing and consumption.

Suspension & Braking followed at 15%, supported by strong aftermarket volume and dominance of suppliers in two-wheeler and commercial vehicle segments and passenger vehicle. With 14%, the Body/Chassis/BIW segment remained vital, feeding rising SUV and premium vehicle production as well as exports.

Drive Transmission & Steering took a significant 13%, bolstered by high export share (34% of component exports in FY24) and localisation initiatives. Electricals & Electronics claimed 12%, a structural growth area propelled by demand for EV components, ADAS, sensors, connectivity modules and export opportunities. Interiors (non-electronic) represented 11%, reflecting growing demand for premium cabin features and rising passenger vehicle sales. Smaller segments like Consumables & Miscellaneous (7%), Rubber Components (1%) and Cooling Systems (1%) also contributed materially, particularly through replacement parts in the aftermarket and niche OEM applications.

3.2.4 Component Sales by OEMs

The passenger vehicle PV segment comprised the highest share of component supplies at 44%, followed by commercial vehicles at 34% and two-wheelers at 19% in FY24. The growth in sales volume across segments was supported by healthy demand in the urban areas, increasing replacement demand, growing demand for utility vehicles in the passenger vehicle segment, vehicle scrappage policy and higher infrastructure spending. Despite inflationary pressure throughout the year, preponing purchases before the implementation of new BS-VI Phase -II norms, easing of semiconductor chip supply and pent-up demand supported the sales growth.

Table 12: Indian Auto Component Industry Sales by Category and Outlook

| Categories | 2018 (USD mn) | 2022 (USD mn) | 2024 (USD mn) | 2025 (USD mn) | 2028 (P) (USD mn) | CAGR (2024-2028) |
|------------------------|------------------|------------------|------------------|------------------|----------------------|---------------------|
| Passenger Vehicles | 21,776 | 24,194 | 26,634 | 28,632 | 35,545 | 7.50% |
| Commercial Vehicles | 12,732 | 13,973 | 15,197 | 16,276 | 19,984 | 7.10% |
| Two Wheelers | 11,257 | 12,301 | 13,459 | 14,361 | 17,437 | 6.70% |
| Tractor | 2,863 | 3,029 | 3,165 | 3,377 | 4,103 | 6.70% |
| Construction equipment | 942 | 1,102 | 1,255 | 1,402 | 1,957 | 11.70% |
| Others | 1,644 | 1,904 | 2,114 | 2,283 | 2,875 | 8.00% |

Source: Maia Research

Note: - The value for each segment is in Calendar Year (CY), Projected (P)

3.2.5 Key players in Indian Automotive Non-Heavy Forging Components Industry¹

The key Indian engine component players are mentioned below: -

1. Ramkrishna Forgings Limited (RKFL): Established in 1981 and headquartered in Kolkata, RKFL is a prominent player in the metal forming industry. The company specializes in supplying forged, machined and fabricated components to various sectors, including automotive, railways, oil & gas and power.

2. Sansera Engineering Limited: Sansera Engineering Ltd, founded in 1981 and headquarters in Bengaluru, specializes in manufacturing precision-engineered components for the automotive and aerospace sectors. The company offers a wide range of products, including crankshafts, camshafts and connecting rods, serving major OEMs like Maruti Suzuki, Honda and Harley-Davidson.

3. Kay Jay Forgings Limited: Kay Jay Group of Companies, established in 1983 in Ludhiana, is a manufacturer of forged, machined and precision sheet metal components for the Automotive & Non-Automotive sector. The company offers wide range of products including crankshafts, connecting rods and other major automotive components serving major 2wheeler OEMs like TVS, Hero MotoCorp., Etc.

4. Rolex Rings Limited: Rolex Rings produces forged parts and machined bearing rings including spacers, ball bearings, cylindrical and tapered components and railway bearing components. They serve both domestic and international markets, supplying leading OEMs, auto-component producers and prominent bearing manufacturers. Their products are tailored to meet the specific requirements of each industry.

3.2.6 Key Government Initiatives

The government has increased focus on the industry related to increased focus on localization of components. Various initiatives taken by the government are: -

- **National Automotive Testing and R&D Infrastructure Project (NATRIp)**

The National Automotive Testing and R & D Infrastructure Project (NATRIp) are an initiative of the Government of India in the automotive sector. The aim of this Project is to improve the core competencies in Automotive sector in India and facilitate seamless integration of Indian Automotive industry with the world as also to position the country prominently on the global automotive map.

The vision of this project involves deepened manufacturing, localized R&D and to boost exports.

Converge India's unparalleled strengths in IT and electronics with automotive engineering sectors, to firmly place India in USD six trillion global automotive business. The project has set the above vision keeping in mind certain facts,

Ministry of Heavy Industries & Public Enterprises, Government of India, has constituted NATRIp Implementation Society (NATIS), an autonomous body, for the execution of National Automotive Testing and R&D Infrastructure Project (NATRIp). NATIS has been entrusted to set up state of the art, Automotive Test facilities at six locations across India, with an investment of Rs 3727.30 Cr. The project involves collaboration among the Government of India, a number of State Governments and Indian Automotive Industry to create a state-of-the-art Testing, Validation and R&D

¹ Note: These companies have been considered as the peers for Kay Jay Forgings.

infrastructure in the country. Four new centers have been set up in Manesar (Haryana), Chennai (Tamil Nadu), Indore (Madhya Pradesh) and Silchar (Assam). The two existing facilities at Pune and Ahmednagar have been upgraded with the new technologies.

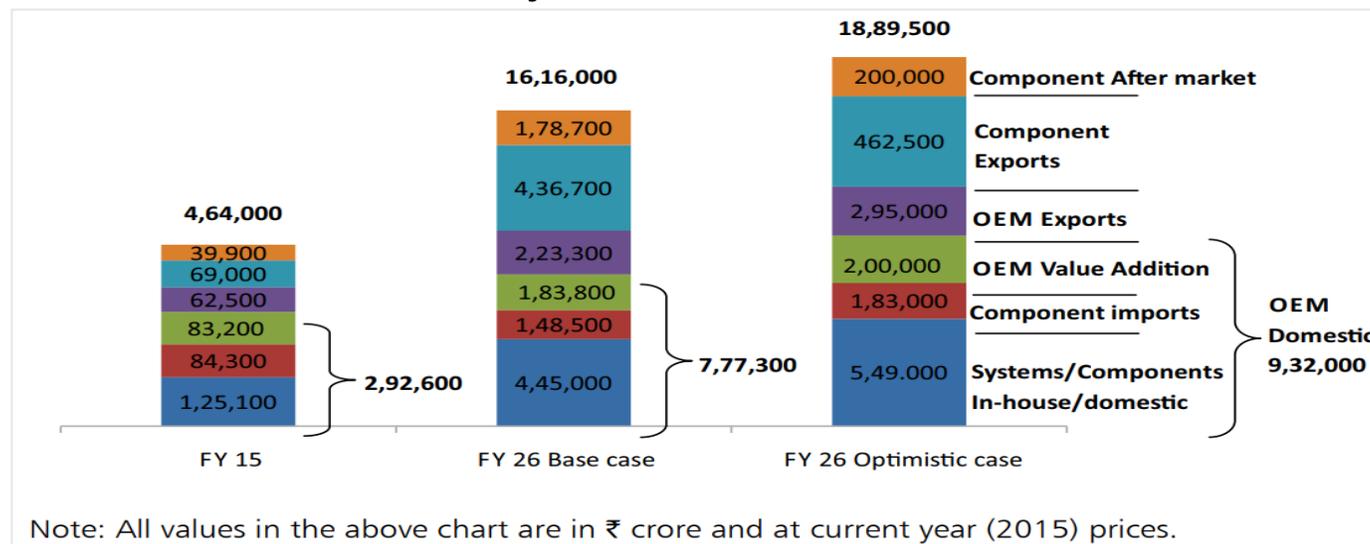
- **The Automotive Mission Plan 2047**

The government is also actively working on the Automotive Mission Plan (AMP) 2047, a long-term strategy aimed at positioning India as a global hub for the automotive and auto-component sectors. Building on the success of the previous Automotive Mission Plans (AMP 2016 and AMP 2026), AMP 2047 envisions substantial growth in vehicle production, increased exports and significant contributions to the economy. AMP 2047 aims to solidify India’s position as a key player in the global automotive landscape while focusing on sustainability, innovation and economic growth.

AMP 2026 is the collective vision of Government of India (Government) and the Indian Automotive Industry on where the Vehicles, Auto components and Tractor industries should reach over the next ten years in terms of size, contribution to India’s development, global footprint, technological maturity, competitiveness and institutional structure and capabilities.

AMP 2026 envisages that the Indian Automotive Industry will grow 3.5-4 times its value from its current output of around Rs. 4,640 billion to about Rs 16,160 – 18,885 billion by 2026, based on a base of case with average GDP growth rate of 5.8% and an optimistic case with an average GDP of 7.5% during the period. The following chart provides current and projected composition of the industry over the next decade.

Chart 22: Automotive Mission Plan Projections



Source: NITI Aayog Press Release

- **Current policy framework/regulations pertaining to Electric Vehicles industry in the passenger vehicles segment**

Automotive industry globally is at the cusp of a major transformation. Growing concerns for environment and energy security clubbed with rapid advancements in technologies for powertrain electrification, increasing digitalization, evolution of future technologies and innovative newer business models and ever-increasing consumer expectations are transforming the automotive business. One of the key facets of such a change is the rapid development in the field of

electric mobility which might transform the automotive industry like never before. The Government had launched FAME (Faster Adoption and Manufacturing of (Strong) Hybrid and Electric Vehicles in India) in 2015 with the objective of promoting and facilitating adoption of Electric Vehicles in India. The second phase of the scheme FAME II was launched from April 2019 for three years with a total budgetary support of Rs 10,000 crore.

- **Scrappage Policy**

The government had announced the scrappage policy in 2021 which will mandate commercial vehicle fleet owners to abandon or scrap their vehicles after 15 years if they don't meet the fitness or emission criterion laid by the government. This is likely to generate demand for new CVs and boost sales. Moreover, it will help in curbing pollution, improving road safety, better fuel efficiency, boosting the availability of low-cost raw materials for auto, steel and electronics industry.

- **Production Linked Incentive (PLI) scheme for Semi-Conductors**

The global automobile industry is facing supply chain disruptions amidst severe semiconductor shortage. On December 15, 2021, the Government of India has proposed to provide incentives of Rs. 76,000 crores for the development of semiconductors and display manufacturing ecosystem. This scheme will provide globally competitive incentive package to the companies for setting up plants in India in order to manufacture high quality semiconductor chips over the next 6-10 years. This initiative will further help to strengthen the domestic semiconductor manufacturing capacity and support the automobile industry over the medium term.

Last year, the Government planned to allocate over Rs. 57,042 crores to the auto industry for a period of five years. However, the Cabinet slashed that by more than 50% to Rs. 25,938 crores to focus on green automotive manufacturing. A total of 115 companies has filed for application in this PLI scheme which is expected to be commencing on FY23 as per the ACMA report, out of which 20 OEMs have already been approved for incentives in February 2022. This scheme is expected to provide 18% incentive for encouraging the industry to make investments.

3.2.7 Importance of Components in Two-Wheelers

Two-wheelers, encompassing motorcycles, scooters and mopeds, are intricate machines where each component plays a vital role in ensuring optimal performance, safety and compliance with regulatory standards.

| Important Components in Two-wheelers | |
|--|--|
| 1. Engine and Transmission Systems | |
| <ul style="list-style-type: none"> • Functionality: The engine serves as the heart of the two-wheeler, converting fuel into mechanical energy. The transmission system efficiently transfers this energy to the wheels, enabling movement. | |
| <ul style="list-style-type: none"> • Significance: A well-designed engine and transmission system ensure smooth acceleration, fuel efficiency and overall performance. | |
| 2. Braking Systems | |
| <ul style="list-style-type: none"> • Functionality: Brakes are essential for decelerating and stopping the vehicle. They include components like brake pads, discs and calipers. | |
| <ul style="list-style-type: none"> • Significance: Advanced braking systems, such as Anti-lock Braking Systems (ABS), enhance safety by preventing wheel lock-up during hard braking, thereby reducing the risk of accidents . | |
| 3. Suspension and Tires | |
| <ul style="list-style-type: none"> • Functionality: The suspension system absorbs shocks from uneven surfaces, while tires provide traction and stability. | |

| |
|---|
| <ul style="list-style-type: none"> • Significance: High-quality suspension and tires contribute to rider comfort, vehicle handling and safety, especially on rough terrains. |
| 4. Electrical and Ignition Systems |
| <ul style="list-style-type: none"> • Functionality: These systems manage the vehicle's electrical needs, including starting the engine, lighting and powering electronic components. |
| <ul style="list-style-type: none"> • Significance: Reliable electrical systems ensure consistent performance and safety features, such as lighting and horn functionality. |

3.2.8 Importance of Supplier Relationships in Two-Wheeler Product Development

In the automotive industry, particularly in the two-wheeler sector, the importance of trust and strong relationships between Original Equipment Manufacturers (OEMs) and suppliers cannot be overstated. These partnerships are foundational to the development of high-quality, reliable and innovative products.

- 1. Risk Mitigation and Flexibility:** In a volatile market, risks related to component shortages, price fluctuations and transportation delays are constant. By building strong supplier relationships, OEMs gain valuable support in times of disruption. For example, during the semiconductor shortage, automakers with close supplier ties were often able to secure essential components more reliably than those with less established relationships.
- 2. Cost Efficiency and Supply Chain Optimization:** Close supplier relationships help streamline the supply chain and reduce costs through better forecasting, coordinated logistics and bulk purchasing agreements. Additionally, many companies with strong supplier relationships benefit from hidden savings such as early defect detection, improved launch support and more favourable payment terms.
- 3. Accelerated Product Development:** Strong supplier relationships facilitate open communication and collaboration, allowing manufacturers to stay ahead of industry trends and integrate cutting-edge solutions into their operations. By leveraging supplier expertise, manufacturers can continuously improve their products and processes, driving innovation and growth.
- 4. Strategic Collaboration and Innovation:** Supplier Relationship Management (SRM) fosters close working relationships, turning suppliers into strategic partners who help meet goals such as cost reduction, quality enhancement and technological advancement. This collaboration opens avenues for innovation, allowing companies to leverage shared knowledge and diverse expertise.

3.2.9 Entry Barriers in Two-Wheeler Component Manufacturing

1. High Capital Requirement for Manufacturing Setup: The auto component industry is highly capital-intensive, requiring large upfront investments in precision machinery, CNC systems, automation, robotics and advanced testing equipment. Apart from manufacturing infrastructure, substantial spending is needed on R&D, prototyping, tooling and quality control facilities. With rising adoption of advanced driver-assistance systems (ADAS), EV parts and lightweight materials, the need for specialized machinery and technology is increasing further. This high financial commitment creates a strong barrier for new players with limited access to capital.

2. Customer Access and Approval Challenges: Automotive OEMs (Original Equipment Manufacturers) rely heavily on trusted suppliers and follow stringent supplier approval processes. New entrants face long lead times in securing approvals, which may involve detailed audits, compliance with global quality systems, sample testing and pilot runs. Even after approvals, suppliers often need to prove consistency over extended periods before securing meaningful business volumes. The high switching costs for OEMs also mean they prefer to continue with existing suppliers rather than onboarding new ones, making customer access a critical entry barrier.

3. Supplier Role in the Value Chain (Tier-1 vs. Tier-2): The supplier ecosystem is structured into **Tier-1 and Tier-2 suppliers**:

- **Tier-1 suppliers** provide complete systems or modules directly to OEMs (e.g., braking systems, engines, infotainment modules). Their role is highly critical, as they integrate sub-components and directly influence vehicle performance.
- **Tier-2 suppliers** provide smaller components, raw materials, or sub-assemblies to Tier-1 players (e.g., castings, fasteners, wiring).

For new entrants, moving up the chain to Tier-1 status requires not only technology and capacity but also years of proven performance. Without strong Tier-1 linkages or established reputation, Tier-2 players may remain in low-margin, high-volume segments with limited OEM visibility.

4. Stringent Quality and Compliance Norms: The automotive industry is one of the most quality-sensitive sectors globally. Compliance with standards such as IATF 16949, ISO/TS certifications, OEM-specific quality audits and global safety/emission norms is mandatory. Any deviation or defect can lead to recalls, reputational damage and significant financial penalties. OEMs demand near-zero defects' levels (often measured in parts per million), making continuous process improvement and quality assurance critical. For new entrants, setting up systems and processes to meet these stringent requirements is both costly and time intensive.

5. Strong Legacy Relationships with OEMs: OEMs typically maintain long-term relationships with suppliers, valuing reliability, proven performance and historical collaboration. Many auto component companies are locked into supply arrangements that span product lifecycles of 5–7 years, reducing the likelihood of new suppliers being considered mid-cycle. Furthermore, suppliers often co-develop components with OEMs at the design stage, embedding themselves deeply into the value chain. For new entrants, breaking into these established partnerships is extremely challenging without a clear technological edge or cost advantage.

6. QCD Advantage (Quality, Cost and Delivery): The global auto industry is governed by the principle of QCD – Quality, Cost and Delivery.

- **Quality** must be world-class and defect-free.
- **Cost** must remain competitive in a market with wafer-thin margins and high price sensitivity.
- **Delivery** must follow Just-in-Time (JIT) systems to reduce OEM inventory costs. Balancing these three simultaneously requires significant operational efficiency, supply chain management and scale advantages. Established players already have fine-tuned QCD systems, while new entrants struggle to meet OEM expectations consistently, which further restricts their entry.

7. Technological Expertise and R&D: The rapid evolution of automotive technologies, particularly with the shift towards electric mobility, demands continuous research and development. OEMs need to invest in advanced manufacturing techniques, automation and digital supply chain management systems. Smaller or new entrants may struggle to match the technological advancements and product offerings of established firms, further complicating their efforts to successfully penetrate the market.

8. Supply Chain Integration and Economies of Scale: Established OEMs benefit from extensive supplier networks and economies of scale, allowing them to negotiate favourable terms and maintain a reliable supply chain. New entrants face difficulties in establishing such networks and may encounter challenges in sourcing quality materials at competitive prices. This disparity can hinder their ability to compete effectively in the market.

9. Brand Recognition and Market Penetration: Building brand recognition in the two-wheeler component manufacturing industry is a formidable task, particularly given the highly competitive and fragmented nature of the

market, characterized by the presence of established OEM suppliers, large organized players, and numerous small and mid-sized manufacturers. New entrants must invest significantly in marketing, relationship-building with OEMs, and quality certifications to establish credibility and gain consumer and client trust. Without a strong brand presence and proven track record, attracting customers and securing market share becomes increasingly challenging in this intensely competitive environment.

3.2.10 Outlook for Auto component Industry

The Auto component industry is playing a pivotal role in propelling India's growth, leveraging emerging global opportunities with its distinctive competitiveness and innovations through electrification, technology, digitization and a range of alternative fuels, to redefine the mobility space. Also, the government is fostering a robust automotive supply chain and has been advocating policies promoting localisation, self-reliance and enhancing competitiveness.

The Indian automotive industry has the potential to reach a global scale and be more sustainable. The Indian Government has set an ambitious export target of USD 100 billion by 2033, up from USD 22 billion in FY25, targeting a CAGR of approximately 20%. Also, Niti Aayog has proposed a set of incentives for more than doubling the domestic automotive component industry's turnover to USD 145 billion by 2030. Much of this growth is expected to be driven by internal combustion engine (ICE) vehicles, which continue to dominate production and exports due to strong global demand, established manufacturing capabilities and wide model availability.

Achieving this goal will significantly enhance self-reliance by positioning Indian auto component manufacturers as key suppliers to global OEMs, thereby reducing dependence on imports and advancing the vision of 'Atmanirbharta'. It proposed fiscal support measures for scaling up manufacturing and capital expenditure support for the development of tools, intellectual property transfers and branding support, which are crucial for the automotive component manufacturing sector. The industry players are making successful strides to ensure global prominence by driving tech-led innovations supported by a favourable business environment. Accordingly, the automotive industry is paving its way by embracing cleaner energy sources, digitalization and prioritizing sustainability.

Further, the government's favourable policies are unleashing India's potential to revolutionize the global mobility landscape. The automobile sales are gaining traction with the announcements in Budget 2023-24 on the Vehicle Scrappage Policy, increased infrastructure spending, lowered direct taxes and focus on green mobility. In addition, with the growth in sales of electric vehicles (EVs), the auto component industry is witnessing a fast transformation to be an integral part of the EV manufacturing supply chain. The industry is making steady investments and acquiring technology companies. Several global firms are looking forward to investing in the Indian auto components industry, given its increased focus on deep localisation and the announcements of the PLI schemes by the government on Advanced Chemistry Cell (ACC) Batteries and auto & auto components. Such factors will enable the development of attractive alternative sources of high-end auto components in India.

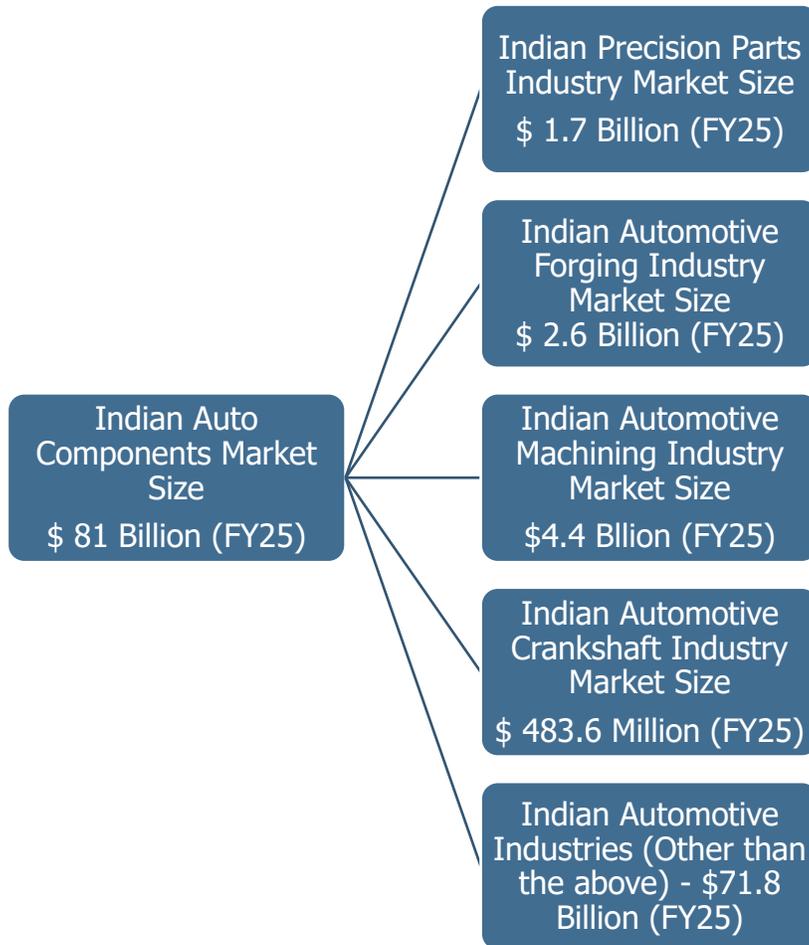
Moreover, the auto component industry is expected to grow over the long term with the premiumization of vehicles, which will translate into healthy growth for auto component suppliers. With significant mitigation in the supply-side issues of availability of semiconductors, input raw-material costs and logistics, the vehicle industry is expected to continue to perform well in FY26, which augurs well for the auto components sector. In addition, exports and growth in domestic aftermarket continue to be robust.

