CZECH AUTOMOTIVE INDUSTRY AND COVID-19

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Abstract: The objective of this paper is to analyze how Czech car manufacturers have coped with the COVID-19 pandemic. Included are data on manufacturing companies taken from the Cribis database of the CRIF - Czech Credit Bureau a.s., specifically data on ŠKODA AUTO a.s., Hyundai Motor Manufacturing Czech s.r.o. and Toyota Motor Manufacturing Czech Republic s.r.o. Subsequently, the research comprises economic results, ROS (return on sales) and indebtedness calculated in relation to the aforementioned companies for the period of 2019-2020. The results show that the car manufacturers had greater losses during the COVID-19 pandemic than the year before. Additionally, they became more indebted in 2020 and had lower return on sales than in 2019.

Keywords: COVID-19; automotive industry; profitability; the Czech Republic; crisis

1 Introduction

The recent COVID-19 crisis has fundamentally changed the way car manufacturers operate. Although the automotive industry has experienced disruptions to CASE (connected, autonomous, shared, electric) in recent years, the COVID-19 crisis consequences are unprecedented for the existing car manufacturers (Choi, 2020; Genzlinger, Zejnilovic, & Bustinza, 2020; Venter, Aunan, Chowdhury and Lelieveld, 2020; Wang & Wells, 2020). According to Wiedermann, car manufacturing is a sector that strongly influences the external environment and has a major impact on the national economy through creating a multiplier effect, which makes the automotive industry key to a particular country's economic development (Wiedermann, 2007). The situation that emerged in 2020 significantly revised further growth and profit prospects of the automotive industry as a whole. As Xu, Liu, and Xie, (2022) correctly point out, the mere fact that the COVID-19 originated in a world manufacturing center such as East Asia is particularly important to the manufacturing industry. Second, the disruption to supply chains that followed the spread of the pandemic had a cascade effect on other countries.

The production of a new car is an extremely complex process where many entities in various stages of production are involved. It is also a huge organizational challenge due to the number of elements, components, parts and modules that are to be assembled. The growing interconnectedness of national economies and the well-developed network of external and internal ties pose a threat of a much faster spread of negative phenomena in the global system of flows, including resources, capital, production factors and services. In particular, the transmission of exogenous shocks caused by cyclical fluctuations in the economies involved in the global network system can be worrying. Thus, all types of damage, including those related to supply chain disruptions, can have a very significant impact on manufacturing companies and directly influenced the economies of individual countries (Łuka, Woźniak, 2012). The spread of the SARS-CoV-2 coronavirus worldwide has been an unprecedented event, and the resulting pandemic has systematically and adversely affected suppliers of individual automotive components. Zhurova and Krakovskya looked into the essence of supply chain strategies related to the automotive industry which is now being gradually disrupted as a result of the pandemic. As Ivanov correctly points out, the COVID-19 pandemic has been one of the most serious supply chain disruptions in recent history, affecting many organizations around the world. In an attempt to stop the virus from spreading, most governments around the world have responded to varying degrees by introducing measures to put a halt to travelling, such as border closures or general quarantine (Ivanov, 2020). The disruption to supply chains due to the coronavirus is not the only problem in the automotive industry, as the virus has also directly contributed to a significant drop in demand for new cars and hence a reduction in the number of registered motor vehicles.

Moreover, the COVID-19 pandemic development has directly affected not only manufacturers of automotive parts, but also distribution companies and companies providing maintenance and repair services for vehicles. Countries around the world are taking steps not only to eradicate the disease with regard to infected people and stop the spread of the virus, which are the priorities, but also to save the world's economies and individual industries important for economic development.

The objective is to analyze how Czech car manufacturers have coped with the COVID-19 pandemic. To achieve the defined objective, the following research questions were formed: What were the impacts of the COVID-19 pandemic on the automotive industry in the Czech Republic? Did car manufacturing companies have greater profitability or loss during the pandemic?

2 Literature research

In the long term, the COVID-19 pandemic will have negative effects on European and global automotive companies, as evidenced by macroeconomic indicators and research by international audit firms to date aimed at highlighting the problem that carmakers will have to deal with. Hoeft (2021) explored how agile methods can be used as a strategic tool to manage established companies in times of unprecedented industry transformation. This goes beyond conceptualizations and previous attempts to improve empirical evidence on how firms use agility to explore and take advantage of market opportunities.

