*European Research Studies Journal*
*Volume XXVII, Issue 3, 2024*

*pp. 15-26*

# Changes in Car Fleet Management as a Result of the COVID-19 Pandemic - The Case of Polish Companies

*Submitted 18/05/24, 1st revision 16/06/24, 2nd revision 24/06/24, accepted 10/07/24*

Tomasz Rokicki[1], Piotr Bórawski[2], Aneta Bełdycka-Bórawska[3], András Szeberényi[4], Luiza Ochnio[5], Marek Zieliński[6], Bogdan Klepacki[7]

***Abstract:***

***Purpose:*** *The aim of the article is to determine changes in the preferences of institutional automotive consumers as a result of the COVID-19 pandemic. The specific objectives are characterise the car fleet of enterprises, showing preferences in car fleet management in enterprises before and after the COVID-19 pandemic, presenting plans and intentions in the field of car fleet management in enterprises.*
***Design/Methodology/Approach:*** *Companies with a car fleet and operating in Poland were deliberately selected for the study. Then, 50 enterprises were selected for testing by random sampling. At the same time, the participation of enterprises operating in various sectors of activity (production, trade, services, tourism) was ensured. The data sources were 50 surveys conducted in June 2023 in the form of a direct telephone interview.*
***Findings:*** *As a result of the COVID-19 pandemic, 24% of businesses struggled to identify ways to finance car purchases. After the pandemic, the percentage of companies holding back on car purchases increased. They were more likely to seek to extend the life of the vehicle and to pay attention to how employees drive. The largest percentage of companies indicated that changes in car fleet management as a result of the pandemic were sustained.*
***Practical implications:*** *The results will fill in the gap concerning changes in car fleet management during the crisis.*
***Originality/Value:*** *The new information about impact of the COVID-19 pandemic on car fleet management.*

[1]*Corresponding author, Warsaw University of Life Sciences, Faculty of Economics, Management Institute, Poland, tomasz_rokicki@sggw.edu.pl;*
[2]*University of Warmia and Mazury in Olsztyn , Faculty of Agriculture and Forestry, Department of Agrotechnology and Agribusiness, Poland, pboraw@uwm.edu.pl;*
[3]*The same as in 2, aneta.beldycka.borawska@uwm.edu.pl;*
[4]*Budapest Metropolitan University, Institute of Communications and Marketing, Hungary, aszeberenyi@metropolitan.hu;*
[5]*Warsaw University of Life Sciences, Faculty of Economics, Department of Logistics, Poland, luiza_ochnio@sggw.edu.pl;*
[6]*Department of Economics of Agricultural and Horticultural Holdings, Institute of Agricultural and Food Economics, National Research Institute, Poland, marek.zielinski@ierigz.waw.pl;*
[7]*University of Agriculture in Krakow, Faculty of Agriculture and Economics, Department of Business Management and Economics, Poland, bogdan.klepacki@urk.edu.pl;*

***Keywords:*** *Car shopping, car use time, impact of the crisis on operations, new or used cars, disruptions in the COVID-19 pandemic.*

***JEL codes:*** *D04, D22, D25.*

***Paper type:*** *Research article.*

***Conflict of interest:*** *The authors declare that there is no conflict of interests regarding the publication of this manuscript.*

***Acknowlegdements****:*

*Research work co-financed from the state budget under the program of the Minister of Education and Science under the name "Science for Society" No. NdS/545129/2022/2022, co-financing amount EUR 1550, total project value PLN 326,000.*

## 1. Introduction

Most companies have smaller or larger fleets of vehicles used to perform different tasks. Different types of vehicles are used2. depending on the needs: for transporting goods, people, passenger cars or a combination of several features. Maintaining a vehicle fleet is generally a significant cost for a company (Lejda and Zielinska, 2013). Reduction of expenses is possible through proper fleet management (Cooke, 2004).

There are many aspects associated with this concept. Companies may opt for different financing methods, use different types of vehicles, acquire new or used vehicles. Technical and equipment details of vehicles may also be important (Hare, 2003; Anjam *et al.*, 2020). The proper management of a vehicle fleet is an important factor for a company to grow and gain market position (Oliveira *et al.*, 2017).

