Research

CRISIL
An S&P Global Company

Industry Report on Indian Auto Industry

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1. Global macroeconomic overview

1.1 Review and outlook of economic growth and inflation in key global economies

The global recovery continues, but the momentum has weakened due to the pandemic fuelled by the highly transmissible Delta variant and the emergence of the omicron variant. Pandemic outbreaks in critical links of global supply chains have resulted in longer-than-expected supply disruptions, further feeding inflation in many countries. Overall, risks to economic prospects have increased, and policy trade-offs have become more complex.

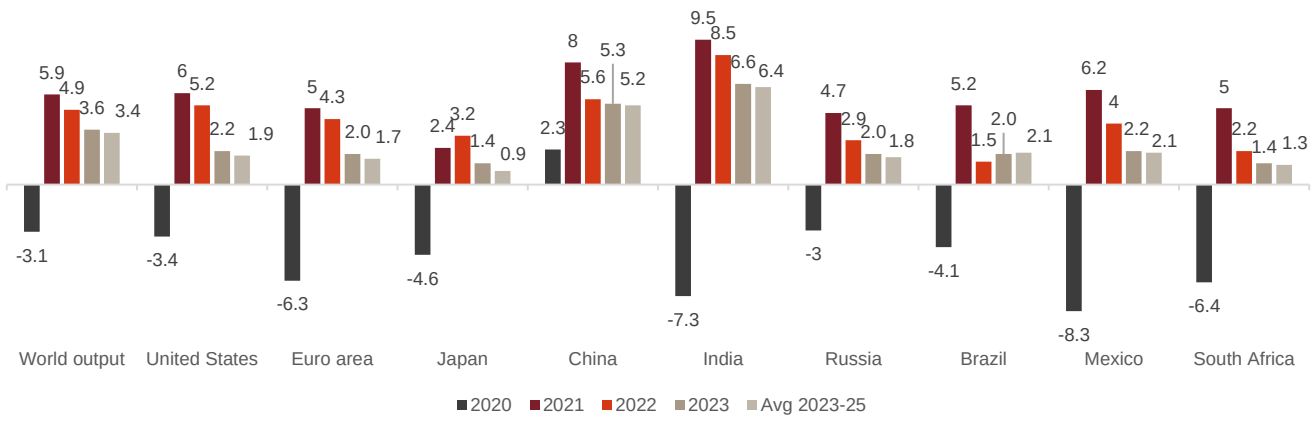
As per International Monetary fund (IMF) the global economy is projected to grow 5.9% in 2021 and 4.9% in 2022. The 2021 global forecast is unchanged from the April 2021 outlook, but with offsetting revisions. Prospects for emerging market and developing economies have been marked down for 2021, especially for emerging Asia. By contrast, the forecast for advanced economies has been revised up. These revisions reflect pandemic developments and changes in policy support. The 0.5% upgrade for 2022 derives largely from the forecast upgrade for advanced economies, particularly the United States (US), reflecting the anticipated legislation of additional fiscal support in the second half of 2021 and improved health metrics more broadly across the group.

Close to 45% of the population in emerging market and developing economies such as India and Russia have been fully vaccinated as of 17th January 2022. China has vaccinated 80% of its population, compared with close to 60%, 70% and 80% in advanced economies such as USA, Euro area and Japan respectively. Low-income developing countries have tiny fraction of their population vaccinated. Faster-than-expected vaccination rates and return to normalcy have led to upgrades, while lack of access to vaccines and renewed waves of Covid-19 in some countries, notably India, have triggered downgrades.

Divergences in policy support are a second source of the deepening divide. We are seeing continued sizeable fiscal support in advanced economies, with $4.6 trillion of announced pandemic-related measures available in 2021 and beyond. The upward global growth revision for 2022 largely reflects anticipated additional fiscal support in the US and from the Next Generation European Union funds.

While more widespread vaccine access could improve the outlook, risks on balance are tilted to the downside. The emergence of highly infectious virus variants could derail the recovery. Financial conditions could also tighten abruptly amid stretched asset valuations, if there is a sudden reassessment of the monetary policy outlook, especially in the US. Stimulus spending in the US could also prove weaker than expected. A worsening pandemic and tightening financial conditions would inflict a double hit on emerging market and developing economies and severely set back their recoveries.

IMF estimates of GDP growth for key economies



**Euro area includes Germany, France, Italy and Spain*

Source: IMF (World Economic Outlook – October 2021 update), CRISIL Research

Global economy to continue seeing uneven growth patterns

It's back to square one as we enter 2022, with the omicron variant of Covid-19 threatening global recovery. That, along with high inflation and supply-chain issues are dominating economic outlook at present.

Put another way, after the rapid global economic rebound in 2021 from the recession of 2020, we may see a year of sober growth.

According to the World Bank's Global Economic Prospects, "global recovery is set to decelerate markedly amid continued Covid-19 flare-ups, diminished policy support, and lingering supply bottlenecks" (January 2022). It expects global growth to slow to 4.1% in 2022 (from 5.5% in 2021).

One common factor between the growth trajectory of both years is the increasing imbalance in the recovery of advanced economies (AEs) vis-à-vis emerging economies (EEs). 2021 saw AEs rebound relatively faster than EEs, the latter constrained due to reduced policy support and inequitable vaccine access. In 2022 as well, while output in AEs is projected to return to pre-pandemic trends, EEs are expected to remain below the trends even in 2023, stated the World Bank.

US consumer price inflation at another record high

Rising inflation continued to dominate headlines for the United States (US) economy: Consumer price index-linked (CPI) inflation accelerated 7% on-year in December (6.8% in November). Core inflation, too, jumped 5.5% on-year compared with 4.9% in November. Sequentially, the rise in prices slowed for the second straight month, to 0.5% from 0.8%. Increases in the housing and used cars and trucks indices were the largest contributors to the monthly increase in prices. Notably, the energy index, which was one of the largest contributors to inflation through most of 2021, declined 0.4% on-month.

In December, the US Federal Reserve (Fed) announced it will double the pace of tapering of asset purchases. Chairman Jerome Powell stated the economy is healthy and in need of a tighter monetary policy, pointing to the Fed's intentions of raising rates through 2022.

Employment data in the US for December showed a mixed picture: non-farm payroll increased ~2 lakh, lower than the 2.5 lakh in November. But there were sector-wise job gains in contact-based services: notably, in leisure and hospitality, construction, and transportation and warehousing. The unemployment rate declined 0.3 percentage points (pp) over the previous month to 3.9%.

The US trade deficit widened to $80.2 billion in November from $67.2 billion in October, since goods imports increased, and exports decreased. Exports of goods declined $2.9 billion on-month to $155.9 billion, driven by a decrease in capital goods exports (industrial machines, telecom equipment) and industrial supplies (including crude oil). Goods imports increased by a much higher $12.3 billion on-month to $254.9 billion in November, led by industrial supplies, consumer goods, and automotive vehicles.

The ECB follows suit in tapering asset purchases

Similar to the Fed's tapering of asset purchases, the ECB also announced scaling back of its Pandemic Emergency Purchase Program in its December monetary policy review. In stated it will decrease its purchases in the first quarter of 2022, before winding down net purchases by March. Unlike the Fed though, which has signalled multiple rate hikes in 2022, the ECB does not expect to raise rates before October 2022.

Inflation in the euro area climbed to 5% in December from 4.9% in the previous month. While still at a record high, the on-year 0.1pp rise is lower than the 0.9pp jump seen over October-November. Energy prices showed the highest on-year increase among the sub- indices: up 26.5% on-year (compared with 27.5% in November). Food inflation rose, as well, becoming the second-largest contributor to headline inflation at 3.2% (vs 2.2% in the previous month). Services inflation slowed 0.3pp to 2.4%.

Europe's unemployment rate continued to trudge lower − 7.2% in November vs 7.3% in the previous month. Compared with October, the number of persons unemployed decreased 2.2 lakh. Among major member countries, the unemployment rate of Germany and France declined 0.1pp to 3.2% and 7.5%, respectively. Italy and Spain saw slightly faster declines of 0.2pp to 9.2% and 14.1%. Countries such as the Netherlands and Austria, which had instituted complete lockdowns in November owing to surge in Covid-19 cases, saw similar declines in unemployment by 0.2 pp.

Euro area trade surplus narrowed on-year to €3.6 billion in October from €29.8 billion in the year-ago period. Imports increased 24.1% on-year, while exports grew by a much slower 7.3%. Among trading partners, exports and imports from China grew the highest on-year in January-October 2021, followed by the US and the United Kingdom (UK).

Japan's economy picking up, states official policy planning agency

In its December economic report, Japan's Cabinet Office stated the economy is showing signs of recovery with the Covid-19 situation easing in the country. Private consumption and corporate profits are showing signs of revival, but supply-side constraints and input costs continue to weigh on short-term prospects. However, the situation is extremely fluid, as January saw cases surge again in the country.

Japan's CPI-linked inflation rose 0.6% on-year in November, up from 0.1% in the previous month. Even as inflation persists in western AEs, Japan's economy was in deflation for most of 2021. Consumer-linked prices have only begun inching up since the fourth quarter. The increase in prices in November was driven by an acceleration in fuel prices (9.2% in November vs 6.4% in October). Food inflation, which has the highest weight in overall inflation, accelerated to 1.4% on-year from 0.7% in the previous month. Core inflation remained in the negative zone but moderated 0.1pp compared to the previous month (at -0.6%).

China's zero-Covid-19 policy risks supply chain logjam

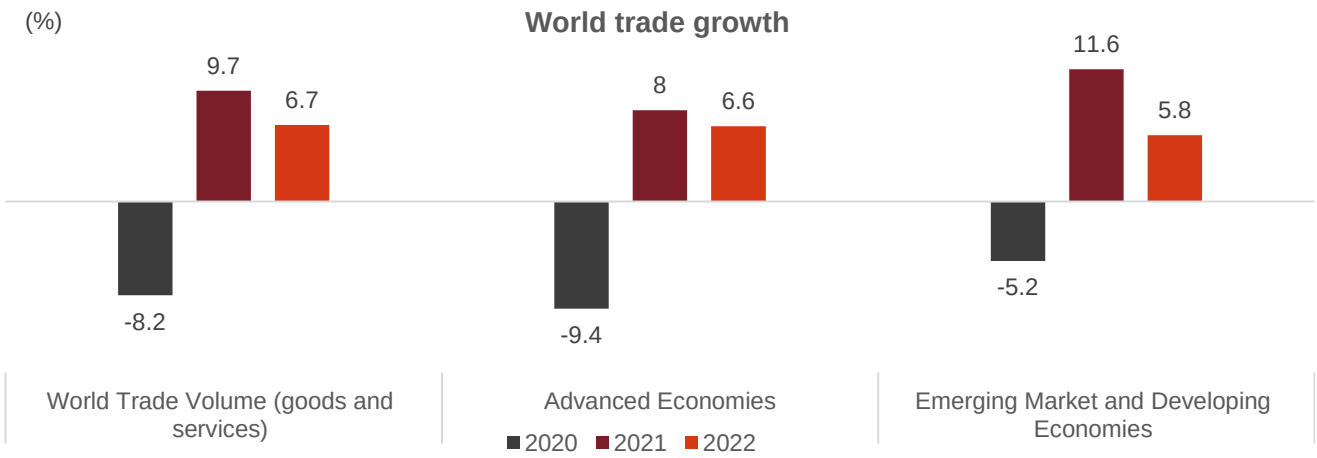
The rapid spread of omicron has wreaked havoc around the world, but China's case counts are low in comparison, possibly owing to its strict zero-Covid-19 policy. Already, some of its provinces are under complete lockdown to contain omicron. While the highly transmissible variant poses a challenge to the policy, it also compounds economic uncertainty globally: supply chain disruptions affected trade and inflation in 2021. Further disruptions owing to restrictions in China, a major global value chain player, could aggravate the existing logjam.

Manufacturing in China is slowly expanding, as indicated by the Purchasing Managers' Index (PMI). The index rose to 50.3 in December from 50.1 in November, above the expansion threshold of 50. Sub-indices of output and buying levels increased, while those of new orders, export sales, and employment continued to contract, but fell at slower rates (remained below 50). With renewed lockdowns at the start of the year in 2022, manufacturing activity is likely to remain subdued.

Inflation in China decelerated rapidly in December from the previous month to 1.5% on-year vs 2.3% in November. The sequential decline in inflation (-0.3% vs 0.4% in the previous month) was a contributing factor to the slowdown in on-year inflation. Food prices were tepid after rising in November to 1.4% (vs 1.6% in), following easing of supply disruptions. Non-food inflation too slowed to 2.1% (compared with 2.5% earlier), with prices rising for all components, with prices moderating for both transportation and communication, and housing.

1.2 Global trade environment

IMF estimates of world trade growth



Source: IMF (World Economic Outlook – October 2021 update), CRISIL Research

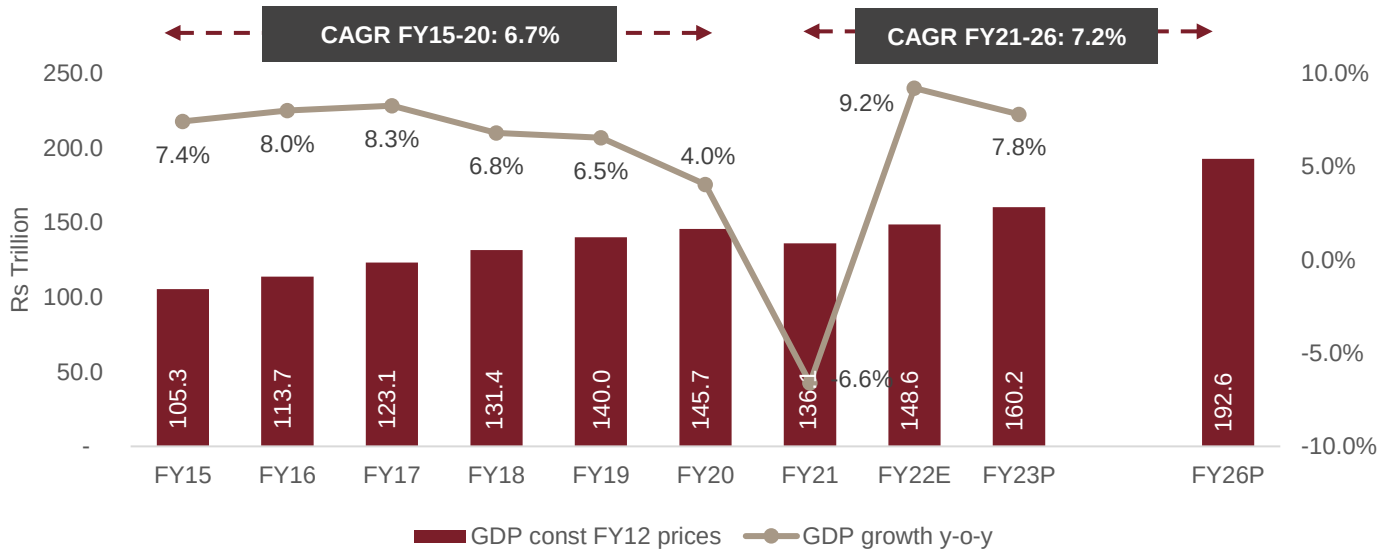
Despite near-term supply disruptions, global trade volumes are projected to expand 9.7% in 2021, moderating to 6.7% in 2022. The merchandise trade recovery is set to broaden after being initially concentrated in pandemic-related purchases, consumer durables and medical equipment. Services trade is expected to recover more slowly, consistent with subdued cross-border travel until virus transmission declines to low levels everywhere.

1.3 Overview of Indian Economy

Despite the pandemic long-term prospects bright for the economy

Indian economy recorded a robust 6.7% CAGR over fiscal 2015 to 2020 period driven by rising consumer aspirations, rapid urbanization, government's focus on infrastructure investment and growth of domestic manufacturing sector. The economic growth was supported by benign crude oil prices, softer interest rates and lower current account deficit. Indian government also undertook key reforms and initiatives such as implementation goods and services tax, Insolvency and Bankruptcy Code (IBC), Make in India initiative, financial inclusion initiatives, gradual opening of sectors such as retail, e-commerce, defense, railways, and insurance for Foreign Direct Investments (FDI). FDI into India grew from 45.1 billion USD in fiscal 2015 to 73.5 billion USD in fiscal 2020. Growth over fiscal 2015 to 2020 was however impacted due to demonetisaton, NBFC crisis, GST implementation and slower global economic growth. Over fiscal 2015 to 2020 India's economic growth was led by services followed by industrial sector.

GDP expected to grow at 9.2% yoy in fiscal 2022; long term growth (fiscal 2021-2026) expected at 7.2% CAGR



Note: P – Projected

Source: National Statistics Office (NSO), IMF, CRISIL Research estimates

Fiscal 2020 was volatile for the global economy. The first three quarters were ensnared by trade protectionist policies and disputes among major trading partners, volatile commodity and energy prices, and economic uncertainty arising from the Brexit. Hopes for broad-based recovery in the fourth quarter were dashed by the Covid-19 pandemic, which led to considerable human suffering and economic disruption.

Growing restrictions on the movement of people and lockdowns in the affected countries led to demand, supply and liquidity shocks, that resulted in major financial losses and bankruptcies of several players in different industries. India saw one of the world's most stringent lockdowns from March 2020. As lockdowns were gradually lifted, economic activity saw a revival in second half of fiscal 2021. After a steep contraction in the first half of this fiscal, owing to the rising number of Covid-19 cases, GDP growth is estimated to have moved into positive territory towards the end of the fiscal. Supported by normal and largely well-distributed monsoon, and healthy sowing and ground-water situation agricultural GDP is estimated to have grown by 3% on-year. On contrary, manufacturing and services GDP shrunk on account of restrictions in activity and people movement especially during first of the fiscal.

The highly virulent nature of the second Covid-19 wave had a negative impact on public sentiment. Economy started recovering from September 2021 as infections subsided and vaccination gathered pace.

The first advanced estimates (FAE) released by the National Statistical Office in January 2022, show India's real gross domestic product (GDP) is set to grow 9.2% in this fiscal compared with a pandemic-led contraction of 6.6% in fiscal 2021, indicating the economy (in real terms) is still only 1.2% above the pre-pandemic (fiscal 2020) levels.

Union Budget Fiscal 2022-23

The budget has bet big on an investment push to lift economic growth, two years and three waves into the pandemic. The lift in the consumption cycle is now tied to a broad-based pick-up in economic activity — which the government is trying to engineer through a focus on investments.

Pursuing this path would enhance the growth potential and, it is hoped, will bring endurance to growth in the medium term, though refraining from giving a direct consumption support could curb the pace of economic recovery in the short term.

For the next fiscal, the government's revenue expenditure is budgeted to grow less than 1% after growing 2.7% in this fiscal. The total capex of the central government though (budgetary capex plus revenue grants for capital creation and capex by central public sector enterprises) is budgeted to rise 14.5% compared with only 3.1% in this fiscal.

So, the budget essentially makes way for capex by tightening the belt around revenue expenditure. In general, the government has refrained from giving any direct consumption support in this budget. Yet, frontloading infrastructure spending could bring about faster growth.

The risks to India's near-term economic outlook are still tilted to the downside. Global growth looks uncertain and that will have a bearing on India's exports, one of the key demand drivers of domestic growth during the pandemic. International commodity prices, especially of crude, remains stubbornly high. And critical raw materials, such as chips, remain in short supply.

CRISIL projects fiscal 2023 real GDP growth at 7.8%, compared with the advance estimate of 9.2% for this fiscal.

Macroeconomic outlook for fiscal 2022

Macro variables	FY19	FY21	FY22E	FY23 P	Rationale for outlook
GDP growth (%, on-year)	4.0%	(6.6)%	9.2%	7.8%	Lower growth in fiscal 2023 would be mainly due to fiscal 2022's high base. Growth will continue to be supported by investment- largely government, but also private in some pockets, and driven by the PLI scheme to an extent. Consumption is expected to revive only gradually.
CPI-linked inflation (%, on-year)	4.8%	6.2%	5.5%	5.2%	Inflation is expected to remain elevated -above the mid-point of the RBI's target of 2-6% - for the third year in a row. Firms are expected to pass on the cost pressures to a great extent as domestic demand strengthens next fiscal. While higher crude oil prices will add pressure, it will be partially offset by lower excise duties on petroleum products relative to last year.
10-year G-sec yield (%, fiscal end)	6.2%	6.2%	6.8%	7.0%	Increase in gross market borrowing by the government, rate hikes by the RBI and the Fed and surging crude oil prices will impose pressure on yields next fiscal
CAD/GDP (%)	-0.9%	0.9%	-1.4%	-1.8%	The current account balance is expected to slip further into deficit as trade deficit widens, with imports increasing as Brent crude oil prices rise and domestic demand improves. External demand may not support exports next fiscal to the extent seen it happened this fiscal, as global growth is seen slowing.
Rs/$ (March, average)	74.4	72.8	75.0	76.0	The Fed's tapering of its asset purchases and raising its policy rate are expected to impose downward pressure on the rupee as demand for the dollar increases. And widening of the current account deficit will add to the depreciation pressure on the rupee

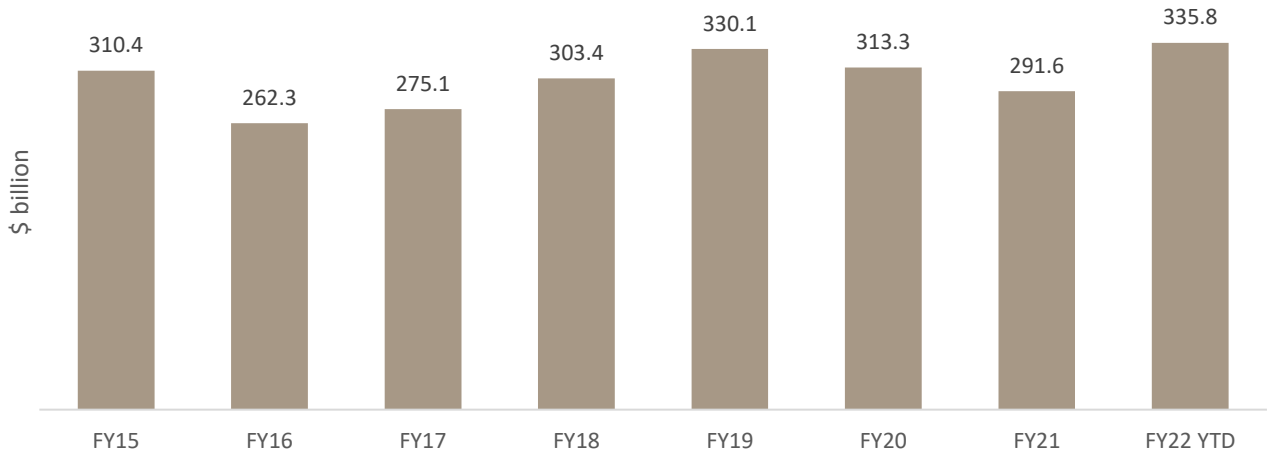
Note: E: Estimated; P- Projected

Source: Reserve Bank of India (RBI), NSO, CRISIL Research

Merchandise exports from India also got impacted during the pandemic and witnessed a sharp drop during the first wave. Even during the second wave, the supply chain disruptions impacted the export demand.

However, improvement in global demand during the second half of CY2021, as well as shift in demand for goods over services supported growth in exports during the year. Moreover, the high commodity prices (especially crude oil/petroleum, metals) provided an additional kicker to the Indian exports. As of April-Jan fiscal 22 period, India has witnessed the record high exports of $ 335.8 billion.

Merchandise exports annual trend



Note: FY22 YTD: April-January

Source: Ministry of Commerce and Industry, International Monetary Fund, CEIC, CRISIL

Risks to growth

Covid-19 cases increasing: India seemed to have Covid-19 cases under control, with the number of cases declining after September 2020. However, since the end of February 2021, India witnessed the second wave of Covid-19 with a surge in infection cases, leading to state governments taking steps to control the spread, including imposing curfews and localised lockdowns, resulting in loss of economic output. During the second wave of Covid-19, total daily active cases had crossed the 400,000 mark for the first time in the first week of May. During the last week of November 2021, daily active cases India logged 6,990 new Covid-19 infections, the lowest in 551 days, taking the country's total tally to 3,45,87,822. Meanwhile, active cases declined to 1,00,543 — the lowest in 546 days.

The recently detected Omicron variant, which has been classified as a Variant of Concern (VOC) by the WHO and the US, may pose significant risk to India's economic growth prospects in the fourth quarter of this fiscal or fiscal 2023 depending upon the spread and severity of infection in the country and globally.

Active cases in India have shot up from 95 thousand on December15th 2021 to 21.05 lakh as on January 27th 2022. However, faster recovery time for most patients and lower hospitalization has provided some breather.

Still most state governments have imposed restrictions till January 2022 end, and central government has in fact extended the Covid19 guidelines till February 28. Impact of the same on the Indian economy remains a key monitorable.

Geopolitical developments: External developments, most importantly the US-China trade war, have proved to significantly impact global GDP growth as well as export earnings and capital flows to emerging markets such as India. While there is some respite with the signing of Phase 1 of the US-China trade deal, several issues remain unresolved. Any re-escalation of tensions could again work adversely. Geopolitical developments in the Middle East could also disrupt crude oil supply and prices, likely hurting a wide range of domestic macroeconomic parameters, including current account deficit, inflation and GDP growth.

Persistent stress in financial sector: This has been one of the major drags on GDP growth this fiscal. Liquidity issues faced by NBFCs and risk aversion hampered credit growth as well as transmission of monetary policy easing. Easing of constraints in the financial system – a key monitorable – is critical for pick-up in growth.

On June 1, 2020, Moody's downgraded India's sovereign rating to the lowest investment grade and maintained the outlook from stable to negative, as the pandemic had exacerbated India's weak fiscal setting. However, in October 2021, Moody's upgraded India's sovereign rating outlook to stable from negative and affirmed the country's rating at Baa3.

Prior to the onset of the pandemic, India's GDP growth was slowing, due to existing vulnerabilities such as a weak financial sector and subdued private investment. However, in the light of the production-linked incentive (PLI) scheme, reduction in corporate tax rate, and labour law reforms, along with favourable demographics, India is expected to witness strong GDP growth when the global economy eventually recovers, supported by prudent fiscal and monetary policies.

GDP to recover over the medium term

Macro variables	FY21E	FY22P	FY22-26P	Rationale for outlook
GDP (%, y-o-y)	-7.3%	9.2%	6.6%	In view of the impact of Covid-19 2nd wave, CRISIL revised its GDP forecast down from 11% to 9/5%. However, gradual pick-up in economic activity, both in India and globally, and optimism on account of vaccine availability, should aid recovery in fiscal 2022, on a weak base of this fiscal. Over the medium term, economic growth is expected to be led by implementation of several reform measures of the government such as the PLI scheme, GST, Insolvency and Bankruptcy Code (IBC), and so on

Note: E – Expected, P - Projected

Source: RBI, NSO, CRISIL Research

India's GDP will still grow faster than the world's

India was one of the fastest-growing economies in the world with annual growth of around 6.7% in between fiscal 2015 to fiscal 2020. Over the past four fiscals, India's macroeconomic situation has gradually improved: the twin deficits (current account and fiscal) have been narrowing and the growth-inflation mix has improved, and durably so. Both fiscal and monetary policies are more prudent, focusing on raising the quality and not just the rate of growth. The government has adopted an inflation-targeting framework that provides an institutional mechanism for inflation control, while modernising central banking. Fiscal policy has managed to stay mildly growth-focused, while managing a gradual reduction in the deficit. The upshot is that India's macroeconomic variables are a lot more stable, and with sufficiently large reserves, the economy is pretty resilient to any global shock today, than it was during the Taper Tantrum of 2013.

Rapid urbanisation, rising consumer aspirations and increasing digitisation, coupled with government support in the form of reforms and policies, are expected to support long term growth. As per IMF's forecasts India is likely to emerge as the fastest growing countries among major global economies during 2022.

Increasing per-capita GDP

Per-capita income is estimated to have grown 3.0% in fiscal 2020, compared with 5.5% in the preceding fiscal. This will be an enabler for domestic consumption. In fiscal 2021, per-capita income is expected to fall in line with the decline in GDP due to the pandemic. Further, lowering of GDP forecast for fiscal 2022 due to the 2nd Covid-19 wave will always have a bearing on the per-capita GDP. As per IMF estimates, India's per-capita income (at constant prices) is expected to grow at 6.7% CAGR between fiscals 2020 and 2025.

Per capita income	Level in FY21 (INR- '000)^		Growth at constant prices (%)							
	Current prices	Constant prices	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY25P
	146	100	6.1	6.6	6.9	5.6	5.5	3.1	-8.2	6.7*

Note: (*) - 5-year CAGR growth (FY20-FY25), as per IMF estimates of Apr 2021, (^) – provisional estimates by MoSPI, Jan 2021

Source: MoSPI, IMF, CRISIL Research

1.4 Contribution of various sectors to India's GDP

1.4.1 Services sector has been the main growth driver

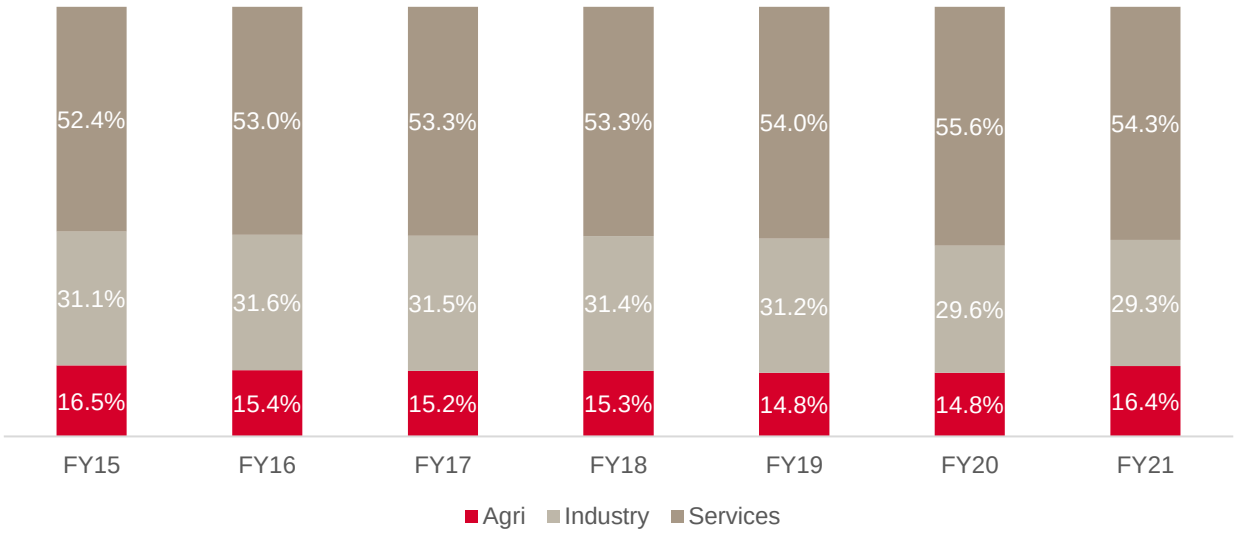
Services sector alone contributes ~55% of India's GDP. Over the fiscal 2015 to 2020 period services sector expanded at 7.7% CAGR increasing its share in overall GDP by from ~52.4% in fiscal 2015 to ~55.6% in fiscal 2020 and dipping to 54.3% in fiscal 2021 due to pandemic.

Industrial sector which is the second largest contributor maintained its share in GDP as the sector grew 7% CAGR over fiscal 2015 to 2019. Industrial contribution contracted in fiscal 2020 with the slowdown in economic development. Before the overall economic activity slowed down in fiscal 2020, growth in India's industrial sector output was supported by Government's make in India initiative, rising domestic consumption and implementation of GST. The government initiatives improved India's ranking in World Bank's ease of doing business ranking by from 142 in 2014 to 63 in 2019.

Economic slowdown was exacerbated in fiscal 2021 amidst the emergence of Covid-19 and the subsequent lockdowns. Services segment witnessed the biggest drop 8.4% y-o-y, followed by industry at 7.0% y-o-y. Agriculture sector was the only sector which clocked a positive growth of 3.6% y-o-y and restricted the drop in GDP.

In turn, during fiscal 2021, agriculture sector witnessed share expansion while services and industry share contracted during the year.

Share of sector in GVA at constant prices



Source: RBI; CRISIL Research

1.5 Review and outlook on Inflation

A sharp rise

Inflation based on the consumer price index (CPI) rose significantly to 5.6% on-year in December compared with 4.9% previous month and 4.6% in December 2020.

