

THE SHARING ECONOMY DEVELOPMENT ANALYSIS IN THE CZECH REPUBLIC AND OTHER SELECTED COUNTRIES

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Abstract: Thanks to its relative novelty, the sharing economy is still an insufficiently studied concept; it has however been raising increasing awareness among population, and therefore its study is very important. During the years 2010-2020, it began to account for an increasing share of the total GDP of almost all world countries. In the sector of the sharing economy, there are companies that offer an ever-growing range of goods and services. At present, these are accommodation, transport, and multimedia services. In the Czech Republic, with the increased share of the sharing economy, an increase in the ICT sector was also recorded. There are more than 700 vehicle sharing companies operating worldwide. Relevant published data are openly available through the Czech Statistical Office (CSO) public database and companies engaged in analytical activities, and also included in annual reports for investors of particular companies (the model company). An analysis of academic and scientific publications published so far on this topic shows that this area of economics has significant potential for future research.

Keywords: sharing economy, car sharing, GDP, the ICT, scientific publications

1 Introduction

At the end of the last decade, the world's population became aware of a new type of economy, the essence of which is sharing properties, goods, and services by more consumers (users). Such type of economy is therefore called a sharing (or collaborative) economy. This term encompasses sharing goods and services in all areas where it is technically possible from the nature of particular goods or services, and this practice can be applied long-term and repeatedly.

Botsman and Rogers (2010), who published a monographic publication 'What's Mine Is Yours' concerning this type of economy, are considered to be the world's leading promoters of the whole idea.

Sharing economy has many advantages and disadvantages for all participants involved in the whole process of collaborative consumption. However, when sharing a particular asset, conditions can be created so that this asset creates value and provides benefits to all the cooperative users. Examples of goods that can be used ('consumed') repeatedly are real estates or personal and commercial motor vehicles, including individual accessories. Real estates, motor vehicles and other means of transport (bicycles, scooters, etc.) currently occupy the largest part of the sharing economy market, and it is also the part with the highest surcharges for their use. The cooperative way of using goods is also constantly expanding. Firstly, the number of people informed about such possibility of using goods is increasing, and above all, the number of consumers who use the sharing economy market is increasingly growing. This new type of economy can also be considered one of the steps in the modernization of our society. According to Kasych and Vochozka (2019), however, choosing the right model of society modernizing is crucial for the economy of each state.

The aim of this paper is to evaluate the development of the sharing economy in the Czech Republic, and to make a comparison with other selected countries. Specific data on car sharing will be used as the model case for the analysis of this development.

2 Literature review

According to Schlagwein, Schoder and Spindeldreher (2020), many authors have already dealt with the definition of the sharing economy. To clarify this concept, they selected a total of 152 different sources which had dealt with the definition of this concept. These sources are further divided into categories according to best suitability of defining this concept based on the description of the use and specific situation in which this term is most relevant to describe such economic behaviour. They also established a consolidated definition that – in their opinion – best describes this concept: The sharing economy is a peer-to-peer economy supported by an IT business model, or non-commercial sharing of unused goods or service capacity through an intermediary without a transfer of ownership.