The Red Sea crisis, driven by Houthi rebel attacks, had severely disrupted global shipping. Major carriers are still avoiding the region, rerouting vessels via the Cape of Good Hope, leading to congestion at ports like Singapore, increased freight rates, delays, and container shortages. This has strained supply chains, raising costs and lead times for manufacturers and exporters. Indian exporters are grappling with high inventory levels and elevated working capital needs, affecting

margins. The industry is characterized by high working capital requirements due to the need to maintain substantial inventory levels and manage extended receivable cycles from OEMs. Additionally, continuous investment in raw materials, tooling, and production processes further increases the dependence on working capital. Going forward, raw material price volatility and freight cost escalation remain key risks for OEMs and auto component makers, though aftermarket demand is expected to remain steady.

3.2.11 Total Addressable Market for Indian Auto Components Market

The Indian auto components market is estimated at \$81 billion in FY25, encompassing several specialized segments. The precision parts segment is estimated to have been at \$1.7 billion, automotive forging at \$2.6 billion, and machining at \$4.4 billion. Within this ecosystem, the automotive crankshaft industry accounts for \$473 million, reflecting a critical sub-segment where Kay Jay Forgings operates. These figures highlight the sizable opportunity within India’s automotive component landscape and the specific niche for forging and crankshaft manufacturing.



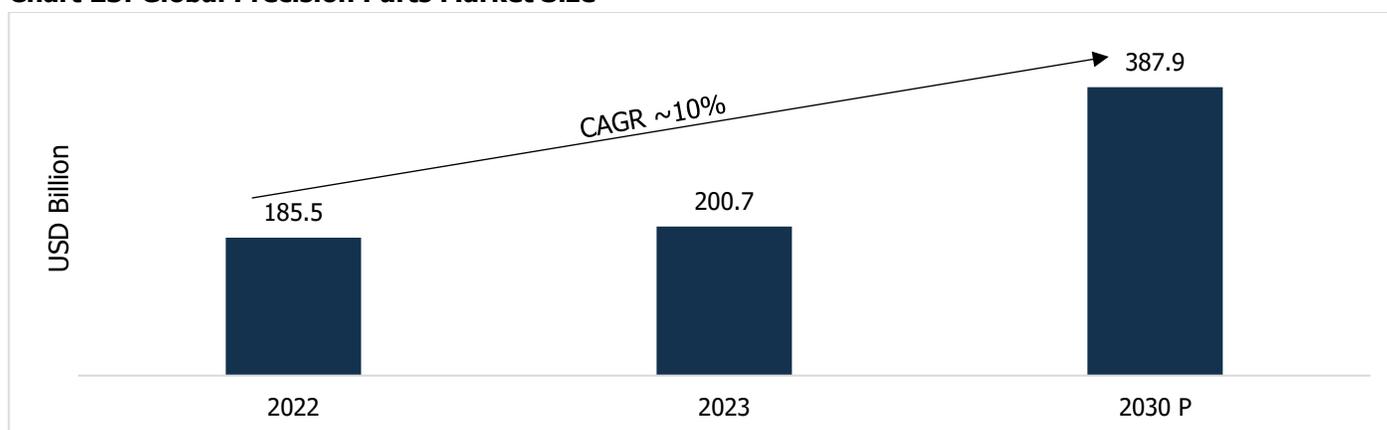
4 Assessment of the Precision Engineering Parts Industry

4.1 Global Precision Engineering Parts Market

4.1.1 Global Market Size

The global precision engineering parts industry involves the design and manufacturing of high-accuracy components for critical applications, serving major sectors like aerospace, medical and automotive. The market is experiencing significant growth, driven by technological advancements, demand for high-quality products, industrial automation and government initiatives supporting advanced manufacturing and clean energy. Key trends include the increasing adoption of lightweight materials, the integration of advanced manufacturing technologies such as 3D printing and a continued shift towards digitalization in production.

Chart 23: Global Precision Parts Market Size



Source: Vibrant Gujarat Global Summit – 2024, CareEdge Research; P: Projected

The global precision parts market, valued at approximately USD 185.53 billion in 2022, is projected to reach around USD 387.89 billion by 2030, advancing at a compound annual growth rate (CAGR) of ~10%. This robust growth is primarily driven by escalating demand across various industries, particularly healthcare, automotive and aerospace, where precision parts are indispensable for manufacturing critical devices and components.

4.1.2 Key Growth Drivers in the Global Precision Parts Market

Rising Demand in Healthcare

Precision parts are increasingly critical in the healthcare and medical device sectors, enabling intricate components for diagnostics, surgical instruments and minimally invasive technologies. This demand is supported by sustained investments in healthcare infrastructure and the growing use of high-precision micro-components.

Surge from Automotive & Electrification

The automotive industry remains a major consumer of precision parts, driven by electric vehicles (EVs), autonomous systems and lightweighting requirements. Precision components are integral to electric drivetrains, power electronics housings, braking systems and safety-critical assemblies.

Aerospace & Electronics Demands

High-precision components are indispensable in aerospace for engine systems, fuel delivery and structural assemblies,

and in electronics for miniaturized, high-reliability parts used in semiconductors, sensors and advanced consumer devices.

Refrigeration & Cooling Equipment Expansion

Growth in commercial and industrial refrigeration driven by cold chain expansion, food processing and pharmaceutical storage is increasing demand for precision components such as compressors, valves, heat exchangers and control assemblies, where tight tolerances directly impact energy efficiency and system reliability.

Mining Equipment & Heavy Machinery

The mining sector requires highly durable precision parts for drilling systems, hydraulic assemblies, wear-resistant components and motion control systems. Rising mineral demand for energy transition materials (copper, lithium, rare earths) is supporting investments in advanced mining equipment with higher precision requirements.

Agriculture Mechanisation & Precision Farming

Mechanisation in agriculture, including tractors, harvesters, irrigation systems and precision farming equipment, is driving demand for precision-engineered gears, shafts, hydraulic components and sensor housings. The shift toward smart and automated agricultural machinery further raises tolerance and reliability standards.

Oil & Gas Exploration and Processing

Precision parts are critical in upstream and downstream oil & gas operations, including valves, pumps, compressors, drilling tools and instrumentation. Demand is supported by ongoing investments in exploration, refinery upgrades and LNG infrastructure, where components must meet stringent safety, corrosion resistance and performance specifications.

Smart Manufacturing & Industry 4.0 Adoption

The integration of IoT, AI, automation and data analytics is transforming precision parts manufacturing, enabling higher throughput, real-time quality control and customization, while reducing defect rates across industrial end-use sectors.

Advanced Manufacturing Technologies

Wider adoption of CNC machining, additive manufacturing (3D printing) and advanced surface treatments enables production of complex, application-specific parts for industries such as refrigeration, mining and oil & gas, where performance requirements vary significantly.

Outsourcing & Cost-Efficiency Strategies

OEMs across automotive, industrial equipment, agriculture and energy sectors are increasingly outsourcing precision component manufacturing to specialized suppliers to reduce capital intensity, shorten development cycles and access advanced manufacturing capabilities.

Role of Lightweight Materials in Driving Demand for Precision Parts

The increasing adoption of lightweight materials such as aluminium alloys, titanium, magnesium alloys and advanced composites is a key structural driver for the global precision parts market. These materials are progressively replacing conventional steel in applications where weight reduction, performance efficiency and lifecycle optimization are critical.

Compared to steel, lightweight materials offer a significantly higher strength-to-weight ratio, enabling manufacturers to reduce component mass without compromising structural integrity. This is particularly important in automotive, aerospace, refrigeration, agriculture and industrial equipment, where lower weight directly translates into improved energy efficiency, reduced fuel or power consumption and enhanced system responsiveness.

Lightweight materials also provide superior corrosion resistance and thermal performance in many operating environments. For example, aluminum and titanium alloys are increasingly preferred in oil & gas, refrigeration and outdoor industrial machinery, where exposure to moisture, chemicals and temperature variations accelerates wear in traditional steel components. This improves equipment longevity and lowers maintenance costs.

From a manufacturing perspective, lightweight materials often require higher machining precision and tighter tolerances than steel due to their distinct mechanical and thermal characteristics. This drives demand for advanced precision machining, surface finishing and quality control capabilities, strengthening the role of specialized precision parts manufacturers.

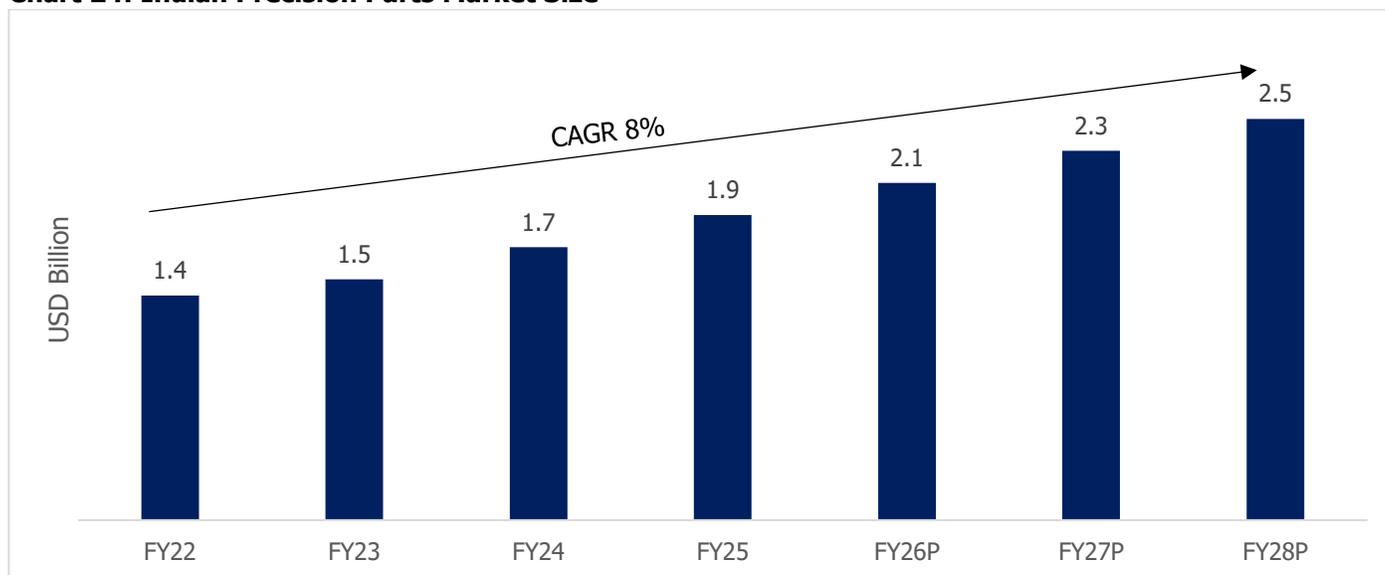
Additionally, regulatory pressure on emissions reduction, energy efficiency and sustainability is accelerating the shift toward lightweight components across end-use industries. As OEMs redesign systems to meet stricter efficiency norms and performance benchmarks, the demand for precision-engineered lightweight components continues to rise, reinforcing long-term growth opportunities in the precision parts market.

4.2 Indian Precision Engineering Parts Market

4.2.1 Indian Precision Engineering Parts Industry

The Indian precision engineering parts industry is characterized by strong growth, driven by sectors like aerospace, defence and automotive, with government initiatives fostering its expansion. Key features include high-precision manufacturing using CNC and automated machines for components with tight tolerances, serving critical national programs in space and defence and producing parts for various industries including medical, industrial equipment and electronics. The industry is supported by an increasing number of technologically advanced, export-oriented units and plays a vital role in both domestic and global supply chains.

Chart 24: Indian Precision Parts Market Size



Source: Vibrant Gujarat Global Summit – 2024, CareEdge Research; P: Projected

4.2.2 Key Growth Drivers in the Domestic Precision Parts Market

1. Critical Role in ICE Manufacturing

India's strength in precision engineering supports the production of high-quality internal combustion engine (ICE) components such as cylinder liners, pistons, crankshafts, valves, gears and camshafts. Tight tolerances and uniform dimensions enhance engine efficiency, minimize friction and ensure durability, making precision machining indispensable to the reliability of ICE vehicles.

2. Transmission & Powertrain Reliability

High-accuracy machining of gears, synchronizers and camshafts enables seamless power delivery and smooth gear transitions, directly contributing to operational efficiency, performance and longevity of vehicles.

3. Stringent Quality & Testing Standards

Adoption of advanced technologies such as CNC machining, Coordinate Measuring Machines (CMMs), non-destructive testing and real-time quality checks ensures consistent quality and minimizes deviations. These practices reduce recall risks, improve scalability and strengthen OEM confidence in Indian suppliers.

4. Digital Design & Rapid Prototyping

Use of CAD-based design, digital simulation and virtual prototyping accelerates innovation cycles. Engineers can validate performance and optimize designs before production, ensuring faster development of next-generation powertrain systems.

5. Support for Regulatory Compliance & Safety

Precision-engineered sensors and electronic interfaces enable advanced engine management, emissions compliance and safety features, aligning with increasingly strict global automotive standards.

6. Rising EV & Hybrid Powertrain Applications

While traditional ICE manufacturing continues to dominate, precision engineering is also finding new opportunities in electric and hybrid vehicles. Components such as electric drivetrains, modular chassis and high-tolerance transmission systems require the same accuracy and consistency, creating fresh demand for precision parts in emerging mobility solutions.

4.2.3 Entry Barriers in the Precision Engineering Parts Industry

Extreme Tolerance and Repeatability Requirements: Automotive components particularly those in engines and transmissions must adhere to extraordinarily rigid dimensional tolerances. Achieving consistent accuracy across production batches demands advanced manufacturing methods and rigorous process control mechanisms.

Critical Infrastructure Investment: Manufacturers must invest heavily in specialized equipment—such as high-precision CNC machining tools, coordinate measuring machines (CMMs), automated robotics and digital inspection systems to meet the exacting standards required for performance-critical components. These substantial capital expenditures deter new entrants.

Compliance with Automotive Quality Frameworks: Suppliers must adhere to stringent automotive quality standards, including IATF 16949 and Advanced Product Quality Planning (APQP), to ensure product safety, traceability and reliability. Compliance involves extensive documentation, audits and validation processes before components are approved for use.

Complex Supply Chain Dynamics: The automotive industry operates within a highly structured, tiered supplier ecosystem characterized by long-term contracts and integrated development cycles. New entrants must integrate into

this established network while proving quality and reliability no small feat in a tightly regulated and reputation-driven industry.

Advanced Design Coordination & Manufacturing Synergy: Automotive engineering requires close alignment between design and manufacturability (DFM). Precision parts must fit seamlessly into complex systems and any deviation can affect performance, compliance and reliability. This necessitates iterative prototyping, simulation and validation capabilities demanding sophisticated technological infrastructure.

Supply Chain Vulnerabilities & Risk Management Challenges: Maintaining precision through manufacturing, logistics and assembly is critical especially given how even minor deviations during shipping or handling can compromise component integrity and warranty coverage. Managing this end-to-end precision demands tight control mechanisms throughout the value chain.

5 Forging Industry

5.1 Global Forging Market

5.1.1 Industry Overview

Forging is a vital manufacturing process that involves shaping metal using compressive forces, typically delivered through hammers or presses. As a foundational element of industrial production, forging plays a crucial role in supporting key sectors that drive economic development, including Automobiles, Industrial Machinery, Power, Construction and Mining Equipment, Railways and General Engineering. Globally acknowledged as a core pillar of manufacturing, the forging industry delivers high-strength, high-performance components essential for both domestic consumption and international trade. India has established itself as the second-largest forging producer in the world, demonstrating remarkable resilience, technical capability and competitiveness on the global stage. The country’s forging sector significantly contributes to economic progress through innovation, exports and employment generation.

With an installed capacity of approximately 3.85 million metric tonnes (38.5 lakh MT), the Indian forging industry is well-equipped to process a wide array of raw materials—including carbon steel, alloy steel, stainless steel, superalloys, titanium and aluminium—catering to diverse application needs. Over time, the industry has evolved from a labour-intensive operation into a capital-intensive ecosystem, reflecting significant modernization and automation. To support this transformation, the sector has seen cumulative investments of around INR 27,833 crore in advanced plant and machinery.

Forging Process

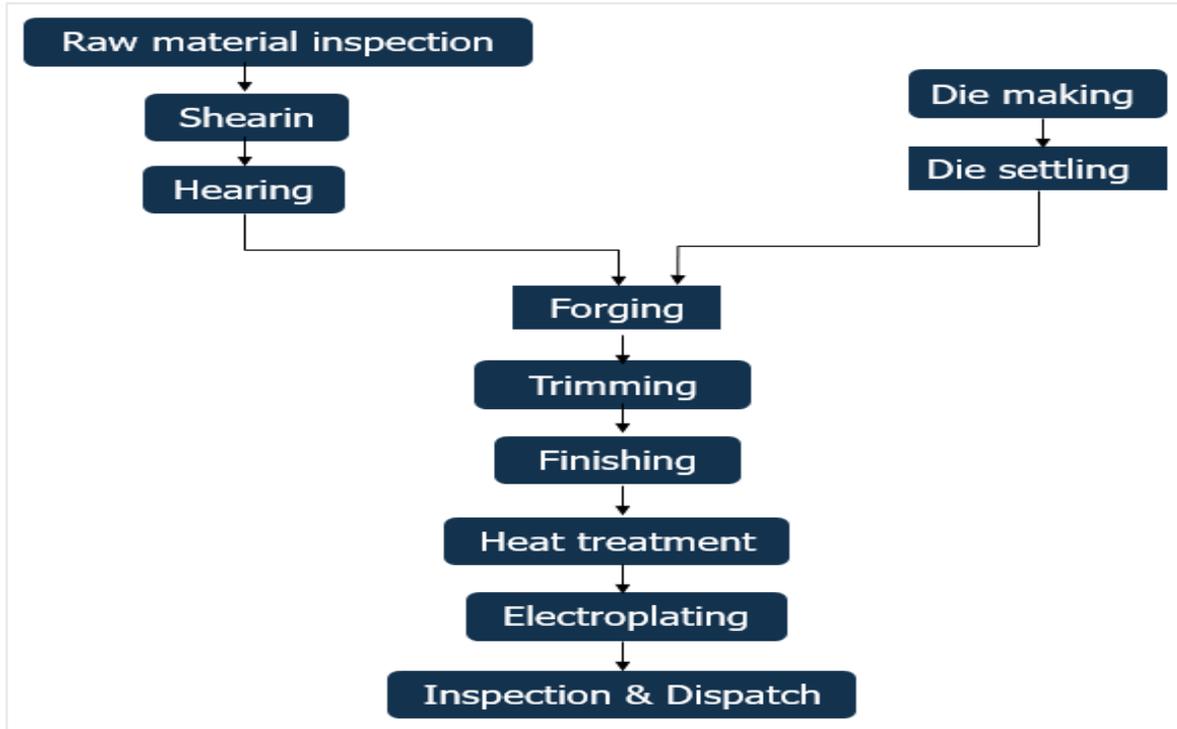
The forging process involves the application of compressive forces to shape metal into desired forms while refining its internal grain structure. This results in components with superior mechanical properties, such as high strength, toughness and fatigue resistance.

The main types of forging processes include:

| |
|--|
| <ul style="list-style-type: none"> • Open-Die Forging: The metal is placed between flat or simple-shaped dies and deformed by repeated blows. Ideal for large, simple components and short-run production. |
| <ul style="list-style-type: none"> • Closed-Die (Impression-Die) Forging: The metal is pressed between two dies that contain a pre-cut profile of the desired shape. This method enables high precision and is widely used in mass production. |
| <ul style="list-style-type: none"> • Cold Forging: Conducted at or near room temperature, this process provides excellent surface finish and dimensional accuracy, commonly used for small parts. |
| <ul style="list-style-type: none"> • Seamless Rolled Ring Forging: A specialised process used to produce ring-shaped components, where a pierced metal billet is expanded into a ring and then compressed to the desired dimensions. |

In motorcycle and two-wheeler manufacturing, closed-die forging is the predominant process, owing to its ability to produce precise, high-strength and repeatable parts. However, the process involves several technical complexities that require careful control and specialised expertise.

Process Flowchart



Types of Forging Used in Two-Wheelers

1. Closed-Die Forging (Impression-Die Forging)

- Most common for components like crankshafts, connecting rods, gear blanks and wheel hubs.
- This process consists of taking heated metal and placing it between specially shaped dies, then applying high pressure to shape it into the required form.
- Enables high dimensional accuracy and refined grain flow for superior strength.

2. Cold Forging

- Used for smaller parts like bolts, shafts and pins that require excellent surface finish and tighter tolerances.
- Carried out at room temperature; offers better material utilization and minimal machining.

Complexities in Forging Process

1. Die Design and Maintenance

- Closed-die forging requires precision dies that must withstand repeated high-pressure cycles.
- Dies are expensive and time-consuming to produce.
- Any design flaw or thermal fatigue in the die can lead to defects, downtime and high replacement costs.