The COVID-19 pandemic affected the operation of almost all activities. In the tourism industry, there were periods of complete closure. For manufacturing, it all depended on product types and global links. Services that were provided face-to-face were affected by the pandemic. The same was true for trade (Rokicki *et al.*, 2024; Kadlubek *et al.*, 2022).

All of these activities required the use of vehicle fleets. As a result of the worsening economic situation and difficult epidemic conditions, companies changed their approach to managing their vehicle fleets (Nhamo *et al.*, 2020). It is important to determine what decisions and changes were made, what aspects were affected, and were the changes sustainable? The research conducted fills a research gap on

changes in vehicle fleet management during the crisis caused by the COVID-19 pandemic.

The article's main objective is to determine changes in the preferences of institutional automotive consumers as a result of the COVID-19 pandemic. The specific objectives are:

- characterise the car fleet of enterprises,
- showing preferences in car fleet management in enterprises before and after the COVID-19 pandemic,
- presenting plans and intentions in the field of car fleet management in enterprises.

The article seeks the answers to one research hypothesis:

*Hypothesis 1: Changes in car fleet management during the Covid-19 pandemic in Polish enterprises were short-lived and enterprises returned to previous practices.*

The organisation of the work is as follows: Chapter 1 provides an introduction to the topic. Aspects of fleet management and changes in this activity as a result of the COVID-19 pandemic are presented.

The rationale and objectives of the paper are also included in this section. Section 2 shows the materials and methods. Section 3 presents the results of the research. Section 4 refers to other research findings on the relationships studied. The main conclusions of the research are included in Section 5.

## 2. Materials and Methods

Companies with a car fleet and operating in Poland were deliberately selected for the study. Then, 50 enterprises were selected for testing by random sampling. At the same time, the participation of enterprises operating in various sectors of activity (production, trade, services, tourism) was ensured.

The data sources were 50 surveys conducted in June 2023 in the form of a direct telephone interview. The interview questions were prepared in advance. Most questions contained closed answers. A few questions also had open-response options. The surveyed enterprises participated in the survey voluntarily.

The data was collected in an Excel form and then coded and processed. The survey results are aggregated so as not to reveal data on individual companies. Based on the resulting survey results, the shares of individual responses can be determined.

The research was divided into stages. The first stage presented the resources in the car fleets of the companies surveyed. Stage two showed the sources of financing for

car acquisition before and after the pandemic. Stage three concerned the identification of important aspects related to the purchase and use of cars. Finally, the duration of the changes introduced in relation to car fleet management was presented.

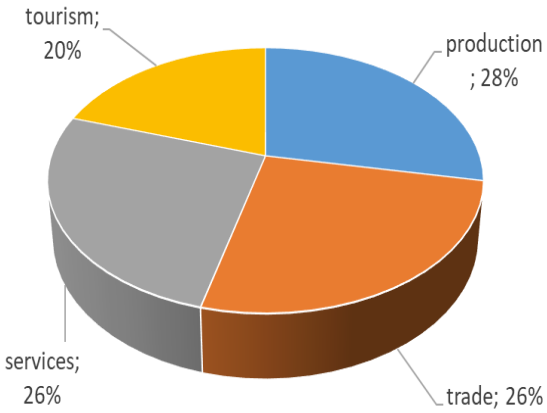
A limitation of the survey conducted is that it was limited to only a subset of 50 companies. It was not possible to survey all companies with a car fleet in Poland. Due to publishing constraints, it was possible to present a slice of the survey, but a fairly significant one.

Another limitation of the study is that the results are quite general, as the survey does not address more detailed patterns and actions taken. It is also planned to conduct in-depth interviews with a smaller number of companies.

## 3. Results

Cars are used in virtually every activity. The companies surveyed were divided into four sectors, i.e. manufacturing (14 companies surveyed), trade (13 companies), services (13 companies), and tourism (10 companies). These were the key sectors of the economy (Figure 1).

***Figure 1.*** *Sector of activity of the surveyed enterprises.*



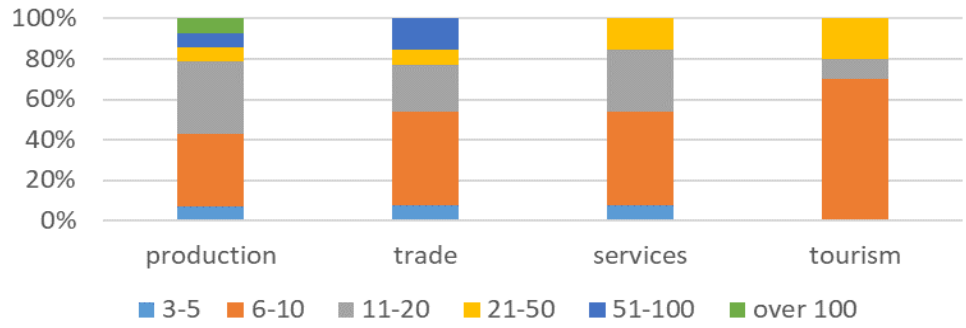

***Source:*** *Own study.*

In the first instance, resources were identified. It was assumed that a car fleet means having at least 3 cars. The size of the transport fleet in the companies surveyed varied (Figure 2). Companies with between 6 and 10 cars (most in the tourism sector) dominated, followed by companies with between 11 and 20 cars (most in the manufacturing sector).

Only one company had a fleet of more than 100 vehicles (in the manufacturing sector). The statistical tests carried out allowed us to conclude that there was no

correlation between the company's sector of activity and the size of the car fleet ($\chi^2_{emp}$ =10.89; $\chi^2_{0.05}$ =25.00; p-value=0.76).

***Figure 2.*** *The size of the car fleet in the surveyed enterprises.*

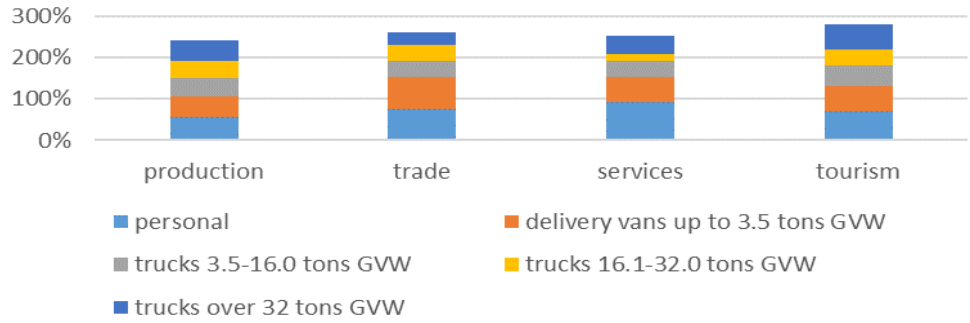



***Source:*** *Own study.*

In addition to the number of cars, it is important to determine what type of vehicles these are. A distinction can be made between passenger vehicles, vans and lorries with different gross vehicle weights. The companies surveyed had the highest proportion of passenger vehicles, 74 per cent, followed by vans up to 3.5 tonnes, 62 per cent (Figure 3). These were therefore vehicles used to represent the company, for sales representatives. Vans allowed transport over short distances. Larger trucks were most often used for long-distance transport.

Statistical tests carried out showed that there was no correlation between the company's sector of activity and the type of vehicle fleet ($\chi^2_{emp}$ =4.87; $\chi^2_{0.05}$ =21.03; p-value=0.96).

***Figure 3.*** *Types of cars used in the surveyed enterprises (multiple selection).*

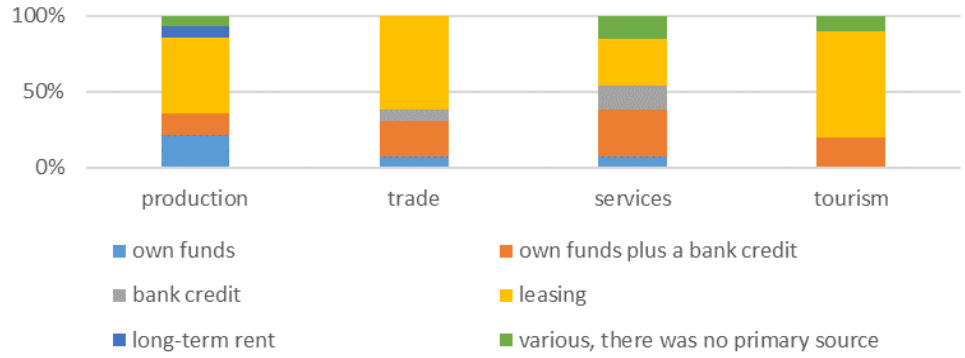



***Source:*** *Own study.*

The source of financing for the purchase of new cars is also an important aspect (Figure 4). The companies surveyed before the pandemic used leasing most often, with 52 per cent of the entities (most in the tourism sector).