Wearing out of a favourable base (4.6% in December last year compared with 6.9% previous month) was the key factor bumping up the current inflation reading. This was especially for seen for food inflation, which more than doubled in December 2021 relative to previous month. Food inflation rose to 4% on-year compared with 1.9% in November and 3.4% in December 2020.

Non-food inflation moderated slightly relative to previous month. Fuel inflation moderated to 11% from 13.3% in November, but higher than 2.9% in December 2020. Core inflation also moderated to 6% from 6.2% in November.

How inflation in key items moved:

- Food and beverages inflation almost doubled to 4.5% on-year in December compared with 2.6% previous month. Important food items such as cereals, vegetables and milk, along with manufactured food products drove the rise. However, edible oils and certain protein items saw inflation ease during the month.
- Fuel inflation eased to 11% in December from 13.3% previous month. Declining electricity prices, coupled with slowing growth in liquefied petroleum gas (LPG) prices, contributed to the moderation.
- Core inflation, while staying beyond comfort zone, moderated to 6% from 6.2% previous month
    - The easing was mainly on account of lower transportation and communication inflation (9.7% in December versus 10% previous month), due to falling petrol and diesel prices. Falling global crude oil prices, coupled with reduced excise duties have reduced pressure on these fuels. Brent crude oil prices slid 8% on-month in December to $74.3 per barrel on average.

- Slight moderation was seen for recreation and amusement (7.4% vs 7.6%), health services (7.1% vs 7.3%), and housing (3.6% vs 3.7%)
- However, prices of other goods and services continued to rise, such as household goods and services (6.8% vs 6.4%), personal care and effects (3.7% vs 3.2%), and education services (3.3% vs 3.1%)

WPI inflation eases despite soaring food prices

Inflation based on the wholesale price index (WPI) moderated to 13.6% on-year in December 2021 from 14.2% in November, but was much higher than 2% in December 2020. Sequentially, WPI declined 0.2% on-month.

Lower fuel and core inflation drove the moderation in WPI. Fuel WPI inflation declined to 32.3% on-year in December from 39.8% in November, driven by petroleum products, while core WPI inflation fell to 12.5% from 13.9%. The key categories that eased the inflation were manufacturing of basic metals (22.2% vs 29.1%), textiles (16.8% vs 17.4%), and machinery and equipment (5.4% vs 6.1%).

However, food WPI surged to 9.2% on-year from 6.7%, driven by cereals (4.9% vs 3.8%), fruits and vegetables (25.6% vs 7.4%), condiments and spices (8.2% vs 3.3%), and coffee (21.4% vs 19.2%)

Inflation outlook

In the first 3 quarters of this fiscal, CPI inflation averaged 5.2%, compared with 6.6% in the same period last year. We expect it to move higher in the coming quarter, as the benefit from a high base wears off, especially for food inflation. In addition, non-food inflation will remain elevated given that cost pressures for producers continue to surge. This is reflected in WPI inflation staying in double-digits since April and reaching a record-high of 14.2% in November. The pass-through of cost pressures to selling prices, which has already been underway, is expected to gain momentum as domestic demand recovers in the coming months. That said, the impact of the third Covid wave on demand recovery will be a monitorable.

Going forward, while commodity prices are expected to stay elevated, they are unlikely to record as sharp a rise as seen last year. The reduced excise duties on petrol and diesel will limit rise in inflation to some extent. This is expected to limit further rise in rate of inflation next fiscal.

Due to these factors, we expect CPI inflation to average 5.5% in fiscal 2022 and 5% in fiscal 2023.

1.6 Crude oil price to remain elevated through 2022, stabilise in $40-45 range in the long term

Crude oil prices declined nearly 35% on-year to $42.3 per barrel in calendar year 2020, given the global oil demand contraction on account of Covid-19. The oil demand loss was substantial in Q2 of 2020. Thereafter, although global demand continued to contract, the momentum of decline reduced.

Crude oil prices remained elevated in $68-73 per barrel range in 2021 from $42.3 per barrel in 2020. In H1 2021, oil prices have already increased ~57% to $64.6 per barrel compared with $41 per barrel in H1 2020, led by continued restriction on production from OPEC+ members. Prices increased by further 70% on-year in Q3 2021 compared with Q3 2020 led by gradual recovery in oil demand. To add to this, prices of alternate fuels such as coal and natural gas have also increased given supply constraints. As a result, crude oil skyrocketed to over $80 per barrel

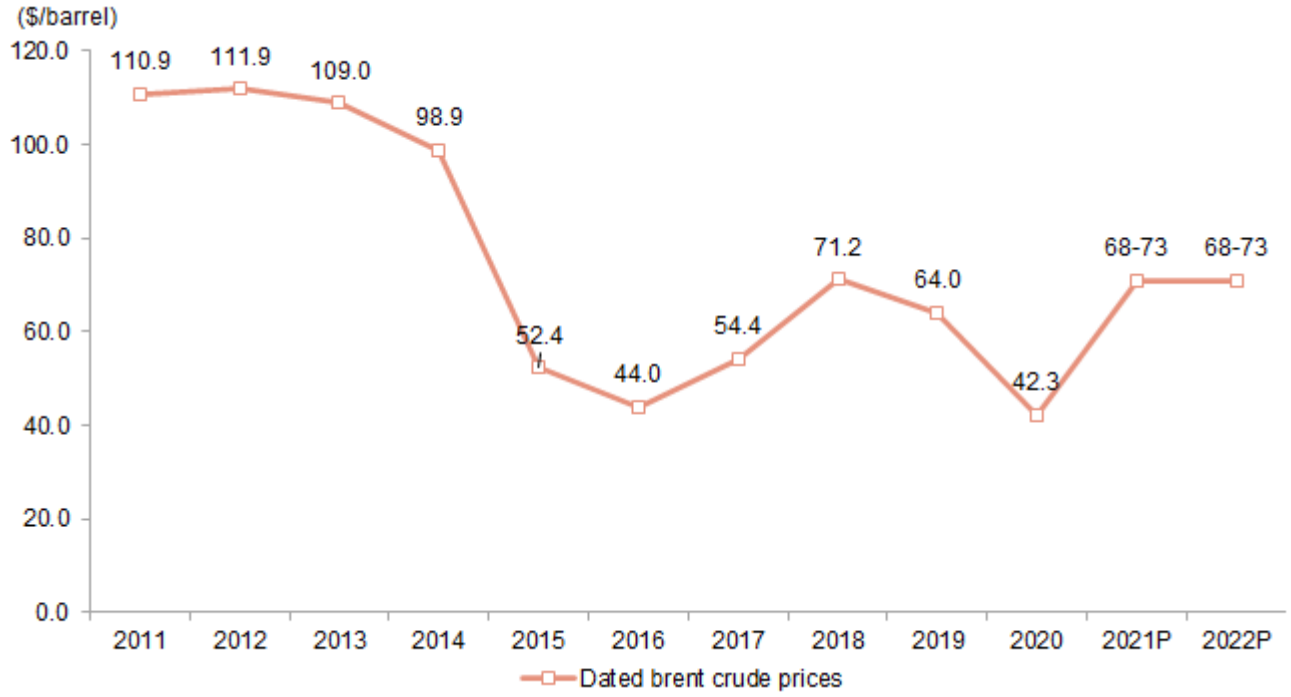
in O/ctober with shift from coal and gas for heating and power usage, demand for which is typically high during winter months.

On the other hand, crude oil prices fell for the second straight month in December owing to the virulent omicron variant. Brent crude averaged $74.3 per barrel in December, down 8% from $80.8 per barrel in November.

In CY 2022, while prices are expected to come down from current levels, they would continue to remain high and range at $68-73 per barrel, similar to the levels seen in 2021.

On the supply side, we expect oil production to increase 2-3 mbpd in 2021 taking the overall supply to 90-92 mbpd. This is against net production decline of 6.57 mbpd seen in 2020. As per the meeting in July 2021, OPEC+ members decided to increase supply by nearly 2 mbpd between August to December. However, despite the easing of supply, it continues to lag behind the demand growth, thus keeping oil prices elevated.

Crude oil price trend ($/barrel)



Source: Industry, CRISIL Research

In 2020, Covid-19 disrupted the global oil demand by 9.1 mbpd due to severe travel restrictions, supply chain disruptions and industrial output cuts. Now, with gradual easing of travel restrictions, global oil demand is expected to recover 5-6mbpd in 2021, thus taking the overall demand at 94-95 mbpd for the year. Demand at this level was last observed in 2016. Thus, as we can see, despite recovery in demand, Covid-19 has led to permanent loss in oil demand by 3-5 mbpd.

On the supply side, the production cuts discussed above could result in hikes in oil prices, however, we may see an increase in oil production from shale assets in the US as their cost of production becomes economically sustainable at above $50 per barrel.

Hence a combination of gradual demand pick-up due to vaccination, restricted supply, reducing inventory levels and increase in alternate fuel prices, is expected to drive oil prices higher to $68-73 per barrel in CY 2021. Production changes in Saudi Arabia, Russia and other oil producing nations such as the UAE, Libya and Nigeria as well as the US would remain the key monitorable for the year. Nevertheless, containment of Covid-19 as well as rollout of vaccines would also be important from the oil demand perspective.

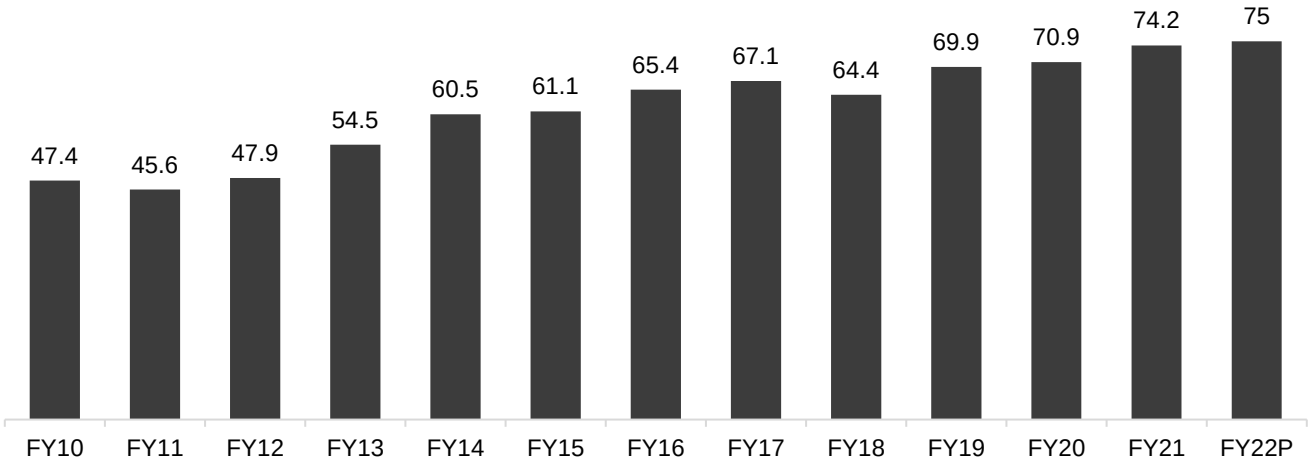
In the long term, we expect oil prices to decline to $40-45 per barrel over 2025 as increase in penetration of electric vehicles as well as rise in renewable capacities would keep global oil demand under check, which, in-turn, would put downward pressure on oil prices.

Along with the structural changes such as rising fuel efficiencies, shift to alternate fuels in the industrial and transportation segment and increasing popularity of electric vehicles, to put pressure on crude oil prices.

1.7 Rupee expected to weaken as second wave grips businesses

During the first wave of Covid-19, industrial production had come to a halt, exports had tanked and rupee exchange rate against the dollar had climbed to 76 in April 2020. The recovery that started in the third quarter of the fiscal was slow but encouraging. GST collection crossed Rs 1 lakh crore in September 2020. As the stock market zoomed on hopes of economic revival foreign investment flowed in and the rupee strengthened. The surge in cases and rise in imports balanced out. Exchange rate remained mostly stable around 73 mark in the last quarter of fiscal 2021.

Exchange rate INR-USD



Source – RBI, CRISIL Research

However, the second wave put downward pressure on the rupee. A steep surge in afflictions dampened investor sentiment. As states implemented localised lockdowns of varying severity, economic activity and industrial production again came to a halt. Widening of the trade deficit and increasing crude price added to the depreciation pressure. As the US ramps up its vaccination, the dollar index is expected to get a further boost putting more pressure on the rupee. Overall, despite expectation of high single-digit growth of the Indian economy in fiscal 2022, the rupee is likely to depreciate further to 75 due to weak economic momentum. US Fed's actions may weaken the rupee as they bring measures to contain inflation.

1.8 Auto finance

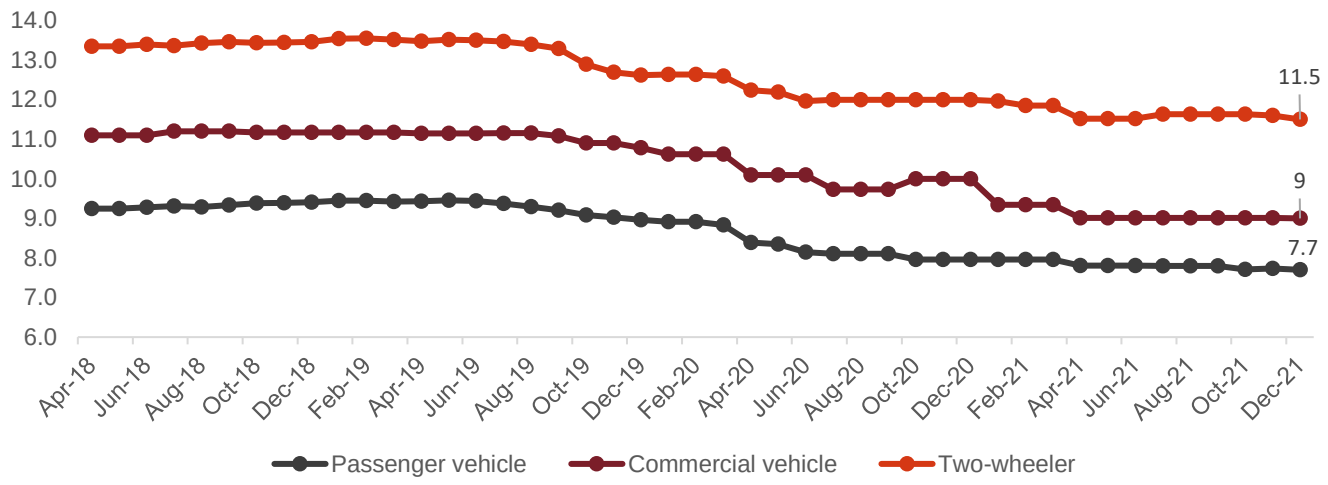
1.8.1 Rates on a downtrend

Yields in the auto finance segment have been declining over the past two-three years, due to softening of retail inflation and a fall in G-sec yields. With the implementation of the marginal cost of funds-based lending rate (MCLR) regime from April 1, 2016, auto finance rates have remained subdued, as banks have been forced to pass on benefits of softer interest rate to end-consumers. This has brought yields down 100-130 bps since fiscal 2015.

Auto finance rates have been on a downward trend as the RBI cut the repo rate by 40 bps over March 2020- June 2021. In fiscal 2021, passenger vehicle (PV) and commercial vehicle (CV) finance rates softened significantly due to the pandemic. Two-wheeler financing rates, however, dropped by a lesser extent, given the relatively humble credit profile of customers. In fiscal 22, financing rates remained competitive with improvement in economy as well as subdued repo rates.

During December 2021, RBI kept the repo rate unchanged at 4%.

Average auto finance rates offered by banks (%)



Source: Industry, CRISIL Research

Lower rates attract more buyers. Attractive interest rates bring down the costs for the buyer generating a positive impact on the sector.

1.8.2 Gradual economic revival to drive disbursements in fiscal 2022

Auto finance disbursement showed better-than-expected revival in the latter half of fiscal 2021. Most sub-segments witnessed underlying asset sales recovering to pre-Covid levels. Two-wheeler and passenger vehicle segments gained on account of pent-up demand and increased preference for personal mobility as lockdowns were lifted and people were wary of using public transport. In the CV segment, while sales of medium and heavy commercial vehicles (M&HCV) and buses remain tepid, that of light commercial vehicles (LCV) are improving.

In the current fiscal, a gradual improvement in consumer confidence on expectations of a faster economic growth will revive vehicle sales. Consumer preference for own vehicle for personal mobility supported by lower financing costs and new model launches are also likely to support underlying demand for PVs. Overall, PV loan

disbursements are expected to see a ~17-21% growth. The chip shortage, however, has posed challenges as OEMs' supply chain challenges heightened.

In case of CVs, too, disbursement is expected to pick up this fiscal as economic recovery will lead to an increase in private consumption and freight demand. As collections improve amid demand revival, lenders' risk aversion is also likely to decline. Replacement demand is also likely to pick up. Overall, new CV loan disbursements are projected to grow 30-35% this fiscal.

Disbursements in the two-wheeler segment are expected to increase 2-6% in fiscal 2022. Due to loss in income on account of pandemic and lockdown, demand for two-wheeler has seen a hit. Motorcycle, whose demand comes more from the rural front, saw a decline in sales on a Y-o-Y basis in the festive months. This can be attributed to irregular rainfalls in many rural pockets affecting farmers income. According to industry sources, people have chosen to postpone their purchases by a quarter or two, until the fuel and vehicle prices moderate.

YoY growth in auto finance disbursement (%)

Segment	FY18	FY19	FY20	FY21	FY22E
PV – new	17%	9%	-9%	-15%	17-21%
CV – new	37%	22%	-36%	-28%	30-35%
Two-wheelers	31%	17%	-2%	-10%	2-6%

Source: Industry, CRISIL Research

1.9 Impact of Government policies on automobile industry

Decline in interest rates

Reserve Bank of India (RBI) has maintained an accommodative stance to mitigate the impact of Covid-19 pandemic and have kept repo rate at 4%. This has helped financial institutions to reduce automobile interest rates.

Major banks have reduced their interest rate to the tune of 100-150 bps in fiscal 2021 as compared to last year.

Fuel prices crossing Rs 100

Fuel prices (petrol as well as diesel) in the last few months has increased massively for the vehicle owners. It has dented the consumer sentiment hurting auto sales. The Rs 100 per litre barrier breaching petrol and diesel prices in several cities across India has impacted sale of passenger vehicles and two-wheelers.

Not just the crude oil prices but the high tax rate imposed by central and state governments too have contributed to fuel price hike. If petrol/diesel is brought under the purview of GST, it will help reducing the fuel costs.

Higher procurement and Minimum Support Price (MSP) to support agricultural activities

Record high procurement of wheat for Rabi 2021-2022 is expected to benefit the farmers in the first half of fiscal 2022. Procurement improved in fiscal 2021 due to lifting of food grains by state governments under Pradhan Mantri Garib Kalyan Ann Yojana (PMGKAY) under which food grain is being distributed free of cost for 3 months to about 80 crore beneficiaries across the country to be beneficial for the industry.

The government's renewed thrust on enhancing irrigation intensity and making the nation more drought-proof is expected to support agriculture growth and increase mechanisation. Irrigation investments to increase at a CAGR (FY20-25) of 4-6%.

The government's objective of doubling farm income by 2022 via initiatives such as e-NAM (National Agriculture Market), expansion of crop insurance coverage, direct income support and improvement in land productivity via soil health cards. These measures should improve farmers' crop yields and affordability and boost rural sentiments and hence the tractor sales.

Scrappage Policy

In August 2018, the Ministry of Road Transport and Highways considered incentivising the scrapping of vehicles sold before April 2005 (15 years old). The final policy is under consideration.

Once implemented, the policy will help reduce replacement cycles and provide an additional traction to auto demand especially CVs.

Union Budget 2022-23

Key announcements:

- A battery swapping policy will be introduced with focus on interoperability standards
- Energy storage systems, including dense charging infrastructure and grid-scale battery systems, will be included in the harmonised list of infrastructure
- Allocation for the National Highways Authority of India (NHAI) and the Pradhan Mantri Gram Sadak Yojana (PMGSY) has been increased by ~3% and ~36%, respectively, versus fiscal 2022RE

Impact:

- Given that batteries account for ~40% of the cost of an electric vehicle (EV), standardising battery swapping infrastructure will accelerate economies of scale and hasten EV adoption, which currently stands at less than 1% for the automobile segments
- Battery swapping and interoperability will propel EV adoption for commercial use (three-wheelers, taxis and light commercial vehicles), as this would reduce waiting time for charging, enabling higher asset utilisation and supporting operator profitability
    - This could also provide impetus to newer business models, wherein vehicles can be sold without fixed batteries, and batteries can be availed on a pay per basis. This is expected to reduce acquisition cost for buyers
- Inclusion of energy storage systems in the harmonised infrastructure list would reduce borrowing cost for charging service providers and battery swapping entities
- Spends on roads maintained at the high level seen in 2022, with 3% incremental allocation, which is expected to support sales of medium and heavy commercial vehicles
- For PMGSY, while allocation has increased by a meaningful 36%, the achievement ratio over the past few years has not crossed 70%, so the benefits could be limited

1.10 Impact of PLI on automotive industry

The government has budgeted ~Rs 1.7 lakh crore as production-linked incentives to local manufacturing units in 13 key sectors. The key sectors likely to benefit from the scheme include: automobiles, pharma, telecom, electronics, food, textiles, steel and energy. By incentivising production, subject to achieving the desired scale, the scheme aims to spawn a handful of globally competitive large-scale manufacturing units in the identified sectors. Furthermore, the government also hopes to reduce India's dependence on raw material imports from China. The scheme is expected to provide a boost to economic growth over the medium term and create more employment opportunities, as many of these sectors are labour-intensive in nature.

Sector	Segment	Budgeted (Rs crore) *	
Automobiles	Advance chemistry cell (ACC) battery	18,100	44,038
	Automobiles and auto components	25,938	
Electronics	Mobile manufacturing and specified electronic components	40,951	52,189
	Electronic/technology products	5,000	
	White goods (ACs & LED)	6,238	
Pharma and medical equipment	Critical key starting materials/drug intermediaries and active pharmaceutical ingredients	6,940	25,360
	Manufacturing of medical devices.	3,420	
	Pharmaceuticals drugs	15,000	
Telecom	Telecom & networking products	12,195	12,195
Food	Food products	10,900	10,900
Textile	Textile products: man-made fibre (MMF) and technical textiles	10,683	10,683
Steel	Speciality steel	6,322	6,322
Energy	High efficiency solar PV modules	4,500	4,500
Total			**1,66,187**

**Approved financial outlay over a five-year period*

Source: Government websites, CRISIL Research

The PLI scheme for the automotive industry intends to promote high-tech green manufacturing such as electric and hydrogen fuel cell vehicles. This scheme excludes conventional petrol, diesel, and CNG segments (Internal Combustion Engine) since these segments have sufficient capacity in India.

The PLI scheme targeting auto parts include the following component schemes:

- Champion Original Equipment Manufacturers (OEM) Scheme: It is a sales value linked plan, applicable to battery electric and hydrogen fuel cell vehicles of all segments.
- Champion Incentive Scheme: It is a sales value linked plan for advanced technology components, complete and semi-knocked down (CKD/SKD) kits, vehicle aggregates of two-wheelers, three-wheelers, passenger vehicles, commercial vehicles and tractors, including automobiles meant for military use and any other

advanced automotive technology components prescribed by the Ministry of Heavy Industries – depending upon technical developments.

1.11 Impact of global political, trade environment on Indian economy and Indian enterprises

India-US trade talks

India-US trade pacts are off the table for now, USA had communicated in Aug 2021 to India that it is not interested in a free trade agreement (FTA). India was pulled out of the U.S.'s Generalised System of Preferences (GSP) that granted some tariff relief to its exports by the Trump government in 2019.

The Government will now seek to work on market access issues on both sides, lowering of non-tariff barriers, mutual recognition pacts and adopting common quality standards can also help Indian exports in the interim. There is a possibility that even these issues, which include providing access to U.S. agricultural products or easing import duties on automobiles, etc., would have to be discussed afresh.

Regional Comprehensive Economic Partnership (RCEP)

It is a multilateral FTA between Australia, China, Japan, New Zealand, South Korea, and member states of the Association of Southeast Asian Nations (ASEAN, composed of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam). The 15 member states account for about 30% of the world's population and nearly 30% of global GDP.

On Nov 2019, India decided to opt out of RCEP in the middle of the negotiations. India has trade deficit with most of the RCEP members and the content of the RCEP deal did not provide protection for the Indian economy.

Japan and the other RCEP member states have strongly desired India to come back and join the FTA. From a Japanese perspective, India's return to RCEP would contribute to strengthening the Australia-India-Japan security network vis-à-vis the rising Chinese military presence in the Indo-Pacific region. Hence, the Japanese government has consistently encouraged India to return to the RCEP framework, stating that joining RCEP is in India's interests and would help the entire region prosper.

Anti-Dumping duty on China

To protect domestic industries from cheap imports, India has levied anti-dumping or countervailing duties on various products imported from China. Recently in Jan 2021, India has imposed anti-dumping duty on 99 Chinese products which include chemicals and petrochemicals, fibres and yarn, machinery items, pharmaceutical, rubber and steel items.

1.12 Assessment of any other local and global factor which has bearing on prospects for Indian economy or entities

Expected FTA agreements

Due to coronavirus pandemic that has upended the economy and concerns of being shut out from global markets due to developing protectionism attitude across nations, India is fast-tracking negotiations with the United Arab Emirates, Britain, Australia, Canada and the European Union.

India is aiming to conclude an early harvest trade deal, seen as a precursor to an FTA, with Australia by December 2021, while continuing negotiations for a Bilateral Comprehensive Economic Cooperation Agreement. Early harvest agreements allow countries to avoid contentious issues and negotiate tariff reductions on select items.

Since the Covid-19 outbreak, India along with Japan has also been working closely with Australia on a resilient supply chain initiative, which seeks to reduce dependence on China.

India is also working with Britain on an early harvest deal, while India-EU trade talks are set to resume, over five years after they were stalled.

In all, India is currently negotiating 20 FTAs and early harvest deals.

The US-China trade war and the Covid-19 pandemic has laid the need for companies to diversify supply chains outside of China. This has given rise to the “China plus one” strategy, in which multinational firms are moving to other countries, in addition to China. India is expected to be one of the promising nations for diversification by such firms

Such trade agreements and China plus one strategy, is expected to strengthen India’s place as a manufacturing hub and have a bigger role in global value chain.

China USA trade talks

According to Peterson Institute of International Economics (PIIE), the average import tariff on Chinese products in USA stands at 19.3% whereas for rest of the world it stands at 3.0%. Similarly, the average import tariff on products from USA in China stands at 20.7% whereas for rest of the world it stands at 6.1%. From Jan 2018 onwards, Donald Trump under his “America First” economic policy, shifted from multilateral trade agreement to bilateral trade agreement to reduce trade deficit.

Trump imposed tariffs on solar panels and washing machines of 30 to 50%. In March 2018 he imposed tariffs on steel (25%) and aluminum (10%) from most countries. In separate moves, the Trump administration has set and escalated tariffs on goods imported from China, leading to a trade war. Currently the tariff on Chinese goods ranges between 7.5% to 25%.

Joe Biden has not taken yet taken any steps on the tariff duty levied by Trump’s administration on China. US tariffs have therefore resulted in reduce imports from China, while US companies actually bought more from other countries. US companies are bearing the brunt, since their input cost have gone up. Higher tariffs on Chinese goods in US has therefore improved cost competitiveness of suppliers from competing trade partners including India.

2 Review and outlook of automobile industry

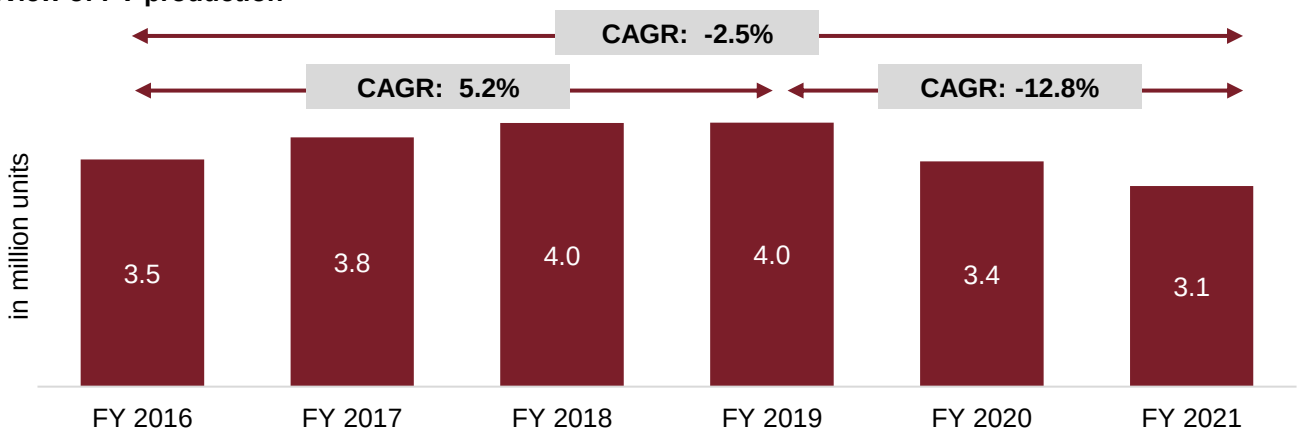
2.1 Review of and outlook on the Indian passenger vehicle industry

2.1.1 Review of the Indian passenger vehicle industry (fiscals 2016 – 2021)

Historical production development (fiscals 2016- 2021)

Production of passenger vehicles (PVs) in India recorded a healthy growth of 5.2% CAGR between fiscals 2016 and 2019 due to a spurt in domestic and exports demand. Domestic demand was driven by expansion in the addressable market, development of infrastructure, and stable cost of vehicle ownership, as crude oil prices remained low except in the few months when output was reduced due to sanctions imposed on Iran.

Review of PV production



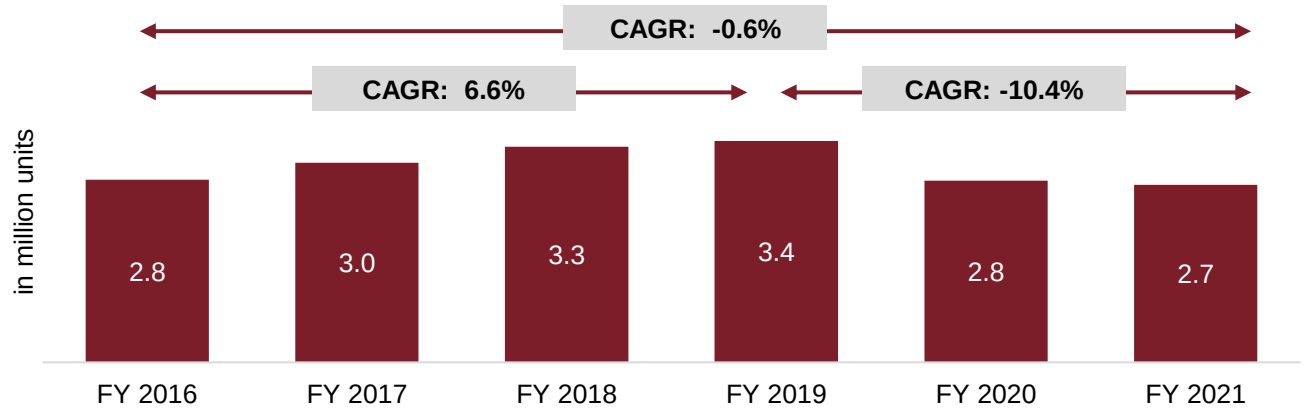
Source: SIAM- Society of Indian Automobile Manufacturers, CRISIL Research

Demonetisation and implementation of the Goods and Services Tax (GST) resulted in the weakening of the economy. Further coupled with emission and safety norms introduced by the government of India resulted in very sluggish growth in the PV industry after fiscal 2018. Production in fiscal 2019 remained flat, with India producing 4.03 million PVs, of which 3.38 million vehicles were sold in the domestic market and 0.68 million were exported.

In fiscal 2020, lower private consumption and inventory adjustment because of a change in emission norms from BS IV to BS VI, liquidity crisis, and the onset of COVID-19 resulted in a decline of 15% in production. Domestic sales fell 18%, whereas exports remained flat.

As COVID-19 spreads through close contact, the use of public transportation and shared mobility services expected to be impacted currently. This has given a boost to personal mobility. Despite real GDP likely to contract 7.5% in fiscal 2021, PV production declined by ~11%— domestic sales declined by ~2% whereas exports declined sharply by ~39%.

Review of PV domestic sales

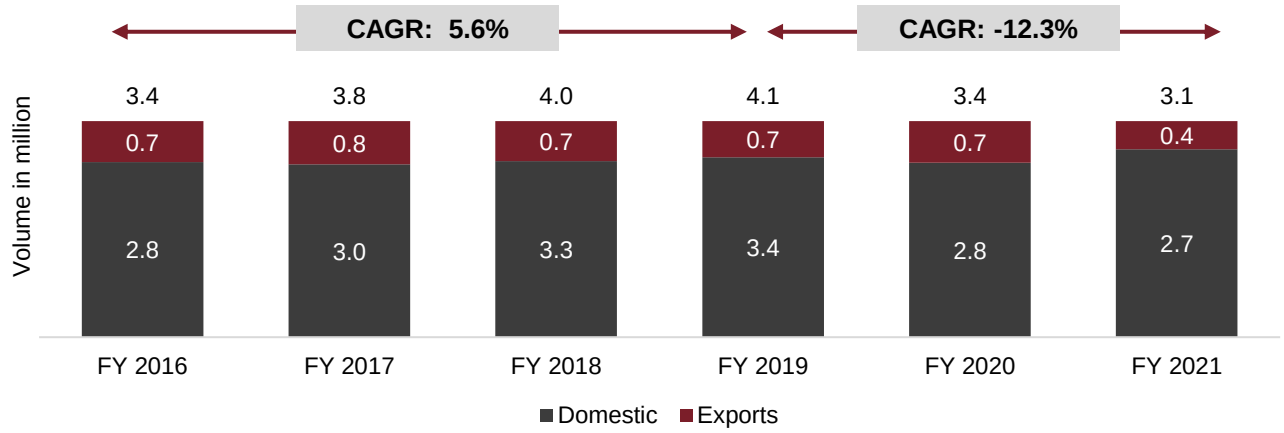


Source: SIAM- Society of Indian Automobile Manufacturers, CRISIL Research

Split by domestic sales and exports

The Indian PV industry is focused on the domestic market, with nearly 81-83% of the demand stemming from the domestic market. The ratio of exports-to-total sales for the industry has been in the 17-19% range. However, this ratio dropped to 13% in fiscal 2021 due to a slowdown in the global automobile industry as well as major OEMs focusing on serving domestic markets over foreign markets amidst the increase in demand for personal mobility & the supply constraints faced during the pandemic.

PV industry split by domestic sales and exports



Source: SIAM, CRISIL Research

The domestic PV industry grew at 6.6% CAGR between fiscals 2016 and 2019, led by strong growth in utility vehicles (UVs), which rose at 14.9% CAGR versus cars, which grew at 3.1% CAGR during the same period. Improving economic scenario, higher affordability, and new model launches drove demand during this period.

Domestic demand fell 18% on year in fiscal 2020 because of lower consumer sentiments due to slowing down of economy and inventory correction due to a change in emission norms. Moreover, acquisition costs increased due to implementation of safety norms such as mandatory anti-lock braking system (ABS), airbags, etc. and due to change in emission norms.

On the other hand, during fiscal 2021, the shift towards personal mobility to maintain social distancing aided PV sales. There was a strong traction for personal passenger vehicles. However, vehicle supply was severely impacted amidst the pandemic and subsequent lockdowns. In turn, industry witnessed a 2% drop in sales during the fiscal 2021.

PV exports from India remained range bound with ~1.2% CAGR between fiscals 2016 and 2019, supported by UV exports, which grew at a CAGR of 10.5%, while car exports fell at 1.2% CAGR during this period.

Due to traction in the domestic market, leading PV OEMs largely catered to domestic demand. Hyundai shifted its export base to Turkey and the Czech Republic in fiscal 2013, thereby reducing its exports from India. Also, industry behemoth Maruti Suzuki's capacity constraints had put pressure on exports growth. In fiscal 2018, teething problems in GST implementation, such as delayed refunds to exporters, leading to a substantial amount of their money being tied up, affected the exports business.

Contraction of the PV market in few developed nations led to a decline in exports post fiscal 2018. Moreover, amidst the strong traction from the domestic market, OEMs focussed more on the domestic market vis a vis exports market. In fiscal 2021, exports saw a sharp decline of ~39% due to global demand contraction amidst the pandemic, supply constraints, and higher focus of OEMs on the domestic market.

Split of industry production volume by PV segments

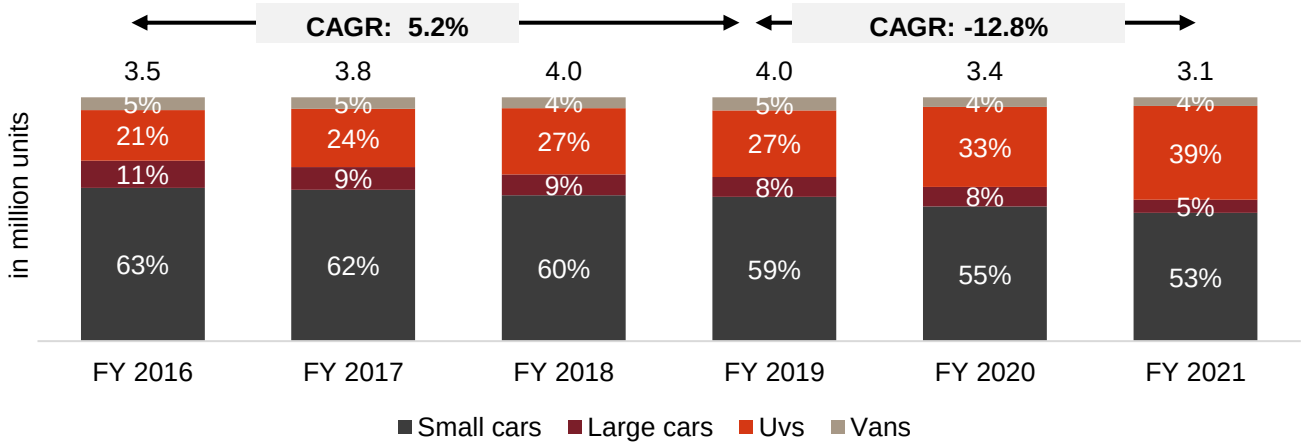
Small cars have a major share in total PV domestic volumes, as their lower ticket size makes them affordable to the average Indian consumer and ideal for first-time car buyers. The UV segment, which traditionally appealed to customers who valued larger seating capacity and ability to drive on rough rural roads, witnessed a major shift in customer preference with the launch of compact UVs. The size of large car segment has gradually shrunk, mainly due to shift in customer preference towards SUV segment, few model launches and availability of high end technology features in SUV segment as compared to large car segment.

In fiscal 2020, new model launches and entry of new players such as Korea's Kia Motors and China's MG Motors (part of SAIC) further increased the number of players and models and intensified competition mainly in compact UV segment.

Vans segment registered a decline in fiscal 2020 due to heavy pre-buying in fiscal 2019 because of hike in prices on account of various safety and crash test norms as well as exit of *Omni* and declining sales of remaining models. Maruti dominates this segment, with more than 85% market share.

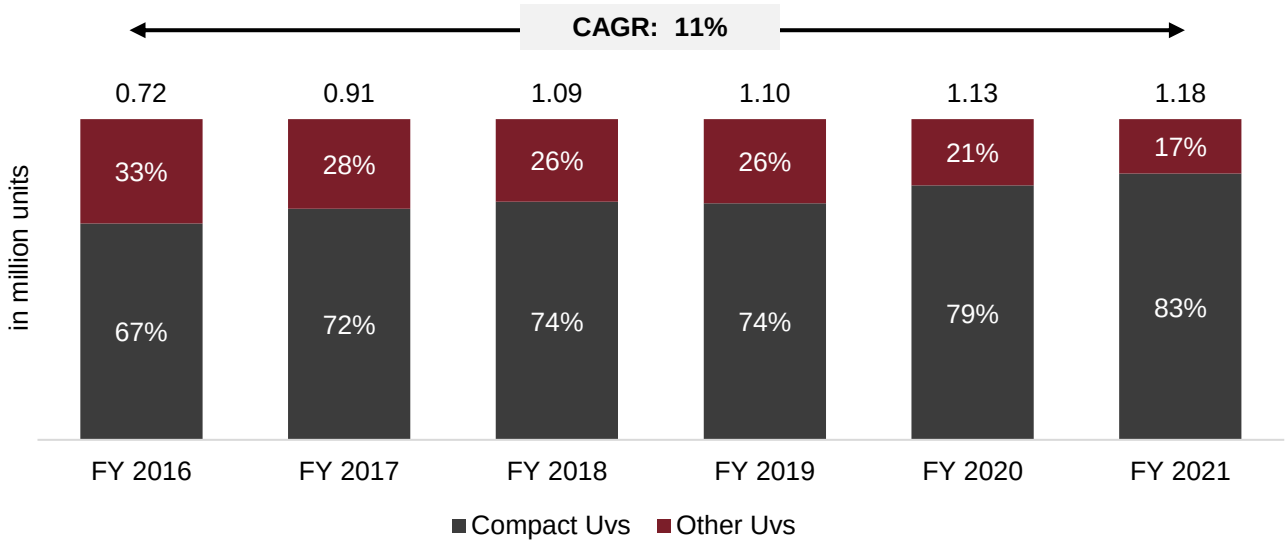
Unlike most developed economies and some developing nations, India's car market is highly underpenetrated. As of fiscal 2020, India had ~24 PVs per 1,000 people. This is significantly lower than both developed nations and even other nations in the BRIC block (Brazil, Russia, and China), based on per-capita GDP. Brazil, Russia and China has 173, 307 and 99 passenger vehicles per 1,000 people respectively in 2015. Thus, the country holds tremendous potential for automobile manufacturers. Also, in the penetration of cars and UVs with per-capita GDP across countries, India still lags behind most countries, and CRISIL Research expects the gap to reduce gradually after a decline in fiscal 2021.

PV production split by vehicle segments



Source: SIAM, CRISIL Research

UV (Compact UV versus other UVs) production development



Note: Compact UV comprise of UVC and UV1, UV2 to UV5 is considered under Other UVs

Source: SIAM, CRISIL Research

Share of UVs has increased in the total PV industry. Its share in PV production has increased from 21% in fiscal 2016 to 39% in fiscal 2021. Within UVs, compact UVs has gained higher share from 67% in fiscal 2016 to 83% in fiscal 2021. In the case of the UV segment, which traditionally appealed to those valuing larger seating capacity and the vehicle's ability to drive on rough, rural roads, there has been a major shift in customer preference with the launch of compact UVs. The launch of Venue, Seltos, Magnite, Triber, XUV 300, etc in fiscal 2020 significantly aided this. New models launched in compact UVs continued to perform well in the first half of fiscal 2022.

The share of compact UV's has been increasing year by year led by major model launches and traction in this segment due to their superior features, capabilities at affordable prices. Models such as Creta, Ecosport, Sonet, Vitara Brezza, Jimny, Venue, Kiger etc. are leading in the demand to regions such as Latin America, African and Middle East countries.

Key Players in Compact UV segment (Production split)

Companies	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
Maruti Suzuki India	14%	23%	24%	24%	22%	21%
Hyundai Motors India	12%	16%	15%	15%	20%	21%
Kia Motors	0%	0%	0%	0%	10%	16%
Mahindra & Mahindra	32%	25%	22%	23%	16%	14%
Tata Motors	3%	2%	5%	7%	5%	7%
Ford India	18%	15%	14%	13%	11%	6%
Renault India	4%	3%	2%	2%	4%	4%
Toyota Kirloskar Motor	10%	10%	9%	9%	6%	4%
MG Motor India	0%	0%	0%	0%	2%	3%
Others	7%	6%	10%	7%	3%	3%

Source: SIAM, CRISIL Research

Due to higher traction in UV segment, players have started to focus more on this segment. Maruti has the highest share in production at 21% in fiscal 2021 from 14% in fiscal 2016. Models such as Vitara Brezza, Ertiga, XL6 has aided this growth. For Hyundai, high demand for models such as Creta and Venue has supported it share in UV segment. Share of new players such as Kia stands at 16% as on fiscal 2021.

Key historical regulatory/macroeconomic trends and growth drivers for domestic sales and exports

Demonetisation

Demonetisation had little impact on PV sales because dealers resorted to alternate sources of cash such as cheques, cards, and e-wallets to buy vehicles. However, due to the negative overall economic sentiment, the industry recorded flat growth in November and December 2016.

Implementation of GST

There has been no change in GST rates in the budget. Overall, slightly lower GST rates did not lead to a major disruption in the industry.

BS-IV to BS-VI transition

BS emission standards are issued by the government to regulate the output of air pollutants from motor vehicles. In January 2016, the central government decided to skip BS-V and shift directly to BS-VI norms. It fixed the deadline at April 1, 2020 for the introduction of BS-VI emission norms.

BS-VI regulations demand major reduction in PM and NOx levels

Type of Vehicle	Unit	BS IV	BS VI	Change
Diesel				
HC	gm/km	0.3	0.17	**-43%**
NOx	gm/km	0.25	0.08	**-68%**
PM	gm/km	0.025	0.0045	**-82%**
Petrol				
NOx	gm/km	0.08	0.06	**-25%**
PM	gm/km	-	0.0045	**Newly added**

Note: HC, NOx, PM refer to pollutants from vehicle exhaust; HC- Hydrocarbon, NOx- Nitrogen oxides, PM- Particulate matter

BS-VI compliant PV price increased 2-4%. Diesel variants became costlier than other fuel variants. Adding of various devices and systems to reduce emission levels adversely affected prices.

Addition of devices and subsystems in BS-VI compliant vehicle

Pollutant	Devices / Subsystems to be included to reduce the Pollutants
NOX- Nitrous oxide	▪Exhaust Gas Recirculation ▪Selective Catalytic Reduction ▪3 way catalyst ▪Lean NOx Trap
HC- Hydrocarbons	▪Secondary Air Injection ▪3 way catalyst ▪Diesel Oxidation Catalyst ▪Purge Control Valve ▪Canister
PM- Particulate matter	▪Diesel Particulate Filter ▪Gasoline Particulate Filter

Safety norms

As per the Bharat New Vehicle Safety Assessment Programme (BNVSAP), introduced from October 2017, new cars sold in India go through mandatory crash testing and comply with voluntary star ratings based on results.

The car testing protocols under regulations are as follows:

- Frontal offset testing (64 Km p/h proposed)
- Side impact testing
- Pedestrian protection testing
- Rear impact testing

While the full frontal crash test was already implemented for new car models and LMV of GVW <1500 kg, the test got implemented for all car models from October 1, 2019. As per the rules, the car has to go through tests pertaining to full frontal crash test, 40% overall offset frontal crash test, and test of moving deformable barrier crash

perpendicular into a stationary vehicle. A test pertaining to pedestrian body forms being impacted on the hood of the vehicle was implemented from October 1, 2018 for new car models. Points are awarded to the car based on safety features in the car such as ABS, seat-belt reminders, child lock, and electronic stability control (ESC). The government is also considering making ESC and autonomous emergency braking (AEB) mandatory on all models from fiscal 2023.

Other safety system includes a mandatory air bag for the driver. Government proposes mandatory airbags for the front passenger on all the cars. For new models, the front passenger airbag has been made mandatory from April 1, 2021, while for models presently being sold in the market it is mandatory from June 1, 2021 according to the notification issued by the government.

Government is also considering making 6 airbags mandatory for vehicles carrying up to 8 passengers.

Some other safety measures are as follows:

- Seat-belt reminders
- Alert systems for speeds beyond 80 kmph
- Reverse parking alerts
- Manual override over the central locking system for emergencies

MEIS scheme to be replaced by RoDTEP

The central government has decided to discontinue the MEIS (Merchandise Exports from India Scheme) scheme from January 1, 2021, as it is not compliant with World Trade Organization norms. Exporters will then be reimbursed the duty paid on inputs through the new Remission of Duties or Taxes on Export Products (RoDTEP) scheme, the scheme was notified on Aug 17th 2021. Rates for automobile and auto components range between 0.5-2%.

Current penetration of Electric PVs

Current EV penetration in passenger vehicle category is miniscule (0.16% as on fiscal 2021) due to unavailability of affordable electric cars and charging stations leading to range anxiety. However, fiscal 2021 saw robust sales of e-Nexon.

Electric vehicle models currently available

Company	Model	Ex Showroom price	Features
Mahindra	E verito	9.5-10 Lakhs	21.2 kWh battery with range of 180 km
Mahindra	eKUV 100	8-8.5 Lakhs	15.9 kWh battery with range of 147 km
Tata	Tigor EV	11.5-12	16.2 kWh battery with range of 140 km
Tata	Nexon EV	13.5-14.5	30.2 kWh battery with range of 312 km
Hyundai	Kona	23.5-24	39.2 kWh battery with range of 452 km
MG	ZS EV	20.5-21	44.5 kWh battery with range of 340 km
BYD	E6	29-30 lakh	71.7 kWh battery with range of 415 km

Source: CRISIL Research

Historic growth drivers for Indian passenger vehicle exports

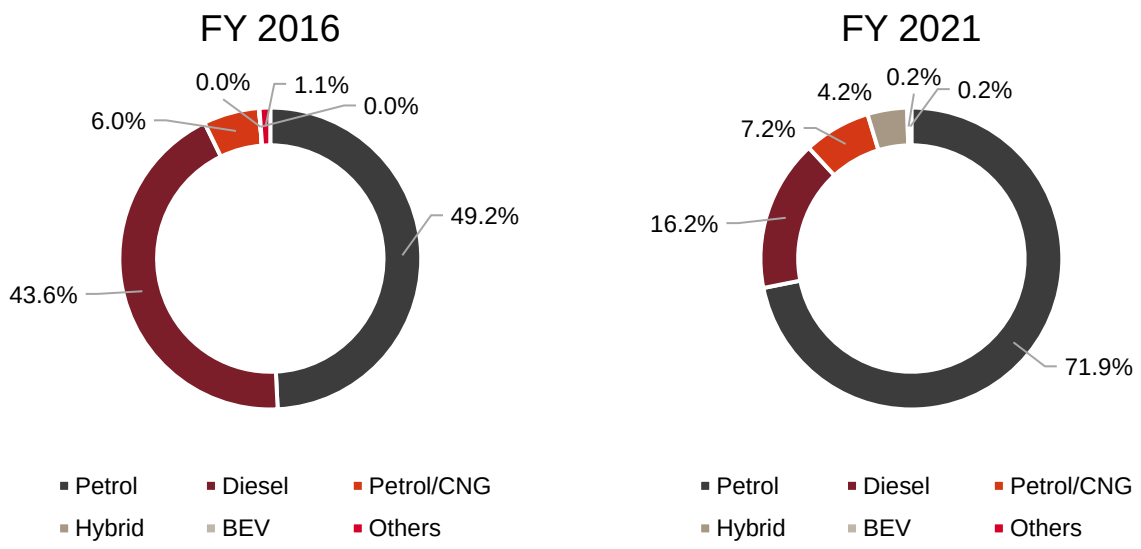
The US, which had nil share till fiscal 2018, has ~10% volume share as of fiscal 2020, estimated to be mainly driven by exports of the Ford Ecosport.

PV exports to African and Middle Eastern countries currently account for ~42% of overall exports in fiscal 2020, compared with ~29% in fiscal 2016. The African economy, which is largely dependent on commodities such as chrome, manganese, vanadium, precious metals and crude, to name a few, was hit in 2015 and 2016 when commodity prices crashed. India's exports to Africa declined to 19% in fiscal 2016 from 15% in fiscal 2017.

Exports to South Africa, Italy, the UAE, Saudi Arabia, Peru and Bolivia also witnessed growth in fiscal 2020 with the launch of new models like the Hyundai Venue, Maruti S-Presso, Renault Triber and Kia Seltos.

However, the outbreak of the pandemic has severely impacted exports across the globe leading to exports declining by 39% yoy in fiscal 2021.

Split of PV production by powertrain type



NOTE: BEV - Battery-powered Electric Vehicle
SOURCE: MoRTH, Crisil Research

Share of petrol, CNG and electric vehicles have increased in last 5 years. Change in powertrain mix can be attributed to changes in emission norms such as migration from BS-IV to BS-VI from April 2020 onwards. Diesel variant saw the sharpest decline, due to majority of the manufacturer phasing out diesel variants on account of increase in the cost of the vehicle due to BS-VI and making them unviable. Traction in CNG variants was seen due to better cost economics as compared to other fuel type. As per MoRTH data, petrol accounted for ~71.9% of sales in fiscal 2021 followed by 16.2%, 7.2%, 4.2%, 0.2%, 0.2% of diesel, petrol/ CNG, hybrid, BEV vehicles etc.

Split of PV production by transmission type

Power from engine to the wheels are translated using transmission components in a vehicle. There are various types of transmissions available depending upon level of automation in the transmitting power from engine to the wheels. In Manual transmission (MT) vehicles, there is clutch and a gear shifter which a driver uses to manually change gears. In such vehicles fuel efficiency is dependent upon the skill of the driver shift gears at appropriate engine revolutions per minute. Driving vehicles with manual transmissions especially prove tiresome in heavy traffic conditions. To reduce strain of drivers, transmission system technologies such as semi- automatic and fully automatic transmission have come up over the years. These technologies differ in terms of their level of automation, thereby achieving differential reduction in driving strain.

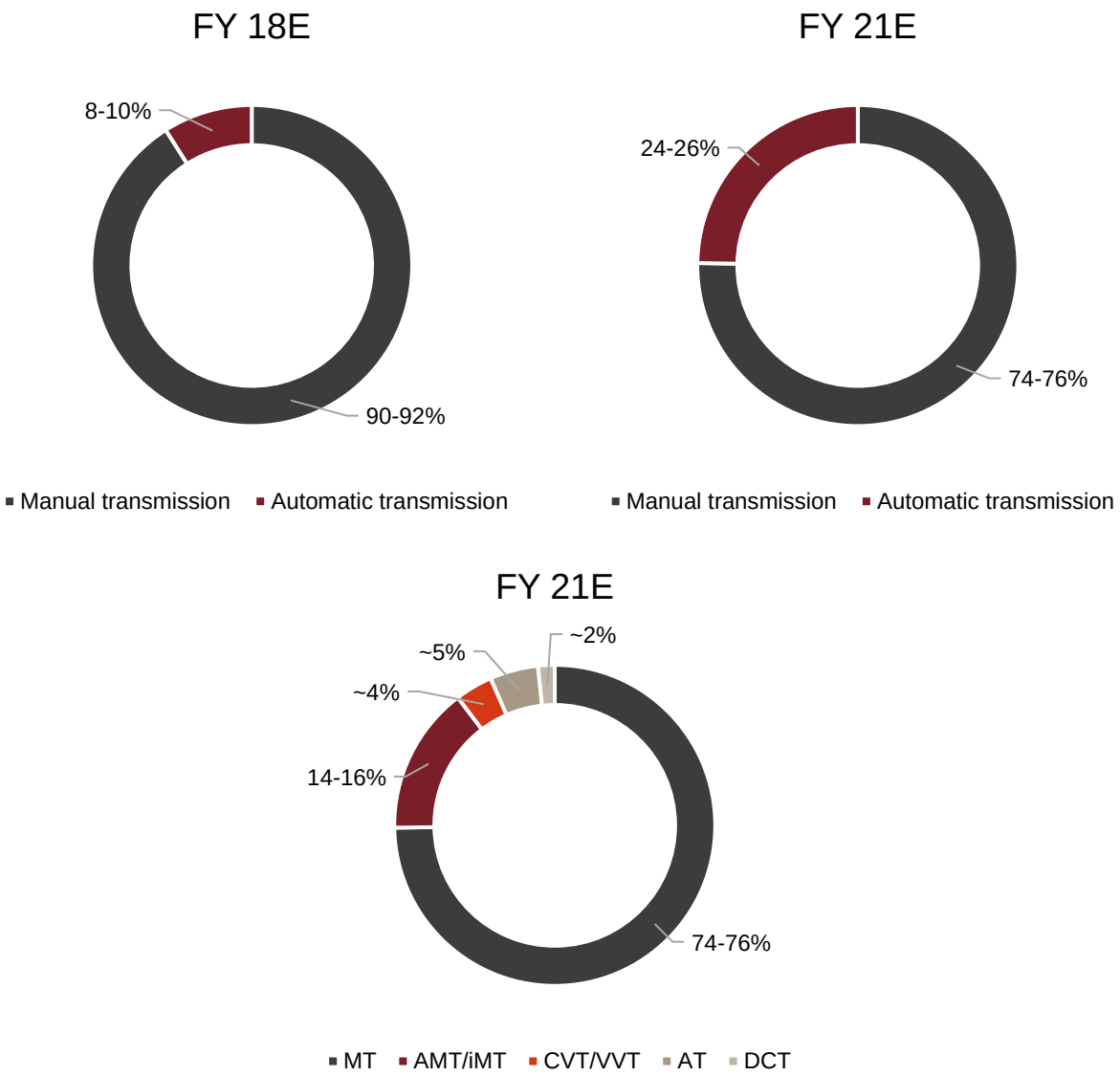
In semi-automatic transmission, transmission technologies such as Automated Manual Transmission (AMT) and Intelligent Manual Transmission (iMT) are available. In AMT, in place of a gear lever and a clutch pedal inside the cabin of the car, which are manually operated by the driver, the AMT transmission has a hydraulic actuator system mounted inside the engine which operates both. The actuators of the AMT system are linked to the ECU of the car. Whereas iMT is a clutchless transmission, here the driver has to manually shift the gears, whereas the operating of clutch is done by automatically by sensors and software.

Fully automatic transmission doesn't require a manual shifting by the driver. Examples of fully automatic transmission includes Automatic Transmission (AT), Dual Clutch Transmission (DCT) and Continuously variable transmission (CVT). DCT uses two clutches, one clutch operates the even gears (2, 4 and 6) and the other clutch operates the odd gears (1, 3, 5 and reverse). A DCT uses clutch packs rather than the torque converter used by traditional (hydraulic) automatic transmissions. Continuously variable transmission (CVT) is an automatic transmission that can change seamlessly through a continuous range of gear ratios. It is a single speed with infinite gear ratios. Unlike conventional transmission system, it uses pulley and a drive train.

Transmission technologies such as AMT, iMT, CVT, DCT and AT differ in terms of their fuel efficiency, response time for gear shift which influences driving experience, cost of acquisition, maintenance cost etc.

Penetration of automatic transmission has increased from 8-10% in fiscal 2018 to 24-26% in fiscal 2021. However, Indian passenger vehicle sales is still dominated by manual transmission systems which accounted for ~74-76% of sales fiscal 2021. Penetration of manual transmission vehicles is still higher due to dominance of high price consciousness over need for comfort. However with rising traffic conditions, rising affordability, need for comfort and availability of semi-automatic transmission at affordable price points has resulted in technologies such as AMT, iMT gaining share over the last 5 years. AMT, iMT together accounted for ~14-16% share in sales in fiscal 2021. AMT, iMT technologies are predominant in affordable range (less than Rs 8 lacs) of passenger vehicles. Whereas in premium cars technologies such as AT, CVT and DCT are being preferred as these technologies offer smoother driving experience. CRISIL Research's market checks indicate that AT offer best in terms of driving experience however are the most costliest among competing technologies and AT penetration currently prevalent in premium and luxury passenger vehicles. AT, CVT and DCT accounted for ~5%, ~4% and ~2% of vehicle domestic production in India in fiscal 2021.

Share of transmission technology



NOTE: MT – Manual Transmission, AMT – Automatic Manual Transmission, iMT – Intelligent Manual Transmission, AT – Automatic Transmission, DCT – Dual Clutch Transmission

E – Estimated

Source: SIAM, Industry, CRISIL Research

Split of PV production by drivetrain type

Drivetrain is a system which connects the engine's power and torque via transmission system to the driving wheels. There are 4 types of drivetrains –

- Front Wheel Drive (FWD)
- Rear Wheel Drive (RWD)
- Four Wheel Drive (4WD)
- All Wheel Drive (AWD)

Majority of the cars in India are Front Wheel Drive (FWD). In FWD transmission transfers power from the engine to the front wheels. The front wheels have to both drive as well as steer the car. Here the engine is mounted transversely to get the gearbox and differential to fit in the same space. Hence, the number of components required as less as compared to other drivetrain system, thereby also reducing the cost of vehicle in a price conscious market like India. FWD vehicles also offer better fuel efficiency as weight of the drivetrain is less than that of a rear-wheel drive vehicle.

As opposed to FWD, in RWD vehicle power is transferred from the transmission to the rear wheels by way of a long driveshaft to a differential. A RWD system requires the engine and gearbox to be longitudinally mounted so that the drive can be sent straight to the differential at the rear. Mainly the pickups and high-end SUVs uses RWD system. Compared RWD offers better acceleration and torque to a vehicle.

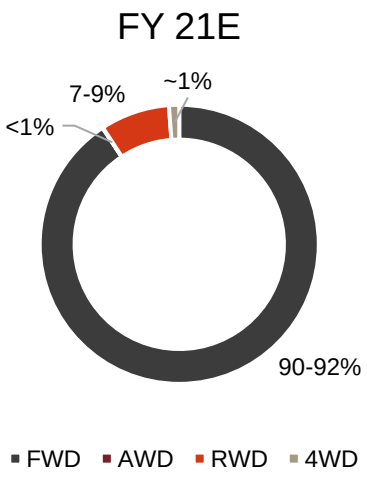
AWD power both the front and rear wheels, all the time. It can be full time or part time. AWD drive system relies on the vehicle's sensors and computer systems to determine and distribute power and traction to the four wheels on real time basis. AWD is ideal for everyday use, light off-roading. In general, AWD offer better traction and stability to vehicle compared to FWD or RWD vehicles. Current penetration of AWD is miniscule in India.

AWD vehicles are similar to 4WD vehicles however differ in terms of way power and traction is delivered to both the axles. 4WD are available as full-time and part-time systems. In case of a full time 4WD, all wheels are driven continuously all the time. However, in case of part time 4WD, only two wheels will be receiving the power, they can be either front wheels (making it FWD) or rear wheels (making it RWD). 4WD are preferred for heavy off-roading.

Traditionally 4WD vehicles have been in demand in hilly terrains of north and south India. Additionally, India is witnessing growing interest among vehicle owners for off-roading. Interest for off-roading is being fuelled by surge in number of off-roading clubs all over the country which regularly organise off-roading exercises for the enthusiasts.

CRISIL Research estimates FWD vehicles to have accounted for 90-92% of domestic production in fiscal 2021, followed by <1%, 7-9%, ~1% demand for AWD, RWD and 4WD vehicles.

Share of drivetrain



NOTE: FWD – Front Wheel Drive, AWD – All Wheel Drive, RWD – Rear Wheel Drive, 4WD – Four Wheel Drive; E – Estimated ; Source: SIAM, Industry, CRISIL Research

Top 10 OEMs based on production & sales (fiscal 2021)

Companies	Domestic sales (Fiscal 2021)
Maruti Suzuki India	1,293,840
Hyundai Motors India	471,535
Tata Motors	222,909
Mahindra and Mahindra	157,216
Kia Motors	155,286
Toyota Kirloskar	93,124
Renault India	92,268
Honda Cars India	82,074
Ford India	48,042
MG Motor India	35,597

Companies	Production (Fiscal 2021)
Maruti Suzuki India	1,304,185
Hyundai Motors India	567,728
Tata Motors	211,674
Kia Motors	193,263
Mahindra and Mahindra	164,079
Renault India	93,894
Ford India	88,805
Honda Cars India	85,715
Toyota Kirloskar Motor	56,205
Nissan Motor India	50,579

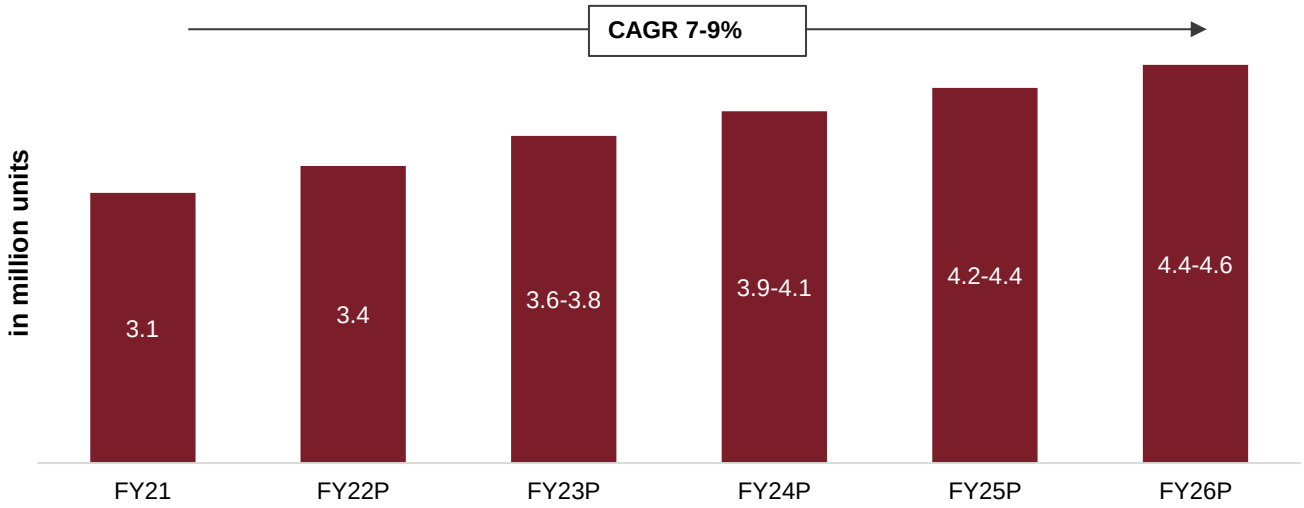
SOURCE: SIAM, CRISIL Research

2.1.2 Outlook on the Indian PV industry (fiscals 2021 - 2026P)

Production outlook (fiscals 2021 - 2026P)

CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. However, risk of subsequent waves of COVID-19 and need for the state and central governments to impose localised or extended lockdown to control spread of pandemic may have an impact on supply chains as well as sales going forward. In such a case, overall industry production is also likely to get adversely affected over the short term.