The complexity of processes taking place during the COVID-19 pandemic is particularly important given the number of entities involved in the automotive industry and the proportion of added value they create in the domestic market, which in turn has negative consequences for the economy. Pelle and Tabajdi (2021) collected a large (> 700 items) sample of relevant business decisions in the European automotive sector over four years (2017-2021), including those taken mainly due to the COVID-19 pandemic. The authors transformed qualitative inputs into a quantitatively analysable database with the use of coding. They then applied descriptive statistical analysis combined with qualitative content analysis behind the data.

The automotive industry is one of the fastest growing industries in Europe, being also a major employer and investor and one of the most determinative industries in the EU. Horobet, Zlatea, Alexe and Smedoiu Popoviciu (2021) used clustering algorithms to try and understand the automotive industry through several performance indicators in 478 companies. Due to high technological demands and apart from production, this industry traditionally plays a key role in research and development (R&D) as well. It is therefore a major innovator and has significant investment capacities (Vaidya and Hopkins, 2021). The European automotive industry involves more than 20 000 companies, produces around 7% of the EU's GDP, accounts for 8.3% of the manufacturing sector employment and 6% of total employment. In addition, European production accounts for 20% of the sector's global production. All of that underlines the importance of this sector in the European economy as well as the global importance of Europe. Raj, Beck, and Soliman (2019) analysed value-based management commitments in automotive companies and examined factors that explain management parameters in the automotive industry. They also considered control parameters of the companies, but there is little evidence of factors that explain which control parameters are used in the automotive industry. They used a survey on the basis of annual reports from 2008 to 2011. A total of 20 annual reports of such

companies were analysed. The results showed that the companies, particularly original equipment manufacturers and listed suppliers, were committed to value-oriented management and implemented value-oriented approaches.

However, the COVID-19 pandemic has affected the European automotive industry (and particularly Central and Eastern Europe) mainly through global value chains (Sameh et al., 2021). It was possible to identify the problem already at a time when the pandemic was only a problem for China. Over the years, China, and especially Wuhan, where coronavirus was first detected, has become a major supplier of intermediate products for the global automotive industry. Any major disruption to Chinese supplies was thus expected to have a significant impact on producers around the world. Hrusecka, Lopes and Jurickova (2019) studied limitations and necessary conditions that must be taken into account when implementing AGV (Automated Guided Vehicle) technology for the automation of selected logistics processes. Based on data collected through multiple observations, a three-phase methodology was proposed with regard to technological, organizational and security aspects and the main output.

3 Data and Methods

3.1 Data

The basic source of data shall be data on manufacturing companies taken from the Cribis database of the CRIF - Czech Credit Bureau a.s. containing 158 150 records. The data shall be processed in Microsoft Excel. The entire set shall include company name, active companies, NACE - SECTION, legal form, year, total assets, total liabilities, equity capital, own equity, net profit, costs, revenue, total sales, sales revenue, sales revenue of own products and services, EBIT, external resources and own resources.

Since data related to three companies shall be used, the overall data in the set shall be filtered and only the following companies shall be considered: ŠKODA AUTO a.s., Toyota Motor Manufacturing Czech Republic s.r.o. and Hyundai Motor Manufacturing Czech s.r.o. Also, a particular period (2019-2020) shall be reviewed and only active companies shall be examined.

3.2 Methods

First, the economic results for the year 2019 and the year 2020 shall be calculated to determine the profit of the above companies in the period under review. The following formula (1) shall be used:

$$Revenue\ (Sales) - Costs = Profit \quad (1)$$

Next, ROS (Return on Sales) shall be calculated using the following formula (2):

$$ROS = EBIT / Sales\ of\ Own\ Product\ and\ Services + Sales\ of\ Goods \quad (2)$$

Finally, indebtedness shall be calculated to find out debts of the above companies in the given period. The following formula (3) shall be used:

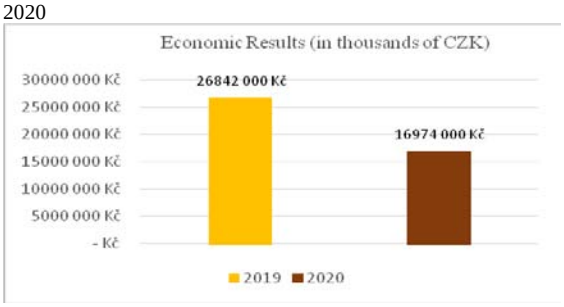
$$Indebtedness = External\ Resources / Own\ Resources \quad (3)$$

4 Results

4.1 ŠKODA AUTO a. s.

As shown in Graph 1, the economic results for the year 2019 (CZK 26 842 000 thousand) and the year 2020 (CZK 16 974 000 thousand) were calculated using the appropriate formula. The total difference between these years is CZK 9 868 000 thousand.

