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RESEARCH ARTICLE **OPEN ACCESS**

THE IMPACT OF COVID ON AUTOMOBILE SECTOR

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ABSTRACT

There has been an increased interest among scholars to investigate supply chain resilience (SCRes) in manufacturing and service operations during emerging situations. Grounded in the SCRes theory, this study provides insights into the impact of the COVID-19 outbreak on the automobile and airline supply chain. Both the short and long-term response strategies adopted by the two supply chains are assessed, using a combination of qualitative and quantitative techniques in three distinct phases. In phase one, we use a sequential mixed-method for resilience evaluation, integrating Time-to-Recovery (TTR) and Financial Impact (FI) analysis. In phase two, we conduct an empirical survey involving 145 firms to evaluate the short-term SCRes response strategies. In the third phase, we conduct semi-structured interviews with supply chain executives both from the automobile and airline industries to understand the long-term SCRes response strategies. Our findings indicate that: (i) the automobile industry perceived that the best strategies to mitigate risks related to COVID-19, were to develop localized supply sources and use advanced industry 4.0 (I4.0) technologies. (ii) The airline industry on the other hand, perceived that the immediate need was to get ready for business continuity challenges posed by COVID-19, by defining their operations both at the airports and within the flights. (iii) Importantly, both the sectors perceived Big Data Analytics (BDA) to play a significant role by providing real-time information on various supply chain activities to overcome the challenges posed by COVID-19. (iv) Cooperation among supply chain stakeholders is perceived, as needed to overcome the challenges of the pandemic, and to accelerate the use of digital technologies.

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INTRODUCTION

Covid 19: Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. These droplets are too heavy to hang in the air, and quickly fall on floors or surfaces. You can be infected by breathing in the virus if you are within close proximity of someone who has COVID-19, or by touching a contaminated surface and then your eyes, nose or mouth.

Automobile industry: Automobile industry, the business of producing and selling self-powered vehicles, including passenger cars, trucks, farm equipment, and other commercial vehicles. By allowing consumers to commute long distances for work, shopping, and entertainment, the auto industry has around major cities, and played a key role in the growth of ancillary industries, such as the oil and travel businesses. The auto industry has become one of the largest purchasers of many key industrial products, such as steel. The large number of people the industry employs has made it a key determinant of economic growth.

Review of Literature

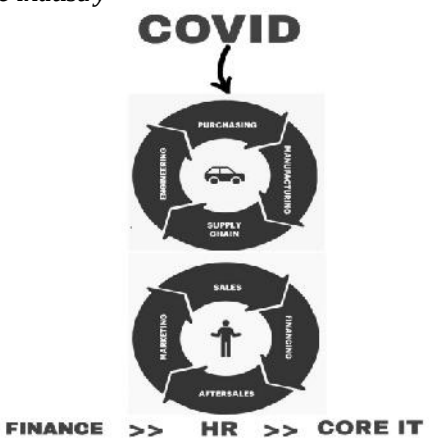
Arun Gaikwad and CMA Sathish Dhokare: pointed out that this epidemic of COVID-19 affected the whole world and was felt throughout the industry.China, the second largest economy in the world, is tagnant. Planetary health organizations call the outbreak a national emergency. In India, we may have felt the supply chain disruption from China and the impact of China as a regional player. The impact of the pandemic on economic activity can be felt far beyond the aviation, transport, tourism and hospitality areas. Analysts see some contribution to the gross

domestic product quarter from January to March 2020. Warwick and Roshen Fernando explained that even a contained outbreak could significantly impact the global economy in the short run. These scenarios demonstrate the scale of costs that might be avoided by greater investment in public health systems in all economies but particularly in less developed economies where health care systems are less developed and population density is high.

Background

The sentiment in the stock markets across the world is gloomy. This is reflected in the frequent crashes in the share markets in all parts of the world. Financial markets in India are witnessing sharp volatility currently as a result of the fallout in global markets. The fall is in line with the global benchmark indices as the domestic market usually tracks the major global indices and the high volatility is likely to continue in the near future. Further, with overseas investors flying to the safety of dollar-backed assets from emerging markets has led to a sharp downfall in the Indian Stock Market. The NSE Nifty 50 which was 12362 points on 14th January, 2020 is 7511 points on 24th March, 2020. Hence, this paper made an attempt to study the impact of COVID-19 on stock market. This research study is an event study to analyze the stock price volatility of automobile sector. The outcome summary of the study revealed that there is a significant impact of automobile sector index price movements after the COVID – 19 in India.

Here is the conceptual model to explain the major challenges faced y the industry



Limited Supply of Vehicle Parts: Starting in China, suppliers around the globe placed production lines in quarantine or shut them down completely. Also, legal and trade restrictions, such as closed borders, increased the shortage of required parts and limited distribution of supplies.