PV production outlook



Note: P - Projected
Source: SIAM, CRISIL Research

After a consecutive drop in production in fiscals 2020 and 2021, PV production is expected to increase at a robust pace over the next five fiscals because of a spurt in domestic as well as exports demand. Domestic demand will be driven by an expansion in the addressable market, fast-paced infrastructure development and relatively stable cost of vehicle ownership, as crude oil prices are expected to stabilise at lower levels.

However, in fiscal 2022, due to semi-conductor shortage, we expect the production of the passenger vehicle to be impacted. During the first half of fiscal 2022, rising covid cases and the lockdowns impacted the chip production in Southeast Asian countries like Malaysia affecting the semiconductor supply in the Indian market. Although the Covid situation has improved in the second half of the fiscal, we expect only gradual recovery in the chip availability.

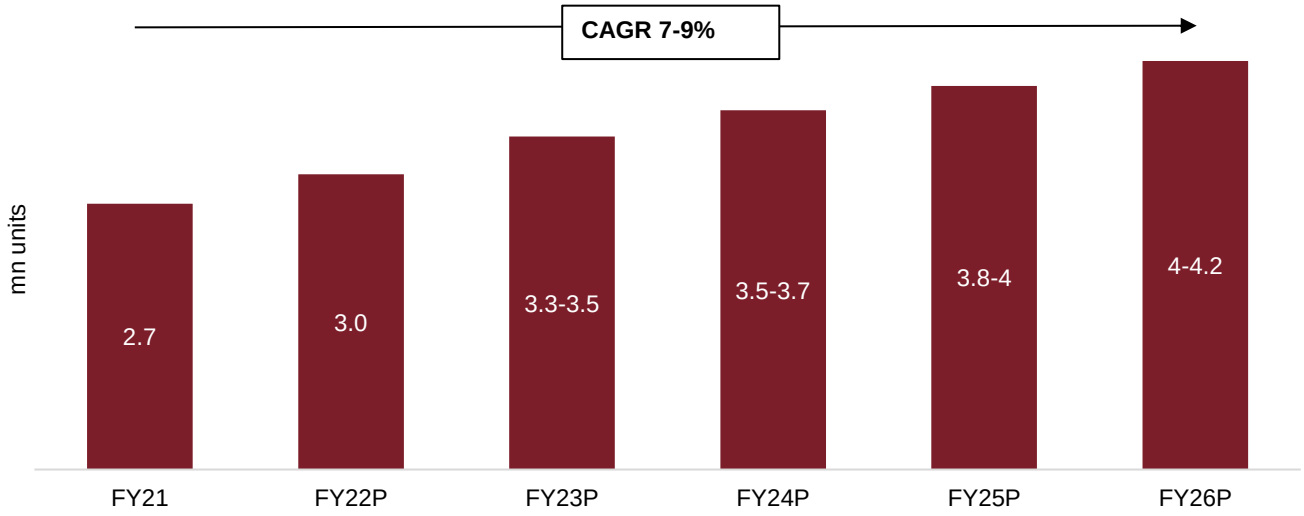
The long-term outlook remains bright with regard to exports as efforts to penetrate newer geographies bear fruit and schemes such as PLI incentivises players to tap exports. CRISIL forecasts exports to clock 11-13% CAGR between fiscals 2021 and 2026. Rising competition in Europe amid sluggish demand growth, though, will prevent further increase in growth. Moreover, penetration of electric and hybrid vehicles will be a key monitorable.

Domestic sales outlook (fiscals 2021- 2026)

Domestic PV sales are expected to increase by 7-9% CAGR over fiscals 2021 to 2026. The growth is expected to be better (post-fiscal 2021), as consecutive years of double-digit declines would lead to a very low base in fiscal 2021. However sharp rise in COVID-19 cases and 2nd wave of covid has led to disruption in supply chain, leading to supply crunch of fast-moving models, waiting periods have increased for models in high demand. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and

lower fuel prices are likely to drive demand for passenger vehicles. Other factors that would aid demand are increasing urbanisation, government support to farm incomes, and improved availability of finance. However, increasing congestion in metro cities and rising popularity of shared mobility services are likely to restrict car sales in the long term.

PV domestic sales outlook



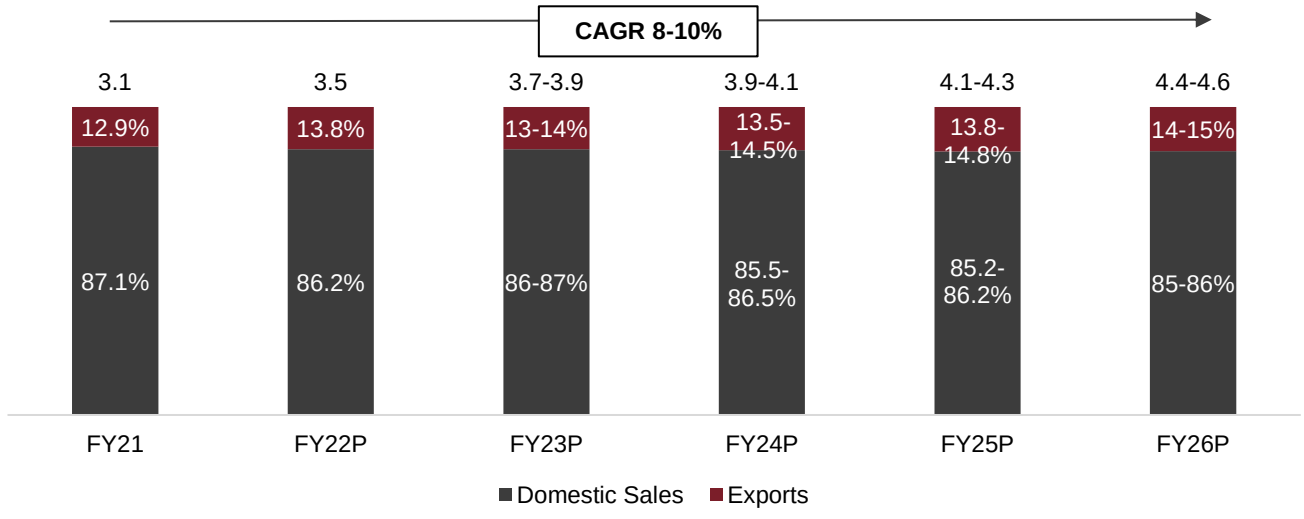
Note: P - Projected

Source: SIAM, CRISIL Research

Split by domestic and export sales

Domestic sales, which is formed ~87% of total production in fiscal 2021, are estimated to grow at 7-9% between fiscals 2021 and 2026. Exports are estimated to grow at by 11-13% CAGR between fiscal 2021 and 2026 on a low base of fiscal 2021.

PV industry: Domestic and export sales share



Note: P - Projected

Source: SIAM, CRISIL Research

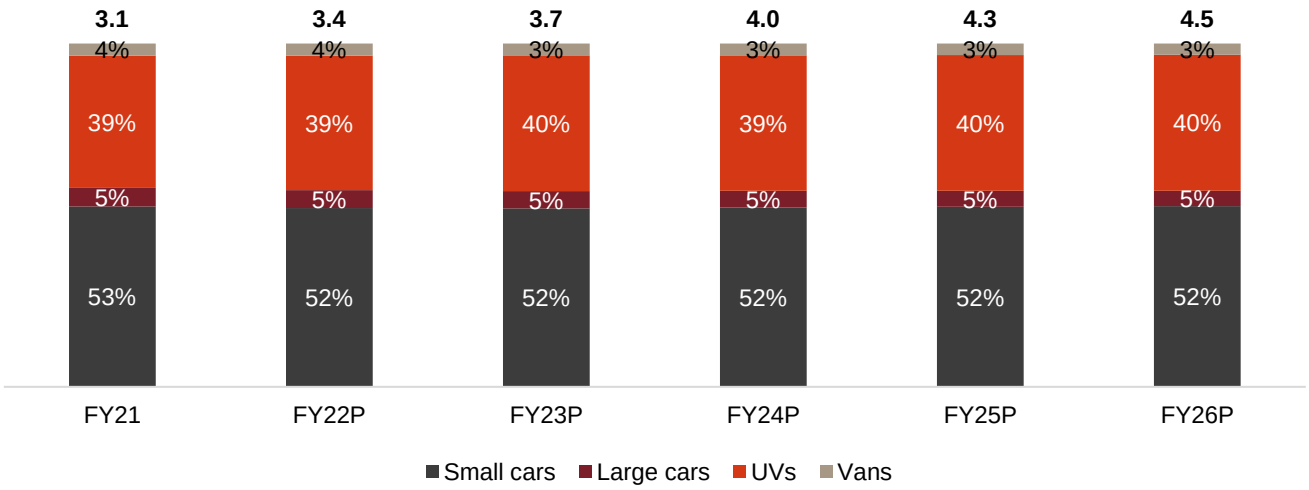
Split by passenger vehicle segments

CRISIL Research projects production of UVs to drive the growth of passenger vehicle industry in long term. UV segment is expected to grow at a CAGR of 8-10% from fiscal 2021 and fiscal 2026 on a low base of fiscal 2021. Small cars and vans to grow at a CAGR of 7-9% and large cars to grow at a stable rate of 3-5% CAGR between fiscal 2021 and 2026.

Growth will be driven by the improving macroeconomic situation, increasing disposable incomes and the relatively stable cost of vehicle ownership owing to steady fuel oil prices.

Other factors aiding demand will be: increased urbanisation, Finance Commission payouts and easy availability of finance. With global automakers flooding India with new models to capitalise on the growth opportunity, buyers will be spoilt for choice. The proportion of replacement demand will rise as car owners opt for newer models due to higher affordability, competitively priced launches, and easy availability of finance.

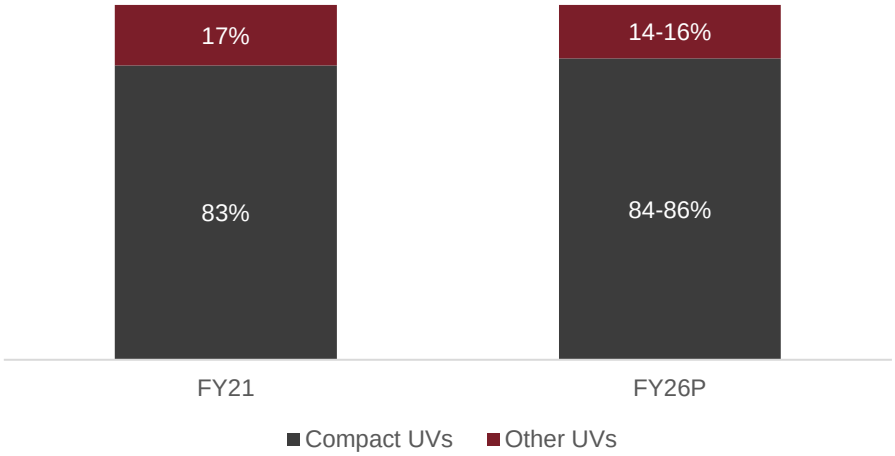
PV production outlook by segment



Note: P - Projected

Source: SIAM, CRISIL Research

UV production outlook by segment



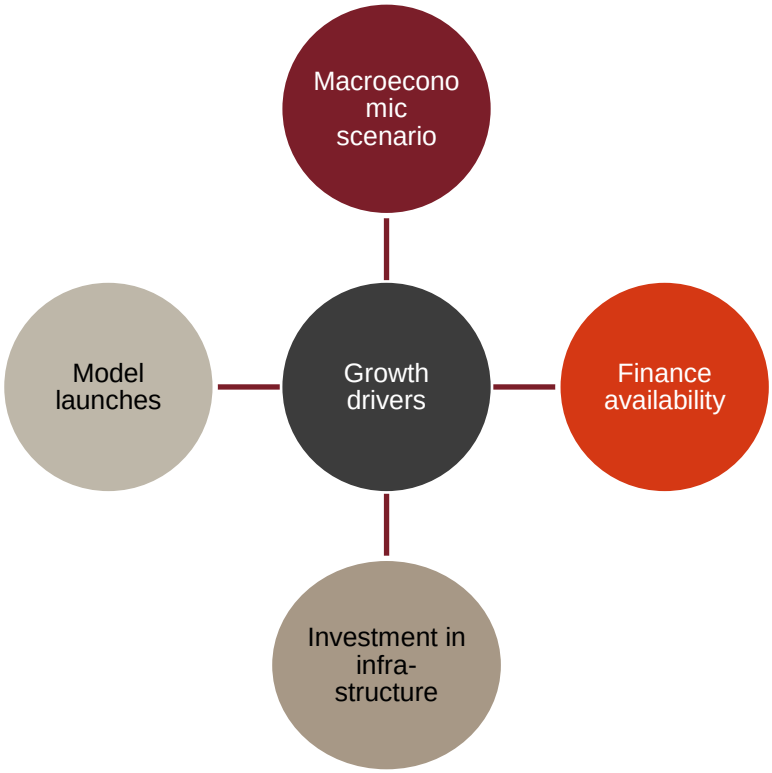
Note: Compact UV comprise of UVC and UV1, UV2 to UV5 is considered under Other UVs
Source: SIAM, CRISIL Research

Continued traction towards compact UVs and expected model launches in this space is expected to drive the demand for compact UVs in domestic market. Currently within UVs, compact UVs occupy a share of 95% in exports as on fiscal 2021. Continued traction in exporting market will also aid production of compact UVs in India. Share of compact UV is expected to reach 84-86% by fiscal 2026 from the current share of 83% in the total UV pie.

Key trends and growth drivers

Primary demand drivers for the PV industry include improved affordability, lower cost of ownership, and new model launches.

Key growth drivers for the domestic PV market

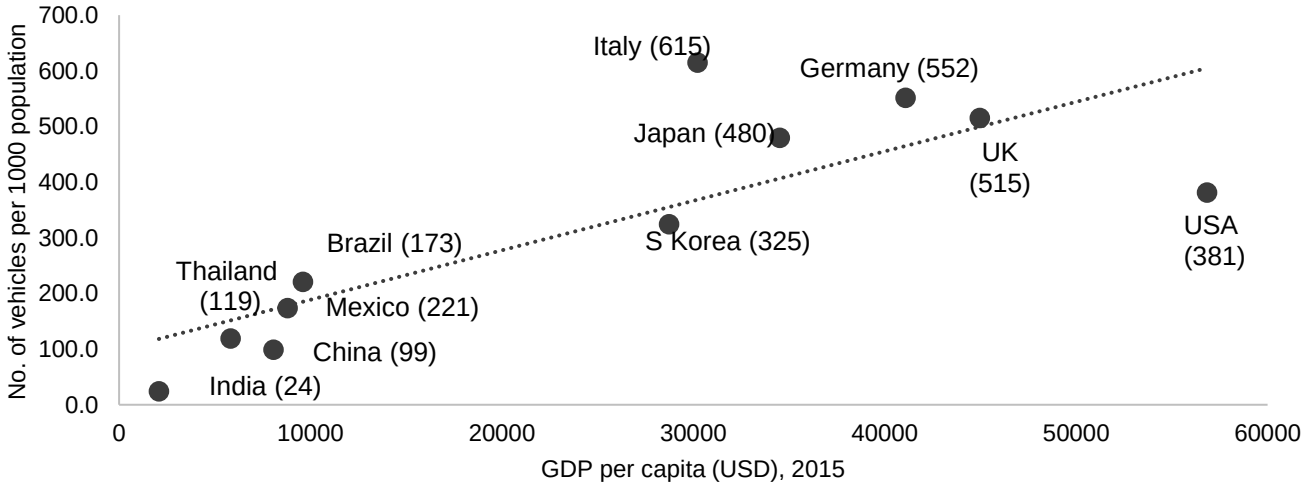


Future growth drivers for the domestic market

- Underpenetrated market huge potential for cars & UVs

India's car market is highly underpenetrated compared with most developed economies and some developing nations. As of fiscal 2020, India had ~24 passenger vehicles per 1,000 people. This is significantly lower than both developed nations and even other nations in the BRIC block (Brazil, Russia, and China), based on per-capita GDP. Brazil, Russia and China has 173, 307 and 99 passenger vehicles per 1,000 people respectively in 2015. Thus, the country holds tremendous potential for automobile manufacturers. Also, comparing on the basis the penetration of cars and UVs with per-capita GDP across countries, India still lags behind most countries and, as such, CRISIL Research expects the gap to reduce gradually after a decline in fiscal 2021.

Country-wise passenger vehicle penetration



Note: Figures except India, are as of calendar year 2015, Dotted line indicates median; Figures in the bracket indicate passenger vehicles per 1,000 people

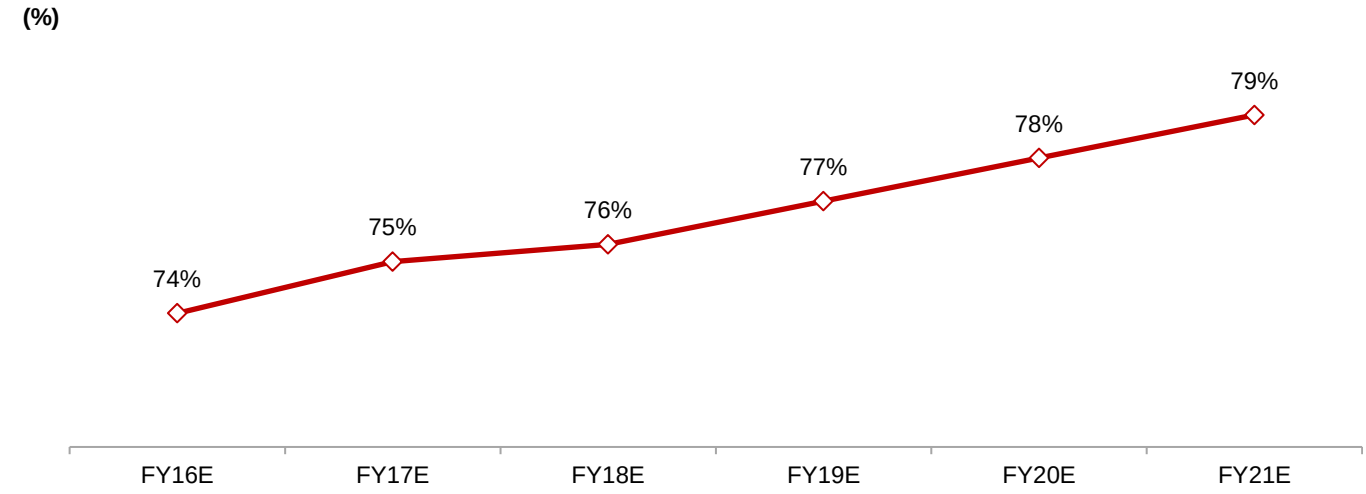
Source: OICA, World Bank, CRISIL Research

- Expected improvement in macroeconomic factors after subdued growth in fiscal 2020 and a decline in fiscal 2021
  - CRISIL Research expects India's GDP to grow ~6.3% on average, annually, between fiscals 2022 and 2026, after an estimated de-growth of 7.7% in fiscal 2021 due to the pandemic and lockdowns
  - GDP growth will continue to be consumption-led, assuming normal monsoons, softer interest rates and inflation, and implementation of Pay Commission hikes by states, which will push up purchasing power
- Anticipated improvement in rural demand
  - Rise in finance penetration in the long term, as banks and NBFCs continue to focus on semi-rural and rural areas, will contribute to this
  - Rural infrastructure growth is expected to have a pronounced impact on rural incomes. Strong investments under infrastructure schemes will further boost rural infrastructure, with multiplier effects
- Improvement in finance availability

  Given the industry's higher ticket sizes and better credit profile of end customers, finance penetration is higher in the PV industry compared with other automobile segments. CRISIL Research estimates finance penetration levels to reach 79% in fiscal 2021 from 74% in fiscal 2016.

  Stringent credit norms and availability of credit information through the Credit Information Bureau (India) Ltd (CIBIL) have helped players widen their customer bases. The industry has witnessed strong competition with new players in the form of non-banking financial companies (NBFCs) targeting those markets that banks exited, and captive NBFCs (operated by two-wheeler manufacturers) largely focusing on non-metros.

PV finance penetration – Fiscals 2016 to 2021



Note: E – Estimated; Note: Finance penetration indicates number of vehicles financed per 100 two wheelers sold in India
Source: CRISIL Research

The penetration is expected to deepen going forward as:

- More customers come under the formal financial services fold
- Banks increase their focus on the retail segments
- Banks start waving off processing fee and pre-payment charges (especially during festival seasons) which will make financing option more lucrative for customers

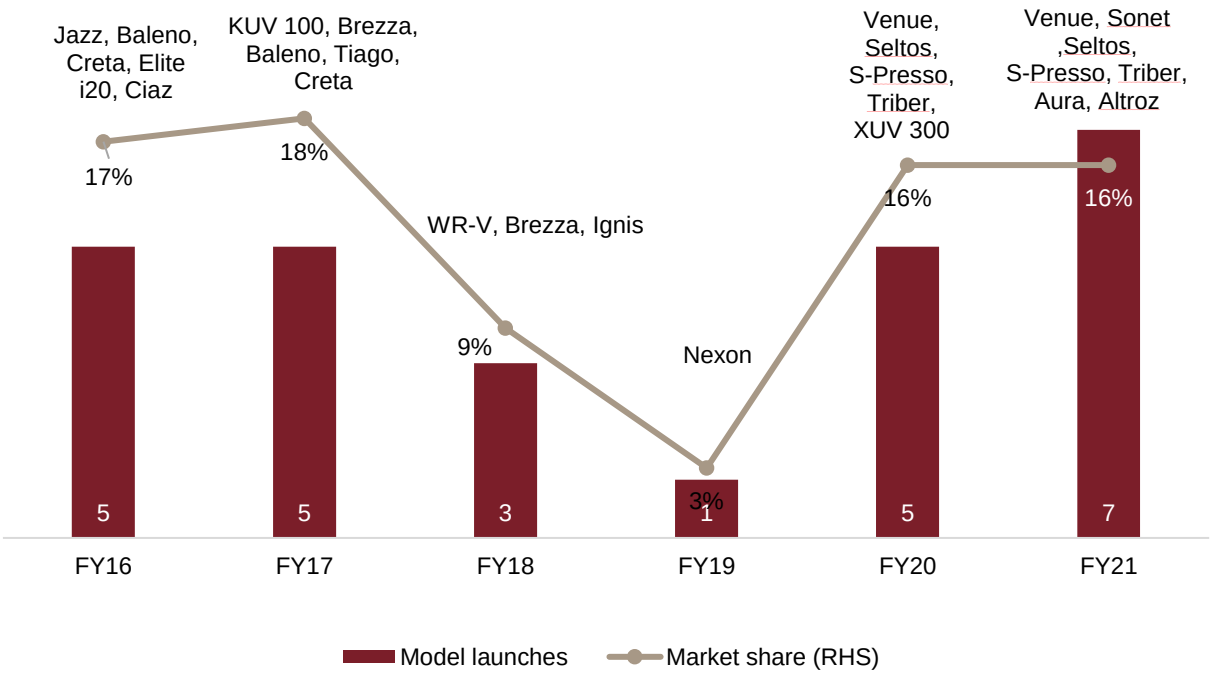
- Enhanced product offering
  - New models launched by manufacturers
  - Increase in offerings because of new entrants such as Kia Motors, MG Motors, etc.

  Apart from rising sales of existing models, sales of new models have supported overall industry growth in the past few years. Majority of the models are in the UV segment leading to its growth.

  New models launched in fiscal 2019 contributed to a mere ~3% of domestic sales that fiscal. However, they gained significant traction in fiscal 2020, leading to ~16% market share. Though launches planned in the first half of fiscal 2021 were deferred due to the pandemic, those within the small car segment, such as S-Presso, Altroz and Aura gained market share during the fiscal.

  Vehicles launched during the current year fiscal 2022 like Tata Punch, XUV700, Safari, Kushaq, Astor are also getting sizeable traction.

Share of newly launched models in total passenger vehicle sales



Note: A vehicle is considered a new launch for a year and a half past its launch. A new launch winning at least 1% share in fiscal year is considered a major launch; Facelift/ revamped versions of old models are not considered as new launches.

Source: SIAM, CRISIL Research

- Cars on subscription
  - Cars have always been an aspirational purchase for Indian consumers. However, new startup business models based on 'cars on subscription' are gaining traction because of convenience, low upfront costs as well as involvement of young, dynamic population in the customer base, which prefers an asset-light lifestyle.
  - In the case of fixed-cost subscription, the consumer pays a periodic sum of money for the use of a vehicle for the subscribed period. Subscriptions can be for any length of time and can be cancelled at any point of time. It also allows the customer to upgrade or change cars after the subscription period. Associated costs of the car, such as insurance, taxes, service and maintenance, repairs and roadside assistance, are borne by the subscription provider. This reduces the burden of down-payment for the consumer, along with the additional costs associated with car ownership.
  - The subscription-based car ownership increases the affordability of consumers substantially.
  - Subscribing for a vehicle entails a lower initial cost compared with buying a new car, which requires a hefty down-payment. Thus, it can have a positive impact on the industry and increase the penetration of cars in the country.
  - However, considering the fact that ~40-50% customers are first-time car buyers, the aspirational value of ownership can hinder the success of the subscription-based model.
  - Currently, retail leasing is still in a nascent stage in India and, thus, remains a key monitorable in the long term for impact on the industry
- Future growth drivers for the exports market

  While predominantly a small car exporter, India has strongly emerged as an exporter of mid-size sedans and UVs with a growing acceptance of vehicles manufactured in India. The share of cars segment reduced from

82% in fiscal 2016 to 65-70% in fiscal 2021 as a percentage of overall exports. Consequently, the share of UVs increased from 18% to 30-35%.

Latin America occupies the highest proportion in PV exports from India, followed by Africa. Indian OEMs have diversified their exports by exploring newer geographies. New markets like Saudi Arabia, the UAE and South Africa have shown significant demand growth. The US, which had nil share till fiscal 2018, garnered ~10% volume share as of fiscal 2020, mainly driven by export of the Ford Ecosport. Exports to South Africa, Italy, the UAE, Saudi Arabia, Peru and Bolivia also witnessed growth in fiscal 2020, with the launch of new models such as the Hyundai Venue, Maruti S-Presso, Renault Triber and Kia Seltos.

Below factors are likely support growth of PV exports from India

- Capacity expansion by top players
- Stable crude oil prices to aid demand from African and Latin American geographies
- Continued expansion undertaken by players into newer markets
- Production-linked incentive (PLI) scheme, expected to provide further boost to the exports

Impact of regulatory changes on domestic passenger vehicle sales

Impact of corporate average fuel efficiency (CAFE) norms

The Paris Agreement, enforced from November 2016 onwards, and ratified by India, set the objective of limiting the global temperature rise this century well below 2 degree Celsius over pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The greenhouse gases emissions reduction that would be compatible with this target would require a significant increase in the share of zero or low emission vehicles over the coming years. These regulations, combined with growing environmental and sustainability consciousness of the population, will lead to a major transformation of the global auto industry from internal combustion engine to green mobility technologies (such as hybrid vehicles, BEVs, fuel cell vehicles and alternative-fuel vehicles).

Fuel consumption standards for Indian vehicles came into force in India in April 2017 for petrol, diesel, liquefied petroleum gas (LPG) and compressed natural gas (CNG) passenger vehicles. These standards are based on the CAFE system and targets to bring about improvement in fuel consumption of passenger vehicles by 2022. The policy supports a continuous reduction in CO_2 emissions through CAFE regulations.

These regulations were first implemented on April 1, 2017 with the introduction of BS-IV emission norms. It was decided that the highest permissible carbon footprint would be 130 gm per km till 2022. Thereafter, it would be further reduced to 113 gm per km. This is expected to incentivise the shift towards greener technology such as hybrids and EVs.

Upcoming regulatory changes and safety norms

The Indian PV industry has seen a host of safety and regulatory changes in the past 3-5 years. Implementation of CAFÉ norms will further help in the cleaner fuel emission. CRISIL Research expects other safety features such as electronic stability control (ESC) and autonomous emergency braking (AEB) to be implemented on all cars to reduce road accidents.

When a driver attempts an ‘extreme manoeuvre’ (e.g., one initiated to avoid a crash or due to misjudgement of the severity of a curve), they may lose control if the vehicle responds differently as it nears the limits of road traction than it does during ordinary driving. In order to counter such situations in which loss of control may be imminent; ESC uses automatic braking of individual wheels to adjust the vehicle's heading if it departs from the direction the driver is steering.

AEB is a driver assistance system that relies on a network of radar sensors mounted behind the vehicle's front grille or windshield to gauge the surroundings and monitor basic driving conditions such as speed, acceleration and proximity to obstacles. If the risk of an accident is detected, the system prompts the driver to brake by providing audible and visual warnings. If the driver fails to react in time, then AEB is even capable of braking autonomously to prevent an accident altogether or at least reduce the impact of collision.

Impact of Production Linked Incentive (PLI) on automotive industry

The PLI scheme for the automotive industry intends to promote high-tech green manufacturing such as electric and hydrogen fuel cell vehicles. This scheme excludes conventional petrol, diesel, and CNG segments (Internal Combustion Engine) since these segments have sufficient capacity in India.

Government has budgeted Rs 44,038 crore within PLI scheme for automobile industry. Rs 18,100 crore is allocated for Advance chemistry cell (ACC) battery and other Rs 25,938 crore is allocated for automobile and auto component manufacturing.

Government has listed advanced automotive technology components that are eligible for incentives. Components range from components required in hydrogen fuel cell vehicle system, xEVs-traction system such as traction motor, xEVs-transmission such as e-axles, components for vehicle exhaust after treatment devices for BS6 vehicles and beyond, components for ECUs for safety, powertrain and comfort system, transmission technology such as Continuously Variable Transmission (CVT), Dual Clutch Transmission (DCT), Automatic Transmission (AT), electric differential lock, components for alternate fuel system, sensors, etc.

The PLI scheme targeting auto parts include the following component schemes:

- Champion Original Equipment Manufacturers (OEM) Scheme: It is a sales value linked plan, applicable to battery electric and hydrogen fuel cell vehicles of all segments.
- Champion Incentive Scheme: It is a sales value linked plan for advanced technology components, complete and semi-knocked down (CKD/SKD) kits, vehicle aggregates of two-wheelers, three-wheelers, passenger vehicles, commercial vehicles and tractors, including automobiles meant for military use and any other advanced automotive technology components prescribed by the Ministry of Heavy Industries – depending upon technical developments.

Impact of Scrappage Policy

The Vehicle Scrapping Policy, 2021 was announced by the Government to curb the pollution. PVs to be deregistered after 20 years in case of failure to get fitness certificate. Incentives for the new buyers include, scrappage value expected to be 4-6% of ex-showroom price of a new vehicle as a scrappage value for the old vehicle, road tax rebate upto 25%, 5% discount and waiver of registration fee on the purchase of the new vehicle against the scrapping certificate.

