

Article

Core elements affecting sharing evidence from the European Union

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Abstract: Sharing activity is getting higher attention due to increasing popularity in recent years. In the paper, the authors investigated the main elements affecting the sharing activity. (1) Literature review: The theoretical part starts from the revision of definitions of sharing activity; description of the links between sharing and sustainable development, policy recommendations and relevant regulation in the field; later on, the study emphasises the key elements important for sharing. Finally, the authors investigated how the Covid-19 pandemic affected sharing activity; (2) Methods: During empirical research, the authors revised the list of 37 variables. The study uses data for each of the 27 EU countries from 2011 to 2020. The authors investigated correlation between macroeconomics variables to determine key variables for the regression model; (3) Results: The authors constructed a dynamic regression model that can be applied to predict the number of participants visiting sharing platforms in the European Union (EU); (4) Conclusions: The study shows that seeking to forecast the number of visits to sharing platforms it is necessary to use values of main macroeconomic variables such as consumer price index, productivity index, total unemployment rate, the number of users and households connected to the Internet, etc.

Keywords: sharing activity, Covid-19 impact, core elements, sustainable development

1. Introduction

Economic and social systems that provide access to goods, services, data and talent without ownership are called sharing (otherwise known as collaborative consumption). All systems operate on the basis of information technology and peer-to-peer communities, where individuals can distribute, share and reuse overcapacity and obsolete (or rarely used) assets. All systems come in a variety of forms.

Sharing is spreading rapidly across Europe and across a wide range of sectors. Shared consumer services such as home-sharing, car-sharing for domestic use are already known and used by many people in the EU. Collaborative consumption offers many new opportunities for citizens and innovative entrepreneurs. A distinctive feature of cooperative consumption is that service providers are usually private individuals who offer their assets or services, sometimes based on cooperation. More and more micro-entrepreneurs and small businesses are using collaboration platforms.

A survey conducted by Eurostat in 2019 showed that 21% of EU citizens used a website or an app to arrange accommodation from another person and 8% have done the same for transport services. In the tourism sector, collaborative consumption provides many exciting opportunities for citizens as consumers as well as for micro-entrepreneurs and SMEs.

Despite the fact that collaborative consumption offers new opportunities for entrepreneurs and more choice for consumers, there are rules and obligations that citizens and businesses need to be aware of. Applicable EU rules and policy recommendations to help citizens, businesses and EU countries take full advantage of new business models and

promote sustainable business development and collaborative consumption are explained in the EU 2016 June Communication on the European Agenda for the collaborative consumption.

It is sometimes very difficult for existing market operators to succeed in collaborative platforms. However, platforms enable individual citizens to offer their services, as well as promoting new employment opportunities, flexible working arrangements and new sources of income. Collaborative consumption for consumers can provide benefits through new services, an extended supply, and lower prices.

The study starts from the literature and regulation review, later introduces the core elements, discuss Covid-19 aspects on sharing and ends with empirical research whose purpose was to identify macroeconomic variables important for sharing activity. Finally, the authors provide the discussion part and conclusions.

2. Literature Review

The EU have common goals: increasing resource efficiency, creating jobs and supporting micro-entrepreneurship, increasing community participation and fostering digital innovation (European Commission, 2016). It is an opportunity to unite in pursuit of common priorities and to integrate a stronger, more resilient Europe (European Commission, 2016).

The Sharing model offers more opportunities to adapt to our needs to use assets more efficiently at a lower cost (Curtis & Mont, 2020; Daunorienė et al., 2015). It revolves around three models:

2.1. Product-based Systems: Without product ownership, users pay for the benefits of using the product (e.g., by sharing a car/bike). Such a model undermines traditional industries based on individual private ownership models.

2.2. Redistributing Markets: Redistribution of second-hand goods from those who do not want them to those who want them (e.g., barter markets and second-hand goods). In different markets, products may be free (Freecycle), others may be exchanged (thredUP) or sold (eBay).

2.3. Collaborative Lifestyles: When people with similar needs or interests come together and share less tangible assets such as time, space, skills, and money. These include jobs (CitizenSpace), gardens (Landshare) or car parks (ParkatmyHouse), loans between individuals (Lending Club) and housing rentals (Airbnb and Couchsurfing).

Given the loose definitions of sharing, many have adopted a flexible and open approach to the topic.

A definition of the sharing is “business models where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often is provided by private individuals (Piscicelli et al., 2018).

According to the EU definition, sharing is a business model where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals (European Commission, 2015). As the European Commission recognizes in offering such definition “The term of collaborative consumption is often interchangeably used with the term ‘sharing activity’. Sharing is a rapidly evolving phenomenon and its definition may evolve accordingly” (European Commission, 2016; European Parliament resolution, 2014; Probst et al., 2015a; Probst et al., 2015b; Probst et al., 2015c).

Vaughan & Hawksorth, 2014 replied on the definition of PriceWaterhouseCoopers (PwC) the “sharing uses digital platforms to allow customers to have access to, rather than ownership of, tangible and intangible assets” (Vaughan & Hawksorth, 2014). In addition to typical examples such as Uber and Airbnb, the definition also includes productive collaborations, as well as Spotify subscription models for content and music entertainment (Botsman, 2013; Selloni, 2017; Ertz, 2020, Huang, 2021).

Mody et al., 2019 argue that sharing is a promising phenomenon due to many economic, social, and technological factors. Geissinger et al. (2019), Cheng et al. (2020) argue that sharing promotes efficiency, community, and sustainability by focusing on servicing

untapped resources, and (Muduli et al., 2020) argue that sustainability is a major business concern.

De las Heras *et al.* (2020) stated that sharing is not a “fragile and temporary trend”, and it has a significant influence on reversing competition around the world by offering opportunities for many small services providers to access the market. Olson & Kemp (2015) identified the main benefits of sharing for consumers, such as: adapting to the needs of individuals, rather than reacting to the changes in demand; offering unique experiences that commercial providers cannot ensure and lower prices compared to commercial providers. Furthermore, various researchers (for example, de Leeuw & Gössling, 2016; Huarng, 2018; Wu & Zhi, 2016; Zhu & Liu, 2020) underlined the reduction of consumers’ costs as the main benefit of sharing. According to Piscicelli et al. (2018), sharing is advantageous to the environment, as it makes greater use of existing resources and the potential energy savings that would result from car and bike-sharing (Heinrichs, 2013; Martin, 2016). Furthermore, Schor & Wengronowitz (2017) state that sharing is less resource-intensive.

According to Toni et al. (2018), the sharing encourages resource efficiency, waste reduction, and lower consumption to promote sustainable consumption practices (Martin, 2016). Furthermore, energy savings as an advantage of the sharing is underlined by Skjelvik et al. (2017), Curtis & Lehner (2019), Curtis & Mont (2020). Schor (2010) emphasised that social innovations and new technologies could improve people’s lives and protect the Earth planet. Huarng (2018), Mauri et al. (2018) state that the sharing creates new opportunities for entrepreneurs and consumers, provides the flexibility of access to goods, and increases consumer choices; it offers broader and cheaper access to services for customers in the short term (Acquier et al., 2017).

According to Harvey et al. (2017), sharing is a potential new path to sustainability (Heinrichs, 2013). Kaushal (2018), Muñoz & Cohen (2017) state that sharing promotes sustainable growth and energy efficiency. Furthermore, it can be argued that sharing is closely related to sustainability (Hossain, 2020; Dabbous & Tarhini, 2021), and the benefits of sharing correspond to the dimensions of sustainable development: economic, social and environmental (Böcker & Meelen, 2017; Wagner & Strulak-Wojcikiewicz, 2020; Strulak-Wójcikiewicz & Wagner, 2021); sharing contributes to sustainable development goals by promoting sustainable consumption and provides growth opportunities for innovative start-ups (European Commission, 2015). Furthermore, Räisänen et al. (2020) stressed that sharing could promote sustainability and is a pathway to circularity (Geissdoerfer et al., 2017).

There is no consensus on what activities are part of the “sharing”. According to Botsman (2013); what is now called “sharing” has also been called “collaborative consumption”. Other authors name other parts of the “sharing”. For a more extensive overview, see Table 1.

Table 1. Alternative names of the sharing

Activities		Authors
Alternative names of sharing	collaborative consumption	Botsman, 2013; Hamari et al., 2016; Möhlmann, 2015; Selloni, 2017; Choi & He, 2019; Graessley et al. 2019; Ertz, 2020; Minami et al., 2021; Perren & Grauerholz, 2015; Huang et al., 2021; Schor, 2016; Cheng, 2016.
	access-based consumption	Bardhi & Eckhardt, 2012; Belk, 2014b; Catulli et al. 2013; Wasserbauer et al., 2020; Gruen, 2017; Lawson et al., 2021; Edbring et al.,2016; Battle et al., 2018.
	the mesh	Gansky, 2010; Ferranti et al., 2019; Sanchez-Espiga et al., 2020; Light & Miskelly, 2019.
	commercial sharing system	Lamberton & Rose, 2012; Akbar et al., 2016; Lee, 2019; Oyedele & Simpson, 2017; Bielefeldt et al., 2016; Lan et al., 2017.
	consumer participation	Fitzsimmons, 1985; Lutz, & Newlands, 2018; Boateng et al., 2019; Kim et al., 2015; Yoon, 2021.
	connected consumption	Dubois et al., 2014; Schor, 2014; Schor, 2015; Schor & Fitzmaurice, 2015.
	collaborative consumption	Vaughan & Hawksworth, 2014; WEF, 2013; WEF, 2014; Dervojeda et al., 2013; Probst et al., 2015a; Probst et al., 2015b; Probst et al., 2015c); Gössling & Hall, 2019; Cheng, 2016.
	digital platforms	Sutherland & Jarrahi, 2018; Garud et al.,2020; Chandna, 2021; Scholz, 2014; Yaraghi, & Ravi 2017; Mazzella et al., 2016.
	recirculation of goods	Schor, 2016; Markendahl et al., 2018; Gerwe & Silva, 2020; Schor, 2017; Räisänen et al., 2021.
	exchange of service	Schor & Fitzmaurice, 2015; Hunt, 2000; Yang et al., 2017; Borsenberger, 2017.

According to the European Parliament, “the sharing or collaborative consumption, is a new socio-economic model that has taken off thanks to the technological revolution, with the internet connecting people through online platforms on which transactions involving goods and services can be conducted securely and transparently” (European Parliament resolution, 2015). The Internet and connectivity technologies have made it possible to bring together demand and supply in a broad spectrum of markets (Becchis et al., 2019). Various researches, e.g., Molenaar (2015), Dervojeda et al. (2013), Hamari et al. (2015), Daunorienė et al. (2015), Demailly & Novel (2014), Selloni (2017), Dabbous & Tarhini (2019), Huckle et al. (2016) stated that technological factors are the most significant factors stimulating the growth of sharing.

According to Baller et al. (2016), the Internet is one of the most critical general-purpose technologies globally, that impacts all activities linked to the Internet. Baller et al. (2016) emphasised the ability of Information and Communication Technology (ICT) to improve access to services and enhance connectivity. Therefore, ICT is one of the most critical factors that determine the growth of sharing. Therefore, it can be stated that the level of network infrastructure and access to ICTs is crucial for the development of sharing. The Internet and mobile technology stimulate the growth of a vast online marketplace. Technology has enabled an easy and more convenient way to interact with others, to share

idle assets with others. Evans & Gawer (2016) emphasised the importance of such technical elements as big data analytics, low-cost cloud storage, social media users' growth, and the increased use of mobile devices to develop sharing. The latest technologies can maintain vast amounts of data concerning people and assets, ensuring continued sharing. Secure payment systems provide a safe and convenient way to transfer money between sharing parties, i.e. between providers and users of services. The Internet of Things (IoT) has a significant impact on the development of sharing by enabling owners of the resources to be connected remotely. According to Huckle *et al.* (2016), the Internet of Things and blockchain technology (Acquier *et al.*, 2017) open opportunities to create peer-to-peer secure automatic payment mechanisms and foreign exchange platforms. The latest technologies provide impetus to spread sharing by facilitating peer to peer business models (CIO review, 2016).

3. Sharing reglamentation in the EU

In 2015, the European Commission (EC) adopted the Single Market Strategy and declared the development of the European Agenda for collaborative consumption. As a result, "A European Agenda for Collaborative Economy" was published in 2016 and aimed to "support consumers, businesses and public authorities to engage confidently in this rapidly evolving landscape". It should be noted that collaborative consumption either is a part of the Digital Single Market Strategy presented in 2016. In addition, the Communication on Online Platforms (2016) highlights the importance of online platforms, including sharing platforms, for further developing digitalisation in the EU.

Although the term "collaborative consumption" was used in the report, European Commission acknowledges that the terms "collaborative consumption" and "sharing" can be used interchangeably. The report defines sharing as "business models where activities are facilitated by collaborative platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals." Sharing encompasses service providers, service users and internet platforms, which act as intermediaries connecting providers with users. Service providers can be private individuals offering services occasionally or service providers acting in their professional capacity (European Commission, 2016). Furthermore, it was stated that transactions in the sharing generally do not involve a change of ownership. However, some transfer of intellectual property ownership could be possible in the sharing. Hence, it can be argued that if individuals sell used things through platforms, such as transactions cannot be classified as part of the sharing. Therefore, it could be argued that e-commerce cannot be considered a part of collaborative consumption platforms.

The European Agenda for Collaborative Economy amplified the contribution of the sharing to job creation and growth, emphasised the emergence of new opportunities for consumers and entrepreneurs and the potential of the sharing to contribute to competitiveness and growth. Collaborative consumption (or sharing) is recognised as a new, innovative, dynamic sector in which consumers may benefit through new services, increased supply, and lower prices. However, the European Commission indicates that policy recommendations and adequate regulations are needed to help EU countries benefit from the sharing and promote balanced development. The critical areas required for regulation emphasised in "A European Agenda for Collaborative Economy" are market access, consumer protection, liability, labour law, and taxes.

European Commission documents state that technological, economic and societal factors drive collaborative consumption (Commission Staff Working Document, 2016). However, it should be noted that political-legal factors are not mentioned as essential factors in developing a sharing activity. