



Repercussion of Covid-19 Pandemic on Indian Automotive Industry

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ABSTRACT

In this paper talking about covid-19 effect on Indian automotive industry and basic problem that automotive industry faced during lockdown/covid-19 period. This paper divided in five major segment. In the first part look introduction and in second part functioning criteria of automotive industry that how automotive industry run and what is basic need to run for it. In third part discuss about covid-19 impact on automotive industry supply chain and liquidity management and in the forth part we discuss how production and demand affected during lockdown . In the last segment we discuss about semiconductor shortage and india and international level and how U.S. , China, and many countries are planning to manufacturing semiconductor and try to solve semiconductor shortage problem.

INTRODUCTION

Automotive Industry is one of the largest wealth creators and job providers in the world; furthermore it also has a significant amount of contribution to the GDP growth of both developed and emerging market economies of the world. According to the data available in the website of India's National Investment Promotion & Facilitation Agency as of now India is the World's largest tractor manufacturer and second largest bus manufacturer, World's largest two-wheeler and three-wheeler manufacturer, World's third largest heavy truck manufacturer and fourth largest car manufacturer. Contemporary automotive industry of the world is an amalgamation of innumerable number of high grade industrial products (both hardware and software). Due to the result of globalization and price rationalization (of free market economy) of products, modern day automotive industry is heavily dependent on the supply of raw materials, spare parts, semiconductor, crude oil and software (artificial intelligence) from other countries. In today's world economy not any single country is self reliant, any significant

supply chain disruption and the consequent price fluctuation of any product (given that product's availability and storehouse capacity of that very product in a given economy) which is an integral component for the development of a certain final product, will have a major impact on the production, sells and profit generating capability of the final product. The designation of the virulent spread of Covid-19 as pandemic and subsequent total lockdown imposed by governments all over the world basically brought the entire world economy to a grinding halt. The resulted stock market crash that followed due to spread of panic mixed with massive FII and DII selling further sucked the liquidity out of the market. The automobile industry which is heavily dependent on ceaseless supply of raw materials (commodity) and semiconductors was fundamentally impacted by the lockdown. Different degrees of quantitative easing measures implemented by the governments throughout the world to take the pressure off the market did not get translated into the revival of automotive industry in India and around the world but on the contrary the huge amount of liquidity injected into the market by lowering the interest rates to historic lows resulted into high amount of inflation which impacted the commodity market which is still not fully back on track. Another important factor that significantly impacted the Indian automotive sector is that the Indian automotive companies as well as foreign automobile companies failed to achieve economy of scale and localized production, distribution and stockpile of indispensable component parts like semiconductor

The COVID-19 pandemic has spread across the world and has affected the people and economy a lot, and the automotive industry is no exception. It's been hit hard. In the context of the global outlook that it's been adversely affected by the global economy. In the United States, which has the largest component market, most states have strict straight home orders. In the United Kingdom, with the third largest component market, state home shutdown for factories. Germany, South Africa everywhere it's seen. Goldman Sachs was predicted that it would be seen everywhere in South Africa, and it has been seen everywhere. Goldman Sachs is concerned with the blue. In context of global economy automotive industry lost around \$210 billion in revenue in 2021. In India short term demand is going to decline, the priorities are going to be given to healthcare, health, and welfare, so it's going to impact on tourism, hospitality, and manufacturing, but where India's going to really struggle is in export markets, with over nine billion dollars of vehicle components exposed in North America and Europe. That's going to be the real struggle for India's sales outlook. A report by PwC in their latest report on navigating covid-19 turbulence . This is all the analysis and perceptions and predictions given by analysts. Pessimism and realism will range from 12% to 22%, with a preference for personal transportation being a key driver. Using a new vehicle market to capture a significant share of this demand. The informal sector, a key buyer of two-wheelers, will be significantly affected by the downturn and online sale that's going to grow a lot , and the average change in passenger vehicle sales going from minus 8% to minus 18%.

INDUSTRY PREPARING THROUGH DIFFERENT SEGMENT

The main focus on the the industry preparing. We divided all activities into four categories: customer segments, product launches, channels, and ecosystems. In customer segments assess the impact across the core segments that What we should do should be planned for the mass market or should be planned for premium rural versus urban private versus fleet markets. In industry, there's going to be a mix of everything automotive OMS component manufactures, so customers means protecting coal segments on prioritized signals that are showing more resilience and then sending any significant impact on coal segments. Identify new, relatively insulated segment opportunities and refocus on business areas that are under stress, protect and grow attractive business segments. Next segment is The product launch that mean Evaluate any product delays and revise the target costs as necessary, assess launch readiness and identify opportunities to accelerate launches. Prepare a product launch strategy based on segment trends. for digital soft launches. We can cancel product launches that do not meet the revised business case and invest in product solutions that meet changing customer needs. Next segment is the Channels it means enhanced promotional activities across digital channels, enabling visuals as well as journey evaluation, network strength and expansion plans optimize your sales analysts or revise your demand forecast Invest in convenient digital sales and marketing channels restructure field cells to create more flexibility and resilience. To create an integrated digital sensory system to enhance visibility of demand and customer needs. Next segment is Ecosystem it means evaluate the financial health of suppliers and dealers to develop support initiatives and evaluate opportunities to enhance the resilience of ecosystems. To support supplies and delays with financial initiatives to ensure sustenance review and enhance ecosystem continuity plans and explore opportunities for strategic investment in distressed partners. Next other segment is workforce, which is one of the main segments that has been significantly impacted. They could worry about the future, etc. among the employees, but many green shoots happening, mini factories are opening up across the world. The people wagons in the plant that opened recently were the largest carmakers. They have made a hundred changes to the way their plant operates as it tries to restart business without risking the health of hundreds of thousands of their workers. These include tight physical distancing norms. The strict implementation of the mass continuous practice of hygiene across their plans. Perhaps it could be more of a robot implementation that separates machine from machine and labor from labor. In India, labor unrest will be the biggest challenge for organizations once factory operations restart, Remote working allows for meaning and compliance testing, as well as technologies to support collaboration and communication. Remote working policies and data security complaints are also possible. Human resource policies realign hiring, on boarding, and exit policies to support our message strategy and current scenario. for the midterm horizons, which are virtual capability building, managing virtual as a capability building leadership capability for a virtual world, coaching of leaders and staff for morale and resilience, future focus capability building, digital fitness transitions management compliance, and brand

management around workforce transitions coaching and career transition support for impacted staff, scenario-based workforce transition plant creation, and for the long-term horizons, some researcher shares Covid-19 knowledge from credible sources like the World Health Organization's creating a digital workplace of the future, constant productivity workforce planning and management refining performance expectations plans for increased absenteeism and work refusal by senior executives, and white collar and blue collar productivity plans.

IMPACT ON SUPPLY CHAINS

In India around 31% of the imports are coming from China for those imports, the risk is going to be moderate. The major primary countries in the high-risk category are Germany, United States, Italy, United Kingdom, Belgium. So, in India, the top five imported components are drivetrain electrical and electronics components, body and chassis components, engineering engine components, and suspension and brake components, with approximately 76 percent is a common moderate risk and the rest high risk for suspension and brake components. According to the financial research, the mortar is in good condition, so companies are not anticipating a significant impact on production by June. Because of the heavy liquidity crunch in the industry prices in 2019 and 2020, the sector faces troubles in maintaining sales and profitability numbers on a quarterly and even yearly basis. In August 2019, As the market leader, Maruti Suzuki (MSIL), which has limited sourcing exposure from China or is closely monitoring the situation in Italy as certain CNG parts are Italian, finally the BS6 ramp up is happening along with an improvement in supply, pushing China to use the condition for a few volumes of liquidity crunch, the sector faces difficulties in maintaining sales and profitability in 2019 and even on a yearly basis and saw 6% drop in domestic sales with 95 thousand units sold due to a subdued market conference, and March 2020 figures show the effect of logging on to the covid-19 pandemic again, with a 50% drop in sales for Nairobi Suzuki This is similar to the case with Mahindra, Hyundai, and many other Williams, and combined with the switch from Barrett's to two bars and six machines, this is also a divorce. So with this inventory power halt of production and the Society of India's normal manufacturers last year, they wrote to the government to take appropriate measures to promote the flow of courage in the system to facilitate new vehicle purchases. It is emphasized to improve liquidity, specifically in the NBA sea sector lending, which is both monthly and quarterly based on a fall in sales and even allows the closure of your relations. According to the Society of Indian Automobile Manufacturers, the sector registered negative growth in sales of all vehicle categories in FY21 (2.24% decline in sales of passenger vehicles, 13.19% fall in sales of two-wheelers, 20.77% fall in sales of commercial vehicles, and 66.06% fall in sales of three-wheelers).