As for PVs, renewal of registration fees is proposed to increase from Rs 600 to Rs 5,000 (valid for five years) for passenger vehicles older than 15 years, a hike of over 8 times. However, these vehicles mostly ply in the rural areas where enforcement of higher registration fees is difficult to monitor. The potential benefit from scrapping a 15-year-old, entry-level small car will be Rs 70,000, whereas its resale value is ~Rs 95,000. That makes scrapping unattractive. But for vehicles older than 20 years, considering that there is a proposal to deregister them, the potential scrappage benefit is ~Rs 50,000, which is similar to its resale value. This can incentivise scrapping. As a result, 40,000-60,000 PVs can realistically be scrapped. So, the incremental contribution to new vehicle sales works out to 12,000 to 20,000 PVs annually, assuming a three-year window. As the number is less than 1% of the 30 lakh units sold on average over fiscals 2016-2020, scrapping will not contribute substantially to new sales.

Estimated Penetration of Electric PVs by fiscal 2026

Regulatory roadmap key for rise of electric mobility in India

The US and China have seen an acceleration of sales of electric/hybrid cars, as most major global original equipment manufacturers (OEMs) have one or more models in their portfolios in these countries. With more model launches by OEMs, issues of range anxiety being addressed, and declining battery prices, CRISIL Research expects electric vehicle (EV) volume to grow at a faster pace globally.

Currently, in India, the charging infrastructure required for EVs is not in place. This has hindered adoption of EVs in India.

The implementation of the National Electric Mobility Mission Plan, 2020 and other policy initiatives by the government to address infrastructure-related issues are key monitorables for the sector over the next five years. The government has announced Rs 100 billion for Phase 2 of Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME). The policy aims to provide a subsidy of Rs 10,000 per KWh to four wheelers (BEV (battery electric vehicle), PHEV, strong hybrid) for commercial purpose and public transport. It also mandates minimum range to be ~140 km and maximum ex-factory price to be ~Rs 15 lakh. It envisions creation of infrastructure for charging of EVs. CRISIL Research expects initial adoption rate to be high among cab aggregators.

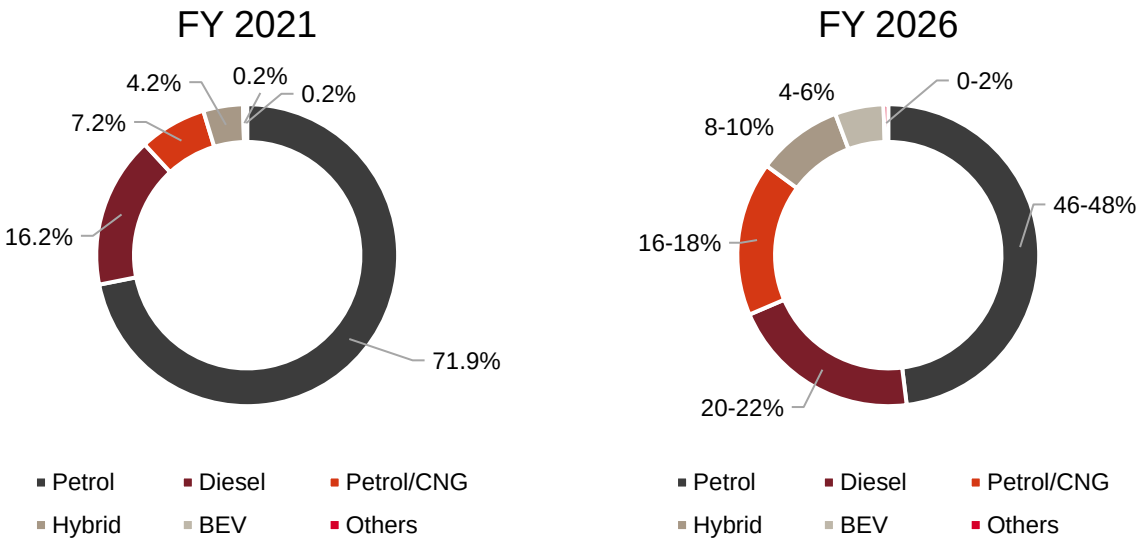
Delhi has announced an EV policy that would provide purchase incentives of up to Rs 1.5 lakh for the first 1,000 electric cars. The benefit would be provided in addition to FAME-2 policy benefits. The Telangana government is also providing 100% exemption of road tax and registration fee on purchase of the first 5,000 electric cars. The Tamil Nadu government is providing 100% exemption for battery-operated vehicles (BOVs). Such regional push will further enable adoption of EVs. Further individual tax payers are allowed to take a deduction on interest payments up to Rs 1,50,000 towards electric vehicles under Section 80EEB. The benefit is available on EV loans sanctioned over 1st April 2019 till 31st March 2023 period. Such favourable tax laws are expected to encourage electric vehicle adoption for personal mobility.

The government is also considering the establishment of a 40-gigawatt (GW) battery manufacturing plant to boost EVs and renewable energy initiatives. However, for any path-breaking changes to happen in the EV market, OEMs need to make more investments and the government should devise clear policies. Among the challenges, infrastructure shortage needs to be resolved urgently.

Hyundai along with Kia is expected to introduce 6 electric models in India by 2024. Nissan has also undertaken a feasibility study to manufacture electric vehicles in India for Indian customers as well as foreign countries, and set

up an EV battery manufacturing unit as well. Global electric car manufacturers such as Tesla, Triton are expected to setup their manufacturing capability in India.

Split by powertrain



Note: P – Projected, *BEV - Battery-powered Electric Vehicle*

Source: MoRTH, CRISIL Research

Due to upcoming emission norms such as BS-VI B and CAFÉ norms, the powertrain mix is expected to change towards alternate fuels such as CNG, hybrid and electric. However, diesel share is expected to gain as in fiscal 2021 few OEMs had phased out diesel variants from their portfolio. Maruti had completely phased out diesel variants from its offering due to price increase on account of BS-VI migration. But from the start of 2022, Maruti is expected to launch diesel variants for a few models. This will lead to increase in share of diesel, leading to an increase in share to 20-22% in fiscal 2026 from 16.2% in fiscal 2021, driven by UVs and large car category.

CNG will be dominated by small car buyers due to its attractive cost economics. Maruti already offers CNG models in Alto, Swift, Ertiga, etc. Other OEMs have also started offering CNG option atleast in its entry level cars. Recently, Hyundai has come up with CNG options for its models such as i10, Santro, Aura, etc. Tata Motors have also come up with CNG variants for Tiago, factory fitted CNG models is expected to be available for its other models such as Tigor and Altroz.

Currently CNG is primarily available in major metro and tier-I cities. Long waiting to refill CNG has led to low preference towards CNG variants by the buyers. However, CNG network is increasing rapidly. According to Petroleum Planning & Analysis Cell, India has 3,143 CNG stations in India as on April 2021. Government's focus for gas-based economy has laid a target of 10,000 CNG stations by 2030. Industry is also exploring various measure to boost CNG ecosystem like mobile refilling CNG facility where CNG refilling facility will be setup in places such as shopping malls, offices, etc.

Many global OEMs like Toyota, Honda have hybrid vehicle offerings in other markets. In the long-term horizon, CRISIL Research expects OEMs launch hybrid vehicles in the domestic market as well boosting the share of hybrid vehicles in India.

Battery Electric PVs to contribute to 4-6% of domestic sales by fiscal 2026

As it stands, FAME-II subsidy is incentivised only towards commercial use. No benefits are provided to personal car owners. Following are the findings of our analysis on the cost of ownership of an electric passenger car versus petrol, diesel and CNG variants for cab aggregators. CRISIL Research has also compared the cost of ownership of an electric passenger car with the petrol variant of a passenger car.

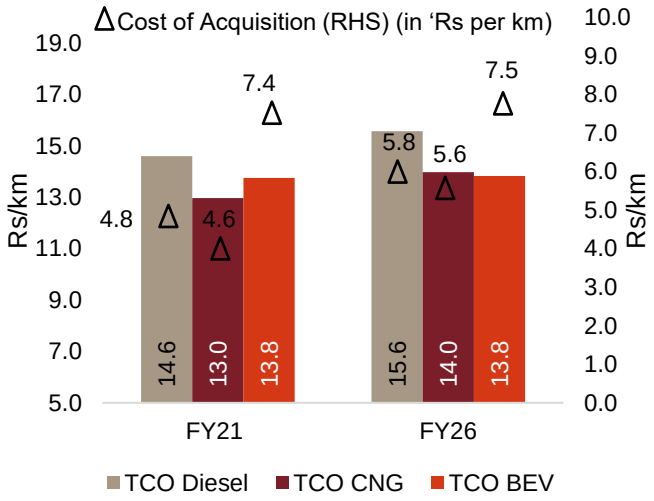
In case of commercial application like cab aggregators, Total Cost of Acquisition (COA) for EVs almost 50% higher for diesel and CNG vehicle. However due to heavy running of the vehicles the Total Cost of Ownership (TCO) of EVs for cab aggregators is lower for EVs compared with diesel alternatives by ~6% and higher by ~6% than CNG alternatives even in fiscal 2021. By fiscal 2026 TCO for EVs is likely to be lower by 11% in with diesel alternatives and marginally lower for CNG alternatives. The lower battery cost is expected to offset the lack of FAME subsidy and will help maintain competitiveness of BEVs against diesel and CNG variants for cab aggregators.

Charging infrastructure, range anxiety and lack of large OEM presence is hindering EV adoption in India. However, battery swapping business model can help in reducing cost of acquisition for buyers, range anxiety, drastically reduces refuelling (charging) time and assuage customer concerns around life of a battery or need for replacement of a battery.

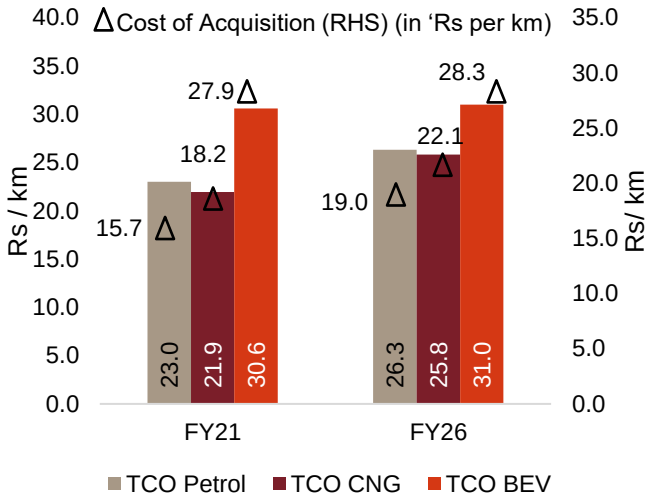
In the union budget 2022-23, government has announced a battery swapping policy with focus on interoperability standards. Standardising battery swapping infrastructure will accelerate economies of scale and hasten EV adoption, which currently stands at less than 1% for the automobile segments. Battery swapping and interoperability will propel EV adoption for commercial use (three-wheelers, taxis and light commercial vehicles), as this would reduce waiting time for charging, enabling higher asset utilisation and supporting operator profitability. This could also provide impetus to newer business models, wherein vehicles can be sold without fixed batteries, and batteries can be availed on a pay per basis. This is expected to reduce acquisition cost for buyers.

The taxi segment accounts for 10-15% of sales within passenger cars, and within the taxi segment, cab aggregators (accounting for ~40-50% of total sales within the taxi segment) are expected to lead adoption of EVs. This should result in an estimated ~25% adoption of EVs within cab aggregator segment by fiscal 2025 (assuming adequate infrastructure is available by then).

Cab aggregators use case: TCO and COA of EVs is lower due to higher running



Personal use case: High TCO and COA of EVs remain a challenge until fiscal 2026



Note: Total cost of ownership analysis framework takes into consideration down payment/ initial payment, EMI, fuel cost, maintenance cost and battery replacement cost if any over the ownership period adjusted for the resale value TCO is in Rs per km; For cab aggregators, compact sedan has been considered for assessment whereas in personal application hatchback has been considered for evaluation; Holding period of 4 years and 5 years is being considered for cab aggregator and personal use case respectively; annual running of 62,500 km and 12,000 km considered for cab aggregator and personal use case respectively.

Source: Industry, CRISIL Research

Due to the limited running of personal vehicles, TCO and COA of electric personal cars are still higher (~33% and ~78%, respectively) compared with the TCO and COA of petrol alternative and higher by (~39% and ~53%, respectively) compared with the TCO and COA of CNG alternative. Therefore, EVs are currently not a viable use-case vis a vis their ICE counterparts. In fiscal 2026 however, the gap is expected stay significant prohibiting EV adoption in personal usage segment. In addition, availability of charging infrastructure and range especially for intercity travels are likely to be key bottlenecks for adoption of EVs in the personal car segment.

Hence, CRISIL Research expects the share of EVs in total passenger car sales to remain low (4-6%) in fiscal 2026. Penetration in fiscal 2021 was ~0.16%. EV penetration can be higher if government adopts stricter policies on OEMs for not meeting CAFÉ norms. The exact quantum of EV penetration in an aggressive case depends on incentives given for adoption and setting up of charging infrastructure. EV penetration will also be propelled by policies adopted by the government for penalising non-adherence to CAFÉ norms. Electrification in PVs is expected to be slower on account of limited range of electric vehicles, very higher cost of acquisition for EVs with desired range, lack of total cost of operations (TCO) with ICE vehicles especially for personal applications, limited availability of charging infrastructure, lack of clarity around vehicle performance and resale value among stakeholders.

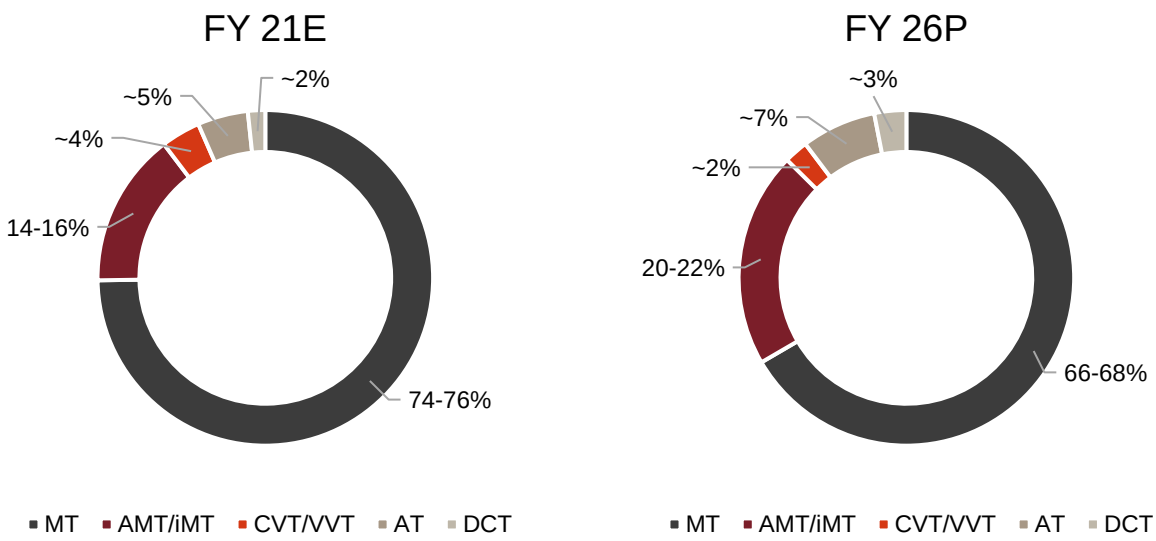
However, the battery swapping policy will provide an additional push to the EV adoption especially from the taxi segment.

Split of PV production by transmission type

Rising affordability and need for comfort to drive shift from manual transmission to automatic transmission from fiscal 2021 to 2026. Across affordable range of cars which include the likes of Alto, Kwid, Santro, Celerio, Swift, i10

AMT, iMT is likely to emerge as technology of choice due to price affordability. CRISIL Research's interactions suggest that in mid-range car segment (Rs 8 lacs to 15 lacs) DCT and CVT technologies are likely to prevail with preference shifting towards DCT due to affordability and performance. In premium priced vehicles (Rs 15+ lacs) AT is likely to be the technology of choice. CRISIL Research estimates AMT/iMT to account for ~20-22% of domestic sales, DCT account for ~7% of domestic production. AT and CVT to account for remaining ~2% and 3% respectively.

Share of transmission technology



NOTE: MT – Manual Transmission, AMT – Automatic Manual Transmission, iMT – Intelligent Manual Transmission, AT – Automatic Transmission, DCT – Dual Clutch Transmission

E – Estimated, P – Projected

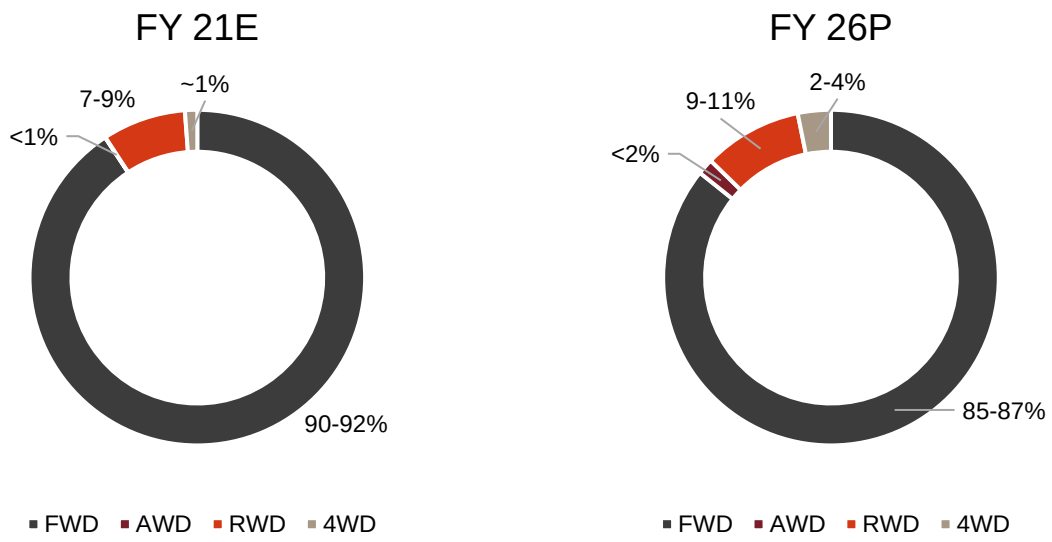
Source: SIAM, Industry, CRISIL Research

Split of PV production by drivetrain type

Expected higher growth of UVs as compared to passenger cars will drive the growth of RWD and 4WD. Share of RWD and 4WD is expected to increase by ~2% by fiscal 2026 driven by need for long distance driving, growing interests in off-roading. Share of AWD is expected to improve slowly by 1% by fiscal 2026 mainly due to its high initial cost as compared to other drivetrain categories.

Accordingly, CRISIL Research estimates FWD vehicles to account for 85-87% of production in fiscal 2026, followed by <2%, 9-11%, 2-4% demand for AWD, RWD and 4WD vehicles.

Share of drivetrain



NOTE: FWD – Front Wheel Drive, AWD – All Wheel Drive, RWD – Rear Wheel Drive, 4WD – Four Wheel Drive

E – Estimated, P – Projected

Source: SIAM, Industry, CRISIL Research

2.2 Review and outlook on the Indian Small Commercial Vehicle Industry

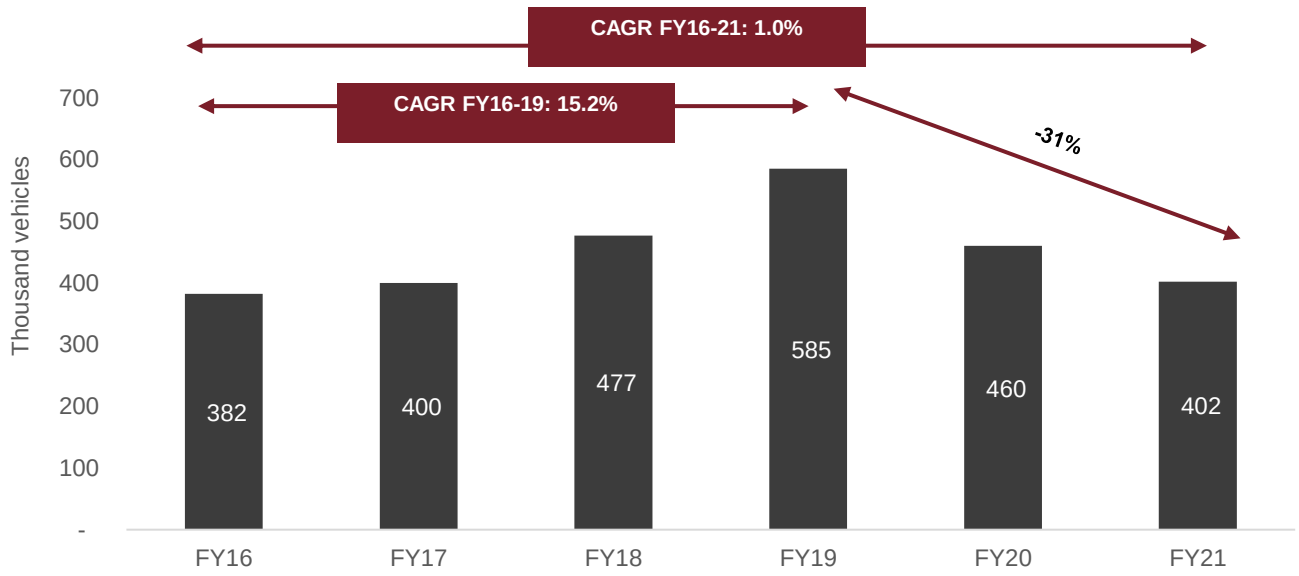
2.2.1 Review of Indian small commercial vehicle industry (fiscals 2016 – 2021)

Historic production development (fiscals 2016 to 2021)

Over fiscal 2016-2019, industry production, in fact, grew at CAGR 15%, driven by domestic sales added by pick up in freight demand from agriculture, FMCG and E-commerce segments. A large portion of this production jump was led by robust demand for SCV (Small Commercial Vehicle) GV which clocked a CAGR of 16.4%, whereas passenger carrier production declined by CAGR 2.4% over fiscal 2016-2019.

However, 21% contraction witnessed in fiscal 2020 dragged the industry growth down.

SCV production trend



Note: SCV includes vehicles with Gross Vehicle Weight (GVW) less than or equal to 3.5 tons; Sub-one tonne constitutes ~38-40% share in SCV while pickup has 60-62% share in SCV cargo segment

Source: SIAM and CRISIL Research

Production of commercial vehicles (SCV) in India registered a growth of 4.7% compound annual growth rate (CAGR) from fiscal 2016-2020. Domestic sales posted growth of CAGR 7.4%, whereas exports declined by CAGR 14.8% between fiscals 2016 and 2020. In fiscal 2021, production decline by ~12.6% over fiscal 2020 as the COVID-19 pandemic and ensuing lockdown measures by the government posed severe demand as well as supply-side challenges for industry.

The production drop in fiscal 2020 was on account of inventory correction as the industry transitioned from BS IV to BS VI emission norms. In addition, policy changes in Sri Lanka, one of the major industry export markets, proved to be a major blow to industry exports.

Overall SCV production posted marginal growth over fiscal 2016-2021 by 1.0% CAGR. However, if we look at fiscal 2016-2019, industry production in fact grew at CAGR 15% due to a sharp 16% CAGR growth in SCV GV segment and de-growth of 2% in SCV PV (<5% of overall SCV industry in FY19).

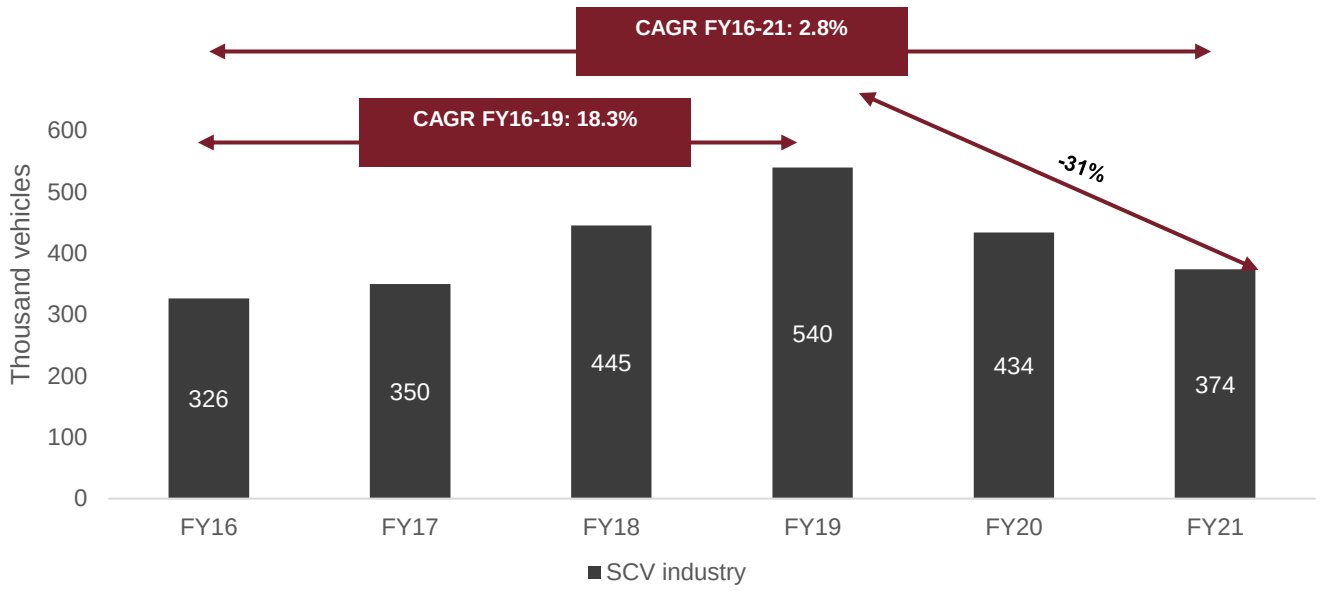
Faster growth in SCV production was on account of strong domestic demand, supported by higher replacement demand over fiscal 2018 to 2020, improved rural sentiments and growing e-commerce penetration.

COVID-19 outbreak had impacted private consumption by lowering disposable income and at the same time lowered redistribution freight (freight dependent on redistribution of goods transported post primary movement), this in turn had hit SCV demand in FY21.

Split by commercial vehicle category

Between fiscals 2016 and 2020, domestic SCV sales logged 7.4% CAGR. In fact, over fiscal 2016-2019, domestic sales clocked a CAGR of 18% on the back of robust 20% CAGR sales growth in SCV GV and -2% in SCV PV.

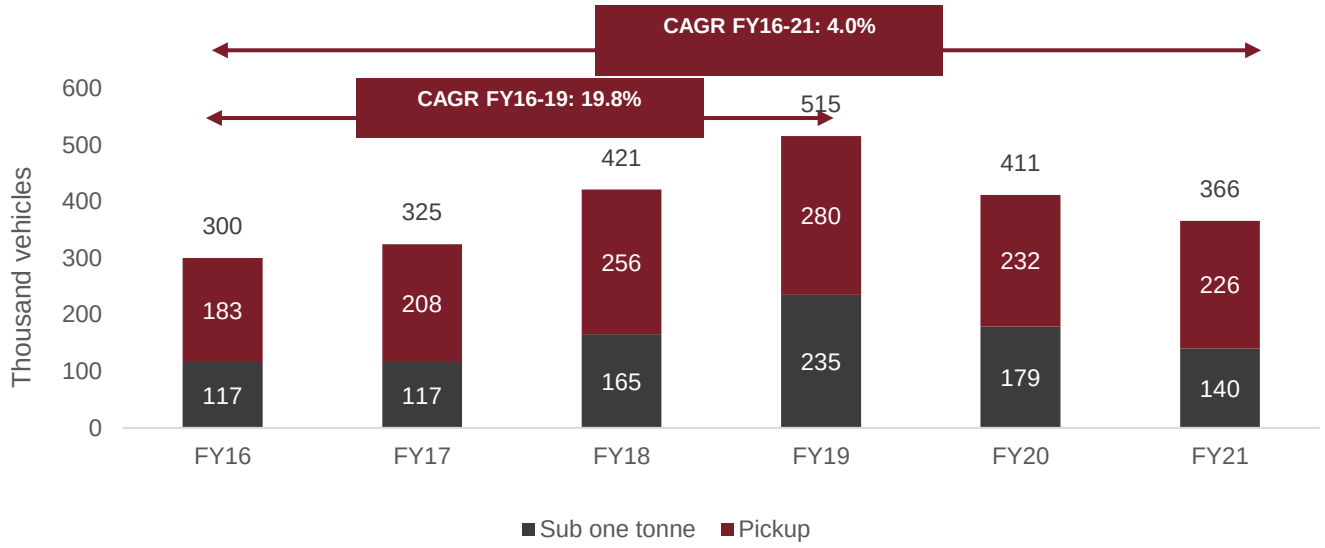
Review of SCV domestic sales



Note: SCV includes vehicles with Gross Vehicle Weight (GVW) less than or equal to 3.5 tons;
Source: SIAM and CRISIL Research

Split by small commercial goods vehicle category

Between fiscals 2016 and 2021, domestic SCV GV sales logged 4.0% CAGR. In fact, over fiscal 2016-2019, domestic sales clocked a CAGR of 19.8% on the back of robust 26.3% CAGR sales growth in Sub one tonne and 15.2% CAGR sales growth in Pickup.



Source: SIAM and CRISIL Research

Over the last five years, the SCV industry weathered major challenges on account of events like demonetisation, NBFC crisis, changes to insurance norms and the transition to BS VI emission norms. A culmination of multiple factors like the NBFC crisis, changes to insurance norms, economic slowdown and the transition to BS VI emission norms, particularly post the second of half fiscal 2019, resulted in a dampening of demand for overall SCVs.

Generally, SCVs are replaced every 6-8 years. SCV sales had increased at a rapid pace between fiscal 2011 and fiscal 2013 and these SCVs would come up for replacement in fiscal 2019. Replacement demand have been estimated to be especially higher for sub-one tonne segment due to its robust sales between fiscal 2011 and 2013. Due to this, sales of sub-one tonne outperformed in fiscal 2019. These higher volumes up for replacement prevented a major fall in SCV sales in FY20 after a robust sales in FY18 and FY19.

Normal monsoons from fiscal 2017 to 2019, minimum support price (MSP) support from the government and a pick-up in rural supported demand from the rural side supporting growth for SCVs. Over fiscal 2016 to 2020, the rise of e-commerce was among the major factors for a pick-up in demand for SCVs. If we look at fiscal 2016-2020, goods vehicles sales clocked a CAGR of 8.2% growth in SCV GV and over fiscal 2016-2019; goods vehicles sales clocked a CAGR of 20% growth. Even during the pandemic, strong rural sentiment and a lesser impact of the pandemic on rural areas resulted in SCVs performing well.

The pandemic brought the entire economy to a grinding halt, affecting profitability and sustainability of transporters due to lack of availability of freight demand. SCVs utilization was however relatively more sheltered from the impact of lockdown as movement of essential commodities were permitted by the government.

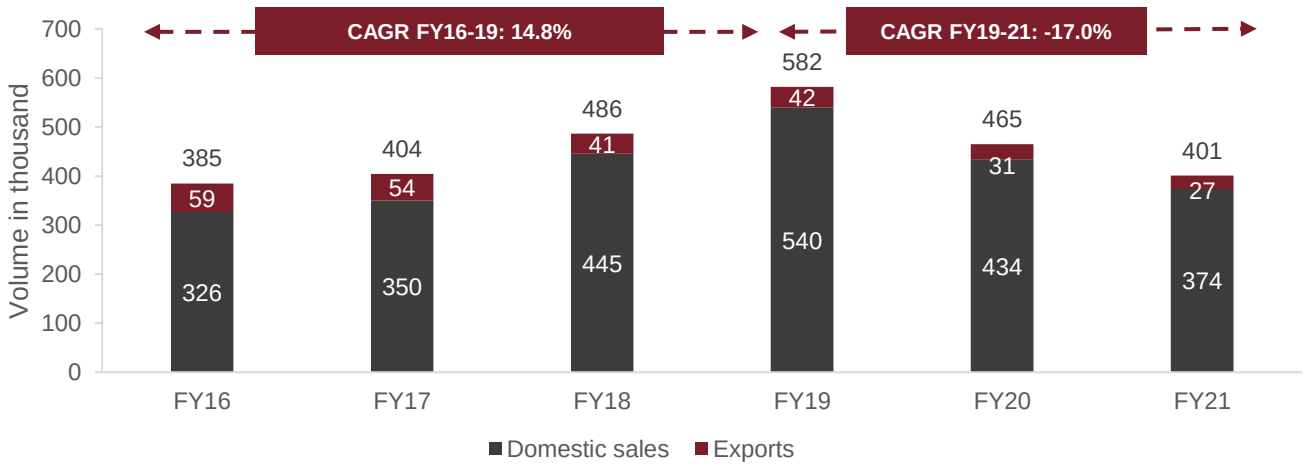
Freight availability started improving since June 2020 as the economy started opening up however again got impacted as the 2nd wave of covid struck. Impact of the lockdown however was less severe on freight availability for SCVs. Post the 2nd wave as economic recovery picked up pace industry witnessing a gradual pick-up in quarterly sales as consumption demand has gathered momentum

The industry is, however, now witnessing a gradual pick-up in quarterly sales as consumption demand and industry activity have started gaining pace.