2. Material Selection and Preparation

- Different alloys respond differently to forging stress.
- Uniform heating is critical; uneven temperature can cause cracks, warping, or incomplete filling of the die.

- Scaling and decarburization at high temperatures must be controlled to preserve surface integrity.

3. Temperature and Deformation Control

- Forging typically occurs between 1,100°C–1,250°C for steel components.
- Overheating can lead to grain coarsening, while underheating may cause insufficient formability or die wear.
- Achieving the correct deformation rate is crucial to ensure optimal grain flow and avoid internal defects like laps or voids.

4. Flash Formation and Trimming

- Excess material (flash) formed during closed-die forging must be trimmed off.
- Flash control is critical; improper trimming can affect part geometry and increase post-forging machining requirements.

5. Lubrication and Die Cooling

- Proper lubrication reduces friction and dies wear, but excess can cause slippage or fire hazards.
- Die cooling between cycles is needed to maintain thermal balance and dimensional stability.

5. Post-Forging Operations

- Many forged parts require heat treatment, machining and surface finishing.
- Inadequate handling during these processes can nullify the mechanical advantages gained from forging.

6. Operational Complexities

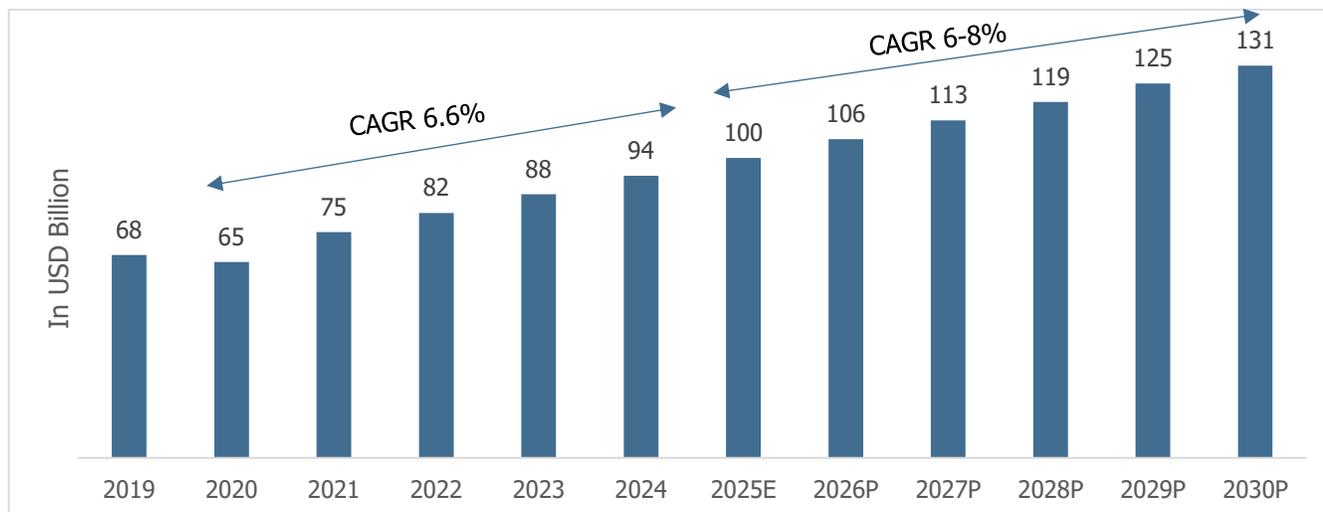
- The forging process involves **inherent operational complexities and occupational hazards**, including exposure to extreme heat, heavy machinery, noise, and high-impact operations, which elevate risks related to worker safety, equipment failure, and production disruptions, necessitating stringent safety protocols and maintenance practices.

5.1.2 Global Forging Industry Market Size

Global Market Size

The global forging industry was valued at USD 68 billion in 2019 and is estimated to have reached USD 100 billion by 2025, growing at a CAGR of 6.6% during this period. The growth has been driven by a recovery in automotive production, increased investments in infrastructure and rising demand from sectors like aerospace, energy and defence. Going further, the market is projected to expand further to USD 131 billion by 2030, reflecting a CAGR of 6-8% over 2025–2030. This continued growth is expected to be fuelled by the shift toward electric vehicles, global defence modernization programs and increased localisation of industrial component manufacturing.

Chart 25: Global Forging Industry Market Size



Source: Imarc Group, CareEdge Research; P: Projected; Years refer to Calendar Year, E: Estimated, P: Projected

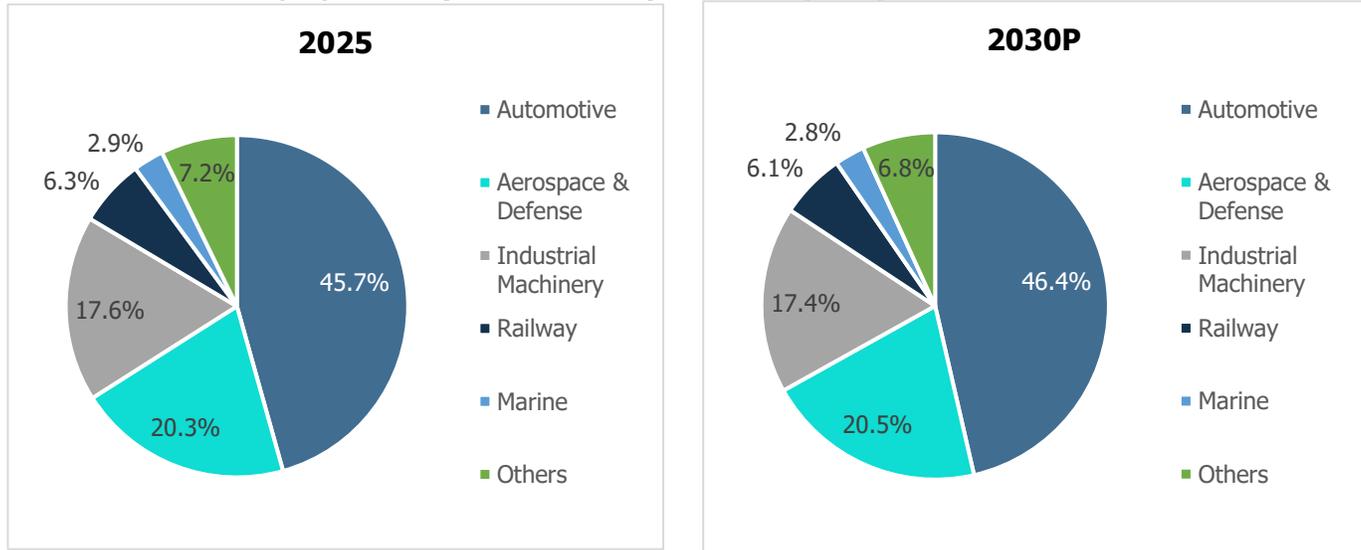
5.1.3 Global Forging Market by End-User

In 2025, the automotive sector leads global forging demand with a 45.7% share, significantly outpacing other segments such as aerospace & defense (20.3%) and industrial machinery (17.6%). This dominance highlights the automotive sector's faster growth pace compared to other segments, driven by its high-volume requirements and the essential role of forged components in engines, transmissions and structural parts.

By 2030, the automotive sector's share is projected to rise modestly to 46.4%, highlighting its continued growth momentum. This increase reflects sustained demand from internal combustion vehicles and an expanding need for forged components in electric vehicles, including lightweight and high-precision parts. In contrast, aerospace & defense is expected to maintain a steady share of 20.5%, supported by growing aircraft production and higher defense spending, though at a slower pace relative to automotive.

The industrial machinery segment, contributing 17.6% in 2024, is projected to see a slight decline to 17.4% by 2030, reflecting a relatively slower growth trajectory. Other segments, including marine, railway and smaller contributors, are anticipated to remain stable, further emphasizing the automotive sector's role as the primary growth driver in the global forging industry.

Chart 26: Global Forging Industry Market Size by End-User (2025)

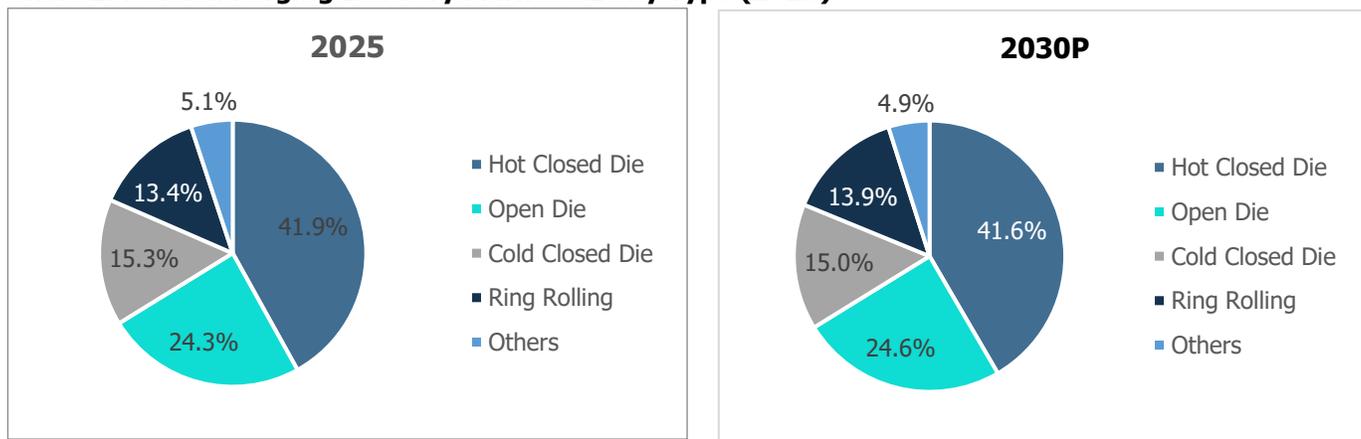


Source: Imarc Group, CareEdge Research

5.1.4 Global Forging Market by Type

In 2025, Hot Closed Die Forging accounts for the largest share at 41.9%, primarily due to its wide applicability in automotive and industrial components requiring high strength and precision. Open Die Forging follows at 24.3%, especially used in large and heavy-duty components. Cold Closed Die Forging and Ring Rolling contribute 15.3% and 13.4%, respectively. By 2030, the forging process mix remains largely consistent. Hot Closed Die holds a 41.6% share, while Open Die Forging increases marginally to 24.6%, supported by its role in aerospace, oil & gas and renewable energy. Cold Closed Die (15.0%) and Ring Rolling (13.9%) maintain stable shares, indicating sustained relevance in specialised forging applications.

Chart 27: Global Forging Industry Market Size by Type (2025)



Source: Imarc Group, CareEdge Research

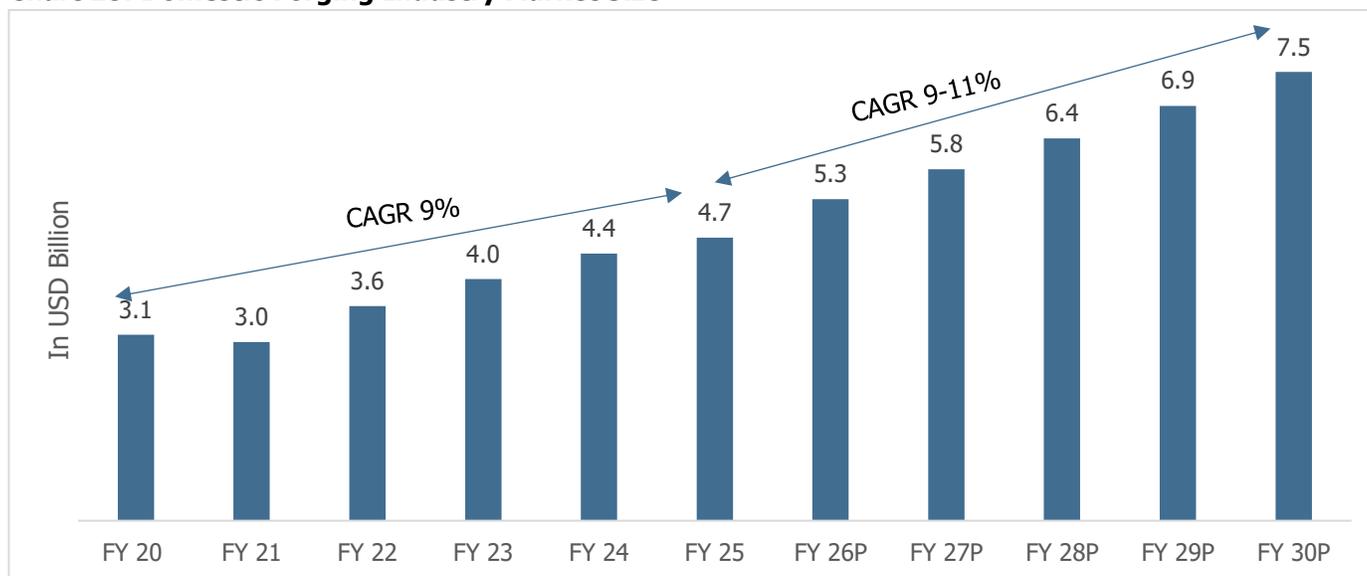
5.2 Indian Forging Market

5.2.1 Industry Overview & Market Size

The domestic forging industry in India has exhibited consistent growth, expanding from USD 3.1 billion in FY20 to an estimated USD 4.7 billion in FY25. This trajectory is expected to continue, reaching USD 7.5 billion by FY30, underpinned by increased manufacturing activity, infrastructure development and a rebound in automobile production volumes.

The growth has also been supported by government initiatives such as “Make in India” and the PLI scheme, which encourage localisation of critical components. Moreover, rising investments in sectors like defence, railway modernization and capital goods have created additional demand for forged parts across varied industrial applications.

Chart 28: Domestic Forging Industry Market Size



Source: Imarc Group, CareEdge Research; P: Projected

5.2.2 Domestic Forging Market by End-User

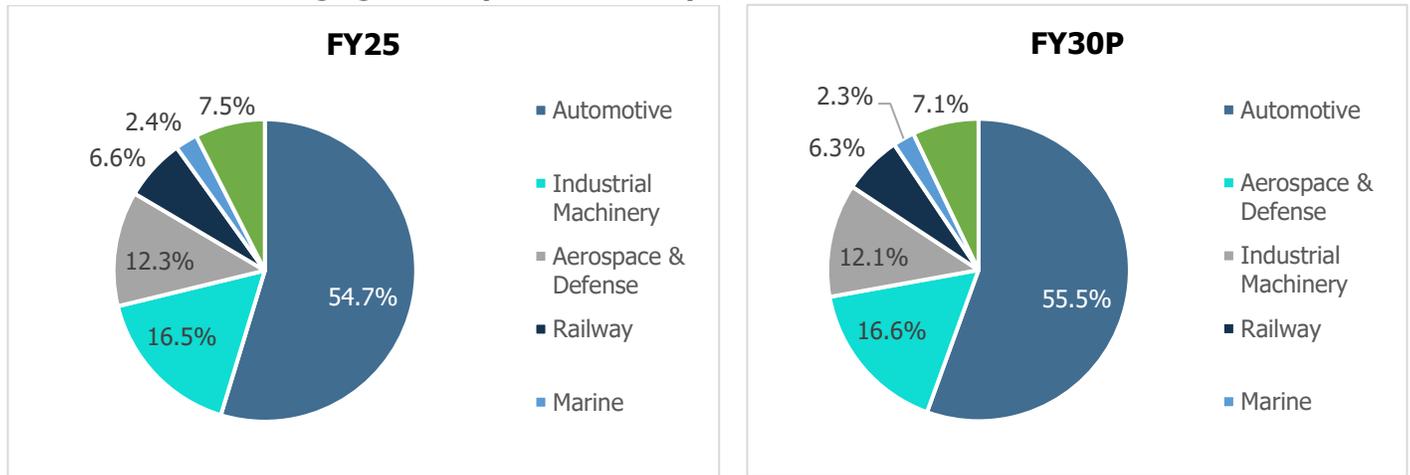
In FY25, the automotive sector remains the dominant consumer, accounting for 54.7% of the forging demand. This dominance reflects the sector's significant growth momentum, fueled by the high-volume requirement for forged parts such as crankshafts, connecting rods and transmission components in both commercial and passenger vehicles. The faster growth pace of the automotive sector compared to other segments underscores its role as the primary driver of forging demand.

The industrial machinery segment contributes 16.5% and aerospace & defense accounts for 12.3%, both benefiting from higher capital expenditure and increased indigenization efforts. However, their relatively stable shares indicate slower growth compared to the automotive sector, which continues to expand its share in the forging market.

Railways (6.6%) and marine (2.4%) collectively form a smaller base but are growing steadily, supported by infrastructure projects and naval modernization. Despite this, their growth remains overshadowed by the robust pace of the automotive sector.

By FY30, the automotive sector's share is projected to rise modestly to 55.5%, indicating a sustained and faster growth trajectory. This increase is driven by continued demand for traditional vehicles and the growing adoption of electric vehicles, which require lightweight and high-precision forged components. In contrast, the shares of industrial machinery and aerospace & defense are expected to remain stable, reflecting a slower pace of expansion relative to the automotive segment. This dynamic solidifies the automotive sector's position as the primary growth engine of the forging industry.

Chart 29: Domestic Forging Industry Market Size by End-User



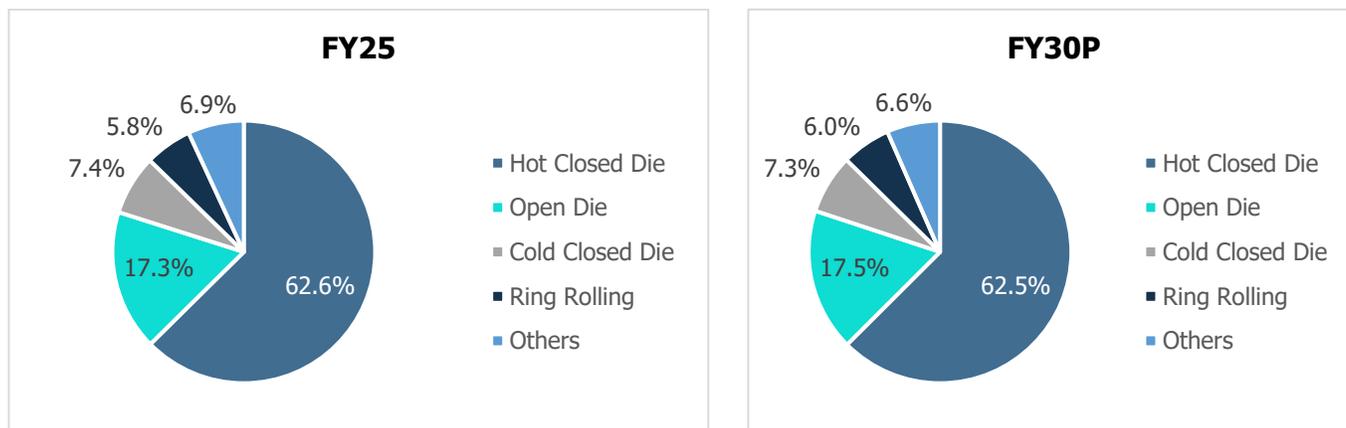
Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

5.2.3 Domestic Forging Market by Type

Hot Closed Die Forging dominates the domestic landscape, constituting 62.6% of the market in 2025. Its prevalence is due to its applicability in producing high-strength and high-volume components, particularly in the automotive sector. Open Die Forging holds 17.3%, catering to large, low-volume components needed in capital goods and heavy engineering. Cold Closed Die Forging (7.4%) is used for precision components requiring close tolerances, while Ring Rolling and other processes collectively account for around 12%.

By 2030, the process mix remains broadly unchanged, with Hot Closed Die Forging holding 62.5% and Open Die Forging increasing slightly to 17.5%. This indicates process maturity and sustains reliance on established forging methods. Incremental shifts reflect diversification in demand from sectors like construction equipment, energy and marine.

Chart 30: Domestic Forging Industry Market Size by Type



Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

5.2.4 Key trends and growth drivers

Rising Automotive Production: The forging industry in India is heavily driven by the growing demand in the automotive sector. With increased vehicle production across two-wheelers, passenger cars and commercial vehicles, the demand for forged components such as crankshafts, connecting rods and gears has surged. The rise in electric vehicles (EVs) is also creating new opportunities for lightweight and precision-forged parts.

Infrastructure Development: Large-scale infrastructure projects and urbanization have increased the demand for construction and heavy machinery, which in turn requires forged components. Government initiatives like "Make in India" and high infrastructure budgets have further stimulated demand for forging products.

Export Potential: Indian forging manufacturers are gaining recognition globally for their cost-effective and high-quality production. The export of forged components to Europe, North America and Asia is growing, fueled by competitive pricing, adherence to global quality standards and robust supply chains.

Advancements in Technology: Adoption of advanced forging techniques, automation and simulation technologies has enhanced productivity, reduced costs and improved the precision of forged components. This has increased the competitiveness of Indian manufacturers in the global market.

Diverse Industrial Applications: Beyond automotive, forging components are widely used in industries like aerospace, defense, oil & gas and agriculture. Growth in these sectors provides a steady stream of demand for forged products.

Government Policies and Incentives: Supportive government policies, such as reduced corporate tax rates for manufacturing, PLI (Production Linked Incentive) schemes and focus on Atmanirbhar Bharat (self-reliant India), have incentivized investments and capacity expansion in the forging sector. In addition to OEM demand, the aftermarket for replacement parts in automobiles and industrial machinery drives consistent growth for forged components.