Other solutions were less popular. Own funds and bank credit were used by 22 per cent of enterprises (most in the services sector). The least popular was long-term rental. Statistical tests concluded that there was no correlation between the sector of activity of the enterprise and the way in which car purchases were financed in the period before the COVID-19 pandemic ($\chi^2_{emp}$ =13.78; $\chi^2_{0.05}$ =25.00; p-value=0.54).

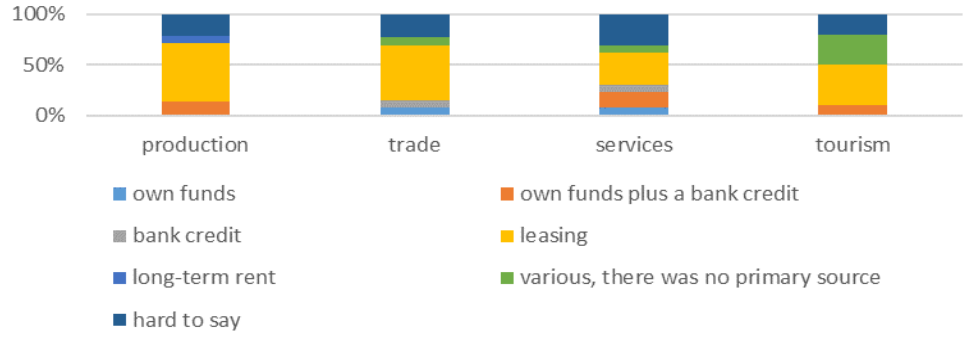
***Figure 4.*** *The main source of financing for new cars before the pandemic.*




***Source:*** *Own study.*

After the pandemic period, leasing continued to be a popular way of financing car purchases within the company, with 46% of entities (Figure 5). However, uncertainty in this area increased. Twenty-four per cent of businesses found it difficult to identify ways to finance car purchases. Statistical tests conducted showed that there was no relationship between the sector of activity of the company and the way in which car purchases were financed in the post-pandemic COVID-19 period ($\chi^2_{emp}$ =15.38; $\chi^2_{0.05}$ =28.87; p-value=0.64).

***Figure 5.*** *The main source of financing for new cars after the pandemic.*



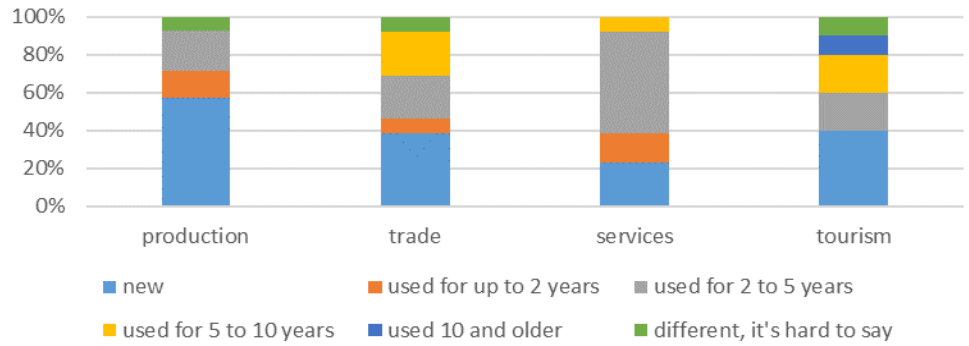

***Source:*** *Own study.*

An important aspect was the age of the means of transport purchased. Before the COVID-19 pandemic, companies often bought new cars - 40 per cent of entities (most often from the manufacturing sector), followed by cars between 2 and 5 years

old - 30 per cent of entities (most often from the service sector) (Figure 6). Cars older than 5 years were purchased quite often by companies from the trade and tourism sectors.

The statistical tests carried out allowed us to conclude that there was no correlation between the sector of activity of the enterprise and the age of the cars purchased in the period before the COVID-19 pandemic ($\chi^2_{emp}$ =15.90; $\chi^2_{0.05}$ =25.00; p-value=0.39).