Shut down of Manufacturing: A limited parts supply and a just-in-time production strategy, coupled with quarantine measures and a reduced workforce, lead OEMs to shut down their production. This is enhanced by the need to secure liquidity and reduce overproduction due to the decrease in sales.

Declining Working Capital/ Liquidity: A decline in cash inflow resulted from the drop in demand while short-term liabilities and salaries still need to be paid. Cash reserves are likely to be exhausted within a few months.

Drop in New Vehicle Sales: Politically enforced measures to contain the virus, such as implementing curfews, closing factories, offices, dealerships and the resulting dismissals of short-time workers, as well as the fear of a recession, are likely to lead to a decrease in sales numbers.

Design of the Study

Objectives of the Study:

To examine the stationarity of automobile sector index during before and after COVID-19. To analyze the volatility index price of automobile sector during pre and post COVID-19. Analyze the impact of COVID-19 on automobile sector. To measure the influence of COVID-19 in the price movements of automobile industry.

Global economies are heavily dependent on the automobile industry: In many respects, the automotive industry is essential for the global economy and the resulting prosperity: Links to other industries: The automotive industry is a critical component of economic growth with extensive interconnections to upstream (e.g. steel, chemicals, textiles) and downstream industries (e.g. repair, mobility services). Employment in the automotive industry: With nearly 14 million people employed in Europe and 8 million in the US, as well as approximately 5 million in China, the figures highlight the importance of the sector. Economy: The turnover earned by the automotive industry exceeds 7% of EU GDP, 3-3.5% of the overall GDP in the US and 10% in China. Although it is currently a difficult time, the OEMs that are able to mobilize their COVID-19 response and take swift actions will be in a better position post-event and more resilient going forward.

Hypothesis: There will be no significant difference between high or low financial efficiency of companies in automobile industry in India. ... H3: There will be no significant difference between high or low the production and sales activity of companies in automobile industry in India

Disrupts of sector: The automotive industry is disrupted by the four megatrends connected, autonomous, electric and shared driving, causing an unprecedented technology and business model transformation. Amid this transformation, the COVID-19 outbreak is putting additional stress on the industry. After initial supply and manufacturing disruptions, the industry is now experiencing a demand shock with uncertain recovery timeline due to shelter-in-place regulations. With limited room to cut fixed costs, some OEMs have low liquidity to power through a long period of missing revenues. Decreases in market capitalization will likely accelerate industry consolidation and without securing additional funding, some players risk going out of business. Changes in customer behavior, such as different mobility preferences and online shopping expectations, might remain after the crisis. To deal with the disruption, businesses need to execute actions over three timelines: A fast response to navigate the emerging situation with focus on protecting people .

- õ A reset of current business activities to adapt to new financial realities
- õ A renewal of strategic plans to emerge stronger after the crisis .

Methodology of Empirical Study: To verify the validity of PORTER's statement as a statistical method, the regression analysis is applied to provide the evidence for a possible link between market share and profitability. The period surveyed was the business year 2012. Additionally, the following assumptions were made:

Comparable accounting standards (IFRS, US GAAP); Uniform profit indicator(s) (EBIT, Operating Income/Profit); Number of cars sold used as basis for market share;

View of calendar year n each case the assumptions refer to the operational earnings achieved in the segment of the respective group of companies (e.g., Automobile/Automotive). In addition to segmental reporting by means of external accounting, all separately compiled financial statements ofhe individual subsidiaries have been considered. The EBIT resp. operating income has been selected as earnings indicator. The "non- operating income" has not been considered.When randomly picking the viewed corporate groups, the concentration process was applied [6,7]. It is applied, when some elements of a basic quantity can make a significant explanatory contribution to the situation to be examined. The realised random test represents more than 91% of turnover of the year 2012 of the entire automotive industry.

For this reason it can be assumed that the data collected are representative. The random check covers the main part of the market being investigated. Therefore it can be assumed that a realistic reflection of the basic quantity viewed is in place. Automotive groups are coherently diversified according to their brand names. They pursue different competitive strategies. Hence, individual brands are viewed separately in the present study. A strict separation is not always possible due to lacking availability and the lacking disclosure obligation of separate financial statements. In most cases the financial statements of subsidiaries are depicted in the consolidated financial statement of the parent company within the segment reporting. In this context it used to be possible - depending on the segmental reporting in the consolidated financial statement.