So how do we manage liquidity?

For manage liquidity steps are very clear and very fundamental. One is to understand that the key is the inflow part. Understand the key cash drivers and current cash position, obtain a weekly detailed collection plan and use the cash to assess non-core and surplus monetize for non-current, reduce our own outflow or prepare a weekly payment plan for each supplier into territory payments. Critical contractual payments discretionary spending review of the

optimization of expenditures for production and business plans So that's the deal. The only liquidity part about We don't know what the demand is going to be like, but looking at the overall market overview, the income, since the income is going to be down because of job losses and pay cuts, and the price decline of assets, that's going to be down, and market sentiments will remain low. when the market opens up the huge demand for personal mobility, people want to get into having more privacy and staying away from the crowd to avoid community spread. Most of the demand will not disappear, but it may be postponed until the end of Q4 or 2021 due to the pandemic. The pandemic might stimulate the demand for first purchase opportunity and shrink purchase power again. I wouldn't say just labor under is going to be a problem, it will be a critical problem industry has to grapple with because it can cause social unrest with a growing young and educated unemployed population willing to take over these shops with new weight skills.

PRODUCTION AND DEMAND

Each segment of the industry has been impacted so far by covert 19 passenger vehicle sales. While commercial vehicle sales have dropped by around 90% for all manufacturers, the segment was already under tremendous pressure due to factors such as the overall economic slowdown, liquidity crunch, and lack of retail financing, all of which have resulted in a significant decline in demand within the segment. This was further aggravated by the axleload norms, which increased the carrying capacity in the medium and heavy commercial vehicle segment, but the pain has now become a cute with the Covid-19 attack, company like Tata Motors, Ashok Leyland, In the last year, Volvo, M&M, and other brands have all lost 90 percent of their value. the month of March 2020, the car segment also witnessed a significant decline as no production and no sales led to a huge demand contraction. M&M volume declined by 88 percent, and Tata Motors' volume declined by 68 percent in two-wheeler and three-wheeler sales. The situation is similar in the two-wheeler segment as well. Hero, the leader in this space, witnessed a sharp decline of 42.4% in volumes. The market leader in the premium bike segment saw a 41% drop in monthly sales. Negligible sales have been registered in the 3-wheeler segment. This time, M&M posted a decline of 93, or 94 percent. TV motors with a boss who is better off than the other players and has clocked a 25% drop in tractor sales and export growth. Of course, he has posted a decline of fifty-four points and three percent, and M&M volume declined by almost 31 percent. M&M management has indicated that the central government has taken timely initiatives for the farming community in the form of specific relief packages, and they hope that this will provide the momentum for tractor sales going forward. Export numbers were also weak for the month of March 2020, all others had posted double-digit declines. Tata Motors, Mahindra and Mahindra, and escorts all experienced maximum declines of 68 percent in the fall, while Maruti Suzuki and escorts experienced a 55 percent decline. Looking ahead, it will continue to be challenging as demand may not pick up easily, especially for commercial vehicle segments. However, because demand is directly correlated with economic activity.