Curtis and Lehner (2020) also dealt with the definition of sharing economy. Their main conclusion is that sharing economy can be the right direction towards sustainable consumption of our society. Businesses operating in the sharing economy have tools that can stabilize the economy of a particular state and contribute to its sustainability, which, according to Kasych, Vochozka and Yakovenko (2019), is very important in defending a competitive strategy and choosing a model of social behaviour. According to Laukkanen and Tura (2020), another advantage of this new economic direction is the value sustainability of the goods that are used cooperatively. However, they do not claim that it is thus possible to increase the sustainability of currently used business models of companies that have already decided to use this economic model to generate their own profits. According to Frenken (2017) the growing popularity of the sharing economy will require a political intervention to regulate this market. The sharing economy can be understood as an environment in which mutual exchange, access to property, and circular business models meet partially. Gabor and Lajos (2019) attribute the emergence of the sharing economy to a change in the pattern of consumer consumption behaviour. They also state that the emergence of this new economic direction will have a major impact on the capitalist economy in the future, as there is a great transformation of the model of asset ownership to the model of asset availability. Along with consumer behaviour, the emergence of this new economic direction is also attributed to the development of new digital technologies that enabled the change in consumer attitudes. According to Abdar and Yen (2019) the sharing economy environment is ideal for analysing consumer preferences. They use as an example the preferences identification of the consumers who use services known as Airbnb in the field of sharing real estate (housing units). For the users of shared properties, the most important thing when choosing a specific offer is the availability of the "food scene" around the target property. On contrary, Zhang and Chen (2019) argue that, in terms of the availability of points of interest, Airbnb users prefer different points of interest depending on the city in which the property in question is located Gutierrez et al. (2017) analysed the relationship between hotel accommodation and Airbnb accommodation in terms of tourist preferences. With the rise of Airbnb, there was a decline in the revenue of hotel facilities that are built on the outskirts of cities. Due to better accessibility of tourist attractions (historical centre, museums, etc.), the options offered by Airbnb are increasingly preferred among tourists. Blal, Singal and Templin (2018) examined the effects of the Airbnb boom on hotel facility turnover. They state that the development and pricing of the use of Airbnb has a major impact on the development of the turnover of hotel facilities. According to Amaro, Andreu and Huang (2019), Airbnb is more lucrative for millennials than for older customers. Airbnb enables the millennials to gain unique accommodation along with the economic benefits they can enjoy at a relatively young age. Even from this point of view, according to Horák and Krulický (2019), real estate sharing can be considered an investment asset. According to Wen and Siqin (2020), although the sharing economy is a means of acquiring

goods and using them at a very low cost, users may in some cases be deterred from using it due to high uncertainty of the quality of the cooperative goods. Therefore, they focused on establishing the price for the provision of these goods which would correspond with the quality of the goods. According to their findings, the users of such goods prefer the price at which they will be able to use the property regardless of its quality or degree of modernization. Therefore, they do not recommend companies operating in this economy sector to invest excessive amounts of money in modernization or quality of the properties offered this way. In contrast, according to Ludbrook et al. (2019) in industry 4.0, investments in the company modernization are essential, but they are mainly investments in the production sectors that are not yet used by the sharing economy.

Kong et al. (2020) found that "verbal expression of positive evaluation of cooperatively used goods" is the most important factor for those interested in temporarily acquiring the goods when deciding and orienting themselves in a large amount of offers. Since supply and demand in the sharing economy take place primarily through online communication and offers, by these verbal expressions are meant the users reactions through web portals.

Another expanding asset that is increasingly used in the sharing economy is bike sharing. It is one of the ways to rather effectively address the mobility of people, especially in cities where special lanes, paths, etc. are reserved for these vehicles. The first bicycle used for bike sharing was served this purpose as early as 1965 (the first motorcycle was operated for this purpose in 1968). However, this idea arose primarily for stabilization of the traffic situation in cities with a large population, and the economic profit from the operation of this service was not the priority (Ploeger and Oldenzel, 2020).

However, the demand for this service has changed greatly since its beginning. Sohrabi et al. (2020) therefore created a model which, in bike sharing operated by the provider through docking stations, can predict the occupancy of individual docking stations and bicycles currently in use in real time. This system takes into account days of the week, times of the day, weather and infrastructure, and can be used to optimize the income of the operators of such service.

Chen et al. (2020) created a pricing model for establishing optimal prices for the use of bike sharing for the operators of this service. This model takes into account as the main price-creating factor the degree of comfort that users derive from the use of this service. A positive factor that can allow the operator to increase prices is the carefree operation of the bicycle for the customer. On the other hand, the loss of comfort and privacy for a customer who has not yet used any of the means of public transport is considered a negative factor.

Zhou, Wang and Li (2019) compared the use of taxi services and bike sharing. In the summer months, according to their conclusions, the user prefers bike sharing. The only significant role that would discourage users from using bike sharing during this period is the distance from the destination.

The last rapidly growing market in the sharing economy sector is car sharing. The world's best-known company providing this service is Uber, which currently operates in more than 700 cities around the world. Nonetheless, in Budapest the car sharing service operated by Uber was regulated since 2007, and in the end it was completely banned. This had an impact on the bike sharing market, as Bako et al. (2020) found that users of car sharing services also use bike sharing services. With the ban on car sharing, the demand for bike sharing on working days also fell by 6.5%. On the contrary, the demand for bike sharing increased by 23% at weekends. It also follows that the income of car sharing and bike sharing operators depend on the number of regular users of these services, and the occasional user will not increase their income.