5.3 Automotive Forging Industry

5.3.1 Global Automotive Forging Market

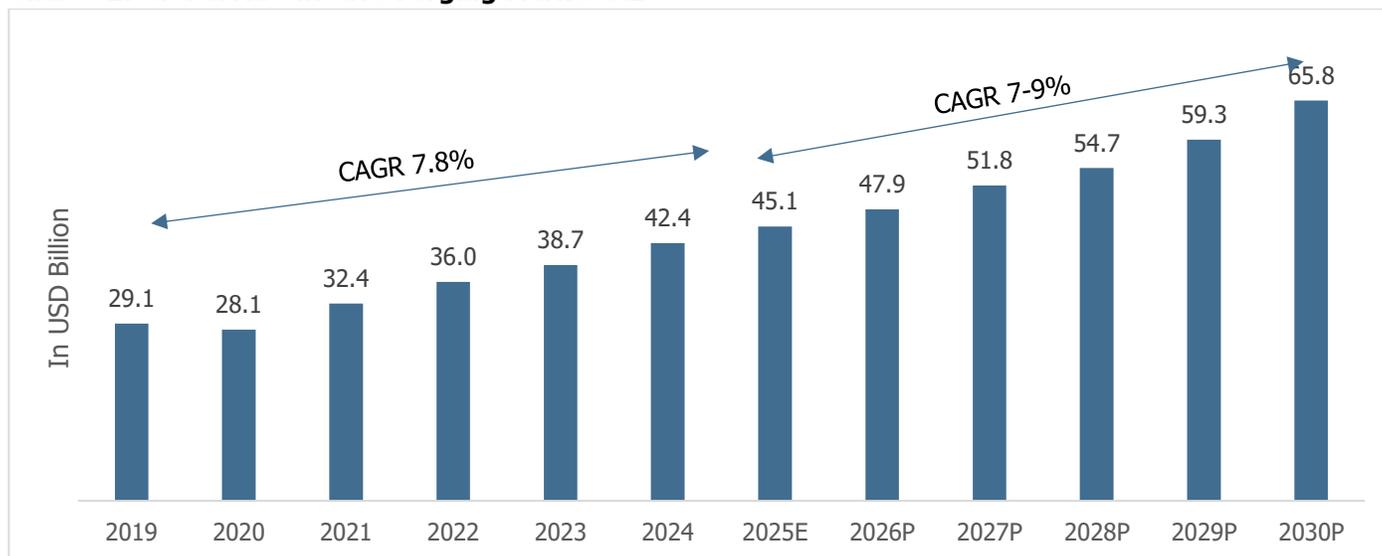
5.3.1.1 Industry Overview

The global automotive forging industry plays a vital role in vehicle manufacturing, supplying critical components such as crankshafts, connecting rods, gears, axles and steering parts that demand superior strength, durability and precision. Driven by rising automobile production, advancements in forging technologies and the increasing demand for lightweight yet high-strength materials, the industry is witnessing steady growth. While traditional internal combustion engine (ICE) vehicles continue to dominate forging demand globally, the transition toward electric vehicles (EVs) is reshaping product requirements, with greater emphasis on lightweight aluminum and precision-forged components.

5.3.1.2 Global Automotive Forging Market Size

The global automotive forging market stood at USD 45.1 billion in 2025 and is expected to reach USD 65.8 billion by 2030, growing at a CAGR of 7-9%. Growth is supported by rising vehicle production, stringent safety norms and the increasing need for durable and lightweight forged components such as crankshafts, gears and connecting rods. The industry is also witnessing technology adoption in precision forging and advanced alloys, catering to both ICE and EV platforms. Asia-Pacific continues to dominate due to large-scale automobile production in China and India, while North America and Europe focus on high-performance forged components.

Chart 31: Global Automotive Forging Market Size



Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected; Years refer to Calendar Year (CY)

5.3.2 Domestic Market

5.3.2.1 Industry Overview

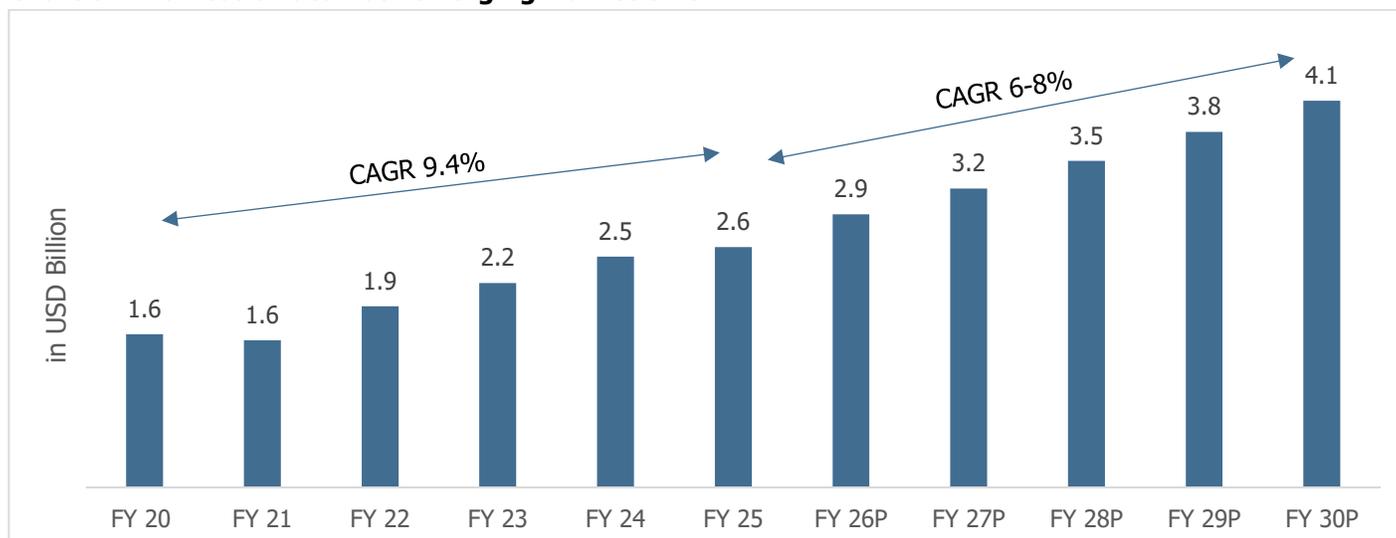
In India, the automotive forging industry is closely tied to the country’s large two-wheeler, passenger vehicle and commercial vehicle markets. India is among the world’s largest forging hubs, supported by cost competitiveness, a strong base of forging clusters (notably in Maharashtra, Tamil Nadu and Punjab) and established linkages with both domestic OEMs and global supply chains. The sector is increasingly focusing on value-added forgings, advanced

machining and exports, while also preparing for evolving opportunities in EV drivetrains, hybrid powertrains and lightweight alloy applications.

5.3.2.2 Domestic Automotive Forging Market Size

The Indian automotive forging market was valued at USD 2.6 billion in FY25 and is projected to reach USD 4.1 billion by FY30, at a CAGR of 6-8%. Domestic demand is being fueled by recovery in passenger and commercial vehicle sales, coupled with India’s positioning as a global hub for auto component exports. Forging companies are increasingly investing in automation, precision tooling and capacity expansion to serve OEMs, Tier-1 suppliers and global clients. Additionally, government incentives under the PLI scheme and the shift toward lightweighting and hybrid/EV components are expected to create new avenues for growth, while ICE-related demand continues to sustain the bulk of volumes.

Chart 32: Domestic Automotive Forging Market Size



Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

5.3.2.3 Key growth drivers for Automotive Forging Industry

Rising Vehicle Production: India’s forging demand is closely tied to automobile production, as forgings are critical in engines, transmissions and drivetrains. The rebound in passenger vehicle and commercial vehicle sales, coupled with steady tractor demand, is pushing higher volumes of forged components like crankshafts, axles and gears. This recovery is being supported by improved consumer sentiment, infrastructure expansion and replacement cycles, creating a strong domestic growth base.

Export Competitiveness: India has established itself as a global hub for cost-competitive and high-quality forgings, with exports supplying leading OEMs in Europe, North America and Asia. Favorable manufacturing costs, engineering expertise and the ability to deliver precision components at scale are strengthening India’s global share. Additionally, global supply chain diversification away from China is creating fresh opportunities for Indian forging manufacturers.

Policy and Government Support: Government initiatives such as the PLI Scheme for Auto & Auto Components, incentives for EV/hybrid manufacturing and production-linked support for critical auto parts are driving fresh investments in capacity and technology. Policies encouraging local sourcing and indigenization also provide a boost to domestic forging players. These measures not only expand domestic supply but also enhance competitiveness for global exports.

Technology and Process Advancements: Indian forging companies are increasingly investing in CNC machining, automated presses, advanced dies and precision heat treatment. These technological upgrades improve consistency, reduce wastage and enhance product performance helping Indian suppliers meet the stringent quality standards demanded by global OEMs. Integration of CAD/CAM design and digital simulations is also shortening development cycles for new components.

Lightweighting and Emission Compliance: With growing emphasis on fuel efficiency and stricter emission norms, automakers are demanding lightweight yet durable components. Forging plays a crucial role here, as it enables the use of advanced steels and alloys to achieve strength with reduced weight. This structural shift ensures long-term demand for precision forgings, both in ICE vehicles and in hybrid/EV applications.

5.3.2.4 Key challenges in the Automotive Forging Industry

High Capital Intensity: Forging is a capital-heavy industry, requiring significant investment in forging presses, CNC machines, dies and heat-treatment facilities. The high upfront costs make it difficult for smaller players to enter or scale, while existing companies face pressure to continuously modernize equipment to stay competitive.

Raw Material Price Volatility: Steel and alloy prices account for a major share of forging costs. Frequent fluctuations in global steel prices directly impact margins, as passing on the increased costs to OEMs is often difficult due to long-term contracts and competitive pricing pressures.

Dependence on OEM Relationships: The industry is highly dependent on long-term contracts with automobile OEMs and Tier-1 suppliers. Forging suppliers face high entry barriers as OEMs prefer established partners with proven quality and delivery records. Losing a key customer can significantly impact business, limiting flexibility for suppliers.

Quality and Certification Demands: Global OEMs enforce strict quality certifications and audits (such as ISO/TS standards). Any deviation in quality, delivery delays, or failure in audit compliance can result in loss of orders. Achieving and maintaining these standards requires continuous investments in testing, precision machining and process controls.

Risk from EV Transition: While forging demand in ICE vehicles is stable, the gradual transition toward electric vehicles poses a medium-to-long-term risk. EVs require fewer engine-related forged components like crankshafts and connecting rods, potentially reducing demand. Forging players must adapt by diversifying into chassis, drivetrain and EV-specific components to offset this risk.

6 Machining Industry

6.1 Overall Global Machining Industry

6.1.1 Industry Overview

The machining segment forms a vital backbone of India's auto components industry, acting as the bridge between raw cast/forged components and finished, ready-to-assemble parts. It supports critical functions such as dimensional accuracy, surface finish and material integrity—parameters essential for OEM compliance and global export standards. With auto OEMs increasingly outsourcing precision requirements to specialised vendors, machining has evolved from a support activity to a high-value manufacturing segment.

Machining demand has historically been driven by ICE platforms (engines, gearboxes, axles), but structural shifts toward electric vehicles and lightweighting are reshaping component architecture. This has led to rising demand for high-speed machining of aluminium and alloy-based casings, motor housing and powertrain subassemblies. As a result, capital investments in 5-axis CNC, robotics, tool monitoring systems and CMM-based quality control are rising, especially among export-focused players.

6.1.2 Complexities Involved

Machining in auto components manufacturing is high in complexity due to:

Tight Tolerances & Repeatability: Automotive parts require micron-level precision (e.g., engine blocks, transmission cases). Variability leads to rejection and high rework costs.

Tool Wear & Process Optimization: Cutting tools degrade over time; tool life prediction, cooling management and vibration damping are critical to ensure quality.

Material Variability: Machining cast iron vs. forged steel or aluminium requires completely different tooling strategies and speeds, increasing shop floor complexity.

Automation & Digitization: Integration of Industry 4.0 elements like real-time tool monitoring, MES (Manufacturing Execution Systems) and automated loading/unloading requires capital investment and skilled manpower.

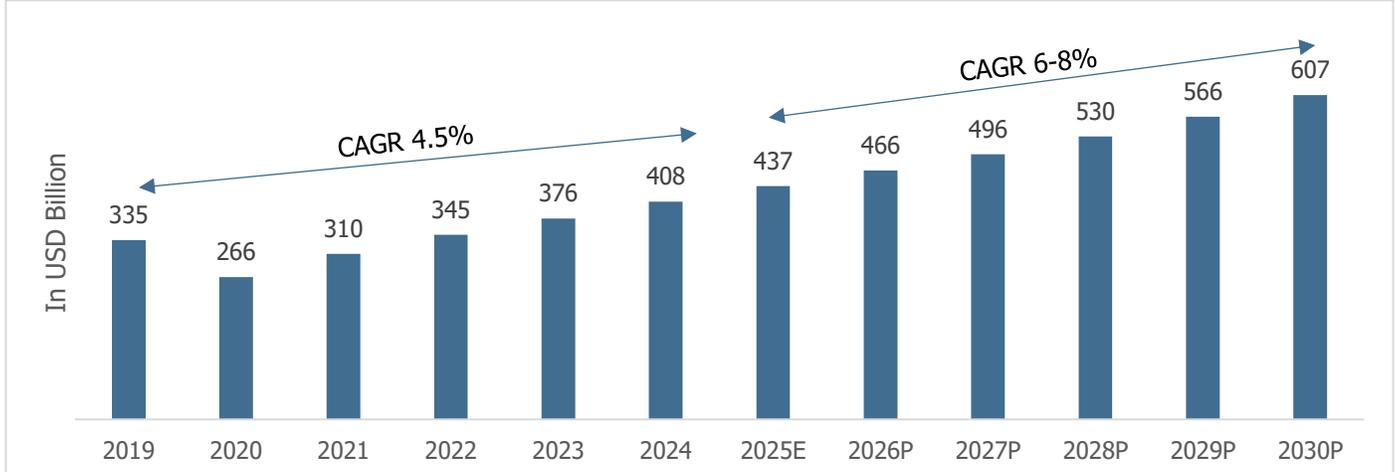
Volume-Driven Cost Pressures: Machining is capital intensive and high-volume production is needed to achieve breakeven. Any demand fluctuation significantly impacts unit economics.

Energy & Coolant Management: Machining generates heat and requires coolant recirculation systems, which add environmental and cost complexities.

6.1.3 Global Machining Industry Market Size

The global machining market was valued at approximately USD 335 billion in 2019, with a dip to USD 266 billion in 2020 due to the pandemic-led disruptions across the manufacturing sector. Since then, the market has shown a gradual recovery, reaching USD 437 billion by 2025, registering a modest CAGR of 4.5% between 2019 and 2025. However, the industry is expected to witness an accelerated growth trajectory going forward, projected to expand at a CAGR of 6–8% between 2025 and 2030. This anticipated uptick is supported by strong momentum in the automotive, aerospace, industrial machinery and energy sectors, coupled with increasing adoption of high-precision and automated machining technologies across developed and emerging economies.

Chart 33: Global Machining Industry Market Size



Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected; Years refer to Calendar Year (CY)

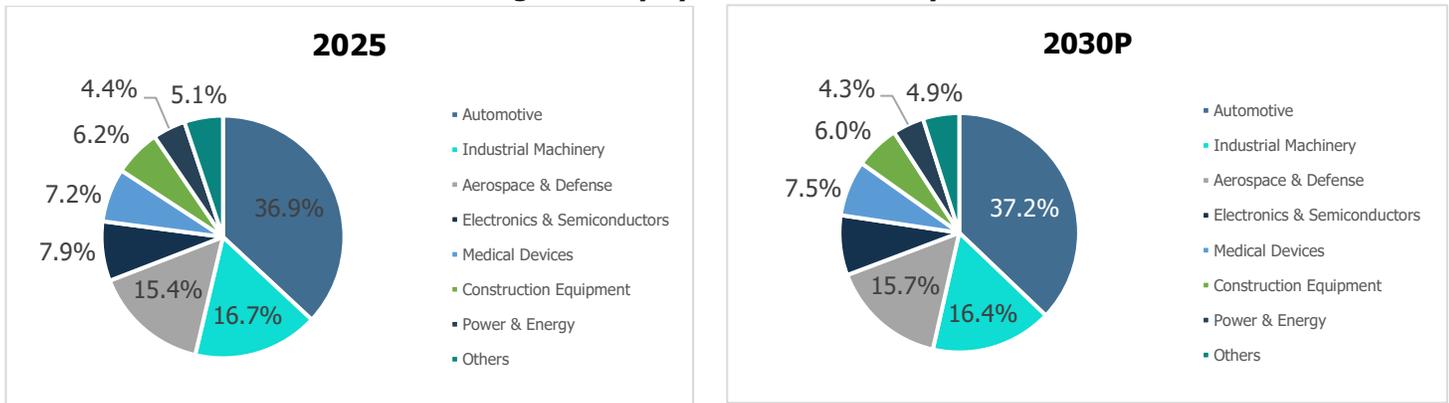
6.1.4 Global Market Size by End-User Industry

The global machining industry remains heavily tilted towards the automotive sector, which is projected to grow from 36.9% in 2025 to 37.2% by 2030. This increase highlights the automotive segment's faster pace of growth compared to other sectors, driven by a consistent demand for machined components in both ICE and electric vehicle platforms. The surge in high-precision parts for EV drivetrains and lightweight assemblies further accelerates this growth, highlighting the sector's dynamic contribution to the overall market.

In comparison, the industrial machinery segment, which represents 16.7% of the market in 2025, is expected to experience a slight decline to 16.4% by 2030. Despite its slower growth relative to the automotive sector, it continues to benefit from manufacturing automation and capital equipment investments in emerging markets.

Other segments, such as medical devices, energy equipment and construction machinery, show marginal changes in their market share but continue to contribute to a diverse demand base. Collectively, these trends emphasize the automotive sector's role as the primary growth engine, outpacing other segments and cementing its leadership in the machining industry.

Chart 34: Global Automotive Machining Industry by End-user Industry



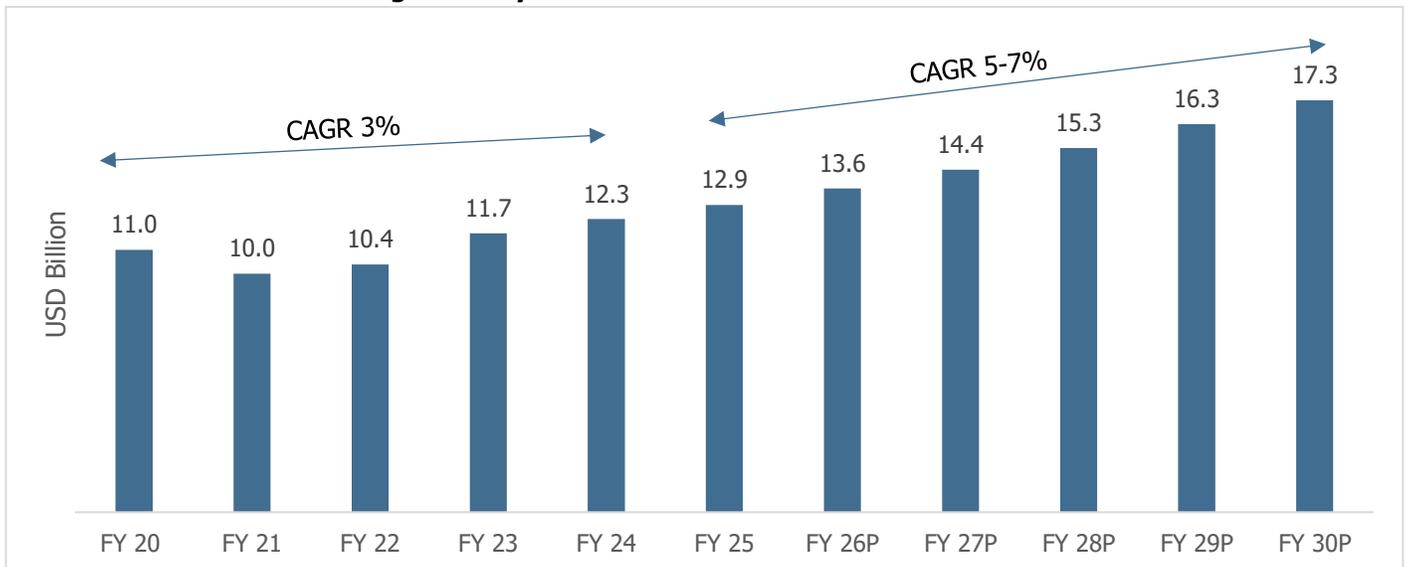
Source: Imarc Group, CareEdge Research; P: Projected

6.2 Overall Indian Machining Industry

6.2.1 Industry Overview & Domestic Market Size

India’s domestic machining industry has shown modest recovery since the pandemic-induced slowdown, with market size growing from USD 11.0 billion in FY20 to USD 12.9 billion in FY25, clocking a CAGR of around 3.2%. The industry is poised for stronger growth over the next five years, projected to reach USD 17.3 billion by FY30, at an expected CAGR of 5–7%. This momentum is largely driven by the rising localisation of component manufacturing, government-led Make-in-India initiatives, increased private sector CAPEX in engineering goods and the broader adoption of digital machining solutions. Moreover, the push toward smart manufacturing and automation is likely to elevate demand for precision and CNC machining capabilities across sectors like capital goods, aerospace and defence.

Chart 35: Domestic Machining Industry Market Size

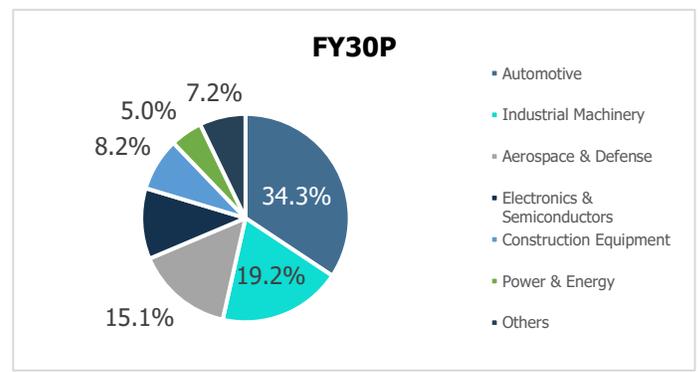
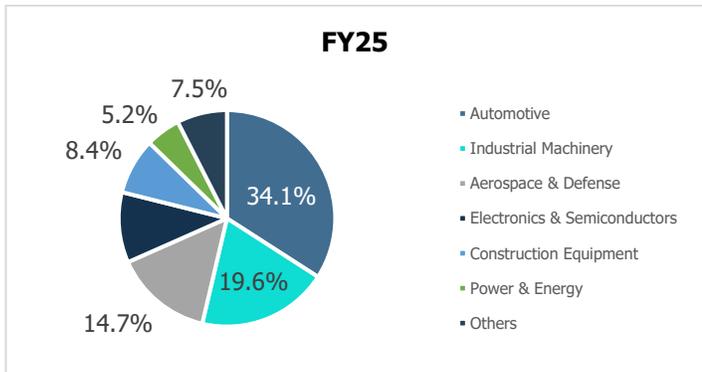


Source: Imarc Group, CareEdge Research; P: Projected

6.2.1.1 Domestic Market Size by End-User Industry

The domestic machining industry continues to be led by the automotive sector, which is projected to increase its share from 34.1% in FY25 to 34.3% by FY30. This marginal growth highlights the sector’s faster expansion compared to other segments, driven by localisation efforts and the growing demand for precision components in electric vehicles. The automotive sector’s ability to outpace others underscores its critical role in shaping the machining industry’s future trajectory.