SEMICONDUCTOR SHORTAGE IN WORLD

It's not an overstatement to say that semiconductors power in the modern world. They're not only a key component of nearly every electronic device, they also power the factories that make the electronic devices. They power our laptops, our cell phones, our cars, and our washing machines. And this is just the stuff in our home. We're not even getting into all the ways semiconductors are important to the military and to the power grid. If software is eating the world, then the chips are the teeth. And now there aren't enough of them getting made. A massive global shortage is getting so bad that General Motors, one of the world's largest automakers, said it could lose up to two billion dollars because of the semiconductor chip shortage, which forced it to temporarily shut down some auto manufacturing plants. The semiconductor crisis has been booming over the world economy for one year now. This crisis has been so severe that Apple has lost \$6 billion in revenue, Maruti has had to cut 60% of its production, Mahindra has had to cut 20% of its production, and the auto industry has already lost \$100 billion in revenue due to chip shortages. What are the factors and the impact of the semiconductor crisis on the stock market for stock market investors? In a car, there are hundreds of semiconductors that handle everything from keyless entry to automatic dosing and even the operation of your engine. Today, in this digital world that we live in, semiconductors are by far the most important components that impact different industries. According to the semiconductor industry association the first reason for this shortage is that the industry had already been growing at such a rapid pace that it was already on the brink of a shortage. More than 100 billion integrated circuits are in use every single day all across the world, which is literally equal to the number of stars in our corner of the milky way galaxy. As a result, when the pandemic struck, demand for electronic gadgets skyrocketed due to working from home, but due to the temporary shutdown of factories and shipping services, demand went far beyond supply capacities. The reason why this shortage is so difficult to recover from is that manufacturing a microchip typically takes more than three months and involves factories, dust-free rooms, multi-million dollar machines, molten tin, and lasers. Since manufacturing cannot be increased on such short notice, the wait times for chips are increasing at an alarming rate, going from just 11.8 weeks in September 2019 to 21 weeks in August 2021. Meanwhile, the chip industry which was already worth 440 billion in 2020, is expected to grow to 550 billion in 2021 and will reach 600 billion dollars by early 2022 in the auto industry alone. The four major industries that face the heat are the auto industry, the LED lighting industry, the consumer electronics industry, and the appliance industry. A large number of companies have been deeply affected by the global semiconductor shortage. This is when many countries, including India realize that it is very important to be a part of the semiconductor ecosystem and it is high time that we decrease our dependence on other countries merely by being the customers of semiconductors. So the question is,

What is India's position in the semiconductor market and What is the government doing to de-risk this situation?

The sad news is that in spite of us having Intel, Micron, and Samsung housing their R & D centres in India, we have nothing significant in chip manufacturing. And even if you look at India's semiconductor trade situation, while we exported 425 million dollars' worth of semiconductors in 2020, we imported 10.59 billion dollars' worth of semiconductors. With a growing electronics market, our semiconductor imports increased by a factor of 100, rising from 5.2 billion dollars in 2016 to 10.59 billion dollars in 2020. The scariest part is that roughly 40% of our imports come from China, with the remaining 26% coming from Hong Kong. And we all know how China is notoriously trying to take control of Hong Kong. Therefore, just like solar wafers and ingots, India is again vulnerable to more semiconductor shortages that could cost us billions of dollars.

Quad Summit

what happened at the quad summit so that we know about it. Australia, the U.S., Japan, and India decided to collaborate together to implement only those processes that are their strengths and pass on the rest to the rest of the countries. For example, the U.S. is a global leader in semiconductor design, and American companies also dominate in electronic design automation and licenced intellectual property. Japanese companies enjoy a dominant position in semiconductor materials and chemicals that are used for manufacturing chips, and Japan is also a market leader in silicon wafers and substrates on which the ics are made. Similarly, Australia occupies an important place in the broader electronic supply chain as it has access to critical materials and advanced mining capabilities. And lastly, semiconductor design requires a large number of skilled engineers and labels, which is where India comes in. So at the quad summit, Australia, the U.S., Japan, and India have joined hands to build a robust semiconductor supply chain based on their strengths to eliminate their dependence on China, Taiwan, and Hong Kong, and this is where India's 76, 000 crore production line incentive programme comes in, wherein the central government of India plans to establish 20 semiconductor units in the country over the next two years. The government has lined up enticing incentive support for companies involved in silicon semiconductor fabs, display fabs, compound semiconductors, silicon photonics sensors, fabs, semiconductor packaging, and semiconductor design, and, as we saw in the solar awards case study, due to the pli land semiconductor grade water power logistics and research ecosystem, will be provided to these companies at a subsidized rate to set up two Greenfield semiconductor fabs. So, long storey short, all these new schemes announced by the government are expected to contribute to the one trillion dollar digital economy by 2025–26. And if this happens, along with the successful execution of the quad summit agreements, India will definitely go on to become a hub of semiconductors and, more importantly, we will be less dependent on China for the same. This is how India plans to go from being an importer of semiconductors to being a major exporter of semiconductors in the global market. And that is,