***Figure 6.*** *Age of acquired vehicles before the pandemic*.




***Source:*** *Own study.*

After the pandemic, cars were still the most purchased, but their share dropped to 34% (it was highest in the manufacturing sector, as in the pre-pandemic period) (Figure 7). As many as 28% of companies said they did not buy cars after the pandemic (one in two companies in the service sector and one in three in trade). The reason for this may be the deterioration of the economic situation of the companies surveyed.

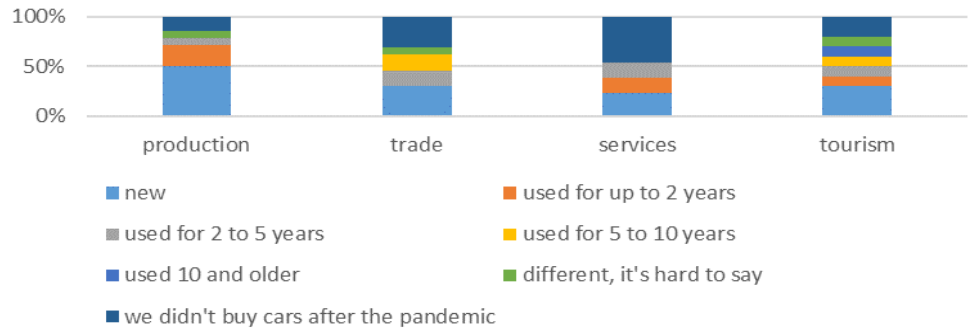
This was particularly felt in tourism and the service industry. Statistical tests carried out showed that there was no correlation between the sector of activity of the enterprise and the age of the cars purchased in the post-pandemic COVID-19 period ($\chi^2_{emp}$ =16.58; $\chi^2_{0.05}$ =28.87; p-value=0.55).

This was followed by an indication of the features and elements of vehicles that are important in vehicle purchasing decisions. Prior to the COVID-19 pandemic, the purchase price was the most important (in all sectors, but especially in services) (Figure 8). One in four companies paid attention to the type of propulsion system and the cost of fuel consumption. These are therefore aspects that are important from the point of view of the cost of using a vehicle.

On the other hand, external appearance was of little importance and ecology was completely unimportant. The statistical tests carried out allowed us to conclude that there was no correlation between the company's sector of activity and the selection

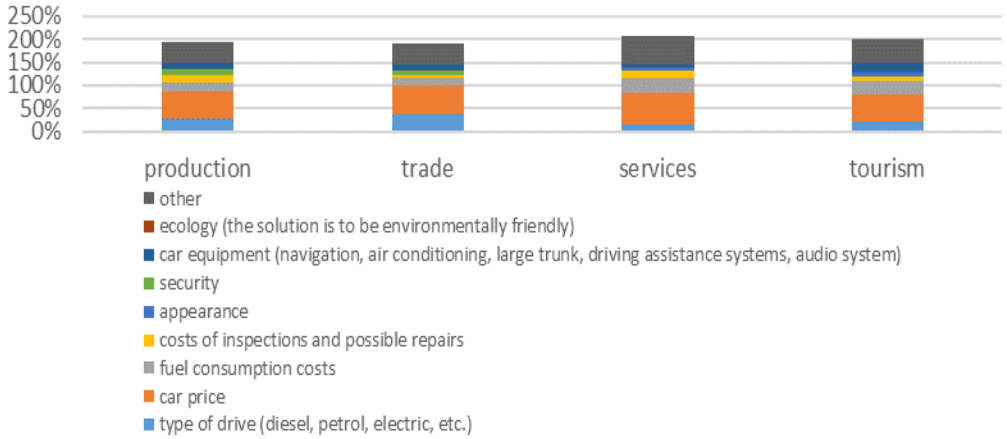
criteria for the cars purchased in the period before the COVID-19 pandemic ($\chi^2_{emp}$ =9.45; $\chi^2_{0.05}$ =36.42; p-value=0.99).