Chart 36: Domestic Machining Industry by End-user Industry

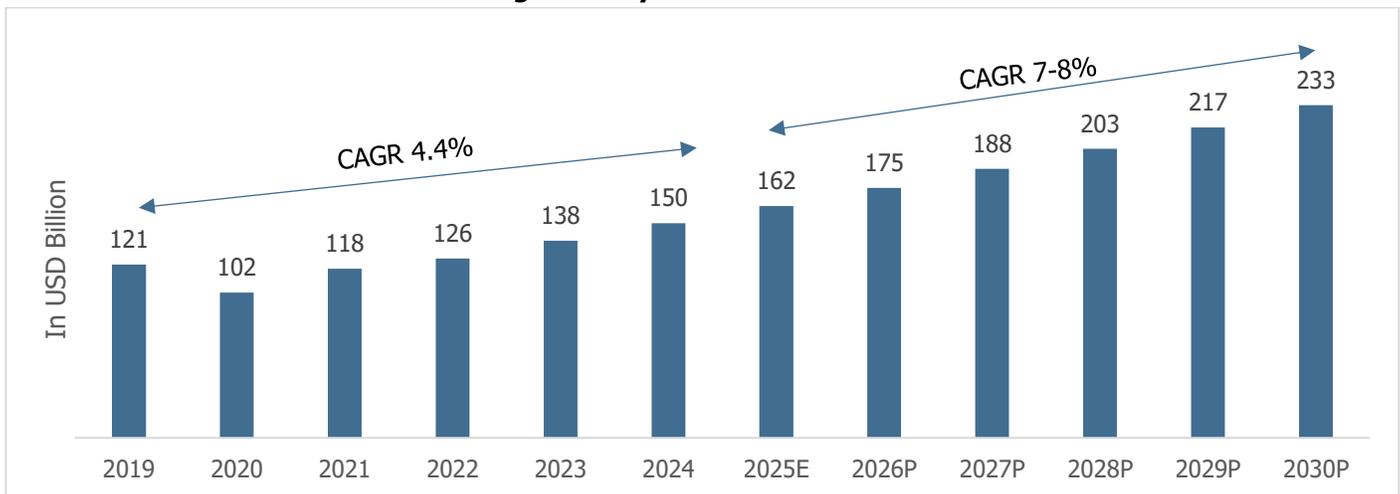


Source: Imarc Group, CareEdge Research; E: Estimated; P: Projected

6.3 Automotive Machining Industry

6.3.1 Global Automotive Machining Market

Chart 37: Global Automotive Machining Industry Market Size



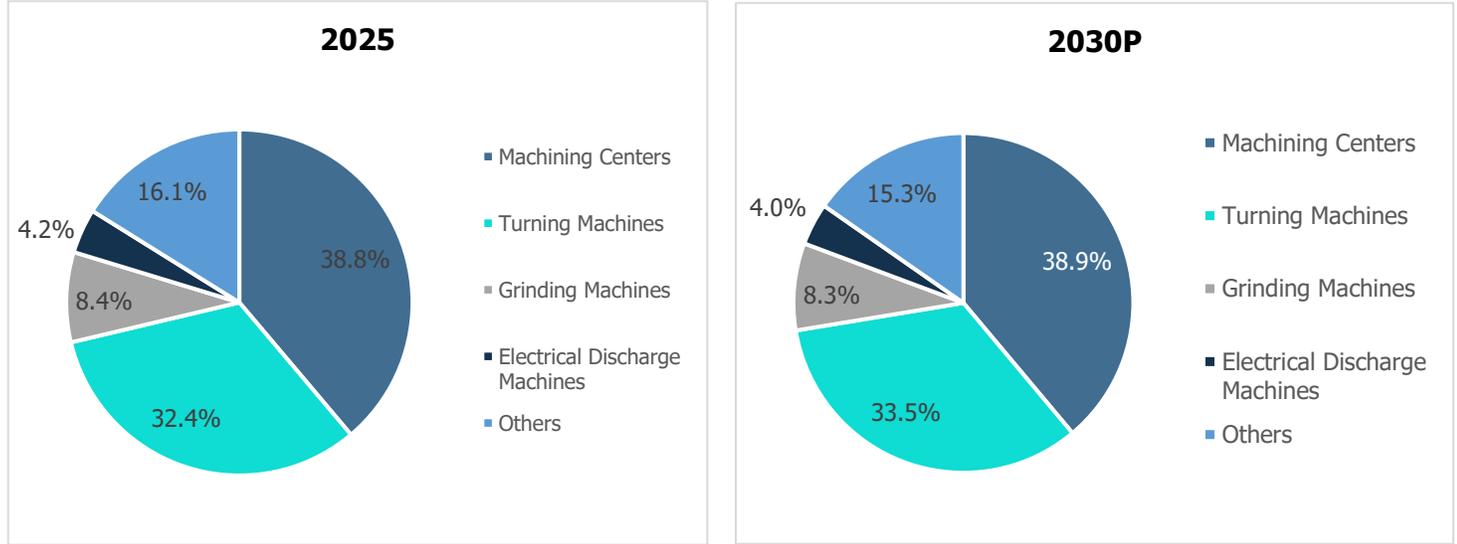
Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected; Years refer to Calendar Year (CY)

6.3.1.1 Global Market Size by Type

The global automotive machining market is primarily driven by machining centres, holding a dominant share of 38.8% in 2025, with a slight uptick to 38.9% by 2030. This reflects sustained demand for high-precision, multi-functional systems used in complex automotive parts like engine blocks and EV components.

Turning machines follow closely, growing from 32.2% to 33.5%, supported by rising production of cylindrical components such as shafts and axles.

Chart 38: Global Automotive Machining Industry by Type

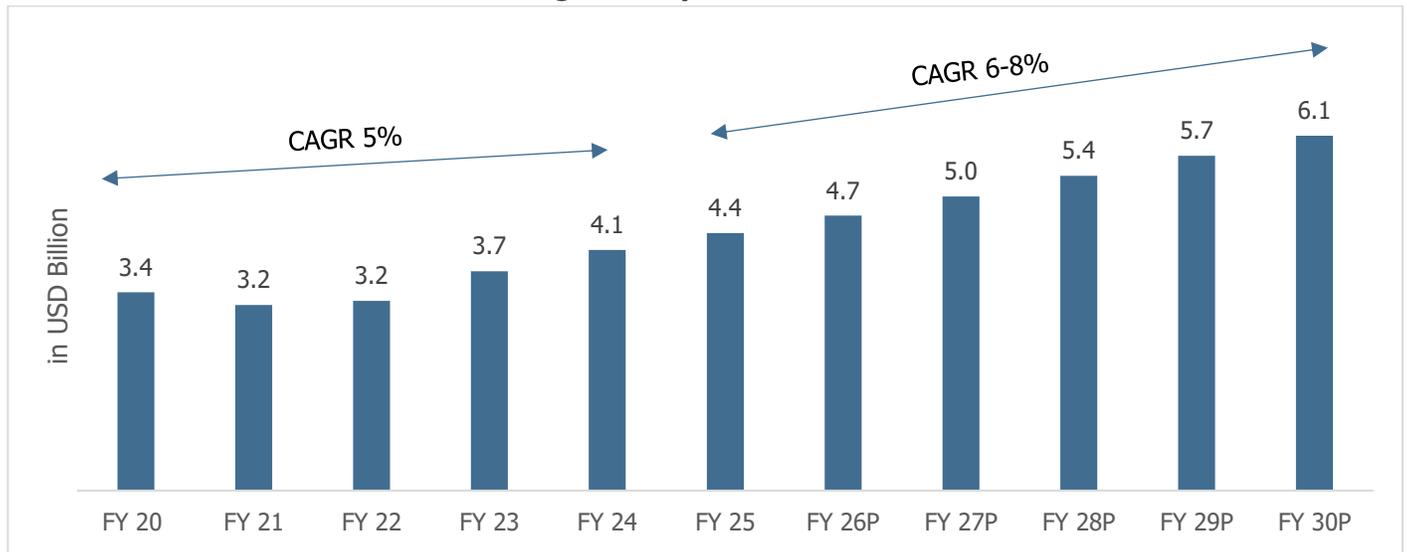


Source: Imarc Group, CareEdge Research; P: Projected

6.3.2 Domestic Market

The automotive machining segment in India, a major sub-segment of the broader machining space, has grown from USD 3.4 billion in FY20 to USD 4.4 billion in FY25, at a CAGR of approximately 5.29%. With growing vehicle production, increased localisation of powertrain and drivetrain components and strong growth in EV and hybrid platforms, the market is expected to expand at a faster clip projected to reach USD 6.1 billion by FY30, at a CAGR of 6–8%. Demand is further supported by rising exports of precision-machined components and increased OEM outsourcing to tier-1 suppliers. Investments in high-efficiency machining centres, process automation and tighter tolerances are expected to remain key differentiators for growth in this space.

Chart 39: Domestic Automotive Machining Industry Market Size



Source: Imarc Group, CareEdge Research; P: Projected

6.3.2.1 Domestic Market Size for Automotive Machining Industry by Type

The domestic automotive machining industry is poised for steady evolution over FY25 to FY30P, with only marginal shifts in the type-wise composition.

Machining Centers, which hold the largest share in both FY25 (41.5%) and FY30P (41.8%), will continue to remain the cornerstone of automotive machining operations. Their dominance underscores the continued preference for multi-axis, high-precision capabilities essential for producing complex automotive components such as engine blocks, cylinder heads and transmission housings. The marginal uptick by FY30P signals a sustained push towards automation and integrated processing, especially as OEMs strive for greater efficiency and part consolidation.

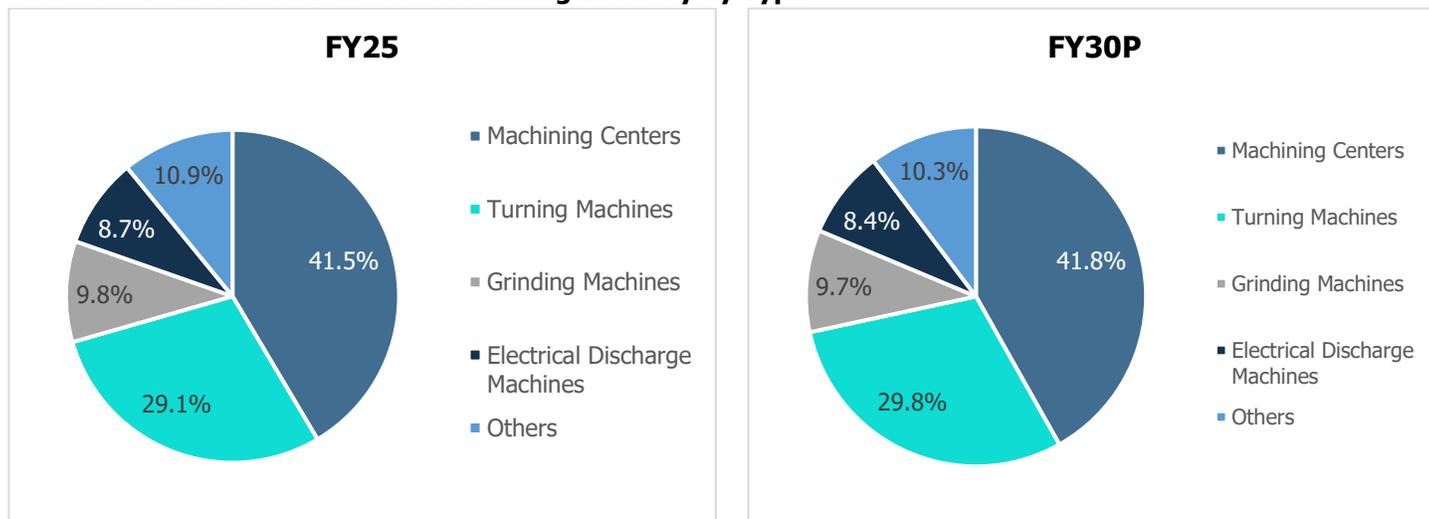
Turning Machines are expected to increase in share from 29.1% in FY25 to 29.8% in FY30P. This can be attributed to the rising demand for precision-turned components in electric and hybrid vehicle architectures, including shafts, axles and connectors. As drivetrain complexity evolves with EV penetration, so does the demand for high-speed, automated turning solutions.

Grinding Machines, although a smaller segment (9.8% in FY25 to 9.7% in FY30P), play a crucial role in achieving high surface finish and tight tolerances. This relatively stable market share might indicate that grinding is a specialised yet crucial finishing process, with limited potential for significant growth due to the rising use of advanced cutting tools and machining centres that minimise the need for post-processing.

Electrical Discharge Machines (EDMs) slightly declined from 8.7% to 8.4%. This reflects a subtle shift away from die-sinking operations in favour of subtractive methods with faster cycle times, or possibly the growing use of additive manufacturing for complex dies and moulds, reducing EDM dependence on certain applications.

Others, comprising 10.9% in FY25 and slightly decreasing to 10.3% by FY30P, indicate a mild rationalization of niche and less frequently used machining categories. This contraction may also suggest consolidation of processes as manufacturers shift towards integrated solutions and reduce reliance on fragmented setups.

Chart 40: Domestic Automotive Machining Industry by Type

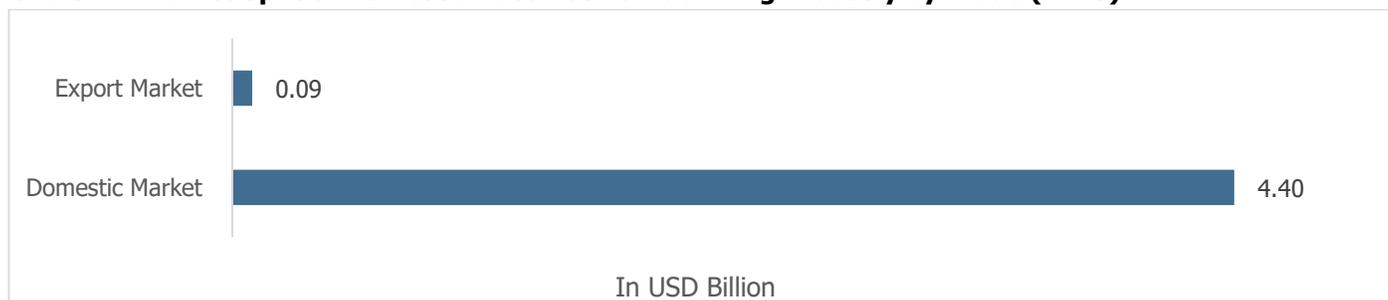


Source: Imarc Group, CareEdge Research; E: Estimated; P: Projected

6.3.2.2 Market Split of Domestic Automotive Machining Industry by Trade

The domestic automotive machining industry is expected to reach USD 4.4 billion by FY25, highlighting strong local demand driven by sustained vehicle production and localisation efforts. In contrast, exports remain minimal at USD 0.09 billion, indicating that the sector is largely inward-focused, catering primarily to domestic OEMs and tier-1 suppliers. The low export base also reflects limited global integration, though it offers potential for growth as Indian manufacturers improve capabilities and competitiveness.

Chart 41: Market Split of Domestic Automotive Machining Industry by Trade (FY25)



Source: Imarc Group, CareEdge Research; E: Estimated

6.3.2.3 Key Growth Drivers for Automotive Machining Industry

| Growth Driver | Description |
|---|---|
| Automotive Sector Expansion | Rising production and exports of vehicles—especially two-wheelers, passenger vehicles and EVs—are directly increasing demand for machined components like engine blocks, crankshafts and brake systems. |
| Shift Toward Precision and Quality | OEMs are demanding high-precision, high-tolerance components, leading to greater investments in CNC machines, automation and metrology systems, expanding market value. |
| Electrification of Mobility | EVs, while simpler than ICE vehicles, still require high-precision machining for components such as battery housings, drivetrain parts and motor shafts. |
| Government Policies & PLI Schemes | Schemes like the Production Linked Incentive (PLI) for auto components and “Make in India” initiatives are supporting capacity expansion and technological upgradation. |
| Export Growth & Global Integration | India’s emergence as an export hub for auto components, particularly to Europe and the U.S., is driving Tier-1 and Tier-2 suppliers to meet global quality standards. |
| Aftermarket and Replacement Demand | As the number of vehicles on the road grows, so does the need for replacement parts—fuelling consistent demand for machined components such as pistons, gears and shafts. |
| Integration of Industry 4.0 | Adoption of IoT-enabled CNC machines, predictive maintenance and Manufacturing Execution Systems (MES) is boosting productivity and attracting investments from organised players. |

7 Overall Crankshaft Market

7.1 Overall Global Crankshaft Industry

7.1.1 Industry Overview

The crankshaft market is a critical segment within the automotive and industrial machinery industries, driven by its essential role in internal combustion engines and mechanical systems. The market is experiencing steady growth due to the rising production of passenger and commercial vehicles, coupled with increasing demand for fuel-efficient engines. Electric vehicle (EV) adoption has introduced both challenges and opportunities, as traditional crankshaft designs are being replaced or adapted for hybrid and alternative propulsion systems.

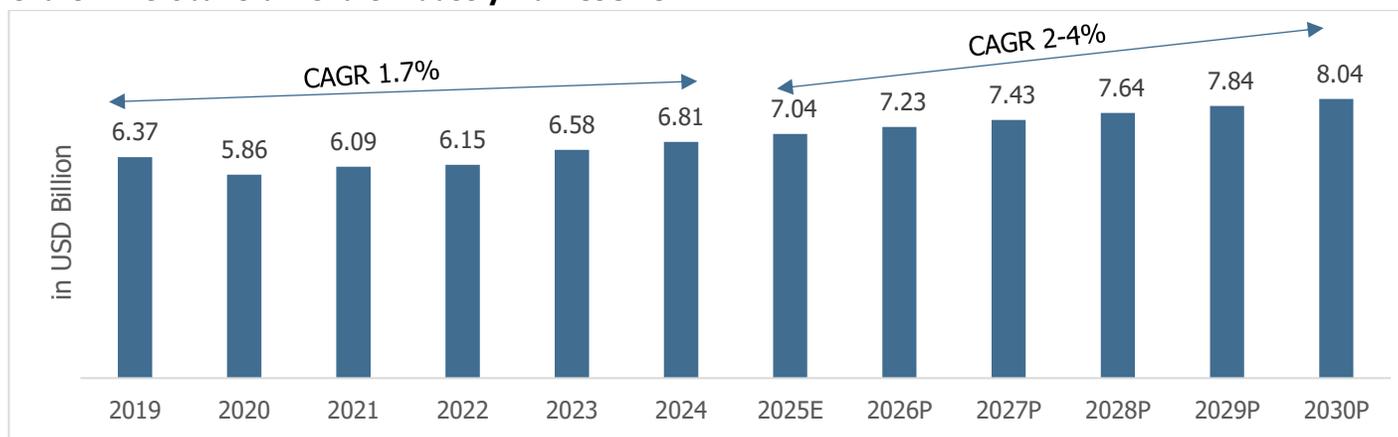
The industrial sector also contributes to demand through applications in heavy machinery, marine engines, and power generation equipment. Technological advancements in materials, such as forged steel and composite alternatives, are enhancing durability and performance, further driving market innovation. Emerging trends include a focus on lightweight crankshafts to improve efficiency and compliance with stricter emission norms globally.

While Asia-Pacific dominates due to its robust automotive manufacturing base, regions like North America and Europe are adopting advanced crankshaft technologies, reflecting broader industry shifts towards sustainability and efficiency.

7.1.2 Global Market Size

The global crankshaft industry has exhibited modest growth over the past few years, with market size increasing from USD 6.37 billion in 2019 to USD 6.81 billion in 2024, reflecting a compound annual growth rate (CAGR) of 1.7%. However, the market is poised for a stronger growth trajectory going forward, with projections indicating a CAGR of 2–4% from 2025 to 2030. By 2030, the industry is expected to reach USD 8.04 billion, driven by demand recovery in key sectors and continued investment in internal combustion engine (ICE)-based platforms, particularly in developing markets.

Chart 42: Global Crankshaft Industry Market Size



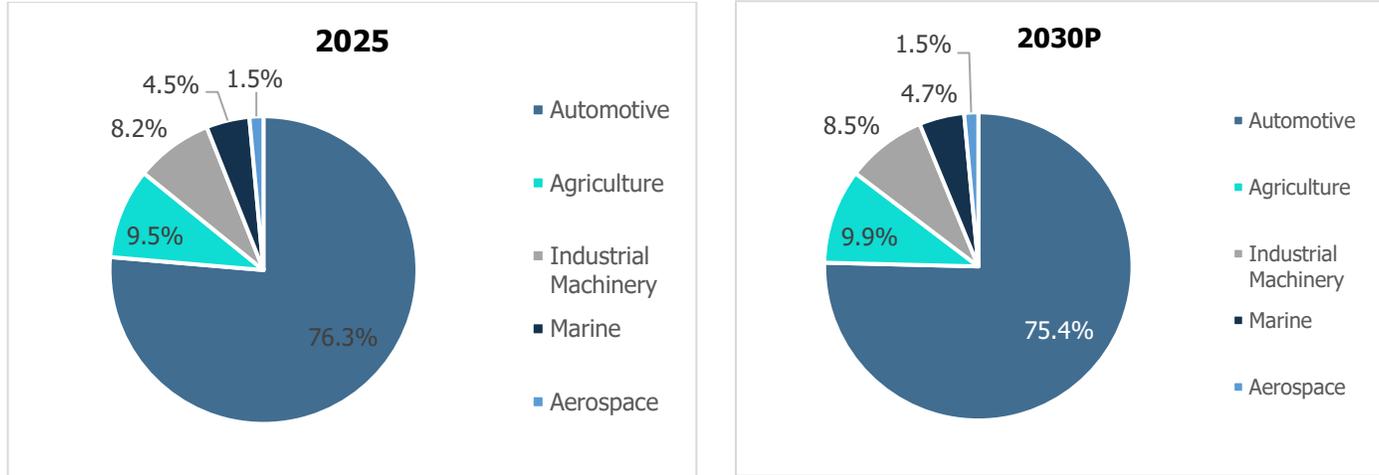
Source: Imarc Group, CareEdge Research; E: Estimated; P: Projected; Years refer to Calendar Year (CY)

7.1.3 Global Market Size by End-User Industry

The automotive sector continues to dominate as the primary end-user, accounting for 76.3% of total demand in 2025. Although its share is projected to decline slightly to 75.4% by 2030, the sector remains the cornerstone of market

volumes, driven by sustained global demand for passenger and commercial vehicles. This slight decrease reflects the relatively slower pace of growth compared to emerging segments but does not undermine its critical role in the overall market.