Uncertainty of the time frame

- **First**, **small signals of a rebound in the Chinese economy:** China's government is talking up the prospects for a rapid economic rebound. At the moment, one can already see that there are early first signs of a recovery in the Chinese economy, measured by the movement of people and goods, production, etc. Whether the recovery of the Chinese economy is sustainable cannot be said at this point in time.
- **Multiple possible rebound scenarios across the globe:** There are various scenarios for the recovery of individuals and the global economy. In general, three scenarios could be observed from previous crises (e.g. "Sharp V" triggered by SARS in 2003; "Short U" caused by the early recession in 1980; "Deep U" caused by financial crisis in 2008). The scenario will be driven by the combination of the resolution and containment of the medical emergency, the resulting consumer confidence, as well as the effects on the overall economy influenced by public intervention.
- **Slower adoption of the megatrends:** The direction of the automotive industry towards the four major megatrends (connected, autonomous, shared and electric driving) is expected to remain unchanged as trends will continue to drive the industry evolution going forward. However, the speed of adoption might change due to the emergency.

Considerable uncertainty regarding the timeframe: As the timeframe cannot be predicted right now, industry players must be ready for all scenarios. Therefore, they must develop the capabilities to quickly identify the signals and direction – how to manage the ongoing crisis, how to reset ways of working and how to renew for the "new normal".

Research and markets

The report analyses the global automotive market on the basis of sales channels, product type, propulsion technology, and geography. Based on the sales channel, the market is segmented into OEM and aftermarket. Based on product type, the market is classified into passenger vehicles and commercial vehicles. Passenger vehicle segments which include 2 wheelers and passenger cars is expected to dominate the global automotive market over the forecast period. Further, based on propulsion technology, the market is divided into conventional vehicles and new energy vehicles. The conventional vehicle segment held the dominating share in the global market in 2018, whereas, new energy vehicle segment which includes fully electric vehicles and hybrid electric vehicles is estimated register robust growth over the forecast period. Geographically, the market is analysed into North America, Europe, Asia-Pacific, and the Rest of the World. Asia-Pacific held the dominating share in the global automotive market with China holding around one-third of the global automotive consumption. Apart from China, economies such as India, South Korea, and Japan are also influencing the automotive industry growth of the Asia-Pacific. North America and Europe also home several automotive companies such as Tesla, Daimler AG, Volkswagen AG, Renault SA, and others which further contribute significantly towards the global automotive industry. However, the recent outbreak of COVID-19 has severely impacted the automotive industry across the globe. China has been hit hard by this spread of the virus as the country is an epicentre of the COVID-19. Several provinces in China including Wuhan and Hubei, which collectively fulfils around 60% of China's automotive vehicle production demand, have been quarantined. This has led to disruptions in the supply chain. The coronavirus (COVID-19) outbreak is causing widespread concern and economic hardship for consumers, businesses and communities across the globe. As the pandemic disrupts business as usual and throws the economic outlook into uncertainty, the automotive industry is on the front line. Some of the most affected regions are major production hubs and home to key links in the sector's global supply chain. Typical contingency plans help enable operational effectiveness following events like natural disasters, cyber incidents and power outages, among others. They don't generally take into account the widespread quarantines, extended school closures and travel restrictions that are being instituted in countries around the world to help stem the spread of the virus. With production shutdowns taking effect, automotive companies need to remain focused and nimble to better navigate this crisis.

Issues the automotive sector are

- **Crisis management and response:** The shift in the pandemic's epicenter to Europe and North America underscores the need for automotive companies to remain nimble in their responses to the crisis. Supply chain disruptions combined with the significant — and growing — macroeconomic uncertainty fueled by COVID-19's global spread can make formulating the right response a moving target.
- **Workforce** - Automakers and their suppliers employ about 1 million people in the US, according to the Bureau of Labor Statistics. These employees' welfare should be the top concern for corporate leaders. A significant share of those people do jobs in factories where components and vehicles are assembled and so cannot be performed remotely. If infections spread and a large percentage of the workforce gets sick, it could drastically reduce production capacity. That means keeping the big picture — a safe, healthy workforce — in focus may also be what's right for the bottom line.
- **Operations and supply chain** -C0VID-19's impact on the automotive supply chain may be substantial. Countries that have been heavily impacted by the outbreak, in particular, China, Japan and South Korea, account for a significant share of global auto manufacturing. China's Hubei province, the pandemic's epicenter, is one of the country's key automotive production centers.
- **Finance and liquidity** - The rapid intensification of the COVID-19 outbreak coincided with the final weeks of the first quarter. For companies in hard-hit regions, such as Italy, France and Spain, that has led to operational disruptions that delayed their ability to finalize financial statements. Additionally, some automotive companies are increasingly concerned about the possibility that the economic impact of the pandemic may cause triggering events for goodwill and long-lived asset impairments, the recoverability of receivables, restructuring actions and/or liquidity issues. To make matters worse, key finance personnel may be directly affected by the virus or forced to shift their focus to mitigating its impact on the business. Reduced productivity of the finance team c0uld make the significant uptick in the volume of work to get through in the coming weeks more daunting.
- **Strategy** - The COVID-19 outbreak and resulting economic uncertainty may likely reduce consumer demand in the short term, possibly leading to dampened new vehicle sales and deferred spending on nonessential maintenance. In the longer run, these forces could trigger a shift in consumer preferences, much as other global events with significant macroeconomic implications (e.g., wars, oil price swings, etc.) have done.