as investors in the stock market and more importantly, as citizens of India, what are the factors that to understand the trajectory of the semiconductor market in India and what are the best sources to help you understand it deeper? Meanwhile, if we keep on investing in specific Indian companies that are now standing up against the Chinese industries, we must definitely check out the China Plus One Strategy small case study. As previously stated, the most relevant small case in this case is the China Plus One strategy small case this small case consists of hand-picked stocks of companies from different sectors like textile electronics and even the renewable energy sector the best part is that the small case manager himself will rebalance the stock strategically depending on the market conditions to give you the best returns possible and even if we don't want to make any investments, here the three important factors that we need to understand the semiconductor market of India the production-linked incentive program of the government and find out which of the public listed companies that could become a beneficiary of this incentive scheme and at the same time before this the government already attempted to rule out attractive subsidies and yet it failed. India is now partnering with Taiwan which is now sternly opposing the Chinese takeover and India is having this partnership in order to establish semiconductor units in India and Taiwan is very critical because the Taiwanese contract manufacturers together accounted for more than 60 of the total global foundry revenue last year and it would not be an exaggeration if we say that the world is dangerously dependent on Taiwan for semiconductors. And thirdly the Quad Summit fact sheet and how it brings new opportunities to the Indian economy. With the world in the throes of a severe chip shortage and geopolitical tensions in Taiwan, which dominates the global chip market, India should have had its own semiconductor fab decades ago. Sadly, so far, local manufacturing has never been on anybody's agenda. At least now, the importance has been realized, and incentive schemes have been launched. The government is doing everything it can to bring us up to par with the global industry. The political will has been evident. We will see now how many proposals we get from global and local players.

International shortage and policy for semiconductor

In 2021, global semiconductor industry sales reached a record \$555.9 billion, up 26.2% year on year, the U.S.-based Semiconductor Industry Association (SIA) said that demand is expected to "rise significantly" in the coming years. China remained the biggest market, with sales there totaling \$192.5 billion in 2021. A top industry association said that global semiconductor sales topped half a trillion dollars for the first time, as companies ramped up production to meet demand amid a worldwide chip shortage. The industry shipped a record 1.15 trillion semiconductor units last year. In 2021, amid the ongoing global chip shortage, semiconductor companies substantially ramped up production to unprecedented levels to address persistently high demand, resulting in record chip sales and units shipped, Demand for semiconductor production is expected to skyrocket in the coming years as chips become even more deeply embedded in critical technologies. Last year, U.S. President Joe Biden earmarked \$50 billion for semiconductor manufacturing and research as part of a \$2 trillion economic stimulus

package. A bill known as the CHIPS for America Act is also working its way through the legislative process and aims to provide incentives to enable advanced research and development and secure the supply chain.

This month (Feb 2022), the European Commission, the executive arm of the EU, announced a new European Chips Act that will enable 15 billion euros (\$17.11 billion) in additional public and private investments until 2030. The SIA said that semiconductor sales in China totaled \$192.5 billion in 2021, up 27.1% year on year, eclipsing any other market. China has been focusing on boosting its domestic chip industry over the last few years amid geopolitical tensions with the United States. Beijing has made increasing self-sufficiency in semiconductors a priority, though China remains heavily reliant on foreign technology solutions for now and the future. The market in the Americas saw the largest sales increase of 27.4% in 2021. Europe followed with 27.3% growth.