In fiscal 2021, COVID-19 outbreak impacted tourism due to social distancing measures as well as mobility restrictions. School segment which is a significant contributor to sales of passenger SCV has been severely hit as schools remained closed in fiscal 2021.

Split by domestic sales and exports

CV industry split into domestic sales & exports



Source: SIAM and CRISIL Research

The Indian small commercial vehicle market is primarily focused on the domestic market, with more than 90% demand from the domestic market in fiscal 2021.

Domestic sales of SCV increased by a CAGR of 18% between fiscal 2016 and 2019 despite of various challenges such as demonetisation, NBFC crisis, changes to insurance norms. However, from fiscal 2020 onwards, industry started declining due to economic slowdown and inventory adjustment which took place at the dealer end prior to BS-VI transition which took place in fiscal 2021. In fiscal 202, domestic SCV sales witnessed a decline of 20% yoy. In fiscal 2021 due to pandemic, industry further witnessed a decline of 14% yoy.

Contribution of exports to production, however, declined sharply in from fiscal 2018 as demand from domestic market grew at a robust pace. Over fiscals 2019 and 2020, the share of exports continued declined as domestic manufacturers faced challenges in neighbouring Sri Lanka on account of restrictions on financing norms for automobiles and a hike in import duties. The Indian SCV industry exports have been largely concentrated in neighbouring countries like Sri Lanka, Nepal and Bangladesh. In fiscal 2022, SCV exports are likely to be lower as domestic OEMs will focus on the domestic market amidst supply chain constraints for critical components.

Key historic regulatory/ macroeconomic trends

Emission norms

In February 2016, the government decided to skip the Bharat Stage (BS)-V Emission Standards and move directly to BS-VI norms by April 2020. The stringent BS-VI norms incorporate substantial tightening of nitrogen oxides (NOx) and particulate matter (PM). These emission standards pushed vehicle prices higher, diesel trucks and buses segment witnessed a higher rise in costs due to the significant upgradation of engines and exhaust systems.

According to our estimates, implementation of the BS-VI norms will result in a 12-15% hike in the cost of diesel trucks. Percentage increase in vehicle price for BS VI models over BS IV was more pronounced in LCV trucks and buses. Percentage price increase was relatively lower for tractor trailers and MAVs.

As the BS VI norms were implemented in April 2020, increased vehicle prices, subdued finance availability resulted in sudden increase both initial cost of acquisition and total cost of ownership as the freight scenario remained lacklustre, impacting viability for transporters.

Higher safety measures for buses

Safety regulation regarding vehicle tracking and panic buttons were introduced in January 2019. Later regulations related to fire detection system, escape hatches, emergency lighting, and emergency doors were implemented in April 2019. These regulations resulted in bus prices increasing by Rs 65,000, in addition to regular price increases.

Historic growth drivers for Indian commercial vehicle exports

More than 90% of the commercial vehicle exports are to Asia, Africa and Middle East regions as on fiscal 2021.

In Asia, demand from Bangladesh, Srilanka, Saudi Arabia and Nepal drives the SCV exports. Geopolitical issues (border tensions) create challenges in exports. In 2020, when Srilanka banned exports (other than essential commodity), SCV exports from India to Srilanka came to a still point.

Border closures, foreign currency issues, sanctions on a few countries has led to impaired SCV exports in past. Africa is another major market for SCV exports from India.

During pandemic, SCV exports had fallen by 13% yoy in fiscal 2021 led by drop in exports of SCV GV by 11% yoy and drop in exports of SCV PV by 66% yoy.

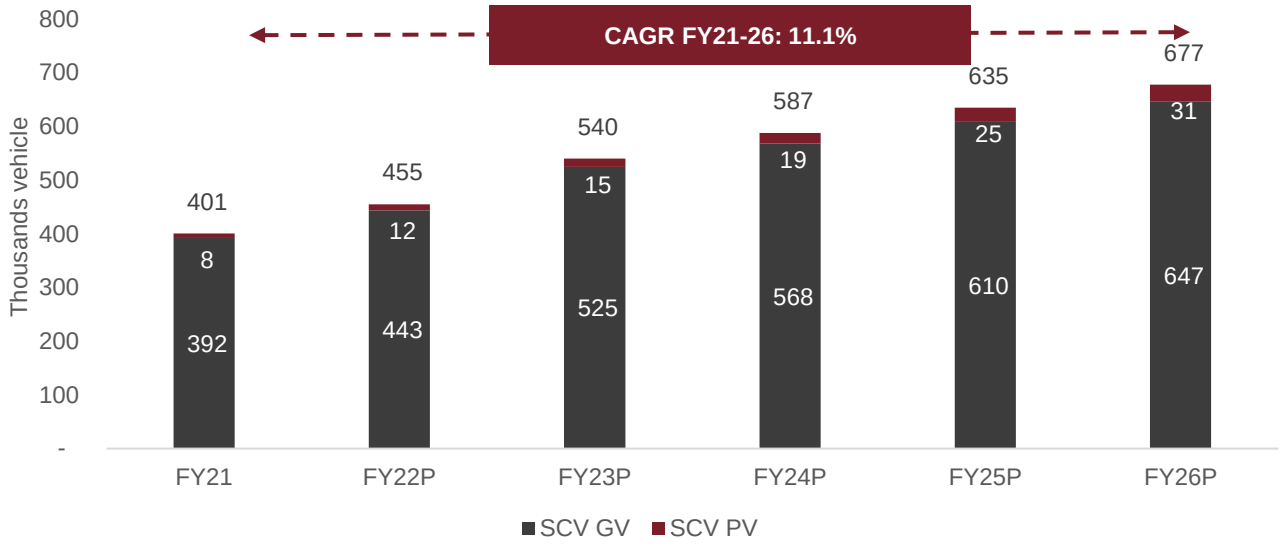
2.2.2 Outlook of Indian commercial vehicle industry (fiscals 2021 – 2026P)

Production outlook (fiscals 2021 – 2026P)

Production of SCVs in India is expected to increase at 11% CAGR over fiscals 2021 to 2026. SCV GV production is expected to grow by CAGR of 10.5% and the SCV PV segment is expected to show CAGR growth of 30% in fiscal 2026 over fiscal 2021 production.

SCV passenger segment in particular is expected to rebound sharply, growing at 30% CAGR over fiscals 2021 to 2026. In fiscal 2021, though, the production of SCV PV has sharply declined because of low people mobility and school closure due to the pandemic. But fiscal 2022 onwards, production of SCV PV is projected to rise as sales recover on a low base of fiscal 2021 on account of availability of vaccine and opening up of schools and resume in mobility.

CV production outlook



Note: SCV includes vehicles with Gross Vehicle Weight (GVW) less than or equal to 3.5 tons;
Source: SIAM and CRISIL Research

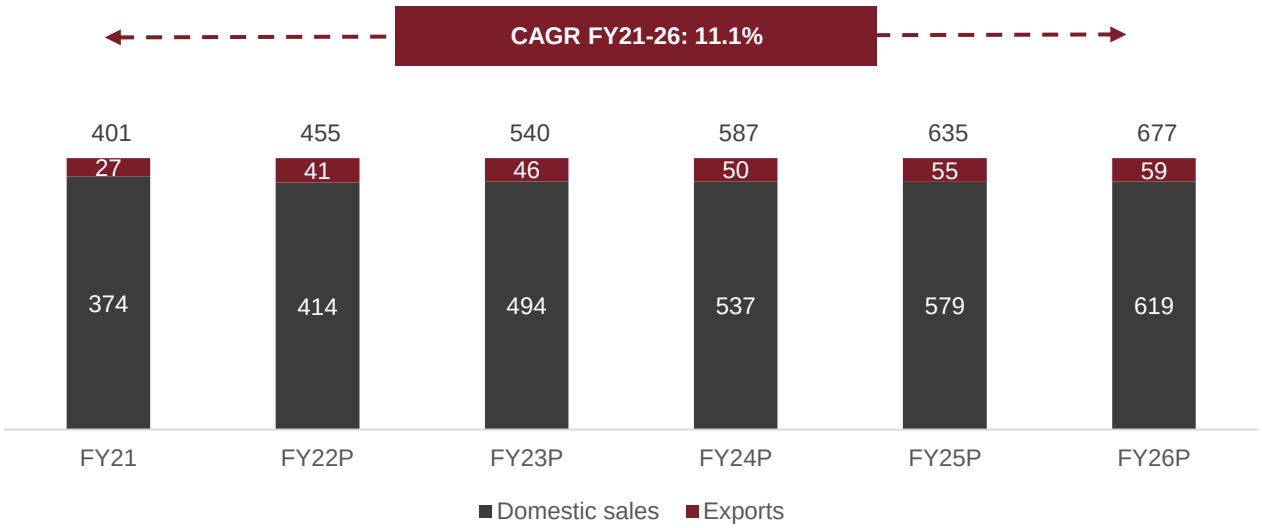
Split by domestic sales and exports

The Indian SCV industry is expected to remain domestic-focused, with domestic sales comprising ~93% share of production in fiscal 2021. However, with exports projected to grow at 16-18% CAGR over fiscals 2021 to 2026 (on a low base of fiscal 2021), its contribution in overall production is likely to marginally rise from 7% in fiscal 2021 to 9% in fiscal 2026.

Second wave of COVID-19 outbreak led to lockdown in key affected regions in Q1 of fiscal 2022. This has impacted domestic sales across segments post a healthy Q4 of fiscal 2021. Consequently, SCV GV volumes decline by ~38% qoq (quarter-on-quarter) in Q1 of fiscal 2022 resulting in ~37% qoq decline in overall SCV volumes. Chip shortages to restrict volumes in pickup segment (~60% of total SCV volumes) limiting volume prospects in H2 FY22.

The reason for the export trajectory is manufacturers directing their investments into expanding their presence to other Asian countries from neighbouring countries, such as Bangladesh, Nepal, and Sri Lanka, and Africa and the Middle East. Domestic players are also considering setting up of assembly operations across multiple markets. Also, going forward, new product line-ups and technology upgradation will allow domestic players to enter relatively advanced markets of South-East Asia. Consultations with the Sri Lankan government is likely to again gradually open up the market for Indian exports in the near future.

CV industry split into domestic sales and exports



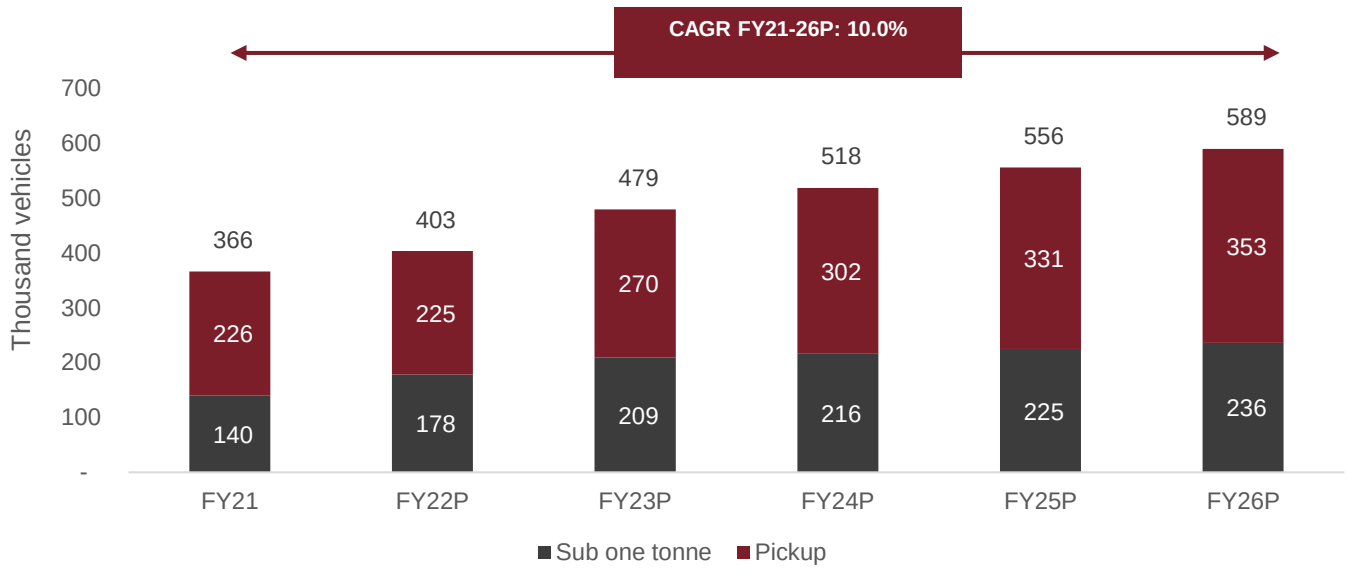
Note: P - Projected

Source: SIAM, CRISIL Research

Split by small commercial goods vehicle category

Domestic sales of SCV GV in India is expected to increase at 10% CAGR over fiscals 2021 to 2026. Sub-one tonne domestic sale is expected to grow by CAGR of 11% and the pickup segment is expected to show CAGR growth of ~9.5% in fiscal 2026 over fiscal 2021 domestic sales.

SCV GV domestic sales trend fiscal 2021-2026



Note: P - Projected

Source: SIAM, CRISIL Research

Key trends and growth drivers

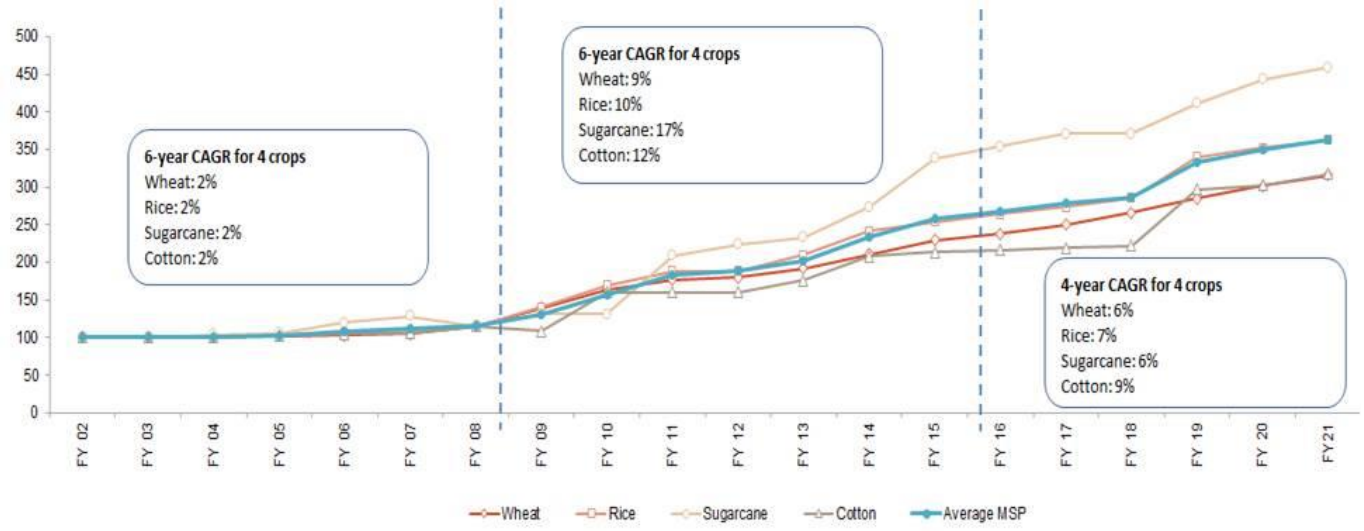
Stable agricultural output

Over fiscal 2021 to 2026, the following structural factors will support 4-6% gross value added (GVA) growth in agriculture.

The government aims to achieve its objective of doubling farm income by 2022 via initiatives such as e-NAM (National Agriculture Market), expansion of crop insurance coverage, direct income support and improvement in land productivity via soil health cards. These measures should improve farmers' crop yields and affordability, and boost average freight utilisation in SCV segments.

Stable hikes in MSP for cash crops have continued in the past, and are looking stable from fiscal 2021 to 2026. This will augment agricultural income, and will lead to new investments in the supply chain.

Hike in MSP



Source: Ministry of Agriculture, CRISIL Research

Fillip in industrial output

The Indian industry's GVA had been growing tepidly, averaging 5% between fiscals 2015 and 2020. After a weak fiscal 2021 due to the pandemic, CRISIL Research expects industrial GVA to bounce back rapidly in fiscal 2022 and later stabilise at around 6.3% CAGR over fiscal 2022-2026, driven by the government's focus on 'Make in India' and growth of consumption, particularly led by growth rural incomes. Moreover, improvement in infrastructure and higher expected corporate expenditure is likely to revitalise the capex cycle going forward, post fiscal 2021.

Positive terrain of E-retail

The online retail sector is expected to witness healthy growth in fiscal 2022 on a low base of previous fiscal. Ban on sale of non-essential for most part of first quarter will impact demand to some extent. However, post that the sector is poised to grow. Pandemic has brought a change in the buying behaviour with more and more people taking online route. CRISIL Research projects online retail to clock 25-30% CAGR between fiscals 2021 and 2024.

Online grocery, which has caught the attention of all major players and has seen significant investment over past few years, will be fastest-growing segment. Apart from this, continued focus of major players on existing business segment such as electronics will drive growth. With omni-channel strategy gaining prominence, the e-retail industry seems set to add to the growth of the overall organised retailing sector rather than pose competition to existing players therefore increasing last mile freight availability and therefore demand for SCVs.

Long-term demand for household appliances industry to be propelled by low penetration and rising affordability

CRISIL Research projects long-term demand for household appliances to witness healthy growth on increasing affordability because of stable product prices, easy financing options, increased government spending on rural infrastructure amid higher economic growth, and assuming moderate inflation. Volume growth will be driven by better affordability, shorter replacement cycles, multiple ownership (in the case of CTVs) and current low penetration levels (in the case of other appliances).

Within the household appliance space:

- The overall TV market is projected to clock 6-7% CAGR in volume terms in long term till fiscal 2026.
- In refrigerators, direct-cool and frost-free segments are likely to post CAGR of 9.5-10.5% in volume terms between fiscals 2021 and 2026.
- The growth in FA and SA machines is expected to grow at 11-12% CAGR and 8.5-9.5% CAGR respectively.
- In fiscal 2021, RAC penetration is only ~16% of total Indian households. Over the next five years, the segment is expected to record 13-14% CAGR in volume terms.
- Rising demand in under-penetrated rural areas and replacement demand, as well as multiple ownership in urban areas could drive last mile freight availability and therefore demand for SCVs.

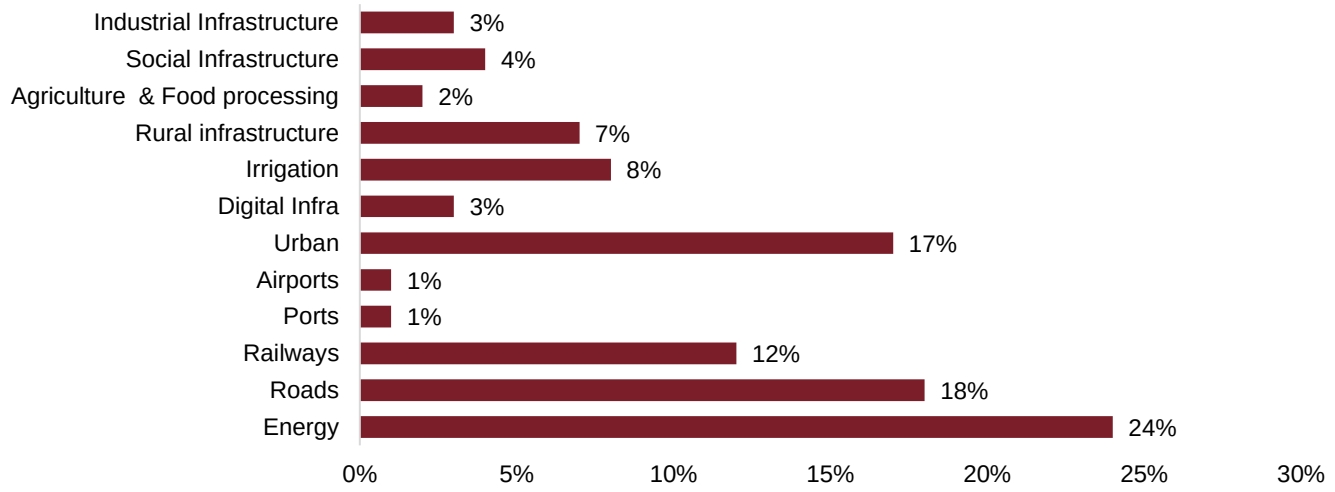
Government’s focus on infrastructure

The National Infrastructure Pipeline (NIP) for fiscal 2019-2025 is a first-of-its-kind, whole-of-government exercise to provide world-class infrastructure to citizens and improve their quality of life.

Infrastructure investment in India from fiscal 2013 to 2019 was Rs 57 trillion. Power, roads and bridges, urban, digital infrastructure and railways together constituted more than 85% of the total infrastructure investment. The centre and states were the major funding sources for sectors such as power and roads and bridges, with moderate participation from the private sector. Digital sector investments were largely driven by the private sector, while investments in the irrigation sector were predominantly made by the state governments.

The total capital expenditure in infrastructure sectors in India during fiscal 2020 to 2025 is projected at Rs 111 trillion. The break-up of the plan is as below:

Sectoral breakup of NIP amounting to Rs 111 trillion



Source: Department of Economic affairs, NIP Volume I

The National Infrastructure plan aims to double infrastructure investment per year from the current average of Rs. 10 trillion per year to Rs 22 trillion per year. Of the total NIP of Rs 111 trillion, Rs 44 trillion (40%) worth of projects are under implementation, Rs 34 trillion (30%) worth of projects are at the conceptualisation stage, and Rs 22 trillion (20%) worth of projects are under development.

Almost 83% of project allocation indirectly benefits the commercial vehicle sector in India, and this push for infrastructure is a major driver of growth.

Investments in infrastructure is expected support demand for SCV for on-site movement of workers and materials. Government focus on infrastructure investment particularly rural infrastructure, social infra, agriculture and food processing are particularly expected to aid SCV sales. In addition, improvement in infrastructure particularly roads, urban infrastructure is expected to aid competitiveness of road freight thereby benefiting SCV sales over long term.

End use sector outlook (FY21 - FY26)

Key end use segments and outlook		
Sectors	**Growth outlook (FY21-26)**	**Key aspects**
Steel	6-7%	Building and Construction major demand creator in this segment
Cement	4-5%	Demand will be led by rural housing / affordable housing and commercialization of Tier III/IV cities Infrastructure demand as per NIP, also plays an important factor
Household appliances	11-13%	Long-term demand for household appliances industry to be propelled by low penetration and rising affordability
Road Investment	8-10%	National Infrastructure plan (NIP) to drive investment in infrastructure on roads and highways. CRISIL expects GoI would be able to achieve 80-85% of targeted investments
E Commerce	10-15%	Food, Fashion and Grocery segment to grow at a faster rate as penetration increases. E Retailers will focus on expansion in Tier I/II cities in this period

Source: SIAM, CRISIL Research

SCV sales to grow at modest pace in long run

SCV demand is expected to rise 10-12% CAGR from fiscals 2021 to 2026, owing to higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

Demand for essentials and high urban share of demand as well as availability of CNG and petrol models to support the segment. Within SCVs, the shift towards pick-ups (which carry higher loads) from sub-one tonne vehicles, though, will curb a sharper increase in sales volume, as fewer trucks will now be required to transport the same quantity.

Replacement demand is expected to be positive in fiscal 2022 as some replacement sales that was expected in FY20 and FY21 would have got postponed to subsequent years. Improving volumes up for replacement in the terminal years would aid demand growth

Key upcoming regulatory changes

Electrification in commercial vehicles

Total cost of ownership assessment

A comparison of total cost of ownership of various types of commercial vehicles will provide a view as to how much a vehicle costs to own and operate over the period. Commercial operation of any vehicle will be successful only if the cost of operating is below the revenue earning. A vehicle with a significantly higher cost of operation will not be viable due to competition from other vehicle categories and varying powertrains.

However, battery swapping helps in reducing cost of ownership in addition to reduction in range anxiety, drastically reducing refuelling (charging) time and assuage customer concerns around life of a battery or need for replacement of a battery. Several states are also supporting battery swapping by offering subsidies for capital investment in battery swapping stations. Success of battery swapping also depends on standardization of battery specifications by a central/ nodal authority and along with commitment of substantial investments by swapping infrastructure providers for establishment of a dense network of swapping stations across parts of India. Also, financier community needs to be provided complete awareness about the same to facilitate vehicle financing. Battery stations are also likely to face viability challenges due to lower existing penetration of EVs in India.

In fact an addition to the same is MaaS (Mobility as a Service) in which there are many players that are planning to get into to build the entire ecosystem and this will also help reasonable EV penetration in the commercial EV segment.

TCO over 4-year period at FY21 and FY26 prices for SCV (2T GVW):

SCV

In the current scenario, CNG comes across as the cheapest alternative powertrain due to the prohibitively high initial cost of electric SCVs.

In case of SCVs (at Mumbai prices), operating cost of an EV is ~50% less than that of a comparable diesel vehicle. Even in the eighth year both electric and diesel versions are unlikely to break even for FY26 prices. At FY26 prices, electric vehicles are expected break even with diesel only in the 12th year of operation.

However, with respect to CNG the difference in operating costs of an electric vehicle is <30%, due to which the break-even period of an electric vehicle with respect to a comparable CNG vehicle is relatively higher at <15 years.

With respect to cost of ownership, while EVs may be able to match the cost of diesel SCVs by FY32, they will still be considerably costlier than CNG SCVs. This when looked at in conjunction with the focus of the government on improving the natural gas grid in India, is expected to keep the overall adoption levels of EVs in SCVs at 4-6% even by FY26.

FY22				FY26			
TCO period (years)	**4**	**6**	**8**	**TCO period (years)**	**4**	**6**	**8**
Diesel (Rs/km)	4.7	4.1	3.3	**Diesel (Rs/km)**	5.1	4.5	4.3
CNG (Rs/km)	3.4	2.9	2.8	**CNG (Rs/km)**	3.7	3.2	3.1
Electric (Rs/km)	7.3	5.2	4.8	**Electric (Rs/km)**	6.5	4.6	4.2

Note: Numbers denote total cost of ownership in Rs per km, TCO period units in years; TCO period has been calculated for 4, 6 and 8 years. Numbers in Diesel, CNG and Electric rows indicate total cost of ownership in Rs per km

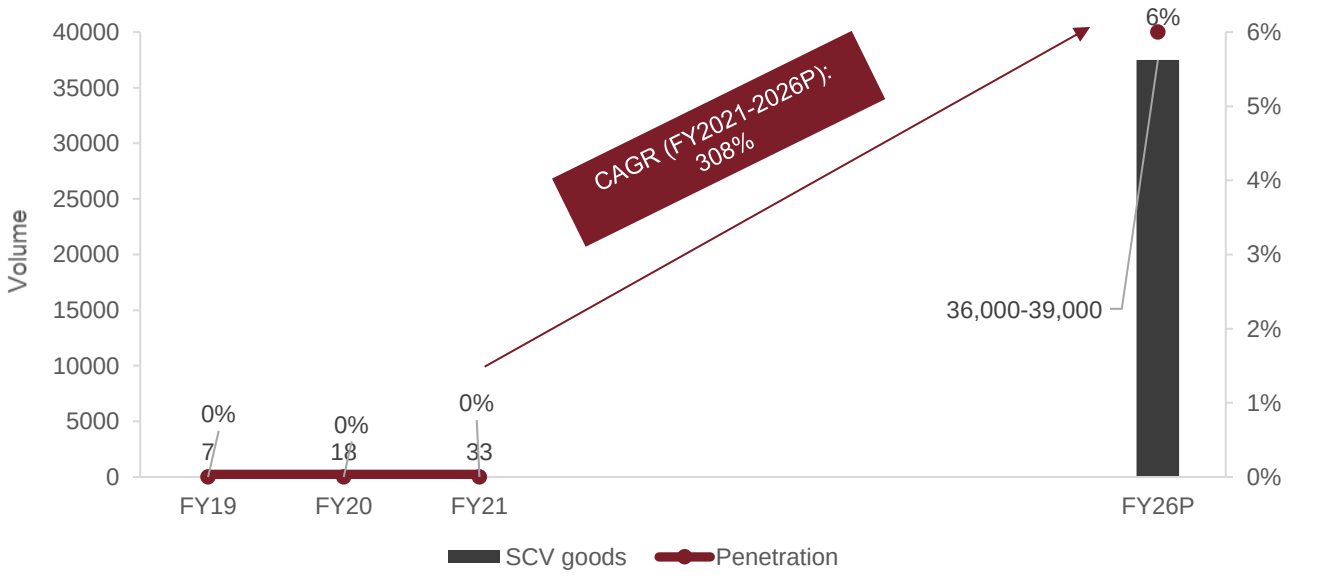
For a vehicle bought in FY22 and held for 6 years; the total cost of ownership will be Rs 4.1 Rs/km for Diesel version vs Rs 2.9/km for CNG vehicle whereas cost of ownership will be Rs 5.2/km for an electric vehicle.

Electrification outlook in small commercial vehicle

Electrification in SCV goods vehicles

Currently, most EVs used in the commercial segment as goods carries are three-wheelers. However, as the cost differential between electric and diesel vehicles start reducing, we expect new models to be launched, which will drive sales in the segment as the third-mile logistics and local distribution of goods are well suited applications for electric vehicles.

EV SCV goods domestic sales outlook



Source: CRISIL Research

Consequently, EV sales in the SCV goods segment can rise to 36,000-39,000 vehicles by fiscal 2026 which would be about 6% of the total light commercial goods vehicle market as CNG offers better total cost of ownership in the near future and be preferred over electric variants.

3 Market sizing and outlook of relevant auto component segments

3.1 Transfer case

Transfer case system is used in four-wheel drive (4WD) or commonly known as 4X4 vehicle that has four driven wheels. In a 4X4 configuration the first 4 indicates that the vehicle has four wheels and the second 4 indicates that all four wheels are driven. A vehicle will have more pulling power and traction if all of its wheels are driven. This requires a transfer case system.

Transfer case system involves the mechanical transfer case components and electronic components ECU & sensors.

The transfer case system transfers power from the transmission to the front and rear axles by means of drive shafts. It also synchronizes the difference between the rotation of the front and rear wheels, and may contain one or more sets of low range gears. Set of reduction gear is used for low-speed and high-torque applications, such as for off-roading. When set of reduction gear are not used but torque is transferred to all 4-wheels, this is known as 4WD high. When 4WD low is engaged, it activates the reduction set in the transfer case and gives the extreme deep ratio which helps the vehicle drive in extreme conditions. In two-wheel drive (2WD) high, torque is transferred only to rear wheels, making a drive type as rear wheel drive (RWD).

To shift between 4WD high, 4WD low and 2W options, in case of a mechanical shift on-the-fly transfer case, a selector lever is to be manually adjusted by the driver. In case of Electronic Shift On-the-Fly (ESOF) transfer case, a dash mounted selector switch or buttons is to be pushed by the driver to change the setting. In ESOF, the transfer case is installed along with an Electronic Control Unit (ECU), it provides a mechanism to select among above three options.

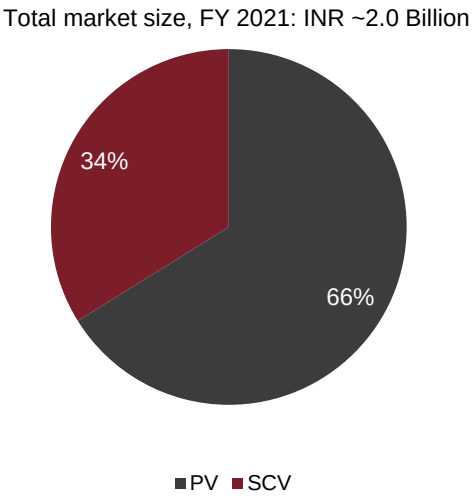
Transfer cases systems are either chain driven or gear driven. Gear-driven transfer cases use systems sets of gears to drive either the front or both the front and rear driveshafts. These are generally strong, heavy units that are used in large trucks. Chain-driven transfer cases systems use a chain to drive most often only one axle but can drive both axles. Chain-driven transfer cases are quieter and lighter than gear-driven ones. They are used in vehicles such as low-tonnage trucks, cars and SUVs. Some off-road driving enthusiasts modify their vehicles to use gear-driven transfer cases, accepting the additional weight and noise to gain the extra strength they generally provide. In India, except for few high-end models, the industry is dominated by chain driven transfer case systems in PV and SCV segment.