According to Hahn et al. (2020) car sharing in the beginnings of the sharing economy failed to take place in all initially operated areas. Based on this fact, individual factors were determined that would encourage or discourage the car sharing users to use this service. The most important factor that is in favour of the use of the car sharing service is the lifestyle of the user, and the possibility to pick up the car anywhere and then leave it at any place at any time of the day. Another positive factor for the users is free parking of the vehicle anywhere in the cities. On the other hand, the content of the vehicle fleet of the operating company has no effect on the outcome of the user's decision to use this service. However, choosing an older or lower quality vehicle fleet can be a fatal mistake for the service operator.

Mugion et al. (2019) one of the reasons for the preference of car sharing is the environment-friendly attitude of the users. Boysen, Briskorn and Schwerdfeger (2019) state that car sharing also shares parking spaces in cities, thus reducing their need.

Pietro et al. (2019) focused on identifying the target users who use the car sharing service most often, and on whom the operators should focus when promoting their company. The most common users of car sharing are the younger generation of males who live in cities. Urban demography can therefore be a valuable tool for the operators who can use this information to increase their income.

Sun et al. (2019) established optimal prices for car sharing use. The primary factor that affects the total price for using this service is the distance travelled by the rented car. Furthermore, the user may be charged an extra fee for using the car during the rush hour, as this extends the waiting time of another person for this particular car. This fee reduces the lost profit of the operator shall the waiting client eventually choose another mean of transport, and the vehicle will thus be no longer used upon arrival. This is the same principle as the fee for a waiting taxi driver.

Jin, An and Yao (2020) analysed the possibilities of replacing internal combustion engine vehicles with electric vehicles. With the development of the battery capacity and lifespan, this trend has already been monitored at many car sharing operators. The disadvantage of this system is that if a person potentially interested in using this service sees that the range of an electric car is low due to the charge of its batteries, they will not decide to use this vehicle even if the range should be sufficient to arrive at their destination.

Along with electric vehicles, vehicles with autonomous control systems can be expected to be added to car sharing fleets in the future. Zhou et al. (2020) have therefore already developed, on the basis of current knowledge, a model of preferences of the users who would rather use this service than vehicles without an autonomous system. Although the user group preferring autonomous vehicles might be expected to be that of users with a low level of driving experience, women, and pensioners, the opposite is true. These groups are in fact also among the groups of users who, according to surveys, trust autonomous vehicles the least because of safety concerns.

3 Materials and methods

First, general data on the development of gross domestic product (GDP) in the Czech Republic will be obtained. Further, the information on the share of the sharing economy in GDP will also be sought. Subsequently, all values found will be specified from the point of view of providing car sharing services.

As the efficient operation of the motor vehicle sharing service is possible mainly through information and communication technologies (ICT), data on the development of this sector in the Czech Republic will be sought.

Materials for analysis will be found using publicly available reports from companies that analyse the Czech market. As efforts will be made to summarize and analyse the latest data (for

the years 2012-2019), other non-academic sources will also be used. Above all will be used the data from the web portal of the Czech Statistical Office (CSO).

Global data on the sharing economy will be also searched for and presented for comparison. These results will be subsequently discussed based on the analysis of the development trend of the sharing economy. Simultaneously, the impact of car sharing on the prices of motor vehicle will be assessed. As a model case, the globally operating company Uber will be selected. It is a provider of car sharing as well as other services (food delivery – Uber Eats, freight transport, and others).

Finally, an analysis of the number of scientific publications that have also addressed this issue will be carried out, together with any possible comments. The Web of Science database will be used for this analysis.

4 Results and discussion

First, an analysis of the GDP development in the Czech Republic was performed. The development of GDP is shown in Table No 1.

Tab. 1: Development of the GDP of the Czech Republic determined by the production method (current prices) for the period 2012-2019 (in millions of CZK)

Year	2012	2013	2014	2015
GDP	4,059,912	4,098,128	4,313,789	4,595,783
Year	2016	2017	2018	2019
GDP	4,767,990	5,047,267	5,323,556	5,652,553

Source: CSO (2020a).