***Figure 7.*** *Age of acquired vehicles after the pandemic.*




***Source:*** *Own study.*

***Figure 8.*** *Features and elements important when buying a car before the pandemic (multiple selection).*

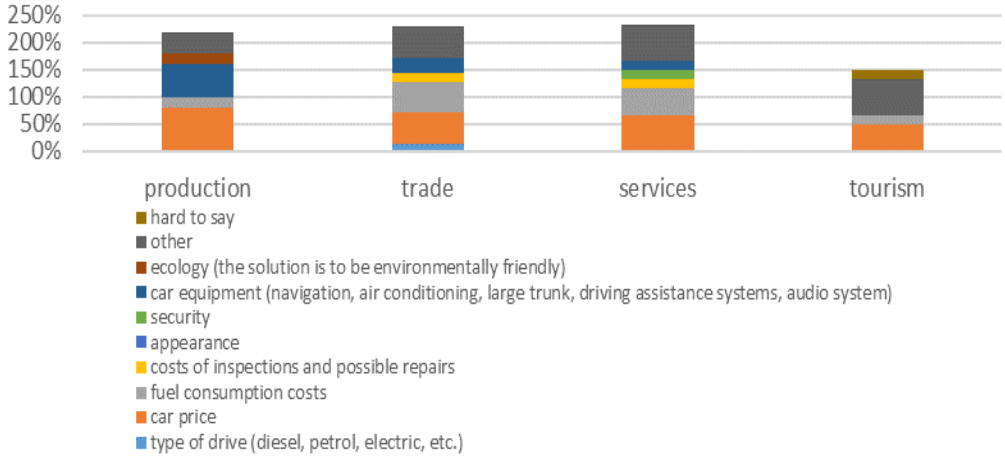



***Source:*** *Own study.*

The importance of the price of a car after the pandemic did not change, again 62 per cent of actors considered it very important (most in the manufacturing sector) (Figure 9). More importance was given to the cost of fuel consumption, especially in the trade and service-related industry. The type of propulsion became less important. However, more attention began to be paid to car equipment.

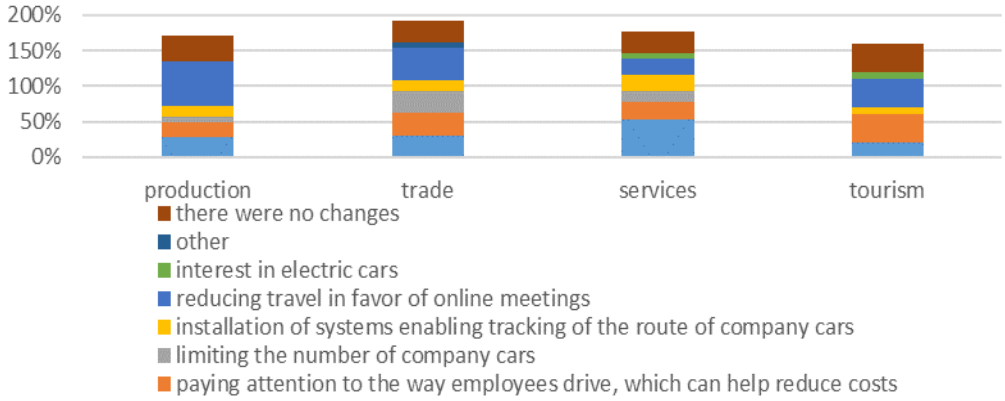
Environmental problems were only noticed in manufacturing companies. The appearance of the car was still not important. The statistical tests carried out showed that there was no correlation between the sector of activity of the company and the selection criteria for the cars purchased in the post-pandemic COVID-19 period ($\chi^2_{emp}$ =18.10; $\chi^2_{0.05}$ =36.42; p-value=0.80).

***Figure 9.*** *Features and elements important when buying a car after the pandemic (multiple selection).*




***Source:*** *Own study.*

***Figure 10.*** *Changes in car fleet management as a result of the COVID-19 pandemic (multiple selection).*




***Source:*** *Own study.*

Changes in approach to car fleet management as a result of the COVID-19 pandemic were then identified, the most important being a reduction in journeys in favour of online meetings (most in companies in the manufacturing sector) (Figure 10). Companies were also looking to extend the life of their cars, particularly in the service sector. Attention was also given to the way employees drive, which can help to reduce costs (especially in the tourism sector).