India depends on the US, Taiwan, and Southeast Asian countries to make its chips, including those used in critical areas such as defense, space, railways, and finance. Once we send the chips out for fab, we have to share our designs. It is no longer your IP. The security risk is always there. India's government is offering almost \$7 billion of enticements to boost the electronics manufacturing sector, which includes a production-linked incentives scheme and a strong desire to move up the value chain from simple assembly to more technologically advanced semiconductor production. The Taiwanese electronics manufacturer Foxconn has teamed up with India's oil, gas, and metals giant Vedanta to manufacture semiconductors in India while the electronics giant plans to diversify its business amid the global chip shortage that has engulfed the world. Foxconn has stated that it plans on investing \$118.7 million, which is around Rs 900 crores, to set up a joint venture firm with Vedanta. The latter would also be the firm's majority shareholder, with the Taiwanese conglomerate owning 40% of the company. Foxconn has signed a memorandum of understanding with Vedanta to make semiconductors, calling it a "significant boost to domestic manufacturing of electronics in India." This move comes right after the announcement of the Rs 76,000 crore PLI scheme for manufacturing semiconductors in India to make India one of the leading markets for semiconductor production across the globe. This scheme will provide eligible applicants with financial assistance of up to 50% of the project cost. In fact, just last year, Vedanta Chairman Anil Agarwal stated that it would invest Rs 60,000 crore to set up a chip manufacturing ecosystem over a three-year period. Then there's the actual chips this new company would produce. It has two real choices, to manufacture-to-order for external clients or to make products that it's designed itself. The former is a tough gig. The rise of Taiwan Semiconductor Manufacturing, Now one of the world's largest companies, might make people believe this is a hot and lucrative business. But the fact that the world's third-largest, Global Foundries INC can barely string together a few quarters of profit highlights the pitfalls, even for those with years of experience. For sure, Vedanta's local connections combined with Foxconn's technical chips make for an enticing enterprise. But for now, that venture is merely on paper and little more.

U.S. President Joe Biden ordered economic and national security experts to look for gaps in the semiconductor supply chain in the United States. They want to see how reliant the US has become on other countries to manufacture semiconductors. Here's how the global chip shortage got so bad and what's being done to fix it. So what are semiconductors? It's silicon with transistors built into it, and these circuits are put into basically any product these days that needs power. Generally, every single electronic product these days has these chips in them that allow them to do what they do. When people talk about semiconductors now, they're talking about the advanced microchips that power smartphones, computers, and cars, as well as advanced medical equipment and the analogue semiconductor devices that power radios and thermostats. The transistor, a kind of semiconductor, was first successfully demonstrated in 1947 at Bell Labs in New Jersey. Its inventors won the Nobel prize. Physics created the first tech companies in Silicon Valley and basically laid the foundation for the modern digital world. After the transistor came the integrated circuit, the microprocessor, and so on, until we have the super small, super advanced chips we have today. The semiconductor industry is massive within the industry. There are semiconductor companies that design the chips called "fabulous companies," and there are semiconductor companies that manufacture them called "foundries." People upgraded their computers, bought smart speakers, upgraded their home theaters, and played a lot of video games. Businesses scrambled to set up remote work systems and needed more cloud infrastructure. So what became very clear is that electronics companies needed to increase production by a lot. You know, once that kind of worked its way through the summer and China started getting back to work, Semiconductor sales totaled 439 billion dollars in 2020, a 6.5 percent increase over the previous year's total of 412.3 billion dollars. According to the Semiconductor Industry Association, global sales for the month of December 2020 were 39.2 billion dollars, an increase of 8.3 compared to the December 2019 total. Another big reason for the shortage is that cars not only need advanced chips to run increasingly complex in-vehicle computer systems, but they also need older, less advanced semiconductors for things like power steering. The auto shortages are happening because the auto OEMs cancelled all their orders during COVID last year, and it just takes the supply chains a while to adjust. We expect the chip shortage to persist well into 2021. Of course, we've heard from the likes of Amanda Sue and others about the expectation of this lasting about six months, so a hundred days if her interpretation is right, is going to put us nearly all the way out, well over halfway into that six month period, and I really do wonder if we are able to shorten this delay at all with any action that can be taken right now. I think the Biden administration really needs to focus on how we do not allow this to happen again. The chip shortage has compelled the White House to take steps to strengthen the chip supply chain in the United States. We need to stop playing catch-up after the supply chain crisis hits. We need to prevent the supply chain crisis from hitting in the first place. In some cases, building resilience will mean increasing our production of certain types of elements here at home, and in others it will mean working more closely with our trusted friends and partner nations that share our values so that our supply chains can't be