Rather than suspending investments with an eye to resuming them when the situation stabilizes, companies should reevaluate strategies and portfolio investment in the context of different potential scenarios for the future. By remaining nimble, auto companies may navigate uncertainty today while preparing for an eventual recovery.

Period of data: In order to analyze the impact of COVID19 on automobile sector, 6 months data have been collected starting from 7th October 2019 to 19th March 2020 which consisted data of 3 months beforeCOVID-19 and 3 months after COVID-19.

Data analysis and Interpretation: The data collected are analyzed through respective statistical tools like Relative Strength Index (RSI), Augmented Dickey Fuller Test (ADF) and GARCH (1,1) Model. The Relative Strength Index (RSI) is a technical indicator used in the analysis of financial markets. The RSI is classified as a momentum oscillator, measuring the velocity and magnitude of directional price movements. Momentum is the rate of rise or fall in price. The smoothing process affects RSI values. RSI values are smoothed after the first calculation. Average Loss equals the sum of the losses divided by 14 for the first calculation. Subsequent calculations multiply the prior value by 13, add the most recent value and then divide the total by 14. This creates a smoothing affect. The same applies to Average Gain. Because of this smoothing, RSI values may differ based on the total calculation period.

Average Value	Upward	Downward	Average upward	Average Down	Relative Strength	RSI
	43.21	25.89	36.96	29.23	1.76	51.97

Price movements of automobile sector during the Pre – COVID-19 period: According to Wilder RSI normalized function, the values range from 0 to 100, with a value greater than 70 indicating an overbought condition and a value lower than 30 indicating an oversold condition. From table 1, it can be clearly observed that Pre – COVID- 19 period the RSI value was average (51.97188) i.e., average performance of share, this value indicates the shares are neither overbought or oversold due to average performance of the company Share during pre – COVID-19.

	Upward	Downward	Average Upward	Average Downward	Relative Strength	RSI
Average Value	24.55	79.33	23.54	66.13	0.53	29.57

Price movements of automobile sector during the Post – COVID-19 period: It appears from the table that there is an average performance (29.57) which has been recorded in automobile sector index. The data analysis shows that there is significant impact of COVID-19 which is found in automobile sector index stock price during the study period.

Now and next

What can be done to stabilise working capital and liquidity?

Establish a working capital crisis mode:

- õ Accounts receivables: Establish immediate accounts receivables crisis management to get full transparency and allow accurate cash flow forecasting
- õ Accounts payables: Prioritize all payment obligations
- õ Maintain a close exchange with major banks – Audit and verify the assurance of committed syndicated credit lines in close exchange with major banks
- õ ▪ Scrutinize subsidiaries – Gain full immediate financial transparency and centralize selected or full corporate finance capabilities (e.g. CapEx, investment decisions)
- õ Enter fixed costs emergency mode – Examine possibilities for optimizing operations and personnel costs

What can be done to boost vehicle sales?

- õ **Keep engaging customers** – Use online or mobile channels to keep in contact with homebound customers to avoid churn during the shutdown. Utilize online live broadcasts to compensate for cancelled trade fairs as

well as reinforce brand perception by e.g. showing commitment to solve global epidemic.

- õ **Pragmatically adjust the sales process** – Establish a contactless sales process to accommodate for hygiene concerns and quarantine conditions, e.g. with home delivery of test drive vehicles.
- õ **Draft a sales recovery plan** – Stimulating demand for luxury goods will be a challenge in the months after the crisis, despite some pent-up demand from the lockdown. Use the idle time to prepare a recovery plan including marketing and promotion measures (e.g. "revenge spending" in China) to kickstart sales as soon as possible.
- õ **Reevaluate pricing strategies** – As soon as the crisis ends (in the second or third quarter) and sales begin to rebound, prices will come under pressure as dealers try to empty inventories. Evaluate discount policies to balance volume and market share, profitability and brand image

Conclusion

The main aim and purpose of the study is to analyse the impact of COVID - 19 on automobile sector .Comparing the return of the automobile sector index has been recorded low return. Hence with the results of all the analysis it can be understood that the COVID-19 in India made an adverse impact in automobile sector during the study period. The sudden fall of stock values affect the industry manufacturing process and it has been influenced the stock market for a period and it may recover soon with optimum potential.

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