According to Table No. 1, it is evident that the GDP of the Czech Republic is increasing every year. This increase also provides space for development of all types of economies. It also concerns the sharing economy. According to Mareček and Machová (2017), the amount of GDP of a specific state can be used to identify the correlation with the state debt of a particular country.

In 2014, the share of the sharing economy in the Czech Republic total GDP was set at 0.02% with the help of the bottom-up method (0.04% with the help of the top-down method). At the same time, the potential share of the sharing economy in the GDP of the Czech Republic was determined by the bottom-up method to 0.51% – the top-down method 1.19% (Deloitte, 2020).

In comparison with the Czech Republic, the sharing economy in other EU member states has a similar share in the GDP of a particular state. Table No. 2 shows the shares of the sharing economy in GDP by the bottom-up method and the top-down method, together with its potential share in selected EU countries.

Tab. 2: The share of the sharing economy in the GDP of selected EU countries

State	Share of the sharing economy (bottom-up)	Share of the sharing economy (top-down)	Potential share of the sharing economy (bottom-up)	Potential share of the sharing economy (top-down)
Germany*	0.02%	0.03%	0.70%	1.10%
Spain*	0.06%	0.15%	0.90%	2.30%
France	0.04%	0.09%	0.80%	1.60%
Italy*	0.02%	0.05%	1.20%	2.50%
Netherlands	0.06%	0.15%	0.70%	1.90%
Austria	0.01%	0.02%	0.60%	1.20%
Poland*	0.03%	0.05%	0.60%	1.20%
Romania*	0.01%	0.02%	0.50%	1.30%
Great Britain	0.09%	0.19%	1.00%	1.90%

Source: Deloitte (2020). *data for the year 2014

According to Table No. 2, it is evident that in selected EU countries the share of the sharing economy in the GDP of a

particular state is as low as in the Czech Republic. Italy has the highest potential share of the sharing economy in its GDP (2.5%).

The development of the sharing economy is significantly conditioned by the development of information and communication technologies (ICT). Platforms developed in this sector serve in the sharing economy for marketing, payment, communication, and localization purposes of the goods shared. At present, the expected growth of the sharing economy is not the only reason for employing more and more ICT professionals. Table No. 3 shows the numbers of natural persons employed in the ICT sector together with the share in total employment in the Czech Republic.

Tab. 3: Employment in the ICT sector in the Czech Republic in the years 2015-2018

Year	Number of natural persons employed in the ICT (in thousands)	Share of ICT in total employment (in %)
2015	147,7	2.8
2016	157,7	3.0
2017	164,2	3.1
2018	169,2	3.1

Source: CSO (2020b).

Table No. 3 shows that the number of natural persons working in the ICT sector in the Czech Republic increased by 21,500 in the years 2015-2018. The total share of all workers in the ICT also increased (by 0.3%). It can therefore be concluded that the conditions needed by the sharing economy for its functioning and development may continue to create jobs in the ICT sector in the future. According to Neary et al. (2018), the development of the ICT sector is very important, for example, in terms of research into the use of artificial intelligence in business practice.

One of the areas where the sharing economy already operates is car sharing. This service was launched in the Czech Republic in 2012. Since then, several operators of such services have entered the Czech market. With the growing demand for car sharing, the total number of passenger cars and commercial vehicles operated for the purpose of sharing is also increasing. They are used by various users and owned by particular companies providing these services. Table No. 4 shows the development of the number of motor vehicles (passenger and commercial vehicles) that are operated in the Czech Republic in the form of car sharing.

Tab. 4: Number of motor vehicles operated for car sharing in the Czech Republic in the years 2012-2019

Year	Number of motor vehicles
2012	9
2013	16
2014	32
2015	90
2016	213
2017	344
2018	490
2019	760

Source: Czech Carsharing Association (2020).

According to Table No. 4, it is clear that the increase in the number of motor vehicles operated for car sharing in the Czech Republic began to increase significantly in 2015. Since then, the number of motor vehicles operated for car sharing has been rapidly increasing. This trend also applies worldwide. Along with the number of motor vehicles on offer, the number of the users of such services is also increasing worldwide. Table No. 5 shows the worldwide development of the number of car sharing and taxi services users.