used against us as leverage. The bond administration is not going to lump everything together in one giant bundle and then negotiate that and geopolitically with China; they're going to look at what's national security related. What's economic security? But let's focus on what's more important. You see the Biden administration doing it with the supply chain and the semiconductor industry. Let's focus on how to address risk. How to have independent testing. But fundamentally, this administration is going to work multilaterally with our allies to try to figure out how to make sure we're safer, and I'm encouraged to see that the US will not just block foreign companies; they'll make America moot. The so-called internet of things will put chips into more and more everyday devices, and the remote work brought on by COVID-19 appears here to stay. China is attempting to become self-sufficient in semiconductor chips, which it currently imports. You know, Beijing has always had big ambitions to have its own home-grown industry, but the US restrictions not only on sales to China for chips but also on the telecoms giant, Huawei, have really acted as a stimulus for the industry, so Beijing has made chips a top priority for its next five-year plan, which will be unveiled soon. The semiconductor industry is one of the five fundamentals of China's economic development, and 1.4 trillion dollars have been earmarked to develop the semiconductor industry by 2025, with the goal of having 70 percent of the chips used in China made in China. I think 19. A lot of people in the business world have started to really look at our supply chains because of COVID-19. You know, it's no secret that electronics manufacturing is kind of based in China, but what people kind of don't know is that the number one pure chip factory in the world is in Taiwan. Taiwan has not had the trade issues that China has, but it's still an island off the coast of China. So there was a lot of discussion early on in the pandemic last year that we had to look at the situation from a geopolitical standpoint. You know, if the military can't make a jet, because they don't have chips, then Taiwan is caught in a geopolitical dispute. This is a term that has been dominating news headlines, especially in the context of the auto sector. Well, this is a material that is made of silicon and is used in electronic circuits, such as integrated circuits or microchips. It's used in almost every electronic device we use these days, from smartphones to LED television sets to laptops, iPads. It's also used in your car and two-wheelers as well, but why are we really talking about it? Why are semiconductors so important? Good question. Semiconductors have become a major issue for automobile manufacturers worldwide, from Tesla to Ford, Hyundai, and Maruti Suzuki. Every automaker has been impacted by this chip shortage. On average, your car has at least 80 to 120 microchips, and if you have a high-end luxury vehicle like a BMW, it could even have up to 150 microchips. Each of these ECUs uses a semiconductor. It's also used in high-performance motorcycles. Okay, but why is there a semiconductor shortage in the first place? Well, very few companies saw this coming in 2020 when the pandemic struck and people worked from home and virtual classrooms became a reality. There was a huge demand for consumer electronics such as smartphones and tablets. As a result, the consumer electronics industry began placing large orders for semiconductors and began stockpiling inventory for the next 12 months. Furthermore, the majority of semiconductor manufacturing occurs in a few countries, such as the United States, Japan, South

Korea, Taiwan, and Europe. We've also had a fire in a Japanese plant that makes semiconductors. You've also had lockdowns in Malaysia that have impacted semiconductor foundries there. In fact, the view is that the semiconductor shortage may persist till the end of 2022 or even early 2023. So, how is this impacting the Indian auto sector? How does this really affect people like you and me? The semiconductor shortage has hit the auto sector really hard. In September, Mahindra plans to cut production by at least 60%. If you've recently visited a dealer, you may have been told that you'll have to wait two to three months, or even up to a year, for certain popular models. Because value generation varies by product category, as it does in every industry, changes in some segments may have a higher impact than changes in others. The most profitable category, for example, has been memory, followed by fabless companies who develop their own circuits but outsource their manufacturing. There are some geographic differences as well. During the 2015-19 period, North America, which is home to some of the major fabless players, accounted for almost 60% of the worldwide semiconductor value pool. Europe contributed for 4% of the industry's total economic profit, with capital-equipment companies benefiting the most. The remaining 36% came from Asia, which is still the centre for contract chip manufacture. The semiconductor industry's value generation can have an impact on economies all around the world because of its global reach.

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