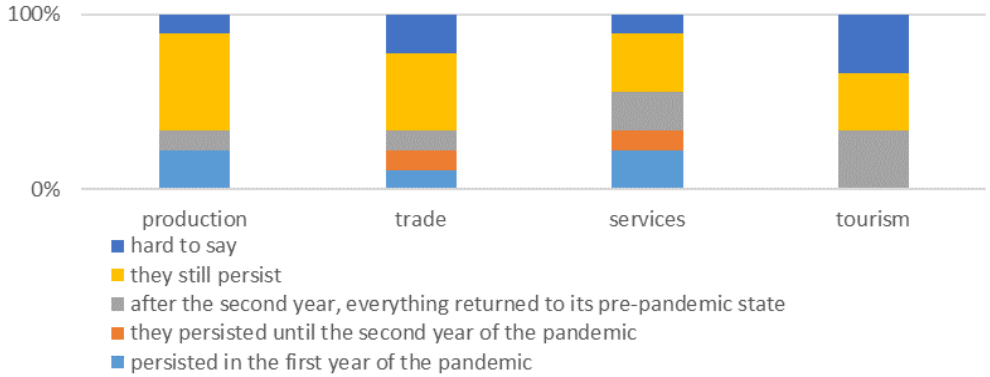
Interestingly, as many as 34 per cent of the companies surveyed did not notice any changes. Statistical tests concluded that there was no correlation between a company's sector of activity and changes in approach to car fleet management as a result of the COVID-19 pandemic ($\chi^2_{emp}$ =16.04; $\chi^2_{0.05}$ =32.67; p-value=0.77).

The duration of the changes in fleet management was then determined. The largest proportion of companies indicated that these changes were ongoing (most in the manufacturing sector) (Figure 11). There was a smaller proportion of companies where these changes were short-lived.

These results imply that changes in fleet management may be sustainable in a large proportion of companies. Above all, the economic factor is important. After the pandemic, there were further problems related to the war in Ukraine.

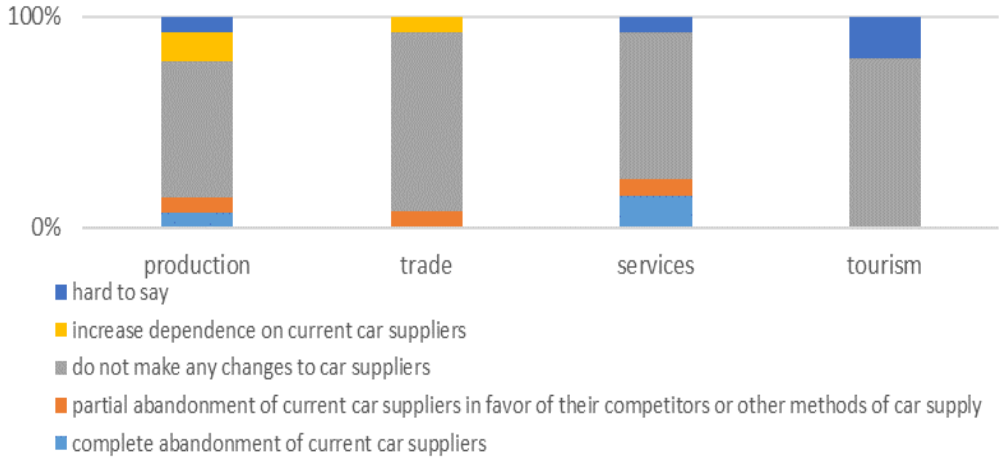
There was an increase in fuel prices, which also affected fleet management. Statistical tests conducted showed that there was no correlation between the sector of activity of the company and the duration of changes in car fleet management in the post-pandemic COVID-19 period ($\chi^2_{emp}$ =6.60; $\chi^2_{0.05}$ =21.03; p-value=0.88).

***Figure 11.*** *Duration of changes in car fleet management.*




***Source:*** *Own study.*

***Figure 12.*** *The company's plans for car fleet management after the pandemic.*




***Source:*** *Own study.*

The experience caused by the pandemic may also have influenced companies' plans. However, it turned out that as many as 74 per cent of enterprises did not intend to make any changes to their car supply (most in the trade and tourism sector) (Figure 12). Changes involving the complete abandonment of current car suppliers were not very popular (only 15 per cent of companies in the service sector).

The same was true for the partial abandonment of car suppliers. Based on the results, it can be concluded that companies are quite cautious in their decision to change car suppliers. Certainly, such a decision requires careful analysis.