Tab. No. 5: Worldwide number of users of car sharing and taxi services (development from the years 2017-2024) (in millions of users)

Year	Number of users (in millions)
2017	1,356,4
2018	1,378,0
2019	1,405,3
2020	1,437,9
2021	1,474,4
2022	1,512,9
2023	1,551,5
2024	1,588,2

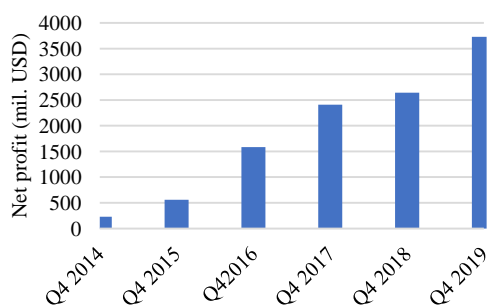
Source: Statista.com (2020).

According to Table No. 5, it is evident that the number of car sharing users will continue to increase, according to the past as well as the current development trend. This is also one of the reasons why the share of the sharing economy in the total GDP of a particular state can be expected to increase. The operation of taxi services may therefore be partially reduced, as a decrease in demand for this service can be expected.

Car sharing can also be expected to have an impact on the number of individually owned motor vehicles in the future. According to Deloitte (2020), there were six car sharing operators in 2017, and since then their number has increased slightly. Fishman, Washington and Haworth (2014) found out that bike sharing became widespread throughout Europe, North America, and China between the years 2004 and 2014. In London, for instance, the rate of substitution of motor vehicles by bicycles increased from 2% to 10% during this period. On a global scale, this value could be considered as the ultimate value of optimizing the use of motor vehicles in order to reduce the burden on the environment.

The growth of the potential of the sharing economy can also be presented on the financial data of the global company Uber, as it is one of the largest companies operating in the field of the sharing economy. Figure No. 1 shows the development of Uber's net income for the period of 2014-2019.

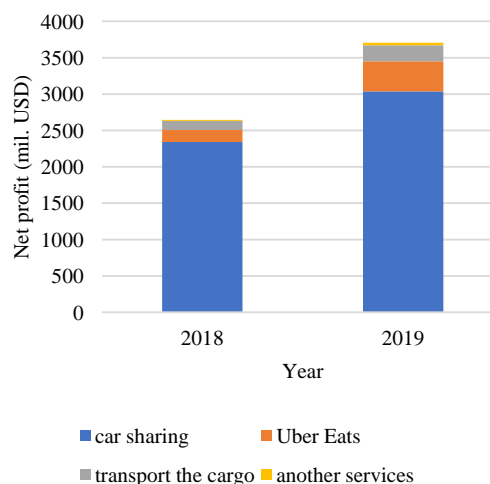
Figure 1: Development of Uber's net revenue in the period of 2014-2019 (in millions USD)



Source: Investing.com (2016), Carsurance.net (2019), Uber investor (2020), own processing.

Based on Figure No. 1, it is clear that the net income of the model company Uber are rising very fast. In 2014, its net profit was \$228,000,000, and in 2019 it was \$3,730,000,000. However, Uber's revenue consists of all its services. Figure No. 2 shows the share of individual operated services in the amount of its net profit.

Figure 2: Share of operated services of Uber in the total net revenue (2018-2019)



Source: Uber investor (2020), own processing.

According to Figure 2, it is clear that for the model company, its main share is the net generated profit from the operation of car sharing services.

At this point, it is also necessary to emphasize the difference between the car sharing service and the service operated by the above-mentioned Uber. In the case of car sharing, this service provides a vehicle that can be used for a fee to meet the transport needs of co-consumers to a location of any distance. However, in the case of services provided by Uber, the motor vehicle is provided for the same purpose, but a part of its lease is also the time of a particular driver who, under the auspices of Uber, acts as the driver of the motor vehicle (shared commodity). It is therefore a cooperative use of a vehicle vs. cooperative use of a vehicle with a driver.

Another very significant difference between car sharing companies and services provided by Uber is the question of ownership of a cooperatively used property. Uber does not own the motor vehicles it offers for rent, but their owners are drivers who offer their private motor vehicles for the cooperative use. On contrary, car sharing companies own and operate all the vehicles on offer.