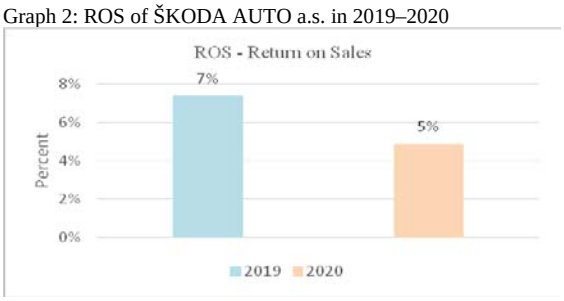
Graph 1: Economic Results of ŠKODA AUTO a.s. in 2019–2020



Source: Own processing based on Cribis data.

The following graph (Graph 2) illustrates ROS (Return on Sales) for the year 2019 (7%) and the year 2020 (5%).

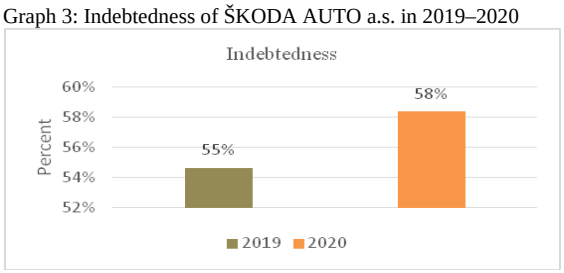
Graph 2: ROS of ŠKODA AUTO a.s. in 2019–2020



Source: Own processing based on Cribis data.

The last graph (Graph 3) reveals indebtedness for the year 2019 (55%) and the year 2020 (58%).

Graph 3: Indebtedness of ŠKODA AUTO a.s. in 2019–2020

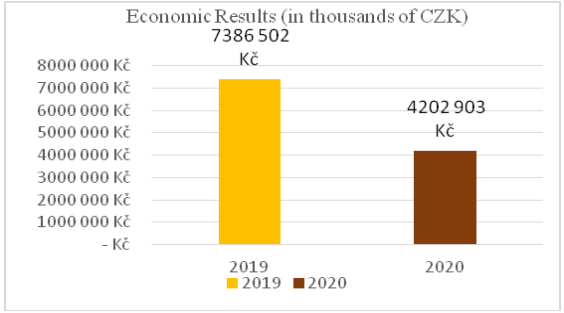


Source: Own processing based on Cribis data.

4.2 HYUNDAI MOTOR MANUFACTURING CZECH

Here, the economic results for the year 2019 (CZK 7 386 502 thousand) and the year 2020 (CZK 4 202 903 thousand) were also calculated. The difference between these years is CZK 3 183 599 thousand.

Graph 4: Economic Results of Hyundai Motor Manufacturing Czech in 2019–2020



Source: Own processing based on Cribis data.

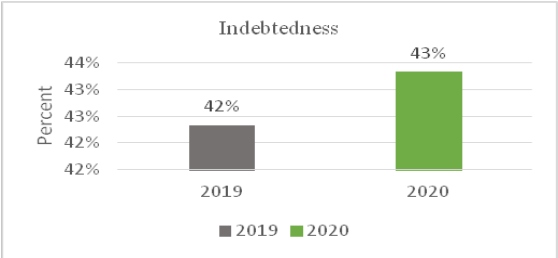
The following graph (Graph 5) illustrates ROS (Return on Sales) for the year 2019 (7%) and the year 2020 (5%).

Graph 5: ROS of Hyundai Motor Manufacturing Czech in 2019-2020

Source: Own processing based on Cribis data.

The last graph (Graph 6) reveals indebtedness for the year 2019 (42%) and the year 2020 (43%).

Graph 6: Indebtedness of Hyundai Motor Manufacturing Czech in 2019–2020

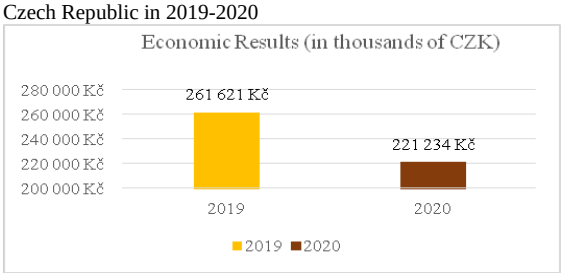


Source: Own processing based on Cribis data.

4.3 TOYOTA MOTOR MANUFACTURING CZECH REPUBLIC

The economic results for the year 2019 (CZK 261 621 thousand) and the year 2020 (CZK 221 234 thousand) were calculated for the above company as well. The difference between these years is CZK 40 387 thousand.

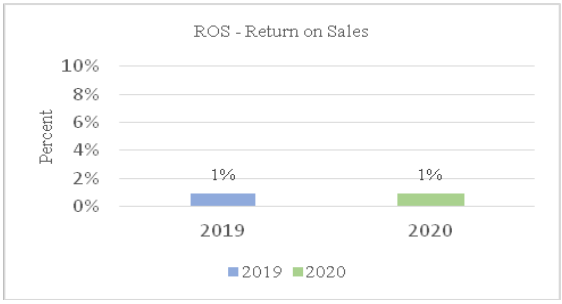
Graph 7: Economic Results of Toyota Motor Manufacturing Czech Republic in 2019-2020



Source: Own processing based on Cribis data.

The following graph (Graph 8) illustrates ROS (Return on Sales) for the year 2019 (1%) and the year 2020 (1%).

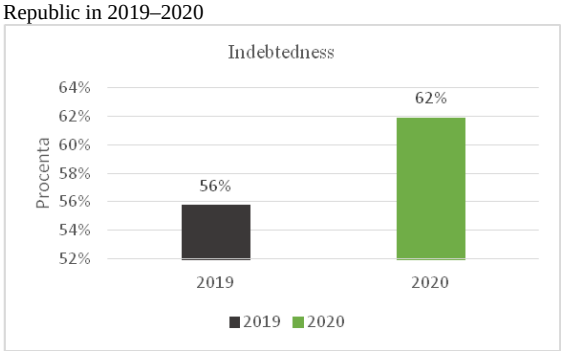
Graph 8: ROS of Toyota Motor Manufacturing Czech Republic in 2019-2020.



Source: Own processing based on Cribis data.

The last graph (Graph 9) reveals indebtedness for the year 2019 (56%) and the year 2020 (62%).

Graph 9: Indebtedness of Toyota Motor Manufacturing Czech Republic in 2019–2020



Source: Own processing based on Cribis data.

5 Discussion Results

Based on the results obtained, it is possible to answer the previously formed research questions.

Did car manufacturing companies have greater profitability or loss during the pandemic? Regarding ŠKODA AUTO a.s., there was lower profitability in 2020 than in 2019 by CZK 9 868 000 thousand. There was also a decrease in return on sales by 2% during the COVID-19 pandemic and indebtedness of ŠKODA AUTO a.s. was at 58% in 2020, which was 3% more than the previous year. Profitability of Hyundai Motor Manufacturing Czech was lower in 2020 than in 2019 by CZK 3 183 599 thousand. Return on sales decreased by 2% as well and indebtedness increased by 1% in 2020. Toyota Motor Manufacturing Czech Republic recorded the worst result since profitability decreased by CZK 40 387 thousand, return on sales was the same in both years (1%), but indebtedness increased by 6% in 2020. It follows that the total losses of the aforementioned companies were greater than their profitability during the COVID-19 pandemic in 2020.

What were the impacts of the COVID-19 pandemic on the automotive industry in the Czech Republic? During the COVID-19 pandemic the above companies had larger losses than in the previous year. Also, they became more indebted in 2020 and had lower return on sales than in 2019.

Pelle and Tabajdi (2021) came to a similar conclusion claiming that the COVID-19 pandemic triggered a number of temporary business decisions, particularly plant closures, thus reducing profitability. There were also redundancies, but this was not a prevalent issue. In the short term, it should be noted that the pandemic has affected the Czech Republic very quickly, which reduced domestic demand. The second wave of the pandemic at the beginning of 2021 brought about a worldwide shortage of semiconductor chips, which significantly affected the automotive industry in Europe as well.

Furthermore, Horobet, Zlatea, Alexe and Smedoiu Popoviciu (2021) achieved the same result in relation to the fact that car manufacturers became less indebted in 2019 than during the pandemic.

Finally, Wang and Wells (2020) as well as a number of analysts state that, due to low profitability, an important impact of the COVID-19 pandemic on the automotive industry will be reflected in increased car prices.

6 Conclusion

The objective of this paper was to analyze how Czech car manufacturers have coped with the COVID-19 pandemic. The objective was achieved. In the results section, economic results, return on sales and indebtedness in the years 2019-2020 were calculated for three car manufacturers. Subsequently, the

resulting figures were compared with the use of graphs illustrating how the companies were managing during the pandemic and the year before, when they had not been affected. As has been found out, the companies experienced serious problems during the pandemic. They became more indebted and had lower profits than the year before the pandemic. Given the COVID-19 government measures, the car manufacturing companies suspended production for some time, which did not help them much either.

Further research should be focused on a financial analysis of the European automotive industry before and during the COVID-19 pandemic to find out if this crisis has also affected other countries in Europe.

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