The statistical tests conducted allowed us to conclude that there was no correlation between the sector of activity of the enterprise and the plans to purchase cars after the experience caused by the COVID-19 pandemic ($\chi^2_{emp}$ =10.44; $\chi^2_{0.05}$ =25.00; p-value=0.79).

## 4. Discussion

One of the effects of the COVID-19 pandemic was a reduction in demand for car purchases. Of course, this was due to restrictions in production and sales, but also to caution on the part of economically distressed companies (Klein *et al.,* 2021). Our study also reported declines in car purchases by companies. Under conditions of uncertainty, companies also started to minimise their car fleets (Hua *et al.,* 2022).

They have started to pay more attention to reducing fuel consumption and emissions, which is in line with sustainability (Benli *et al.,* 2024). Hensher (2020) highlighted the positive aspect of the pandemic, which allowed the company to reduce its car fleet. Some work was done remotely and the use of the fleet was only for jobs that required employees to move around. Work in the manufacturing, construction and service sectors fell into the latter category.

In our research, respondents also highlighted this aspect. In general, there is a lack of research relating to changes in companies' car fleet management as a result of the COVID-19 pandemic. Authors usually study individual mobility in cities, or the problems of the entire transport sector or automotive industry. Our study therefore fills a research gap.

## 5. Conclusions

On the basis of the research carried out, it was possible to identify the types of change in fleet management.The research presented allows several conclusions to be drawn:

1. The companies surveyed maintained a small fleet, consisting mainly of new leased cars.

2. The pandemic has caused companies to pay more attention to the economic parameters associated with vehicle operation, such as extended service life and economical driving. Companies are also reducing travel in favour of online meetings.
3. The largest percentage of companies indicated that changes in fleet management as a result of pademia persisted. The research hypothesis was negatively verified.
4. Future plans do not involve radical changes; most companies do not want to change car suppliers.

**References:**

Anjam, M., Khan, H., Ahmed, S., Thalassinos, E.I. 2020. The Antecedents of Consumer Eco-Friendly Vehicles Purchase Behavior in United Arab Emirates: The Roles of Perception, Personality Innovativeness and Sustainability. International Journal of Economics & Management, 14(3).

Benli, D., Çimen, M., Soysal, M. 2024. Sustainable vehicle allocation decisions under a vertical logistics collaboration setting. Journal of Cleaner Production, 453, 142226.

Cooke, P.N.C. 2004. Zarządzanie ryzykiem i bezpieczeństwem floty, IPM, Wrocław.

Hensher, D.A. 2020. What might Covid-19 mean for mobility as a service (MaaS)? Transport Reviews, 40(5), 551-556.

Hua, M., Chen, X., Chen, J., Jiang, Y. 2022. Minimizing fleet size and improving vehicle allocation of shared mobility under future uncertainty: A case study of bike sharing. Journal of Cleaner Production, 370, 133434.

Kadłubek, M., Thalassinos, E., Domagała, J., Grabowska, S., Saniuk, S. 2022. Intelligent transportation system applications and logistics resources for logistics customer service in road freight transport enterprises. Energies, 15(13), 4668.

Klein, C., Høj, J., Machlica, G. 2021. The impacts of the COVID-19 crisis on the automotive sector in Central and Eastern European Countries. OECD Economics Department Working Papers, No. 1658, OECD Publishing, Paris.

Lejda, K., Zielinska, E. 2013. Car fleet management problems in enterprises. Teka Komisji Motoryzacji i Energetyki Rolnictwa, 13(1), 89-94.

Nhamo, G., Dube, K., Chikodzi, D., Nhamo, G., Dube, K., Chikodzi, D. 2020. Impact of COVID-19 on global car rental industry and ride and share transport services. Counting the cost of COVID-19 on the global tourism industry, 159-181.

Oliveira, B.B., Carravilla, M.A., Oliveira, J.F. 2017. Fleet and revenue management in car rental companies: A literature review and an integrated conceptual framework. Omega, 71, 11-26.

Rokicki, T., Bórawski, P., Bełdycka-Bórawska, 2024. A. Disruptions in the COVID-19 Pandemic in the Supply Chains of the Automotive Industry as Crucial for the Polish Economy. Sustainability, 16, 269.

Zając P. 2003. Logistyczne zarządzanie flotą pojazdów drogowych. Wydawnictwo Politechniki Wrocławskiej, Wrocław.