Transfer case market

Review, fiscal 2021

CRISIL Research estimates the size of the transfer case market (catering to OEM demand) at Rs 2.0 billion in fiscal 2021. Passenger vehicle (PV) segment occupies the highest share of 66%, followed by small commercial vehicle (SCV) segment at 34%. However, per unit realisation of ESOF transfer case will be higher as compared to manual shift due to the cost of ECU integration involved.

Transfer case industry split by application in value terms, fiscal 2021



SOURCE: Industry, SIAM, CRISIL Research

Key players

Current penetration of 4WD is estimated at ~1% in India. Hence, the transfer case systems are mostly imported by the OEMs in India. OEMs typically manufacture these transfer cases in-house through group subsidiaries. Aisin, BorgWarner, Dana, Divgi TTS, Magna, Univance are among the key suppliers of transfer cases to passenger vehicle industry in India.

Divgi TTS is one of the leading players supplying transfer case systems to OEMs in India and the largest [1]supplier of transfer case systems to passenger vehicle manufacturers in India. Divgi TTS is also the only player manufacturing and exporting transfer cases (including the dominant chain driven transfer cases and ESOF transfer cases) to global OEMs from India.

Outlook, fiscals 2021- 2026

Market for transfer case is expected to increase by 33-35% CAGR from fiscal 2021 and 2026 that is from 58k to 248k in volume terms and by 37-39% CAGR in value terms i.e. from Rs 2.0 billion to Rs 10.2 billion.

CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Demand for transfer cases is expected to be driven by growing demand for 4WD vehicles which will supported by growing interests in off-roading. Penetration for 4WD technology is expected to reach 2-4% by fiscal 2026 from current level of ~1%, witnessing higher traction in SUV segment. However, Indian PV market is still expected to be dominated by small cars and compact SUV, they are expected to continue being a front wheel drive (FWD) vehicle.

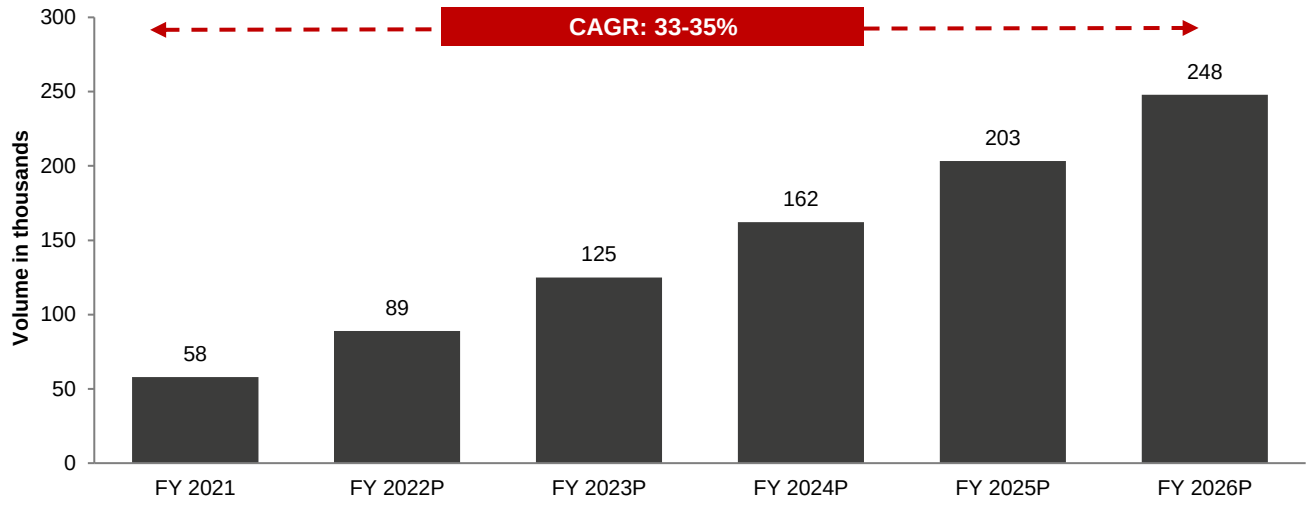
Production of SCVs in India is expected to increase at 10-12% CAGR over fiscals 2021 to 2026. SCV growth will be driven by higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

[1] *Based on the data provided by the company, primary interactions and data available from credible secondary sources*

SCV passenger segment in particular is expected to rebound sharply, growing at 30% CAGR over fiscals 2021 to 2026. In fiscal 2021, though, the production of SCV PV has sharply declined because of low people mobility and school closure due to the pandemic. But fiscal 2022 onwards, production of SCV PV is projected to rise as sales recover on a low base of fiscal 2021 on account of availability of vaccine and opening up of schools and resume in mobility.

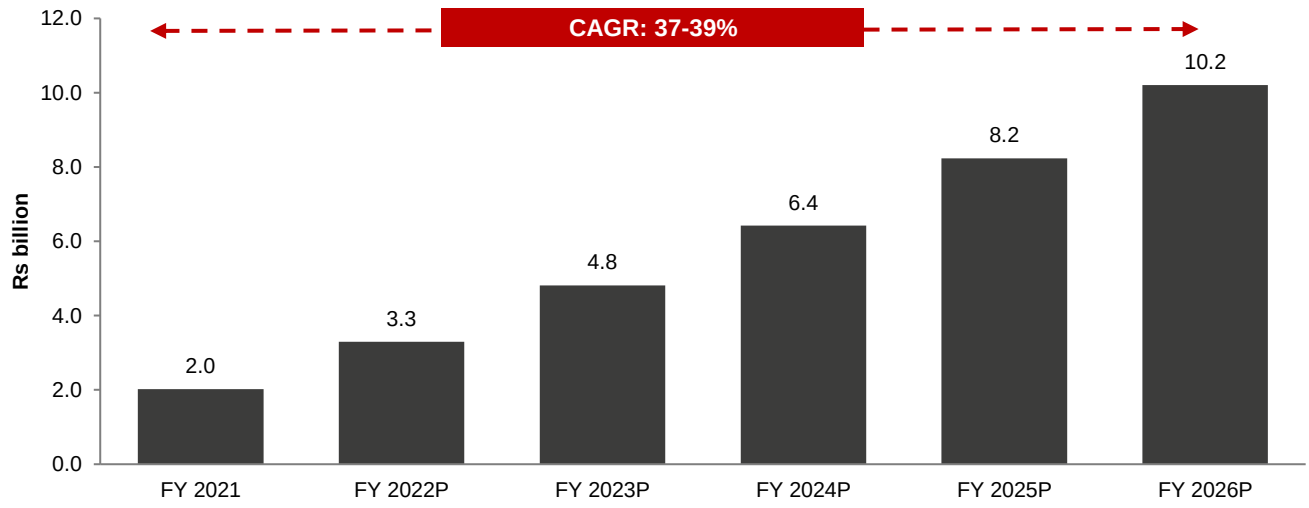
In SCV category, pickup vans such as Mahindra Bolero is available in 4WD option. It is mainly used in rough terrain such as tea plantation in North East or in desert region. Here, the application of 4WD SCV is not expected to materially change over the forecast period. Hence, by fiscal 2026 we expect the penetration of 4WD to remain stable at current levels penetration of ~5%.

Indian Transfer cases market outlook (thousand units) (fiscal 2021-2026P)



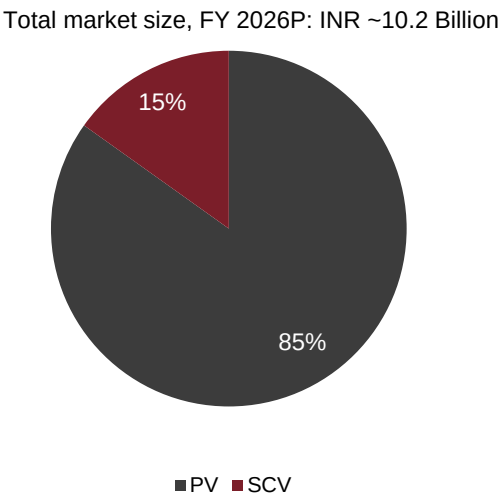
SOURCE: Industry, SIAM, CRISIL Research

Indian Transfer cases market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

Transfer case industry split by application in value terms, fiscal 2026



SOURCE: Industry, CRISIL Research

3.2 Torque coupler

Torque coupler is used in front wheel drive (FWD) based all-wheel drive (AWD) vehicles. Torque coupler senses the torque requirement & transfers the necessary torque to the rear wheels when wheels start slipping on the surface. Here the response time of actuating the clutch is very critical to proper functioning of a vehicle, else the vehicle begins to skid. Clutching and de-clutching is performed by an ECU. The calibration of ECU with the performance of a vehicle is critical. This testing is done jointly by the OEM and the component supplier. This type of technology where ECU integration is required is known as multi-disc wet clutch technology. Another technology called as viscous coupling is also present. Here the actuation of clutch is not electronically controlled. A series of plates and silicon is used. When driving wheels slip (here front wheels), viscous coupling locks and torque is transferred to the other axle i.e. the rear wheels. Here, the engagement of rear axles is slightly delayed.

Review, fiscal 2021

In India, FWD based AWD has a miniscule penetration of <1% in fiscal 2021. It is offered mainly in premium SUV category. Market size of torque coupler is estimated at ~1k units and Rs 0.02 billion as on fiscal 2021.

Key players

Torque couplers are mainly imported since the penetration of AWD is miniscule in India. Aisin, BorgWarner Divgi TTS, Schaeffler, Valeo, ZF are among key global suppliers of torque coupler. Few suppliers like Aisin, BorgWarner, Divgi TTS provide system level solutions offering software that controls the vehicle dynamics and the clutching and de-clutching system. Divgi TTS is the only manufacturer for torque couplers in India.

Automatic variant of one of the most popular SUVs, XUV 700 uses Divgi TTS made Nextrac Torque Coupler. In the overall vehicle sales of XUV 700, the automatic variant has a significant (40-45%) contribution.

Outlook, fiscals 2021- 2026

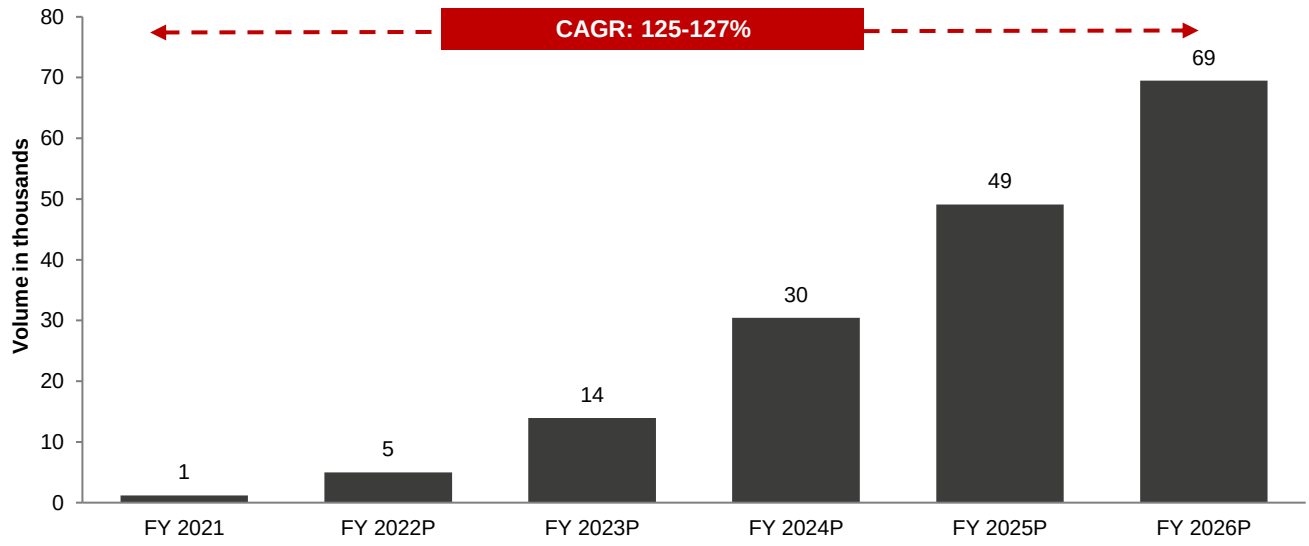
Market for torque coupler is expected to increase by 125-127% CAGR from fiscal 2021 and 2016 in volume terms and by 133-135% CAGR in value terms. Demand for torque couplers are expected to grow from ~1 thousand units in fiscal 2021 to 69 thousand units by fiscal 2026.

CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Because of the high cost associated with AWD drive train, the penetration of FWD based AWD is expected to be in the range of 1-2% by fiscal 2026. Again, the offering is expected to be in UV category.

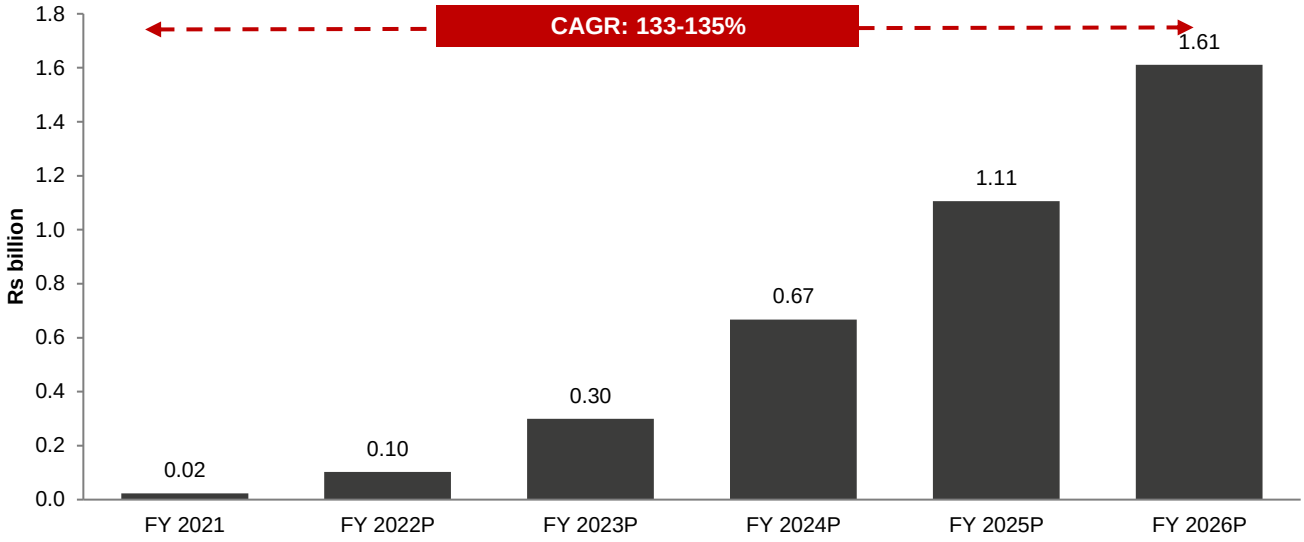
Drive type is not impacted by the type of fuel required to drive a vehicle. Hence, EV penetration will not have any impact on transfer case industry.

Indian torque coupler market outlook (thousand units) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

Indian torque coupler market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

3.3 Auto locking hub

Auto locking hub is used in conjunction with ESOF based transfer case. When a vehicle is running in 2WD high, the auto locking hub locks the front wheels i.e. no torque is transferred to the front wheels, they are freely rotating. This helps in avoiding the frictional losses which otherwise will arise when front wheel is driving the axle. This helps in providing better fuel mileage. In India, in most cases it used to be manual locking hub. Here, the driver had to get down and manually lock the hub when moving from 4WD to 2WD. However, global OEMs are preferring central axle disconnect (CAD) system over a locking hub. Moving forward, AWD based new models are not expected to be using auto locking hub, CAD is expected to be used for such application.

In India, very few models are currently on this system (auto lock hub in conjunction with ESOF transfer case). Hence, auto lock along with the ESOF based transfer case is imported as a whole transmission system.

3.4 Synchroniser

Vehicles fitted with Manual Transmission (MT), Automatic Manual Transmission (AMT)/ intelligent Manual Transmission (iMT) and Dual Clutch Transmission (DCT) will require synchroniser set.

The purpose of a gear synchroniser is to synchronize the speeds of the input and output shafts of a gearbox. during a gearshift, before the engagement of the upcoming gear. The synchroniser acts like a friction clutch and decelerates (upshift) or accelerates (downshift) the input shaft, in order to match the speed for the upcoming gear.

Within a gearbox, the synchronizers are located between two adjacent gears. For example, gears 1-2 share the same synchronisation mechanism, 3-4 another one and the same for 5-6. In India, synchroniser for reserve gear is offered for passenger vehicle starting from premium hatchback category.

Synchroniser can be classified as single-cone, double-cone and triple-cone depending on the number of friction elements. Multi-cone provides higher friction as compared to a single-cone. Hence, generally between 1st and 2nd gear multi-cone synchroniser is used.

In India, synchronisers are available using different raw material such as brass, brass with carbon lining and steel with carbon lining. For higher durability and performance, synchroniser used are of brass or steel with carbon lining.

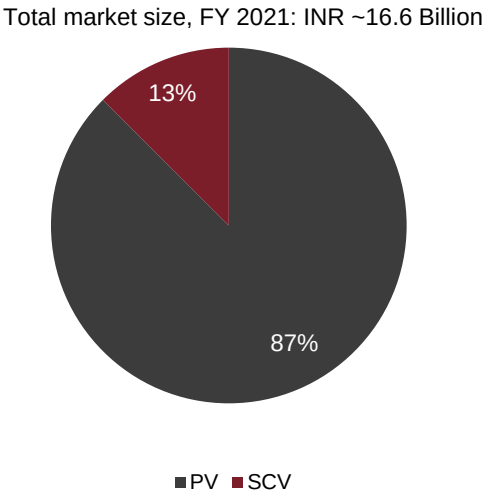
Synchroniser pack includes sliding sleeve, synchroniser hub, synchroniser ring, ring spring and locking element.

Synchroniser pack market

Review, fiscal 2021

CRISIL Research estimates the size of the synchroniser industry (catering to OEM demand) at Rs 16.6 billion in fiscal 2021. Passenger vehicle (PV) industry occupies the highest share of 87%, followed by small commercial vehicle (SCV) industry at 13%. ~92% of PVs are currently using MT, AMT, iMT or DCT transmission, whereas in SCVs 100% vehicles are using MT.

Synchroniser pack industry split by application in value terms, fiscal 2021



SOURCE: Industry, SIAM, CRISIL Research

Key players

Key players such as Anand CY Muteck Automotive Pvt. Ltd., Divgi TorqTransfer Systems Private Limited, Natesan Synchrocones Pvt. Ltd., Yugal Precision Pvt. Ltd. manufactures synchronisers for PV and SCV vehicles.

Divgi TTS is one of the first few suppliers of steel and carbon-based synchronizer systems for the Indian market. Divgi TTS has also been one of the leading manufacturers of steel synchronizers in India.

Outlook, fiscals 2021- 2026

Market for synchroniser is expected to increase by 7-9% CAGR from fiscal 2021 and 2016 in volume terms and by 12-14% CAGR in value terms. Market for synchronizers is expected to touch Rs 30.5 billion by fiscal 2026.

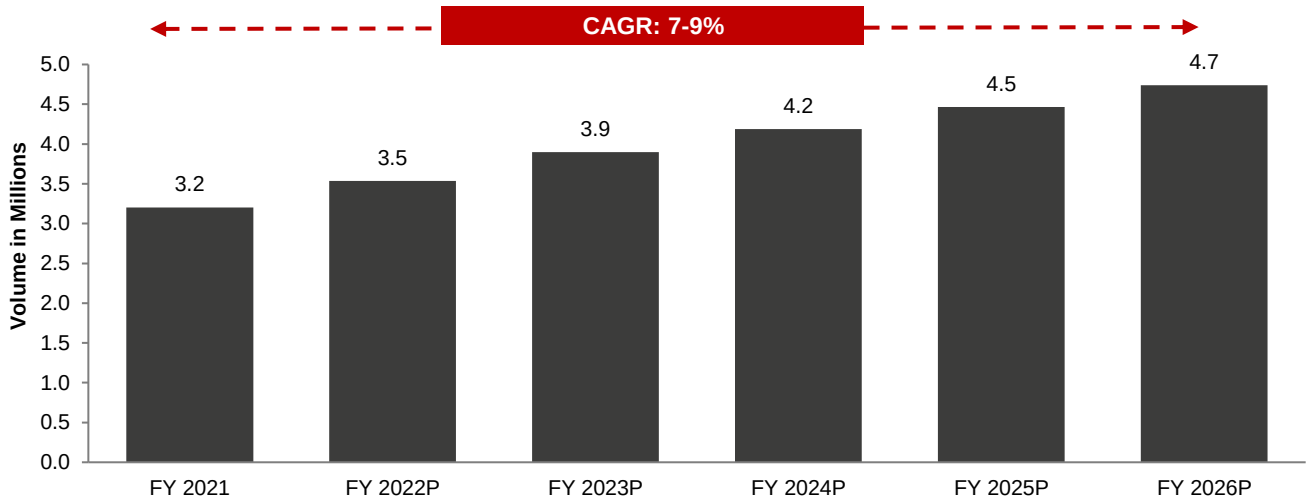
CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Production of SCVs in India is expected to increase at 10-12% CAGR over fiscals 2021 to 2026. SCV growth will be driven by higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

SCV passenger segment in particular is expected to rebound sharply, growing at 30% CAGR over fiscals 2021 to 2026. In fiscal 2021, though, the production of SCV PV has sharply declined because of low people mobility and school closure due to the pandemic. But fiscal 2022 onwards, production of SCV PV is projected to rise as sales recover on a low base of fiscal 2021 on account of availability of vaccine and opening up of schools and resume in mobility.

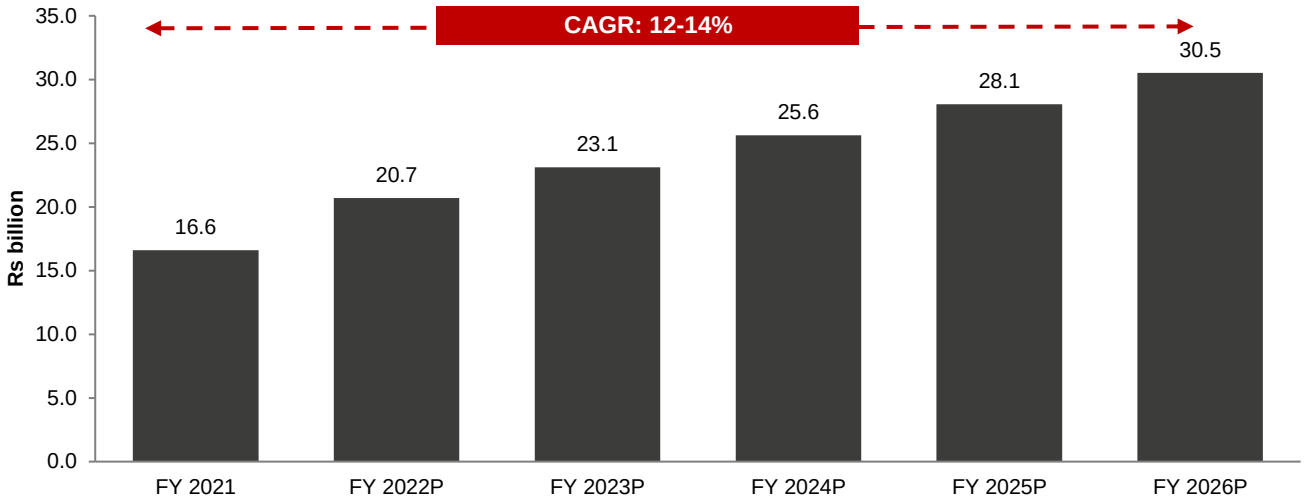
Synchronisers which are majorly required in MT, AMT, iMT and DCT transmission, share of these transmission systems is estimated to have a penetration of ~92% in PV segment, and 100% in SCV category. This penetration is expected to be at 90-92% by fiscal 2026 in PV. Electric vehicle penetration in PVs is expected to increase from ~0.16% currently to 4-6% by fiscal 2026, this is expected to shave off some demand for synchronizers. Despite the drop in the share of total share of MT, AMT, iMT and DCT transmission in overall PV production, rising electrification, demand for synchroniser packs is expected rise from 3.2 million units in fiscal 2021 to 4.7 million units in fiscal 2026 Indian SCV market is expected to remain on manual transmission thereby aiding the demand for sychronisers,

Indian Synchroniser pack market outlook (million units) (fiscal 2021-2026P)



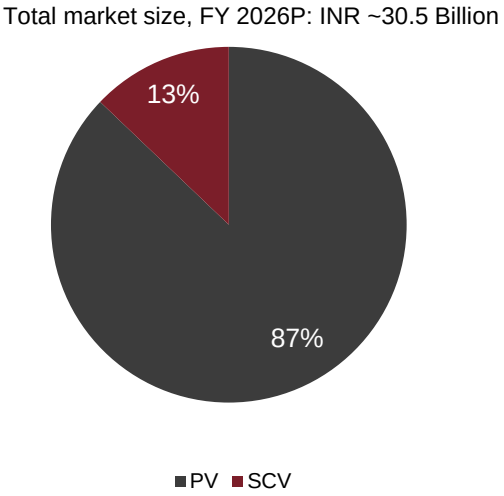
SOURCE: Industry, SIAM, CRISIL Research

Indian Synchroniser pack market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

Synchroniser pack industry split by application in value terms, fiscal 2026



SOURCE: Industry, CRISIL Research

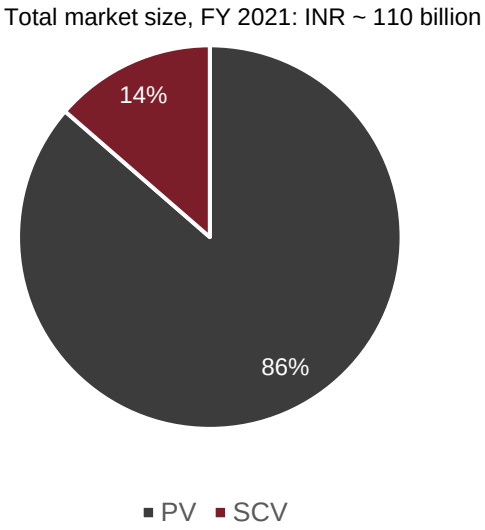
3.5 Manual Transmission

Manual transmission is used to transmit power from the engine to the wheels and contains a gear box that would require the driver to manually choose between different gear ratios using a gear stick and clutch during acceleration and deceleration. This is the most predominant transmission system in the Indian market for PVs and SCVs.

Review, fiscal 2021

CRISIL Research estimates the size of the manual transmission market at a system level for PVs (catering to OEM demand) at Rs. 95 billion and for SCVs at Rs. 15 billion in fiscal 2021. Manual transmission is the most common transmission system found in PVs and in all the SCVs. The average penetration of manual transmission is lowest in large cars and premium utility vehicles.

Manual transmission industry split by vehicle segments (fiscal 2021)



SOURCE: Industry, SIAM, CRISIL Research

Key players

OEMs typically undertake assembly of manual transmission systems in-house or through subsidiary companies. OEMs procure sub-components such as gears, shafts, synchronisers, etc. from various auto component suppliers and then assemble it in-house. Few component players supply entire transmission assembly in India, key players are Avtec and Kinetic Engineering.

Outlook, fiscals 2021- 2026

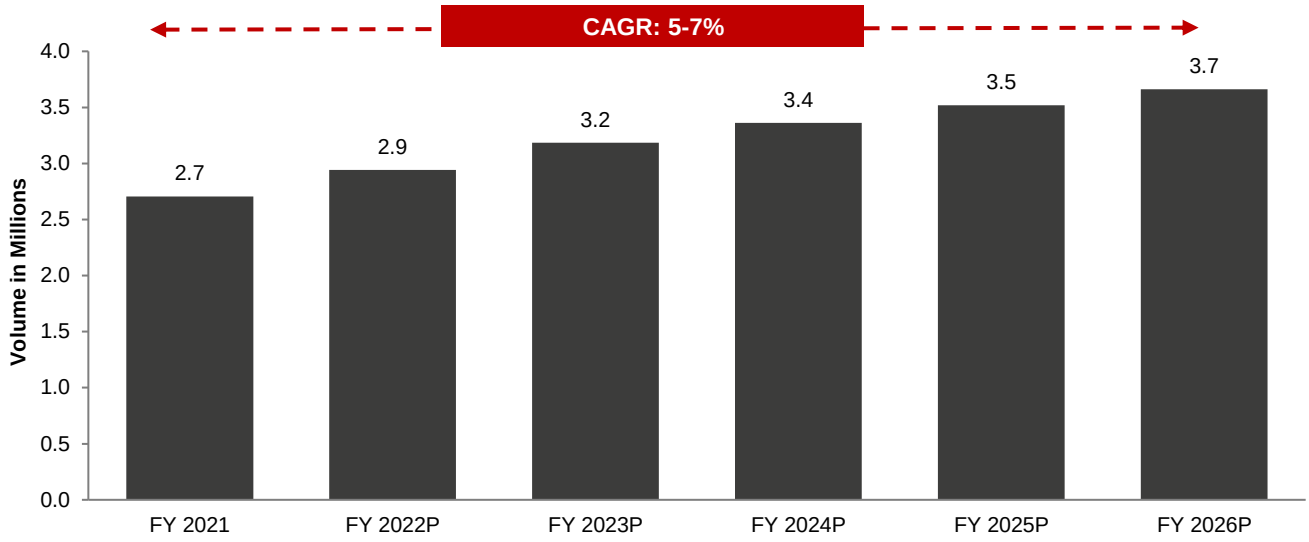
CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Production of SCVs in India is expected to increase at 10-12% CAGR over fiscals 2021 to 2026. Improving industrial activity, steady agricultural output, and the government's focus on infrastructure will drive the growth of SCVs. It will also grow on the back of higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

Shift to automatic transmission coupled with reduction in the cost of technology is likely to impact the demand for manual transmission considerably. Although it is expected to be the predominant transmission system in fiscal 2026, the penetration levels are most likely to come down compared to the current levels. Penetration of manual transmission in PV is expected to reduce from ~75% in fiscal 2021 to ~67% by fiscal 2026. However, in SCV segment, we expect the penetration of manual transmission to remain at current levels of 100% by fiscal 2026

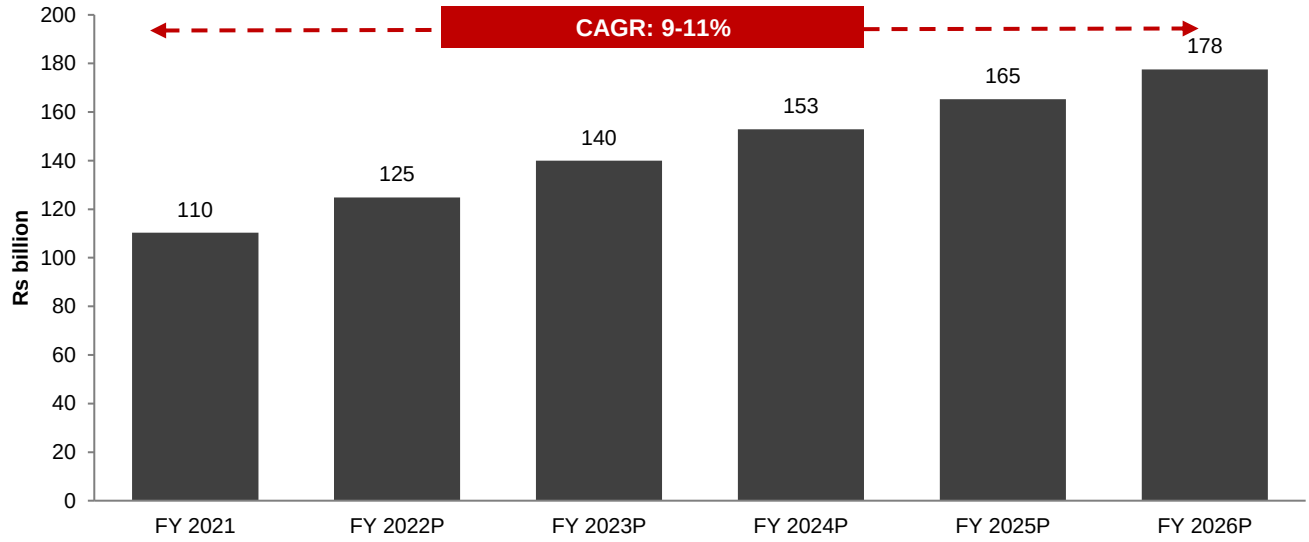
Volume of MT (PV and SCV combined) is still expected to grow at a CAGR of 5-7% from 2.7 million units to 3.7 million units and in terms of value, industry is expected to grow by 9-11% CAGR from fiscal 2021 to 2016 i.e. from Rs 110 billion to Rs 178 billion.