It is also important to note that Uber's services are usually provided in the mornings and afternoons. This is because the drivers who provide their motor vehicles for cooperative use are generally able to do this activity before and after their own employment, which forms the main part of their income, and the work for of Uber services is usually a source of secondary income. In the case of car sharing, it is possible to operate such service 24 hours a day, as the offered vehicles are rented without the need for the presence of another person (driver), and their management is usually digital (electronic vehicle reservation).

Car sharing has a significant impact on the development of prices of selected groups of motor vehicles (new and used). The very idea of car sharing is supported by reducing the number of passively used motor vehicles and increasing the share of actively used motor vehicles. If car sharing becomes even more popular in the future, which can be assumed based on the results from historical data, it is also possible to assume a decline in demand for selected groups of motor vehicles, especially by natural persons. This may lead to motor vehicle dealers being forced to reduce the prices of selected groups of the motor vehicle range on offer. The most risky groups of motor vehicles, for which a drop in demand can be expected, will be sports motor vehicles, the operation of which is the most expensive in terms of the type of fuel and maintenance. On the other hand, we can expect an increase in demand for motor vehicles that have long-lasting propulsion units and are also powered by alternative

fuels, such as LPG and CNG, which are also more affordable than conventional fossil fuels. Although it is necessary to regularly service motor vehicles equipped with alternative fuels, their utility for car sharing companies is much bigger than that of motor vehicles with fossil fuels. Nevertheless, it cannot be expected that, as a result of the sharing economy development, the only customers of motor vehicle dealers will be car-sharing service operators.

Another effect of car sharing on motor vehicle prices can be observed in the valuation of the company's assets. From the viewpoint of valuing the company's assets, it can be assumed that companies whose assets consist mainly of motor vehicles (transport companies) will be more prone to loss of the value of their own assets. In contrast, companies that are not primarily engaged in transportation activities will not be exposed to the risk of a decrease in the value of assets to such an extent.

From the point of view of the number of scientific publications dealing with the sharing economy, a total of 19,081 articles were found after entering the key phrase "sharing economy". After applying a filter from the field of economics, 5,762 contributions corresponded to this selection. In terms of time, there has been an increase in publications on this topic since 2014. Since 2017, 500 articles on this topic have been published annually. However, after entering the advanced keyword "car", only 58 articles were found since 1998, the vast majority of which was published in the years 2017-2019 (a total of 31 articles). Only six articles out of 31 are focused on car sharing. The remaining 25 contributions were more concerned with the use of electric vehicles.

5 Conclusion

The sharing economy has become a recent phenomenon, and its popularity is growing, as is the amount of turnover that is recorded by companies operating in this part of the market.

Based on the results, it is evident that in the Czech Republic, as well as in other countries, the full potential of the sharing economy – given current technological conditions – has not yet been fulfilled. Therefore it can be expected that the share of the sharing economy in the GDP of each state will increase in the future. In the field of car sharing, this service is currently operated in more than 700 cities around the world (Uber). In the Czech Republic, the operating companies increased the number of motor vehicles provided for car sharing from nine motor vehicles to 760 motor vehicles (2019). The number of users of these services around the world is also growing.

The net income of the model company Uber are growing at a very fast pace. Despite providing several types of services, the company generates the largest share of its net profit through car sharing.

In the future, we can also expect a decrease in the prices of new and used motor vehicles of selected groups (sports motor vehicles, vehicles with higher operating costs) due to a decline in demand. This is also related to the assumption of an increase in demand for alternative fuel vehicles (LPG, CNG) with a longer service life of the power units and low operating and service costs.

In the field of scientific and academic publishing activities, a significant increase in the number of published articles on the topic of the sharing economy has been recorded since 2014. However, the issue of car sharing has so far been relevantly addressed by only 31 contributions. By analysing all available data, the goal of this paper was met.

Based on the number of publications on the topic of car sharing, and the demonstrable development of the sharing economy, there is a new, so far insufficiently researched area opening up for academic and publishing activities; an area which shall require increasing attention from the general public in all countries.

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Primary Paper Section: A

Secondary Paper Section: AH