Chart 43: Global Crankshaft Industry Market Size by End-User Industry



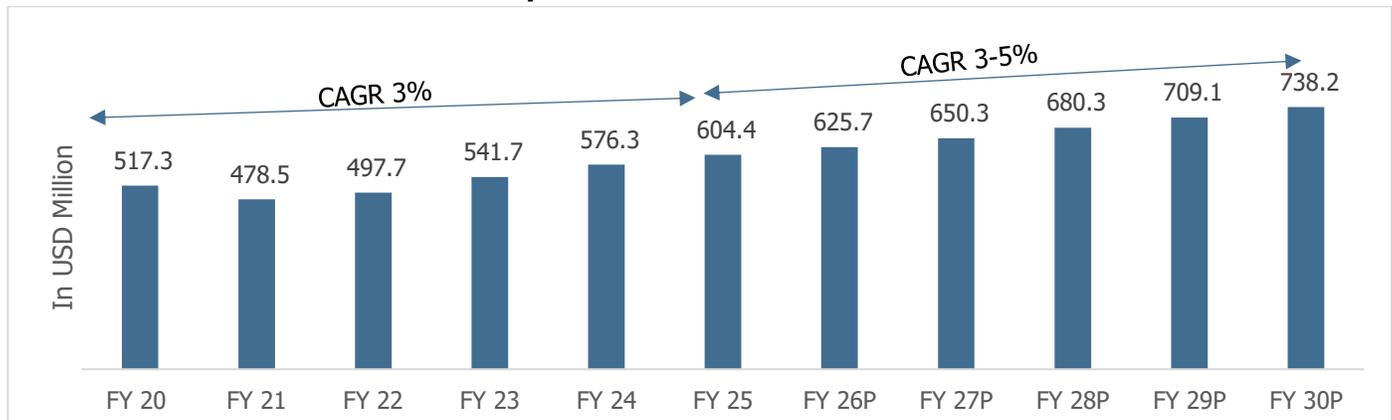
Source: Imarc Group, CareEdge Research; P: Projected

7.2 Overall Indian Crankshaft Industry

7.2.1 Industry Overview & Domestic Market Size

The domestic crankshaft industry in India has demonstrated a steady recovery and is poised for a stronger growth phase. After a subdued period marked by a contraction in FY21, the market rebounded from USD 478.5 million to USD 625.7 million by FY25, reflecting a moderate CAGR of 3.88%. Looking ahead, the market is expected to accelerate further, growing at an estimated CAGR of 3–5% between FY25 and FY30P, reaching a projected size of USD 738.2 million by FY30. This expansion is being driven by renewed demand in the automotive sector, rising farm mechanization and industrial output recovery.

Chart 44: Domestic Crankshaft Industry Market Size



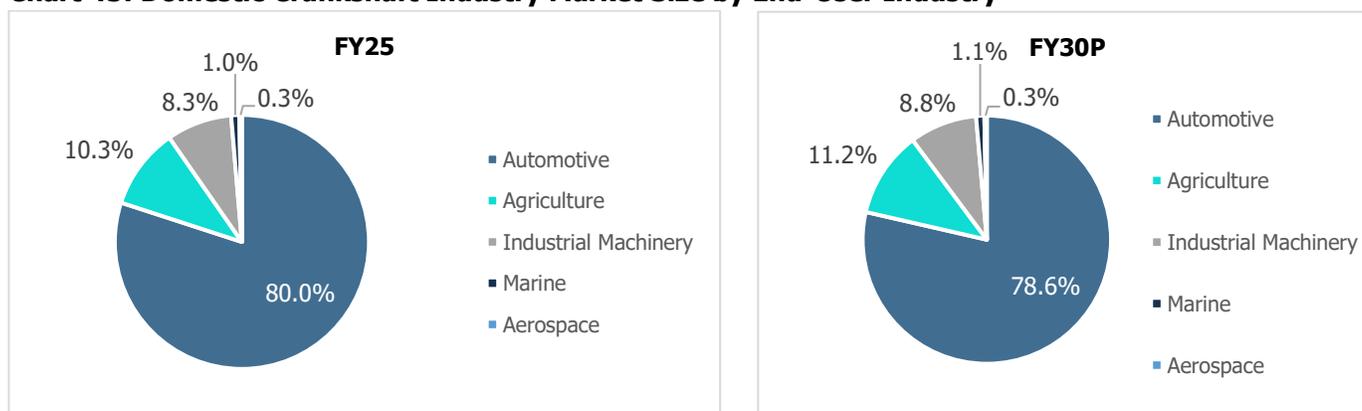
Source: Imarc Group, CareEdge Research; P: Projected

7.2.2 Domestic Market Size by End-User Industry

The automotive sector continues to dominate the domestic crankshaft market, accounting for 80% of the demand in FY25. Although its share is projected to decrease slightly to 78.6% by FY30P, it remains the primary growth driver, fueled by rising vehicle production and robust domestic consumption trends. This indicates the automotive segment's enduring role in anchoring market demand, even as other sectors exhibit incremental growth.

The agriculture sector is expected to see an increase in its share from 10.3% to 11.2% during the same period, driven by the growing adoption of tractors and advanced farm equipment in response to mechanization trends. Similarly, the industrial machinery segment is projected to grow modestly, from 8.3% to 8.8%, supported by infrastructure expansion and increased capital goods manufacturing.

Chart 45: Domestic Crankshaft Industry Market Size by End-User Industry



Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

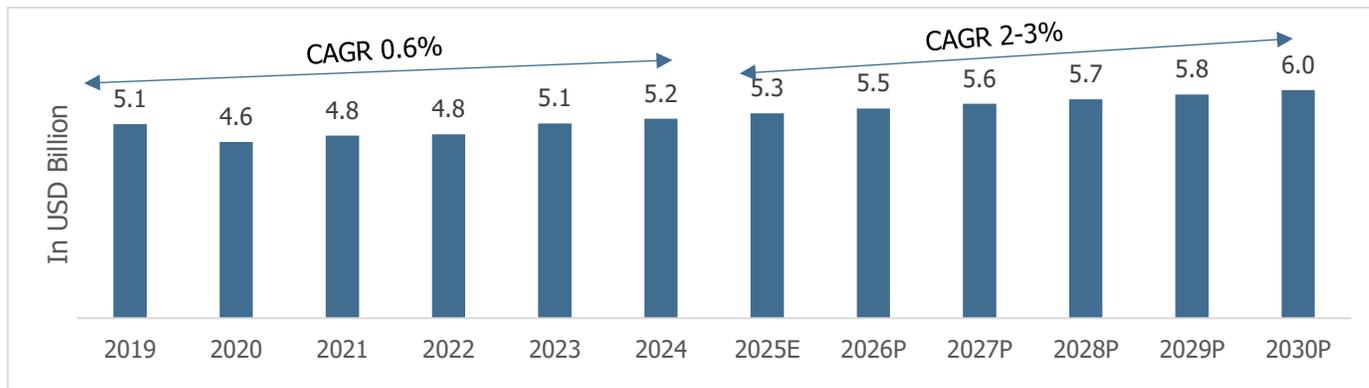
7.3 Automotive Crankshaft Market

7.3.1 Global Automotive Crankshaft Market

7.3.1.1 Industry Overview and Global Market Size

The global automotive crankshaft industry has undergone a relatively flat trajectory between 2019 and 2025, growing at a marginal CAGR of 0.6% and reaching USD 5.3 billion in 2025. However, the outlook turns more optimistic from 2025 onward, with the market projected to expand at a CAGR of 2–3%, reaching USD 6.0 billion by 2030. This anticipated growth is supported by stable global automotive production, particularly in developing markets, as well as an increasing demand for fuel-efficient internal combustion engines (ICEs) in hybrid vehicles amid the gradual EV transition.

Chart 46: Global Automotive Crankshaft Industry Market Size

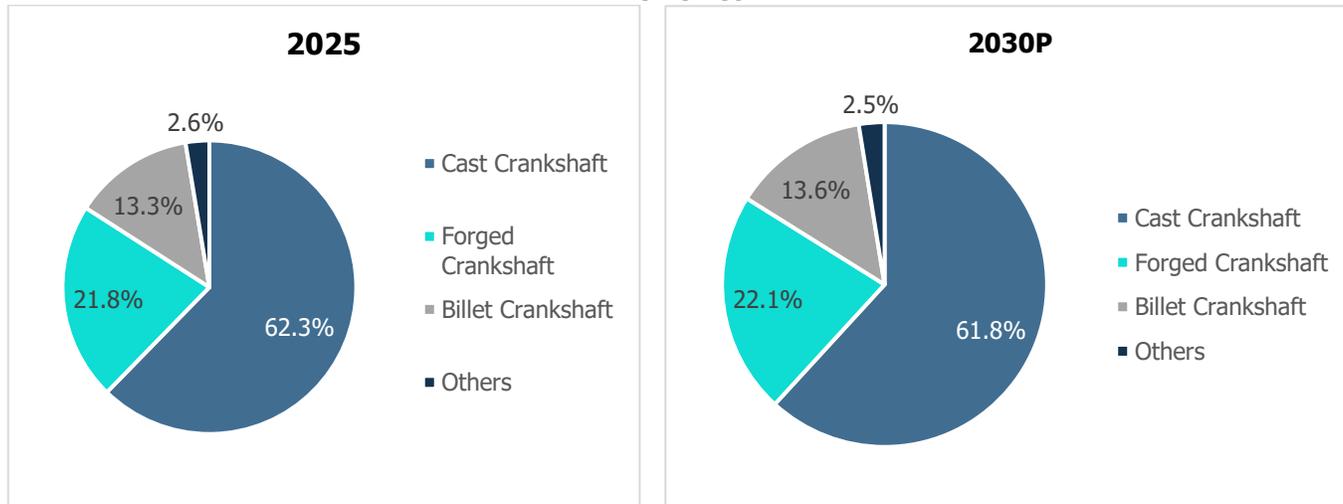


Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected; Years refer to Calendar Year (CY)

7.3.1.2 Global Market Size by Type

From a product-type segmentation, cast crankshafts continue to dominate, accounting for 62.3% of the global automotive crankshaft market in 2025. While this share is expected to decline marginally to 61.8% by 2030, it will remain the mainstay due to cost-effectiveness and high-volume applications in passenger vehicles. Forged crankshafts, known for their superior strength and performance, are expected to see modest growth in share from 21.7% in 2024 to 22.1% in 2030, driven by rising demand in commercial vehicles and performance-focused applications. Billet crankshafts, although niche, are projected to maintain a steady share (~13.2% to 13.6%), primarily serving the aftermarket and high-performance automotive segment. The "Others" category remains minimal in its contribution (~2.5%).

Chart 47: Global Automotive Crankshaft Industry by Type



Source: Imarc Group, CareEdge Research; P: Projected

7.3.1.3 Key Drivers for Global Automotive Crankshaft Market

1. Rising Vehicle Production and Fleet Expansion: Global demand for passenger cars and commercial vehicles continues to rise, particularly in emerging markets such as India, China and Southeast Asia. The expansion of logistics and infrastructure sectors is also driving higher commercial vehicle production, directly boosting crankshaft requirements.

2. Stringent Emission Norms and Fuel Efficiency Targets: Regulatory frameworks worldwide are compelling automakers to improve engine performance and efficiency. This has led to demand for high-strength, precision-engineered crankshafts that support better combustion efficiency, reduced friction losses and compliance with emission standards.

3. Adoption of Advanced Materials and Manufacturing Technologies: Automakers are increasingly turning to forged steel, micro-alloyed materials and advanced surface treatment technologies to produce lighter yet more durable crankshafts. Precision machining and automation in forging processes are further improving product reliability and reducing production costs.

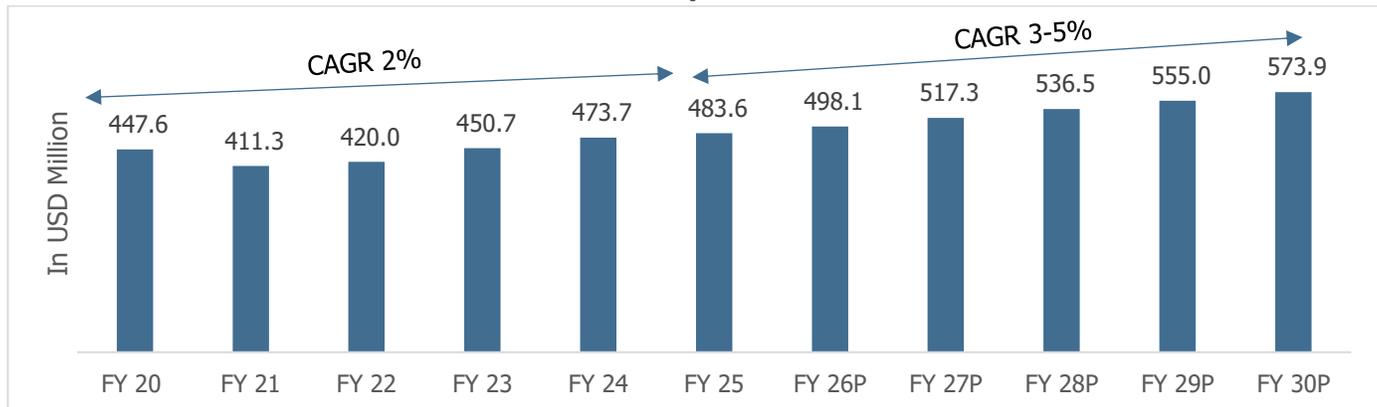
4. Sustained Aftermarket Replacement Demand: Crankshafts undergo significant stress and wear during engine life, making them a frequent replacement component in the aftermarket, especially for commercial vehicles and heavy-duty applications. This replacement cycle ensures stable, recurring demand irrespective of fluctuations in new vehicle production.

7.3.2 Domestic Market

7.3.2.1 Domestic Market Size

The domestic automotive crankshaft industry has exhibited steady growth from FY20 to FY25, driven by a modest CAGR of 1.5%. This trend reflects the sector's resilience despite global disruptions and economic uncertainties. However, the outlook, spanning FY25 to FY30, projects an accelerated CAGR of 3-5%, signalling a significant shift in market dynamics. The increase in demand can be attributed to technological advancements, expanding automotive production and the growing focus on efficiency and durability in engine components. By FY30, the market size is anticipated to reach USD 573.9 million, suggesting a healthy trajectory fuelled by both domestic and export opportunities.

Chart 48: Domestic Automotive Crankshaft Industry Market Size



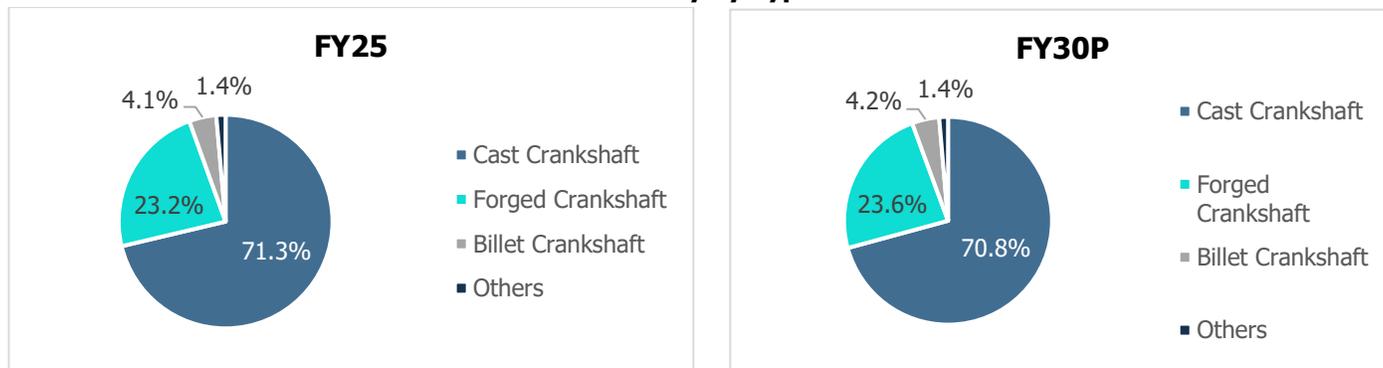
Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

7.3.2.2 Domestic Market Size by Type

The composition of the domestic crankshaft market showcases a predominant reliance on cast crankshafts, accounting for over 70% of the market in both FY25 and FY30P. This dominance underscores their cost-effectiveness and wide applicability in mass-market vehicles. Forged crankshafts maintain a stable share of approximately 23%, emphasizing their critical role in high-performance and heavy-duty applications due to superior strength and durability. Billet crankshafts and other niche categories continue to capture marginal shares, collectively comprising less than 6%, which

reflects their specialised use cases in premium vehicles or racing engines. The slight increase in the share of forged crankshafts by FY30 hints at a gradual shift towards higher performance and durability preferences in the market.

Chart 49: Domestic Automotive Crankshaft Industry by Type

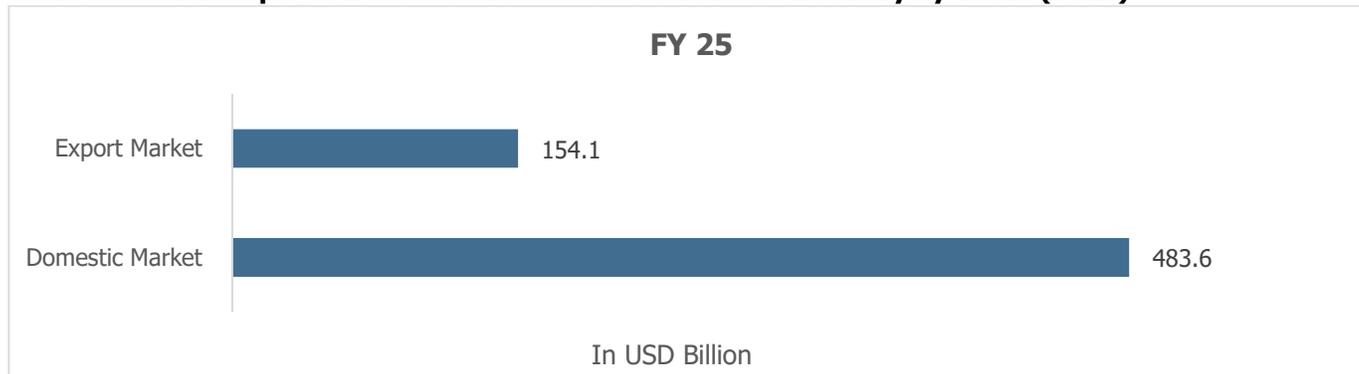


Source: Imarc Group, CareEdge Research; P: Projected

7.3.2.3 Market Split of Domestic Automotive Crankshaft Industry by Trade

In FY25, the domestic market stands out as the dominant contributor, with a staggering value of USD 483.6 billion, accounting for a significant majority of the industry. This strong domestic focus reflects the robust local automotive manufacturing ecosystem and the growing replacement demand for crankshafts. In contrast, the export market, valued at USD 154.1 billion, underscores the global competitiveness of domestic manufacturers. Even though it is on a smaller scale, the export segment highlights the increasing global appetite for high-quality, affordable crankshafts made in India. This points to a great chance for expanding internationally. The balance between strong domestic demand and growing export activity shows how adaptable the industry is and hints at its potential for long-term growth.