Indian manual transmission market outlook (million units) (fiscal 2021-2026P)



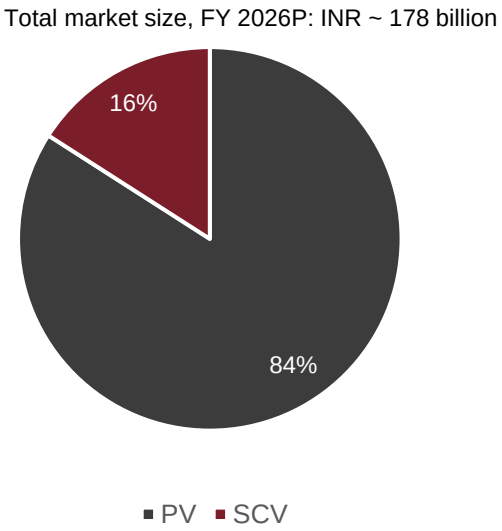
SOURCE: Industry, SIAM, CRISIL Research

Indian manual transmission market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

Manual transmission industry split by vehicle segments (fiscal 2026)



SOURCE: Industry, CRISIL Research

3.6 Dual Clutch Transmission

Dual clutch transmission (DCT), also known as twin-clutch transmission transmits the power from the engine to the wheels of the passenger vehicle using two separate clutches for odd and even gears, within one housing. The architecture of a DCT is similar to a manual transmission and can be considered as a hybrid of manual and automatic transmission. Among all the transmissions, DCT is most suited for diesel engines.

The two clutches function as a single unit, controlled by an electro- hydraulic control unit to shift the gears thereby eliminating the need for driver input in changing gears. The gear shift happens with minimal interruption to torque supply to the wheels because of which the fuel efficiency of a DCT is better than that of a manual transmission. DCT is also more responsive enabling smoother and faster acceleration to a higher speed.

In the Indian market, the manufacturing ecosystem for DCT is most suitable for meeting the expectations of a fully-fledged automatic transmission and to support features like ADAS, automatic parking, etc. Manufacturing capacity of manual transmission is also fungible for migration to DCT. However, tropical weather conditions remain a key monitorable about how the adoption of DCT takes place.

Review, fiscal 2021

CRISIL Research estimates the size of the DCT market at a system level for passenger vehicles (catering to OEM demand) at Rs 4.5 billion in fiscal 2021. DCT variants are available in models of premium hatchback and upwards. Utility vehicles and compact utility vehicles together occupy more than 85% share of the market, followed by large cars and small cars. Vans do not have DCT.

Key players

OEMs are heavily dependent on imports for DCT. The major suppliers to Indian market include Aisin, Hyundai Powersys, Stellantis, etc. BorgWarner, Continental, Eaton, GKN, KG International, Magna, Magnetti Marelli, Punch Powertrain, Schaeffler, Valeo, ZF, etc. are some of the major global competitors.

Company like Divgi TTS is in the process of launching domestically manufactured DCT systems for the Indian market. The company is planning to localise and commercialise 7 Speed Dual Clutch Automatic Transmission.

Divgi TTS will therefore be the only the manufacturer of DCT systems in India as other leading manufacturers such as Aisin, BorgWarner, Hyundai Powersys have import based business model.

Outlook, fiscals 2021- 2026

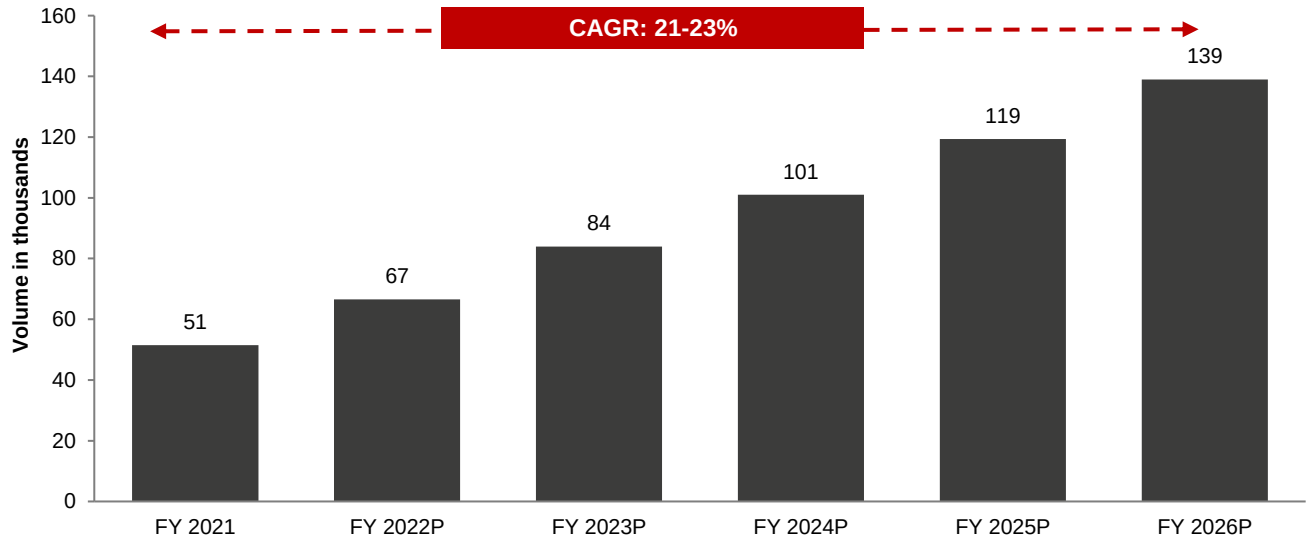
CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Production of SCVs in India is expected to increase at 10-12% CAGR over fiscals 2021 to 2026. Improving industrial activity, steady agricultural output, and the government's focus on infrastructure will drive the growth of SCVs. It will also grow on the back of higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

Shift to automatic transmission coupled with reduction in the cost of technology is likely to impact the demand for DCTs considerably. Increasing customer preference towards vehicle specifications and performance are also driving demand. The manufacturing facilities are also present which is an added advantage along with rising imports of transmissions and rising local JV operations. Increasingly stricter emission norms are also an important driving factor considering the fuel efficiency of DCTs.

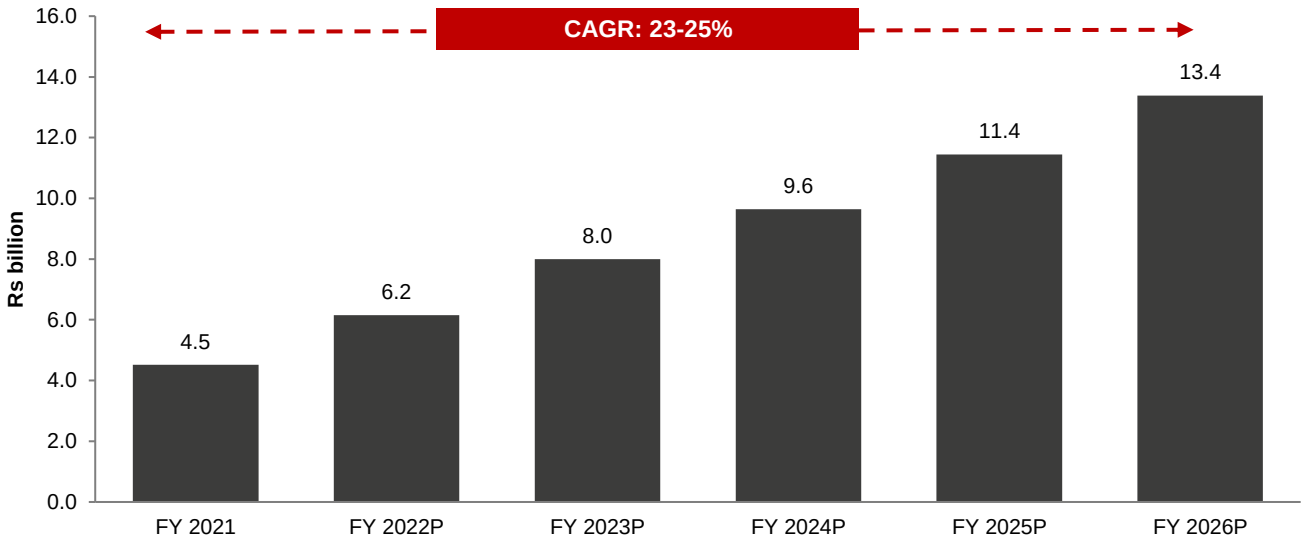
CRISIL Research projects production of DCT will see moderate growth of 21-23% CAGR during the fiscal 2021 to 2026 on a low base of fiscal 2021 due to pandemic. Penetration of DCT is expected to improve from ~2% in fiscal 2021 to ~3% by fiscal 2026. Penetration of DCT is expected to remain at the highest level in the compact UV and UV segments. Therefore, the size of DCT market is expected to grow at a CAGR of 23-25% on a low base of fiscal 2021 to Rs.13-14 billion in fiscal 2026.

Indian dual clutch transmission market outlook ('000 units) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

Indian dual clutch transmission market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

3.7 EV transmission

To curb pollution, electric vehicles are gaining global interest. In India, too, electric vehicles are gaining popularity, as the government is extending support via FAME (Faster Adoption and Manufacturing of Hybrid and Electric vehicles) and tax-rate cuts to boost EV adoption.

Transmission assembly in electric vehicle is different from the one which is used in conventional Internal combustion engine (ICE) vehicles. Say ICE vehicle can at max run at 7,000 revolutions per minute (rpm). As compared to this in EV the motor run at revolutions as high as 20,000 rpm. Rotational speed is 3-5 times higher. Electric vehicles typically operate on single-speed transmission whereas conventional ICE based vehicles operate on multi-speed transmissions Very high revolutions per minute (RPM) in electric drives cause noise, vibration and harshness (NVH) issues in EVs. This results in higher technological complexity in differential gears and assembly design. An EV transmission requires specialized bearings and the accuracy with which the gear teeth are manufactured are also significantly of a much higher precision as compared to ICE vehicle.

Single speed Transmission and Multi-speed Transmission are two types of transmission mostly used in electric vehicles. In India, electric PV vehicle is run on single speed transmission assembly.

Components considered for sizing as an EV transmission assembly (single-speed) are mechanical gear box, motor and its integration. Pricing of an EV transmission is directly proportional to the motor capacity.

EV transmission market

Review, fiscal 2021

CRISIL Research estimates the size of the EV transmission industry (catering to OEM demand) at Rs 0.5 billion in fiscal 2021. Electric SCVs are currently not manufactured in India.

Key players

Since the EV penetration is 0.16% as on fiscal 2021 in PV category. Currently, OEMs are importing EV transmission assembly in India. BorgWarner, Magna, Prestolite electric, ZF are the leading suppliers of EV transmission systems globally.

Outlook, fiscals 2021- 2026

Market for EV transmission is expected to increase by 108-110% CAGR from fiscal 2021 and 2016 in volume terms as well as value terms. EV transmission market is expected to be Rs 20.8 billion with a volume of 224.8 thousand by fiscal 2026.

CRISIL Research estimates overall PV production to grow at a 7-9% CAGR from fiscal 2021 to 2026, and reach ~4.5 million units by fiscal 2026. Over short to mid-term COVID-19 induced demand for personal mobility is likely to support PV sales, over mid to long-term, moderate macroeconomic growth, increasing disposable income, relatively stable cost of vehicle ownership, and lower fuel prices are likely to drive demand for passenger vehicles.

Production of SCVs in India is expected to increase at 10-12% CAGR over fiscals 2021 to 2026. SCV growth will be driven by higher private consumption, low penetration levels providing headroom for growth, greater availability of redistribution freight, and improved finance availability post fiscal 2021.

SCV passenger segment in particular is expected to rebound sharply, growing at 30% CAGR over fiscals 2021 to 2026. In fiscal 2021, though, the production of SCV PV has sharply declined because of low people mobility and school closure due to the pandemic. But fiscal 2022 onwards, production of SCV PV is projected to rise as sales recover on a low base of fiscal 2021 on account of availability of vaccine and opening up of schools and resume in mobility.

CRISIL Research expects the share of EVs in total passenger car sales to accelerate to 4-6% by fiscal 2026 from ~0.16% in fiscal 2021. EV penetration can be higher if government adopts stricter policies on OEMs for not meeting CAFÉ norms. The exact quantum of EV penetration in an aggressive case depends on incentives given for adoption and setting up of charging infrastructure. EV penetration will also be propelled by policies adopted by the government for penalising non-adherence to CAFÉ norms. Electrification in PVs is expected to slower on account of limited range of electric vehicles, very higher cost of acquisition for EVs with desired range, lack of total cost of operations (TCO) with ICE vehicles especially for personal applications, limited availability of charging infrastructure, lack of clarity around vehicle performance and resale value among stakeholders.

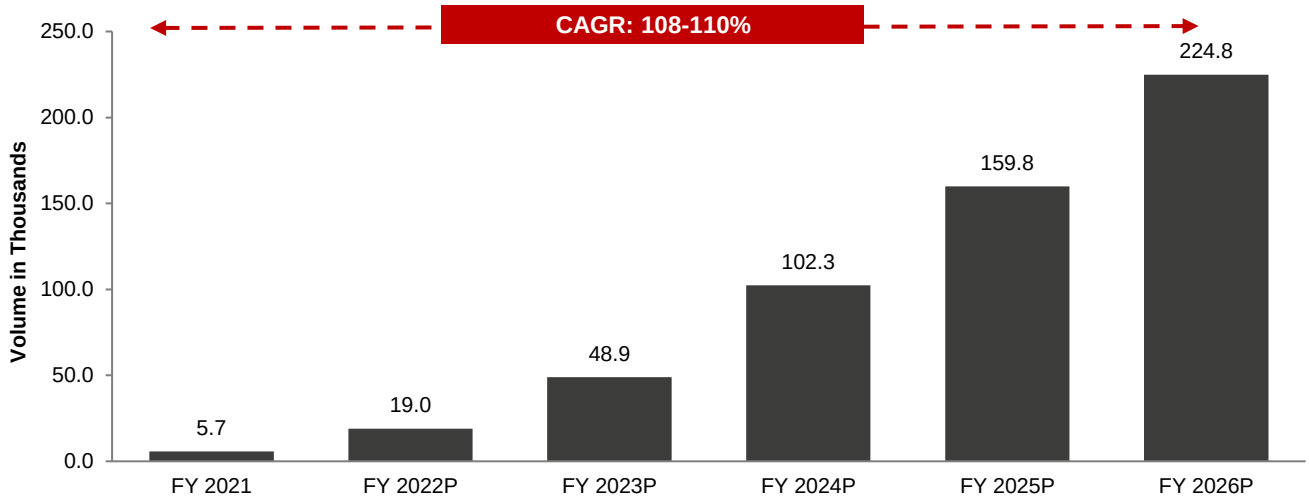
EV penetration in SCV category is also expected to remain low at 4-6% penetration by fiscal 2026. New model launches, last-mile logistics and local distribution of goods is likely to aid EV demand.

In the last quarter of fiscal 2022, many large OEMs like Tata Motors, Hyundai have hinted towards a significant shift in their product pipeline towards electric vehicles in the coming years.

Tata Motors EV business, one of the leading providers of electric vehicles in India (~70% share in EV retail sales in fiscal 2021), is anticipating launching new EV models over the next couple of years; basis industry interactions, the models in pipeline are Nexon EV long range/ coupe, Altroz EV, Punch EV, Sierra EV and Harrier EV. Tata Motors EV business is also targeting 50k EV sales in fiscal 2023 and planning to scale it to 125-150k units annually in the next two years.

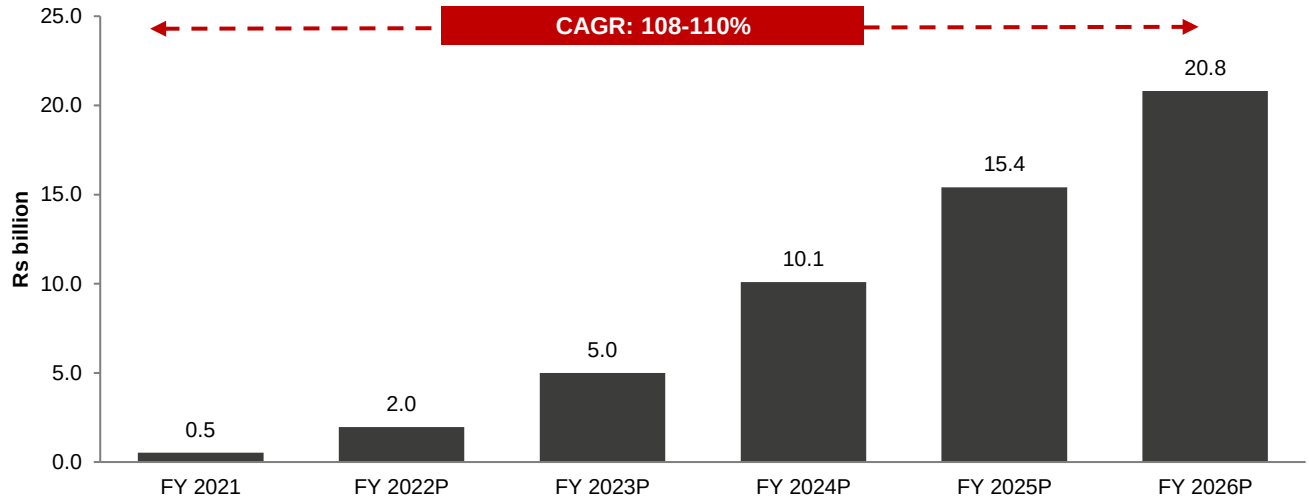
Hyundai India is expected to make a significant investment ($530 million by 2028) in India to introduce 6 new EVs in coming years.

Indian EV transmissions market outlook (thousand units) (fiscal 2021-2026P)



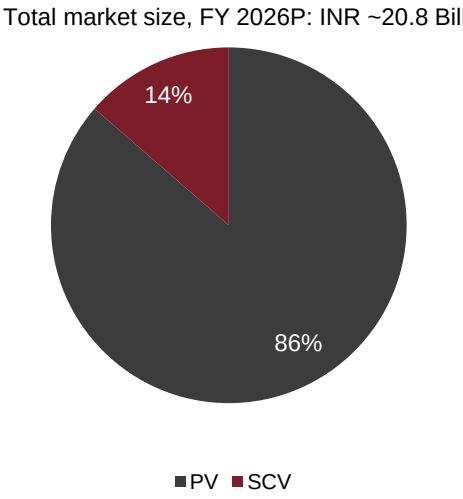
SOURCE: Industry, SIAM, CRISIL Research

Indian EV transmissions market outlook (Rs billion) (fiscal 2021-2026P)



SOURCE: Industry, SIAM, CRISIL Research

EV transmission industry split by application in value terms, fiscal 2026



SOURCE: Industry, CRISIL Research

3.8 Transmission Component kit

Transmission component kit consists of parts of the transmission systems such as manual transmission, Dual Clutch Transmission, Transfer case, EV transmission etc. These component kits are typically sourced by tier I transmission system manufacturers from tier II transmission component manufacturers.

Globally tier 1 transmission system manufacturers such as BorgWarner, Aisin, Magna do further value add to these components and supply transmission systems as a solution to global vehicle manufacturers. Divgi TTS is positioned as a tier I supplier in India while on the global platform, the company acts as a tier I supplier as well as a tier II supplier, providing components to other tier I suppliers.

Below table depicts typical composition of major transmission component kits for manual transmission, DCT, Transfer case, EV transmission:

Manual Transmission	Dual Clutch transmission	Transfer Case	EV transmission
• Aluminium Castings: clutch housing, main case, rear case etc • Torque Transfer Components: Gears, shafts, clutches etc • Synchronizers • Others:Shift Linkages, elastomers, Bearings, oil seals, fastners, speedo sensors, reverse switch, gear indicators etc	• Aluminium castings • Torque transfer components • Synchronizers • Dual clutch • Electrohydraulic control unit • Sensor cluster • ECU/Software • Others: Oil pump, oil cooler, oil filter etc	• Aluminium castings • Torque Transfer components; Planetary gear set, strokets, output shafts • Electromagnetic Actuator • ECU/ software • Others: Elastomers, bearings, oil seals, shift linkages, fastners	Torque transfer components: Gears, Shafts

SOURCE: Industry, CRISIL Research

A tier II transmission manufacturer typically manufacturers high value add, complex parts like castings, Torque Transfer Components, Synchronizers, Electrohydraulic unit in-house while non-core components such as elastomers, Bearings, oil seals, fasteners, oil cooler, oil filter etc are typically bought-out.

Players like Divgi TTS serve both as system level solution providers to global OEMs and also as component kit suppliers to global tier I transmission system suppliers due to its technical capabilities and ability to supply from low cost production hub like India.

Below are key components in the transmission component kits involving high value add by tier II manufacturers. The parts involving high in-house value add forms 45-50% of the overall transmission system costs for manual transmission and 55-60% for DCT.

Parts in the transmission component kit involving high value add by tier II manufacturers:

Transmission	Components
Manual Transmission/ DCT	Synchronizers
	Torque transfer components- Gears and Shafts
	Companion Flanges
	Yokes
Transfer case	Planetary Gear System
	Input/ Output Shaft
	Companion Flanges
	Yokes
EV	Torque transfer components- Gears and Shafts

SOURCE: Industry, CRISIL Research

3.9 Criticality of system level solution provider for vehicle OEMs

Vehicle manufacturers globally value transfer case suppliers having capability to provide system level solutions. Transfer case supplier is expected to bring in mechatronic expertise in the overall design and development phase of the transfer case.

Mechatronics typically integrates mechanical, electrical and electronics systems to provide the optimum and efficient output for the vehicle. It plays a very crucial role in all modern age vehicles in terms of vehicle dynamics, safety, suspension systems, transmission, powertrain systems as well as to maintain ride quality & comfort.

The advanced control capabilities from the close integration of mechanical systems and electronic systems is achieved through a series of sensors and the supporting software in the ECU controlling the mechanical output.

Thus, the software controlling the ECU is of utmost importance. Given the complexity of the mechanical and electronic part integration, software development remains one of the niche fields in the automotive component development. Very few component suppliers as well as OEMs globally have the capability to develop these system integration software solutions in house. Therefore, OEMs typically outsource the software development to tier I system level solution providers.

OEMs normally control the overall software development process considering the criticality of the transfer system in achieving desired drive handling and drive quality. In the entire development process, a capable system level solution provider is given a privileged access to the vehicle handling and ride quality data by the OEM.

Such system level solution providers are highly valued by vehicle manufacturers globally. In India, Divgi TTS is amongst the very few suppliers who have the capability to develop and provide system level transfer case, torque coupler, DCT solutions as the company has in house software development capability.

3.10 Key player profiles

Companies/Particulars	Operating income		Operating EBITDA (Rs mn)	PAT (Rs mn)	Operating EBITDA margin (%)	PAT margin (%)	ROCE (%)	ROE (%)	Gearing ratio
	(Rs mn)	CAGR (FY16-FY21)							
Anand CY Mutec Automotive Private Limited	953	-1%	94	26	10%	3%	10%	8%	1.1
Avtec Ltd	3,065	-11%	241	-694	8%	-23%	-6%	-54%	4.1
Divgi TTS##	1,866	81%	519	381	28%	20%	13%	13%	0.2
I M Gears Private Limited*	2,561	4%	316	230	12%	9%	5%	13%	0.6
Kalyani Transmission Technologies Private Limited	883	N.A	140	-142	16%	-16%	1%	N.M	N.M
Natesan Synchrocones Private Limited*	1,467	-0.1%	162	89	11%	6%	0.1%	4%	0.2
Average #	**1,692**	**23%**	**249**	**-107**	**15%**	**-4%**	**4%**	**-11%**	**1.8**

Note: N.A – Not Available, N.M – Not Meaningful

Figures at standalone level for fiscal 2021 unless otherwise specified

**: Fiscal 2020 financials; Fiscal 2021 financials are not yet available on MCA.*

#: Average does not include companies who's fiscal 2021 financials are not available

##: Company commenced operations in 1964 under Divgi Metalwares Pvt Ltd (DMPL). In 1995, company formed a JV with BorgWarner. JV continued between 1995 to 2016. In 2016, the JV was dissolved and Divgi TorqTransfer Systems (Divgi TTS) was formed.

EBITDA – Earnings Before Interest Tax Depreciation and Amortisation, PBT – Profit Before Tax, PAT – Profit After Tax, ROCE – Return on Capital Employed, ROE – Return on Equity

Operating EBITDA: Indicates operating earnings before interest, taxes, depreciation and amortization which takes into consideration only operating income whereas non-operating income is excluded

Operating EBITDA margin: Operating EBITDA / Operating income

PAT margin: PAT/ Operating income

ROCE: PBIT/ total debt plus tangible net worth

ROE: PAT/ tangible net worth

Gearing ratio: Total debt/ Tangible networth

Average calculated is simple average

Source: Company Financials, CRISIL Research

Domestic players-

Anand CY Myutec Automotive Private Limited

CY Myutec ANAND was set up in 2008 as a joint venture between CY Myutec, Korea (earlier Chang Yun of Korea) and ANAND. The Company has changed its name from Chang Yun India Private Limited on 13 January 2017 to Anand CY Myutec Automotive Private Limited.

Company manufactures single-cone and multi-cone synchronizer rings for passenger car applications. Company also manufactures friction-coated rings tailored to customer requirements. It has its manufacturing capability based in Tamil Nadu, India.

Avtec Limited

Avtec Ltd. Is a part of CK Birla Group. It manufactures powertrain and precision-engineered products in India. It manufactures cylinder heads, cylinder blocks, crank shafts, cam shafts, cam rods and transmission gears for automotive, off-highway, defence, agriculture and railway industry.

Its manufacturing facilities are based in Hosur, Chennai, and Pithampur in India.

Divgi Torqtransfer Systems Private Limited

Company manufactures manual transmissions, DCT, transfer cases, torque couplers & auto-locking hubs (ALH), essential components for 4WD/ AWD vehicles, Synchronizers for transmissions (gearboxes) and components for the above-mentioned products. It mainly caters to passenger and small commercial vehicle industry. Company is also expanding its offering by venturing into EV transmissions.

Its manufacturing facility is present in Bhosari and Shivare in Pune and Sirsi in Karnataka.

Hyundai Transys India Private Limited

The company is a subsidiary of Hyundai Transys Inc. It is in the business of manufacture and supply of transmissions, seat systems, accessories used by automobile manufacturers The company is situated in Anantpur, Andhra Pradesh.

I M Gears Private Limited

Its product ranges from Shaft rocker arm assembly for three-cylinder engine, fork assembly and integrated for assembly for gear transmission in passenger car, gear blanks for two-wheeler, axle shaft, differential case assembly for industrial and automotive application, etc. It is present in automobile, aeronautics, hydraulics, etc.

Its manufacturing facility is based in Chennai, Tamil Nadu.

Kalyani Transmission Technologies Private Limited

The company is a subsidiary of Kalyani Technoforge Limited. Its product range includes components for speed gears, reverse idler assembly, etc. for manual transmission, pinion shaft assembly, gear secondary, etc. for CVT, plant gear, ring gear, etc. for DCT and output shaft for automatic transmission. It manufactures components such as input shaft, intermediate shaft assembly, etc. for electric drivetrain.

Its manufacturing facility is present in Pune, Maharashtra and Bhiwadi, Rajasthan.

Kinetic Engineering Limited

Kinetic Engineering Limited is the flagship company of the Firodia Group of companies. It manufactures gears, shafts, axles, and more; engine components, including crankshafts, cylinder heads, camshafts, with complete gearbox and engine assemblies for auto and non-auto products.

Its manufacturing facility is present in Ahmednagar, Maharashtra.

Natesan Synchrocones Private Limited

It manufactures synchroniser for automobile industry. The company is located at Chennai, Tamil Nadu.

RSB Transmissions (I) Ltd.

It manufactures auto components such as hub and sleeve and transmission components. It caters to automobile and construction equipment industry.

It is present in Pune (Maharashtra), Pantnagar (Uttarakhand), Jamshedpur (Jharkhand), Chennai (Tamil Nadu), Dharwad and Lucknow (Uttar Pradesh)

Global players-

BorgWarner Inc.

The company is an American multinational automotive supplier for combustion, hybrid and electric vehicles. The company manufactures components such as controllers, sensors, fuel injection system, engine timing system, electric drive motor, EV transmission, etc. It caters to light vehicles, medium & heavy-duty vehicles as well as off-highway applications.

The company's plants are spread across Asia, Europe, North and South America.

Magna International Inc.

Magna is in range of products such as body exteriors, powertrain and transmission technologies such as flex plates, lighting, seating, etc. It caters to applications such as automotive as well as non-automotive applications such as construction equipments, aircrafts, etc.

Globally it is present in North and South America, Europe, Asia and Africa.

Aisin Corporation

The company manufactures automotive parts and energy- and lifestyle-related products. In automotive domain, it manufactures components for powertrain such as 1-motor hybrid transmission, e-axle, automated parking system, electronically controlled brake system for chassis and vehicle safety system, other body parts, etc.

Its manufacturing plants are spread across North and South America, Europe, Asia and Africa.

Hyundai Transys

The company manufactures transmissions including automatic transmissions (AT), continuously variable transmissions (CVT), dual-clutch transmissions (DCT), manual transmissions (MT), hybrid transmissions and gearboxes for electric vehicles (EV). It also manufactures powertrain products such as axles, 4 wheel-drive (4WD), AT for railroad cars, and decelerators for high-speed trains and EV and specialized car seats.

Its manufacturing plants are spread across North and South America, Europe, Asia and Africa.

ZF Friedrichshafen AG

The company is present in automotive (mainly passenger car and commercial vehicle industry) and non-automotive applications. In automotive, it is present in transmission systems, units and components, chassis systems and components as well as safety technology, electronics and sensors

It has presence across North and South America, Europe, Asia and Africa.

Eaton Corporation Plc

It is present in diverse industries such as automotive, aerospace, data center, healthcare, etc. In automotive, it has presence in manufacturing of components such as transmission components for ICE and electric vehicle, clutch and braking parts, etc.

It has manufacturing facilities across North and South America, Europe, Asia and Africa.

Prestolite

Prestolite Electric is a manufacturer and supplier of alternators, starters, electrical equipment to the transportation, industrial, military, marine, agricultural and construction industries.

It has manufacturing and distribution locations spread across the United States, United Kingdom, Europe, China, Canada, Mexico, and Hong Kong.

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It is India's foremost provider of ratings, data, research, analytics and solutions with a strong track record of growth, culture of innovation, and global footprint.
It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers through businesses that operate from India, the US, the UK, Argentina, Poland, China, Hong Kong and Singapore.
It is majority owned by S&P Global Inc, a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

About CRISIL Research

CRISIL Research is India's largest independent integrated research house. We provide insights, opinion and analysis on the Indian economy, industry, capital markets and companies. We also conduct training programs to financial sector professionals on a wide array of technical issues. We are India's most credible provider of economy and industry research. Our industry research covers 86 sectors and is known for its rich insights and perspectives. Our analysis is supported by inputs from our large network sources, including industry experts, industry associations and trade channels. We play a key role in India's fixed income markets. We are the largest provider of valuation of fixed income securities to the mutual fund, insurance and banking industries in the country. We are also the sole provider of debt and hybrid indices to India's mutual fund and life insurance industries. We pioneered independent equity research in India, and are today the country's largest independent equity research house. Our defining trait is the ability to convert information and data into expert judgments and forecasts with complete objectivity. We leverage our deep understanding of the macro-economy and our extensive sector coverage to provide unique insights on micro-macro and cross-sectoral linkages. Our talent pool comprises economists, sector experts, company analysts and information management specialists.

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