Chart 50: Market Split of Domestic Automotive Crankshaft Industry by Trade (FY25)



Source: Imarc Group, CareEdge Research; E: Estimated

7.3.2.4 Key Growth Drivers for Crankshaft Industry

| Growth Driver | Description |
|---|--|
| Rising Vehicle Production and Demand | The surge in global vehicle production, particularly in emerging markets, is fuelling the demand for crankshafts. As people earn more and cities grow, owning a vehicle becomes easier for many. Also, the trend towards SUVs and larger cars is increasing the need for strong and reliable crankshaft designs. |

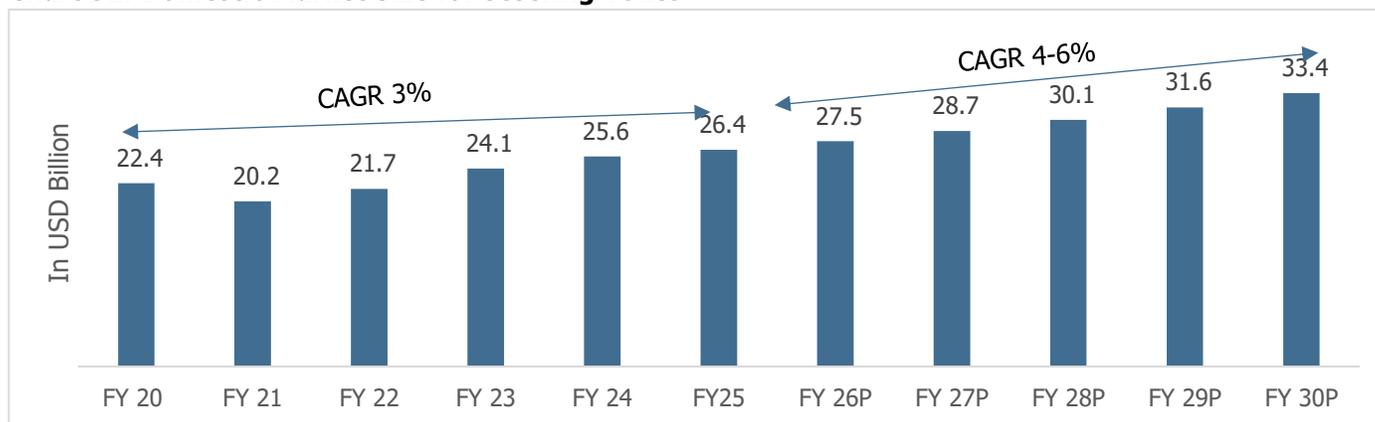
| | |
|--|---|
| <p>Advancements in Manufacturing Technology</p> | <p>Innovations in forging and casting, along with automation and precision machining, have enhanced production efficiency, reduced material waste and improved product quality. These technological advancements enable manufacturers to meet stringent performance and environmental standards, boosting their competitiveness in global markets.</p> |
| <p>Focus on Lightweight Materials and Engine Efficiency</p> | <p>The shift towards fuel efficiency and emissions control has led to the adoption of lightweight, high-strength materials and advanced design methods. These enable the production of crankshafts that support better engine performance without compromising durability, aligning with both regulatory requirements and consumer demand for greener vehicles.</p> |
| <p>Growth in Aftermarket and Replacement Demand</p> | <p>The increasing size and age of the global vehicle parc, especially in commercial and heavy-duty segments, has fuelled growing demand for replacement crankshafts. Extended vehicle lifespans and usage cycles in developing regions present a strong opportunity in the aftermarket segment.</p> |
| <p>Electric and Hybrid Vehicle Integration</p> | <p>Although EVs reduce reliance on traditional ICE components, hybrid vehicles still require crankshafts capable of handling load transitions between electric and combustion power. This need for high-precision, durable crankshafts in hybrid systems offers a transitional growth avenue as the industry moves towards full electrification.</p> |

8 Other Key Product Segments

8.1 Steering Yokes Assembly

The domestic market for steering yokes assembly has shown consistent growth, with a CAGR of 3% from FY20 to FY25, reflecting increasing demand driven by the expansion of the automotive sector. The market is projected to grow at an accelerated CAGR of 4-6% from FY25 to FY30P, reaching USD 33.4 billion by FY30P. This growth is largely attributed to advancements in steering technology, the adoption of electric power steering systems and a surge in vehicle production, particularly in the passenger car and SUV segments.

Chart 51: Domestic Market Size for Steering Yokes

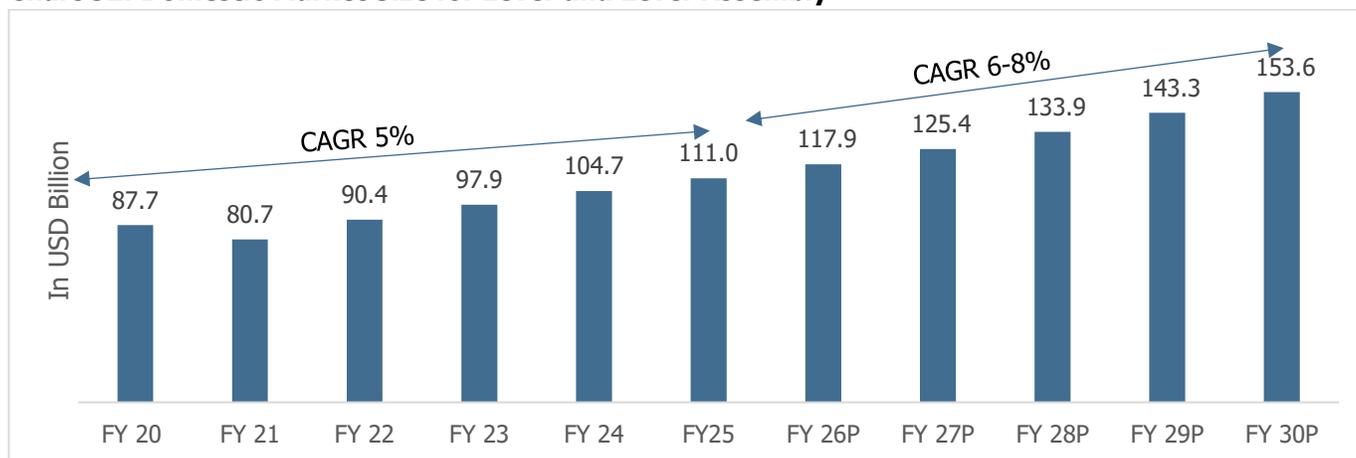


Source: Imarc Group, CareEdge Research; P: Projected

8.2 Lever and Lever Assembly (2W)

The lever and lever assemblies' segment has witnessed steady growth at a CAGR of 5% from FY20 to FY25, reaching USD 111 billion. The robust growth is driven by the increasing production of two-wheelers and commercial vehicles, where these components play a critical role. From FY25 to FY30P, the CAGR is expected to rise to 6-8%, reaching USD 153.6 billion, fuelled by innovations in manufacturing processes and the growing demand for ergonomically designed levers in modern vehicles.

Chart 52: Domestic Market Size for Lever and Lever Assembly

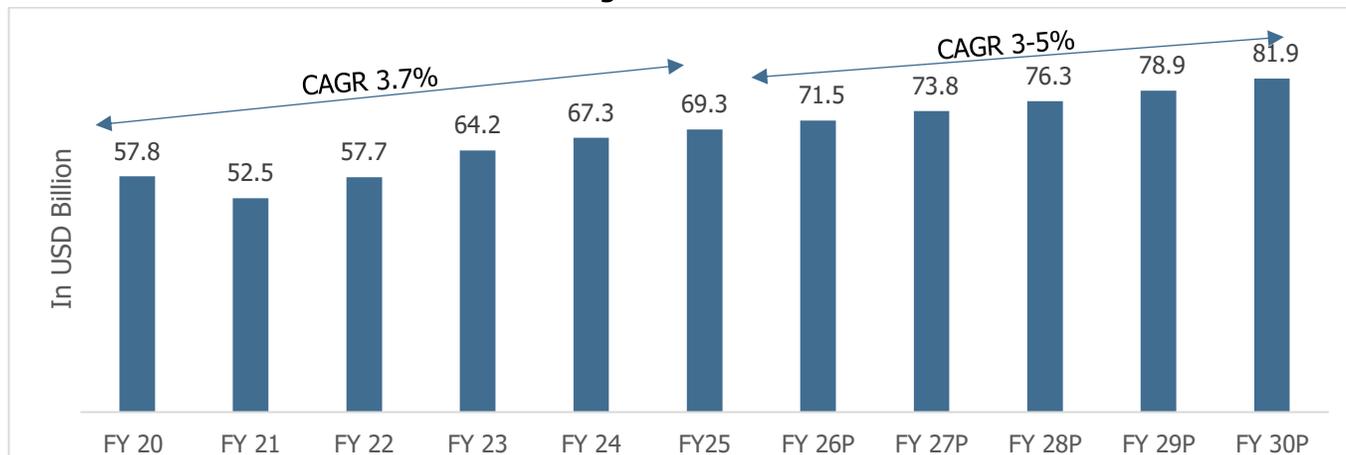


Source: Imarc Group, CareEdge Research; P: Projected

8.3 Door Hinges (4W)

The door hinges market for four-wheelers has grown at a moderate CAGR of 3.7% from FY20 to FY25, reflecting its reliance on steady automotive production. However, the market is projected to maintain a growth trajectory of 3-5% between FY25 and FY30P, reaching USD 81.9 billion. The emphasis on lightweight and corrosion-resistant materials, along with an increase in premium vehicle production featuring advanced door systems, contributes to the segment's consistent expansion.

Chart 53: Domestic Market Size for Door Hinges

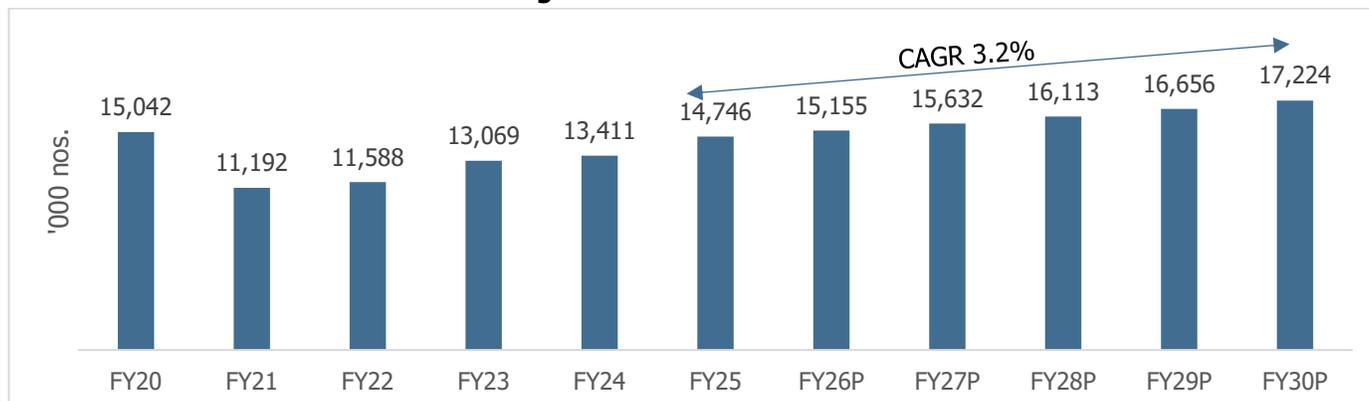


Source: Imarc Group, CareEdge Research; E: Estimated, P: Projected

8.4 Domestic Refrigerator Market

Production, which stood at 15,042 thousand units in FY20, witnessed a decline over the next two years, bottoming out at 11,192 thousand units in FY21 due to pandemic-led disruptions. A gradual recovery followed, with production reaching 13,411 thousand units in FY24 and further increasing to 14,746 thousand units in FY25. Looking ahead, projections indicate steady growth, with output expected to cross 17,200 thousand units by FY30, supported by rising household incomes, urbanization and expanding replacement demand. This trajectory reflects both a rebound from past disruptions and sustained long-term growth in consumer durables demand.

Chart 54: Domestic Production for Refrigerators

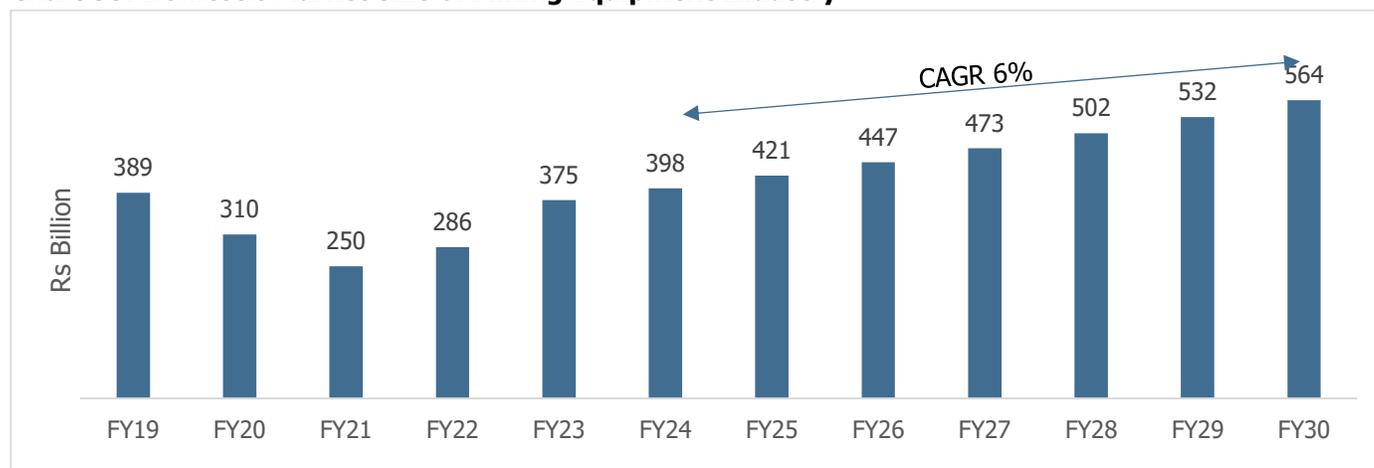


Source: CMIE, CareEdge Research

8.5 Mining Equipment Industry

India’s mining equipment market, estimated at Rs. 389 billion in FY19 and projected to reach about Rs. 564 billion by FY30 (6% CAGR), will be a key enabler of the sector’s growth. Rising demand for coal, iron ore and critical minerals to support infrastructure and the energy transition will drive the need for advanced machinery such as surface miners, high-capacity dumpers and underground equipment. Increasing mechanization and automation are expected to improve productivity, reduce costs and enhance ore recovery, while digital solutions like GPS-enabled drills and predictive maintenance systems will boost efficiency and sustainability. As a result, the expansion of mining equipment capacity will directly support India’s broader mineral and industrial growth.

Chart 55: Domestic Market Size of Mining Equipment Industry



Source: Department of Mining, CareEdge Research

8.6 Significance of Agriculture Industry in Indian Economy

Agriculture is the primary source of livelihood for about 58% of India’s population. As a result, the share of agriculture and allied sectors to the total economy’s Gross Value Added (GVA) has been significant and has increased over the years as shown in the table.

Table 13: Percentage share of GVA of Agriculture and Allied Sector in Total Economy (At Current Prices)

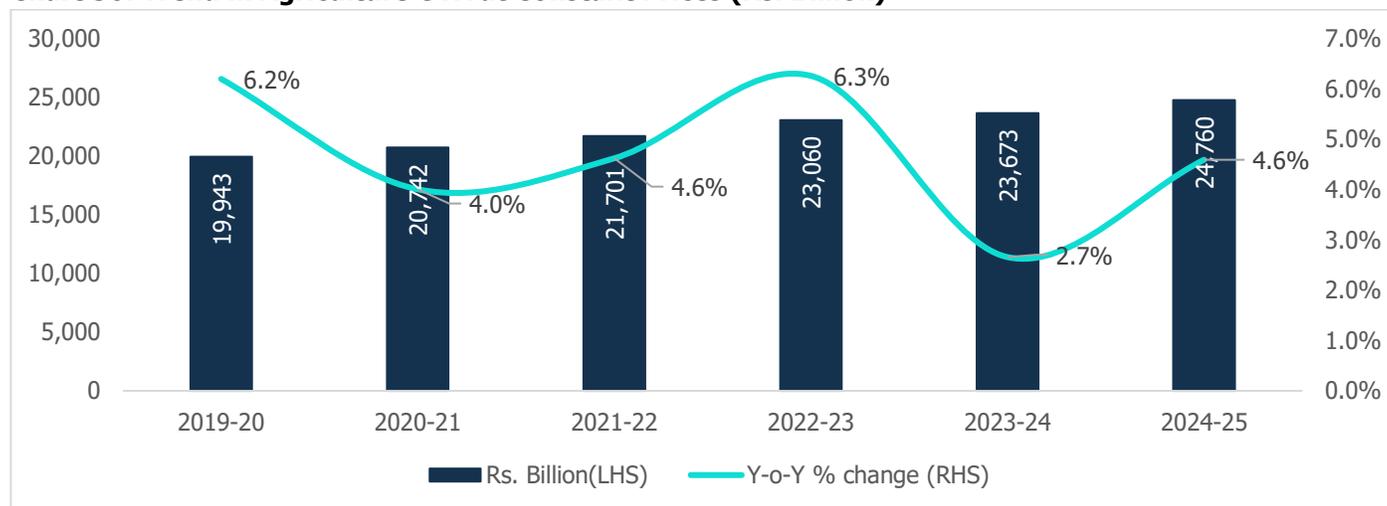
| Year | % Share |
|---------|---------|
| 2016-17 | 18.0 |
| 2017-18 | 18.3 |
| 2018-19 | 17.6 |
| 2019-20 | 18.3 |
| 2020-21 | 20.4 |
| 2021-22 | 18.9 |
| 2022-23 | 18.0 |
| 2023-24 | 17.8 |
| 2024-25 | 18.0 |

Source: PIB Release, MOSPI; SAE: Second Advance Estimates

As of 2024-25 the agriculture sector is the largest employer of the workforce and accounted for a sizeable 18.0% of the Gross Value Added (GVA) of the country. Growth in allied sectors including livestock, dairying and fisheries has also been the major drivers of overall growth in the sector.

Further, the expansion in the share of agriculture and allied sector’s GVA is backed by an upward trend in the GVA of agriculture activities. During the five-year period 2020-21 to 2024-25, the GVA for agriculture increased at a CAGR of 3.7% from Rs. 19,943 billion in 2019-20 to Rs. 24,760 billion in 2024-25.

Chart 56: Trend in Agriculture GVA at Constant Prices (Rs. Billion)



Source: RBI, MOSPI

The growth in agriculture GVA has been supported by various measures on credit, market reforms and food processing. Moreover, several measures are in place to raise productivity and improve the marketing of agricultural produce. Accordingly, the government has a large food management programme in place with significant financial implications in terms of food subsidies.

The agriculture sector is expected to be driven by rising food demand, government support through MSPs and subsidies and adoption of modern farming practices. Increased mechanization, digital agri-tech solutions and improved irrigation coverage are enhancing productivity. Growing exports of rice, spices and horticulture produce, along with focus on food processing, are further supporting sectoral expansion.

9 Competitive Landscape

9.1 Company Profile

Kay Jay Forgings Ltd (KJFL), established in 1983 in Ludhiana, is a manufacturer of precision forged and machined components for the Automotive & Non-Automotive sector. Promoted by Kothari family, KJFL has customer relationship with major auto manufacturer in India. Its products have end industry application in two-wheeler, three-wheeler, four-wheeler and agriculture industries.

Kay Jay Forgings Ltd (KJFL) is engaged in manufacturing of auto components with key products including crankshaft assemblies, connecting rods, lower bracket assemblies, lever kick starter assemblies and steering assembly yokes. It operates 4 plants in Ludhiana and 2 Manufacturing plants in Hosur, Tamil Nadu. Equipped with advanced technology, some of its manufacturing plants are approved by IATF 16949:2016, ISO 14001:2015 and ISO 45001:2018.

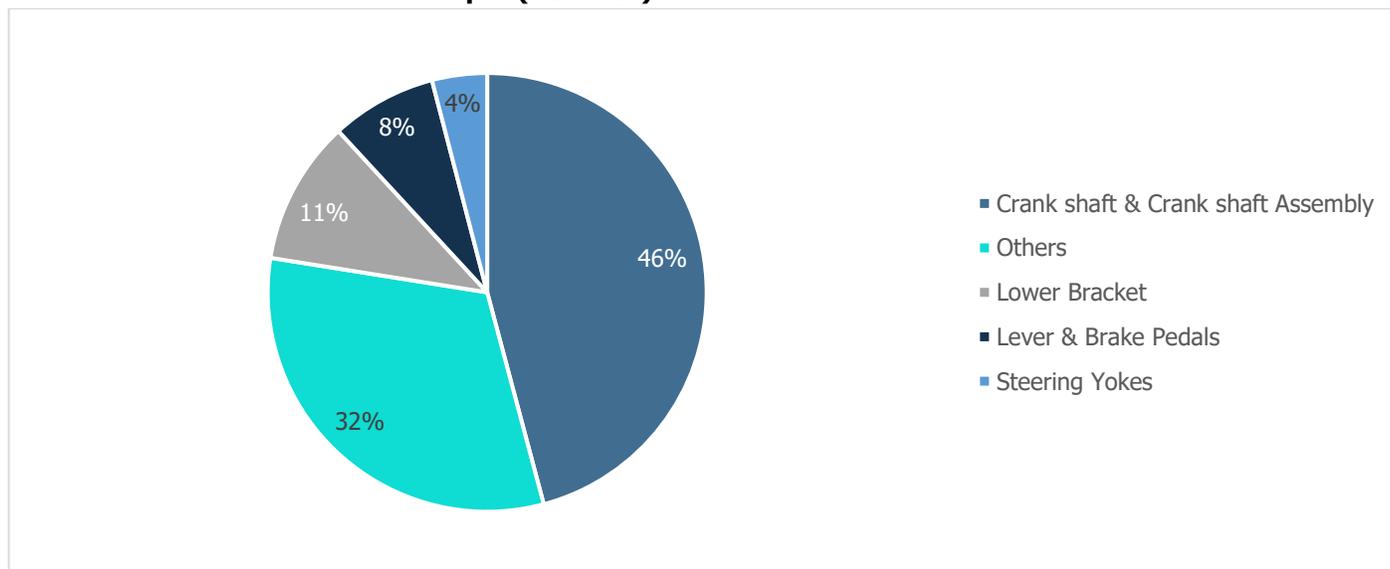
Key Product Portfolio

Precision Forged & Machined Components: crankshaft and crankshaft assemblies, lower bracket assemblies, lever kick-starter assemblies, gear-shift lever assemblies, propeller shafts, door hinges and steering yokes

Non-automotive:

- Parts for mining, agriculture, forestry and gardening equipment, toolholder basic body.

Chart 57: Product Wise Revenue Split (H1 FY26)



Source: Company Disclosures

Strategic Positioning of the Company

Kay Jay Forgings Limited has emerged as one of the well-established manufacturers of precision automotive components in India, with key products including crankshaft and crankshaft assemblies, lower bracket assemblies, lever kick-starter assemblies, gear-shift lever assemblies, propeller shafts, door hinges and steering yokes.

Throughout its journey, kay jay forgings has consistently achieved key milestones, underscoring its focus on quality, innovation and global reach.

The company's established a presence in the precision components manufacturing industry due to its ability to manufacture and supply complex, high-quality precision components according to their customers' specifications. Kay Jay Forgings has been a key preferred supplier to TVS Motor Company for over three decades, maintaining a strong and long-standing partnership founded on consistent quality and evolving product offerings.

Kay Jay has been trusted by marquee clients like TVS Motor Company Limited, Mahindra & Mahindra limited and Honda Motorcycle and Scooter India Private Limited. It has also earned accolades including a QSR score of 7.61 in 2021, highlighting its focus on maintaining high standards in product quality.

Within the forged crankshaft component market segment, Kay Jay Forgings Limited is the largest supplier of crankshaft and crankshaft assemblies to OEMs in India for two-wheelers with an estimated domestic market share of ~36% in Fiscal 2025. The company supplies directly to vehicle manufacturers and is recognised as a key supplier of two-wheeler crankshaft assemblies in India, while also serving the non-OEM (aftermarket) segment.

In 2014, the company expanded the supply to lower bracket assembly as well. In 2021, the company started supplying three-wheeler crank shaft assemblies to TVS Motor Co. Limited. The company started supplying Crank Shafts to Honda Motorcycles & Scooters India in 2023. In 2023 they also started supplying door hinges to Mahindra & Mahindra. The company's innovative approach has driven portfolio expansion, from launching crankshaft assemblies in 2012 to entering the EV and three-wheeler segments in 2021 and adding advanced components for Husqvarna and Mahindra by 2023. As on March 31, 2025, the company supplies 10,000 crank shaft assembly and 4,000 lower bracket assembly per day to TVS Motor Co. Limited for various two-wheeler models.

9.2 Peer Comparison of Financial & Operational Indicators

Table 14: Comparison for H1FY26

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|--|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Financials Parameters (Rs Million) (H1FY26) | | | | | |
| Revenue from operations | 4,660.63 | 19,227.86 | 1,198.06 | 15,915.06 | 5,269.66 |
| Gross profit | 2,135.92 | 7,619.99 | 685.26 | 9,464.16 | 2,519.42 |
| Gross margin % | 45.83% | 39.63% | 57.20% | 59.47% | 47.81% |
| EBITDA | 445.61 | 1,692.20 | 125.00 | 2,751.96 | 804.13 |
| EBITDA margin % | 9.56% | 8.80% | 10.43% | 17.29% | 15.26% |
| PAT | 213.57 | 22.90 | 35.57 | 1343.78 | 934.94 |
| PAT margin % | 4.58% | 0.12% | 2.97% | 8.44% | 17.74% |
| ROE % | 11.59%# | 0.07%# | 3.87%# | 4.67%# | 8.02%# |
| ROCE % | 12.67%# | 2.14%# | 6.20%# | 6.47%# | 10.99%# |
| Debt/Total Equity | 0.45 | 0.66 | 0.99 | 0.07 | 0.00 |

| | | | | | |
|--|-----------|-------|-------|-------|-------|
| Inventory Days | 73 | 125 | 177 | 138 | 164 |
| Trade Receivables (Days) | 25 | 93 | 133 | 29 | 66 |
| Trade Payables (Days) | 49 | 179 | 184 | 100 | 61 |
| Cash Conversion Cycle (Days) | 50 | 39 | 125 | 67 | 169 |
| Average Net Fixed Asset Turnover Ratio | 2.60# | 0.72# | 1.85# | 0.88# | 1.19# |
| Operational Parameters (H1FY26) | | | | | |
| Installed Capacity (MTPA) | 21,050 | N/A | N/A | N/A | N/A |
| Revenue from Automotive Industry (Rs Mn) | 4,371.80* | N/A | N/A | N/A | N/A |
| Percentage of revenue from Automotive Industry | 98.66% | N/A | N/A | N/A | N/A |
| Revenue from Non-Automotive Industry | 59.38* | N/A | N/A | N/A | N/A |
| Percentage of revenue from Non-Automotive Industry | 1.34% | N/A | N/A | N/A | N/A |
| Domestic Revenue (Rs Mn) | 3,994.99* | N/A | N/A | N/A | N/A |
| Percentage of revenues from domestic sales | 90.16% | N/A | N/A | N/A | N/A |
| Export Revenue (Rs Mn) | 436.19* | N/A | N/A | N/A | N/A |
| Percentage of revenue from exports | 9.84% | N/A | N/A | N/A | N/A |

Source: Company Disclosures; *Excludes sale of scrap; ^Standalone figures; N/A: Not Available; #: Non-Annualised

Table 15: Comparison for FY25

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|--|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Financials Parameters (Rs Million) (FY25) | | | | | |
| Revenue from operations | 7,504.64 | 40,341.07 | 2,366.43 | 30,167.51 | 11,548.02 |
| Gross profit | 3,540.31 | 17,886.00 | 1,243.70 | 17,754.00 | 5,701.73 |
| Gross margin % | 47.18% | 44.34% | 52.56% | 58.85% | 49.37% |
| EBITDA | 714.97 | 5,595.55 | 240.01 | 5,147.56 | 2,406.25 |
| EBITDA margin % | 9.53% | 13.87% | 10.14% | 17.06% | 20.84% |
| PAT | 290.15 | 4,150.25 | 83.15 | 2,168.81 | 1,739.97 |
| PAT margin % | 3.87% | 10.29% | 3.51% | 7.19% | 15.07% |
| ROE % | 17.81% | 13.66% | 9.27% | 7.84% | 16.23% |
| ROCE % | 18.98% | 7.86% | 10.11% | 11.80% | 19.34% |
| Debt/Total Equity | 0.63 | 0.66 | 0.80 | 0.11 | 0.01 |
| Inventory Days | 89 | 202 | 176 | 131 | 149 |

| | | | | | |
|--|-----------|------------|----------------|-----------|-----------|
| Trade Receivables (Days) | 24 | 83 | 110 | 6 | 65 |
| Trade Payables (Days) | 55 | 191 | 157 | 106 | 60 |
| Cash Conversion Cycle (Days) | 59 | 93 | 128 | 31 | 154 |
| Average Net Fixed Asset Turnover Ratio | 4.41 | 1.69 | 4.08 | 1.86 | 2.54 |
| Operational Parameters (FY25) | | | | | |
| Installed Capacity (MTPA) | 40,100 | 2,68,400 | ~18,000-24,000 | N/A | 1,65,000 |
| Revenue from Automotive Industry (Rs Mn) | 7,017.97* | 28,438.39* | N/A | 26,668.51 | 11,548.02 |
| Percentage of revenue from Automotive Industry | 98.91% | 78.25% | N/A | 88.40% | 100.00% |
| Revenue from Non-Automotive Industry | 77.14* | 7,904.60* | N/A | 3,499.49 | - |
| Percentage of revenue from Non-Automotive Industry | 1.09% | 21.75% | N/A | 11.60% | - |
| Domestic Revenue (Rs Mn) | 6,711.50* | 21,522.09* | N/A | 20,634.91 | 6,008.21 |
| Percentage of revenues from domestic sales | 94.59% | 59.22% | N/A | 68.40% | 52.03% |
| Export Revenue (Rs Mn) | 383.60 | 14,820.90* | N/A | 9,533.09 | 5,539.81 |
| Percentage of revenue from exports | 5.41% | 40.78% | N/A | 31.60% | 47.97% |

Source: Company Disclosures; *Excludes sale of scrap; N/A: Not Available

Notes:

1. Revenue from Operations means the revenue from operations for the period / year.
2. Gross profit is calculated as revenue from operations minus cost of materials consumed minus (increase)/decrease in inventories of finished goods, stock in trade and work-in-progress.
3. Gross Margin is calculated as gross profit divided by revenue from operations
4. EBITDA is calculated as profit for the year/ period minus other income plus finance costs, depreciation and amortisation and total income tax expenses.
5. EBITDA Margin is calculated as EBITDA divided by revenue from operations.
6. PAT means the profit after tax for the year/ period.
7. PAT Margin is calculated as restated profit for the year/ period divided by revenue from operations.
8. Return on Equity is calculated as restated profit for the period / year divided by total equity.
9. Return on Capital Employed is calculated as EBIT divided by Capital Employed. Capital employed is calculated as total equity plus total borrowings while EBIT is calculated as restated profit for the period / year plus total income tax expense plus finance costs.

10. Debt/ Total Equity is calculated as total debt (including current and non-current borrowings) divided by total equity.
11. Inventory Days is calculated as Average Inventory divided COGS* 365; while COGS is calculated as cost of materials consumed + Purchase of stock in trade + changes in inventories of Finished Goods, Stock in trade and Work In Progress; for H1FY26 Inventory days is calculated as Average Inventory divided by COGS* 183.
12. Trade Receivable Days is calculated as Average Receivables/ Revenue from Operations *365; For H1FY26 Trade Receivable Days is calculated as Average Receivable divided by Revenue from Operation *183.
13. Trade Payable Days is calculated as Average Payables / COGS * 365; For H1FY26 Trade Payable Days is calculated as Average Payable divided by COGS*183.
14. Cash conversion cycle (CCC Days) is calculated Inventory Days plus Trade Receivable Days minus Trade Payable Days.
15. Average Net Fixed Assets Turnover Ratio is calculated as revenue from operations for the period / year divided by Average Net Fixed Assets (Property, Plant and Equipment)
16. Installed capacity refers to the maximum production capacity of our manufacturing facilities as per the design and technical specifications of the plant and machinery, and as certified by our management/technical consultants, assuming operations under normal working conditions.
17. Revenues from automotive industry is revenue derived from sale of product to automotive industry.
18. Percentage of revenue (%) from automotive industry is calculated as revenue from sale of products in automotive industry divided by revenue from operation excluding sales from scrap.
19. Revenues from non-automotive industry is revenue derived from sale of products to non-automotive industry
20. Percentage of revenue (%) from non-automotive industry is calculated as revenue from sale of products in non-automotive divided by revenue from operation excluding sales from scrap
21. Domestic revenue means revenue from sale of products from domestic sales.
22. Percentage of revenue (%) from domestic sales is calculated as revenue from domestic sale of products divided by revenue from operation excluding sales from scrap.
23. Exports revenue means revenue from sale of products from export sales.
24. Percentage of revenue (%) from exports sales is calculated as revenue from exports sale of products divided by revenue from operation excluding sales from scrap.

Table 16: Comparison for FY24

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|--|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Financial Parameters (Rs Million) (FY24) | | | | | |
| Revenue from operations | 6,723.16 | 37,045.45 | 2,367.87 | 28,114.32 | 12,217.55 |
| Gross profit | 3,075.25 | 16,157.97 | 1,230.83 | 15,938.92 | 5,946.01 |
| Gross margin % | 45.74% | 43.62% | 51.98% | 56.69% | 48.67% |
| EBITDA | 647.10 | 7,729.12 | 138.57 | 4,798.51 | 2,619.68 |
| EBITDA margin % | 9.62% | 20.86% | 5.85% | 17.07% | 21.44% |
| PAT | 241.26 | 2,912.13 | 45.50 | 1,875.49 | 1,560.38 |
| PAT margin % | 3.59% | 7.86% | 1.92% | 6.67% | 12.77% |
| ROE % | 17.98% | 11.06% | 5.55% | 13.76% | 17.37% |
| ROCE % | 17.80% | 14.70% | 8.06% | 15.40% | 23.18% |
| Debt/Total Equity | 0.83 | 0.42 | 0.74 | 0.59 | 0.02 |
| Inventory Days | 82 | 189 | 185 | 115 | 143 |
| Trade Receivables (Days) | 24 | 42 | 105 | 31 | 67 |
| Trade Payables (Days) | 51 | 177 | 144 | 97 | 62 |
| Cash Conversion Cycle (Days) | 56 | 54 | 146 | 49 | 148 |
| Average Net Fixed Asset Turnover Ratio | 4.71 | 1.96 | 4.99 | 2.06 | 2.85 |
| Operational Parameters (FY24) | | | | | |
| Installed Capacity (MTPA) | 40,100 | 2,10,900 | N/A | N/A | 1,65,000 |
| Revenue from Automotive Industry (Rs Mn) | 6,320.82* | 26,979.85* | N/A | 24,656.98 | 12,217.55 |
| Percentage of revenue from Automotive Industry | 99.54% | 77.10% | N/A | 87.70% | 100.0% |
| Revenue from Non-Automotive Industry | 29.35* | 8,013.47* | N/A | 3,458.02 | - |
| Percentage of revenue from Non-Automotive Industry | 0.46% | 22.90% | N/A | 12.30% | - |
| Domestic Revenue (Rs Mn) | 5,879.49* | 20,164.33* | N/A | 19,314.32 | 5,904.44 |

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|--|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Percentage of revenues from domestic sales | 92.59% | 57.62% | N/A | 68.70% | 48.33% |
| Export Revenue (Rs Mn) | 470.69* | 14,828.99* | N/A | 8,799.68 | 6,313.11 |
| Percentage of revenue from exports | 7.41% | 42.38% | N/A | 31.30% | 51.67% |

Source: Company Disclosures; *Excludes sale of scrap; ^Standalone figures; N/A: Not Available

Table 17: Comparison for FY23

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|---|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Financial Parameters (Rs Million) (FY23) | | | | | |
| Revenue from operations | 6,026.92 | 31,928.95 | 2,658.40 | 23,460.44 | 11,789.53 |
| Gross profit | 2,549.16 | 15,503.95 | 1,137.91 | 13,285.86 | 5,791.33 |
| Gross margin % | 42.30% | 48.56% | 42.80% | 56.63% | 49.12% |
| EBITDA | 500.85 | 8,482.70 | 106.71 | 3,847.53 | 2,607.16 |
| EBITDA margin % | 8.31% | 26.57% | 4.01% | 16.40% | 22.11% |
| PAT | 138.13 | 2,481.08 | -1.84 | 1,483.42 | 451.74 |
| PAT margin % | 2.29% | 7.77% | -0.07% | 6.32% | 3.83% |
| ROE % | 12.51% | 18.77% | -0.24% | 12.55% | 6.08% |
| ROCE % | 12.23% | 20.27% | 4.01% | 13.98% | 12.15% |
| Debt/Total Equity | 1.29 | 0.85 | 0.49 | 0.60 | 0.11 |
| Inventory Days | 75 | 184 | 109 | 108 | 161 |
| Trade Receivables (Days) | 29 | 51 | 101 | 65 | 71 |
| Trade Payables (Days) | 48 | 176 | 95 | 100 | 70 |
| Cash Conversion Cycle (Days) | 56 | 59 | 116 | 74 | 162 |
| Average Net Fixed Asset Turnover Ratio | 4.88 | 2.06 | 6.40 | 1.98 | 3.07 |
| Operational Parameters (FY23) | | | | | |
| Installed Capacity (MTPA) | 36,900 | 1,87,100 | N/A | N/A | 1,44,750 |
| Revenue from Automotive Industry (Rs Mn) | 5,662.22* | 23,347.77* | N/A | 18,298.80 | 11,789.53 |
| Percentage of revenue from Automotive Industry | 99.84% | 77.80% | N/A | 81.25% | 100.0% |
| Revenue from Non-Automotive Industry | 9.22* | 6,662.22* | N/A | 4,222.80 | - |

| Benchmarking Parameters | Kay Jay Forgings Limited | Ramkrishna Forgings Limited | Kalyani Forge Limited | Sansera Engineering Limited | Rolex Rings Limited |
|--|--------------------------|-----------------------------|-----------------------|-----------------------------|---------------------|
| Percentage of revenue from Non-Automotive Industry | 0.16% | 22.20% | N/A | 18.75% | - |
| Domestic Revenue (Rs Mn) | 5,320.89* | 17,558.69* | N/A | 16,797.36 | 5,216.23 |
| Percentage of revenues from domestic sales | 93.82% | 58.51% | N/A | 71.60% | 44.24% |
| Export Revenue (Rs Mn) | 350.56* | 12,451.30* | N/A | 6,662.24 | 6,573.30 |
| Percentage of revenue from exports | 6.18% | 41.49% | N/A | 28.40% | 55.76% |

Source: Company Disclosures; *Excludes sale of scrap; ^Standalone figures; N/A: Not Available

9.3 Financial Benchmarking

1. Net Sales

Net sales performance across forging companies reflects a mix of growth and pressure over FY23–FY25. Ramkrishna Forgings and Sansera Engineering posted strong double-digit growth with CAGRs of 12–13% whereas Rolex Rings remained broadly flat. Kay Jay Forgings reported consistent growth with sales rising from Rs. 6,027 million in FY23 to Rs. 7,505 million in FY25, translating into an 11.6% CAGR, reflecting steady scale-up in line with broader industry momentum.

| Net Sales (Rs. Millions) | H1 FY26 | FY25 | FY24 | FY23 | CAGR (FY23-FY25) |
|--------------------------|-----------|-----------|-----------|-----------|------------------|
| Kay Jay Forgings Limited | 4,660.63 | 7,504.64 | 6,723.16 | 6,026.92 | 11.59% |
| Ramkrishna Forgings Ltd | 19,227.86 | 40,341.07 | 37,045.45 | 31,928.95 | 12.40% |
| Kalyani Forge Ltd | 1,198.06 | 2,366.43 | 2,367.87 | 2,658.40 | -5.65% |
| Sansera Engineering | 15,915.06 | 30,167.51 | 28,114.32 | 23,460.44 | 13.40% |
| Rolex Rings Ltd | 5,269.66 | 11,548.02 | 12,217.55 | 11,789.53 | -1.03% |

Source: Company Disclosures, Annual Reports

2. Operating Margin

Operating margin performance across forging companies shows both stability and pressure over FY23–FY25. Sansera Engineering maintained steady margins at around 17%, while Rolex Rings reported a slight tapering from 22.1% to 20.8% but remained at a healthy level. Ramkrishna Forgings, however, saw a sharp decline from 26.6% in FY23 to 13.9% in FY25, pointing to margin compression. Kalyani Forge improved significantly from 4.0% to 10.1%, reflecting operational recovery. Kay Jay Forgings maintained stable margins, moving from 8.3% in FY23 to 9.5% in FY25, highlighting consistent cost control and operating efficiency.

| Operating Margin (in %) | H1 FY26 | FY25 | FY24 | FY23 |
|--------------------------|---------|--------|--------|--------|
| Kay Jay Forgings Limited | 9.56% | 9.53% | 9.62% | 8.31% |
| Ramkrishna Forgings Ltd | 8.80% | 13.87% | 20.86% | 26.57% |
| Kalyani Forge Ltd | 10.43% | 10.14% | 5.85% | 4.01% |
| Sansera Engineering | 17.29% | 17.06% | 17.07% | 16.40% |
| Rolex Rings Ltd | 15.26% | 20.84% | 21.44% | 22.11% |

Source: Company Disclosures, Annual Reports

3. Net Profit Margin

Net profit margin trends across forging companies reflect differing profitability trajectories over FY23–FY25. Rolex Rings maintained the highest margins, though with some fluctuation, moving from 16.8% in FY23 to 15.1% in FY25. Ramkrishna Forgings improved steadily, reaching 10.3% in FY25, while Sansera Engineering also showed gradual gains from 6.3% to 7.2%. Kay Jay Forgings reported consistent improvement, with margins rising from 2.3% in FY23 to 3.9% in FY25, reflecting gradual strengthening of bottom-line performance.

| Net Profit Margin (in %) | H1 FY26* | FY25 | FY24 | FY23 |
|--------------------------|----------|--------|--------|--------|
| Kay Jay Forgings Limited | 4.58% | 3.87% | 3.59% | 2.29% |
| Ramkrishna Forgings Ltd | 0.12% | 10.29% | 7.86% | 7.77% |
| Kalyani Forge Ltd | 2.97% | 3.51% | 1.92% | -0.07% |
| Sansera Engineering | 8.44% | 7.19% | 6.67% | 6.32% |
| Rolex Rings Ltd | 17.74% | 15.07% | 12.77% | 3.83% |

Source: Company Disclosures, Annual Reports

4. Return on Capital Employed (ROCE)

Across the peer set, ROCE trends were mixed, with some companies witnessing moderation while others showed improvement by FY25. Rolex Rings Ltd reported the highest ROCE in FY24 at 23.18%, which remained strong at 19.34% in FY25, while Ramkrishna Forgings Ltd saw a decline from 20.27% in FY23 to 7.86% in FY25. Sansera Engineering maintained relatively stable ROCE in the low-to-mid teens, whereas Kalyani Forge Ltd showed gradual improvement from 4.01% in FY23 to 10.11% in FY25. Kay Jay Forgings Limited demonstrated a steady improvement in capital efficiency, with ROCE increasing from 12.23% in FY23 to 18.98% in FY25, reflecting strengthening operating performance.

| Return on Capital Employed (ROCE) (in %) | H1 FY26* | FY25 | FY24 | FY23 |
|--|----------|--------|--------|--------|
| Kay Jay Forgings Limited | 12.67% | 18.98% | 17.80% | 12.23% |
| Ramkrishna Forgings Ltd | 2.14% | 7.86% | 14.70% | 20.27% |
| Kalyani Forge Ltd | 6.20% | 10.11% | 8.06% | 4.01% |
| Sansera Engineering | 6.47% | 11.80% | 15.40% | 13.98% |
| Rolex Rings Ltd | 10.99% | 19.34% | 23.18% | 12.15% |

Source: Company Disclosures, Annual Reports; *Figures Non-Annualised

5. Return on Equity (ROE)

Across the peer set, ROE performance remained mixed, with selective improvement by FY25 and moderation for a few players. Kay Jay Forgings Limited reported consistently healthy ROE, improving from 12.51% in FY23 to ~18% in FY24–FY25, indicating stable profitability and equity efficiency. Rolex Rings Ltd showed a sharp improvement from 6.08% in FY23 to 17.37% in FY24, followed by a marginal moderation in FY25, while Ramkrishna Forgings Ltd witnessed a decline from 18.77% in FY23 to low-teens levels in FY25. Sansera Engineering reported volatility, with ROE peaking in FY24 before softening in FY25, whereas Kalyani Forge Ltd improved from negative ROE in FY23 to high single-digit levels by FY25.

| Return on Equity (ROE) (in %) | H1 FY26* | FY25 | FY24 | FY23 |
|-------------------------------|----------|--------|--------|--------|
| Kay Jay Forgings Limited | 11.59% | 17.81% | 17.98% | 12.51% |
| Ramkrishna Forgings Ltd | 0.07% | 13.66% | 11.06% | 18.77% |
| Kalyani Forge Ltd | 3.87% | 9.27% | 5.55% | -0.24% |
| Sansera Engineering | 4.67% | 7.84% | 13.76% | 12.55% |
| Rolex Rings Ltd | 8.02% | 16.23% | 17.37% | 6.08% |

Source: Company Disclosures, Annual Reports; *Figures Non-Annualised

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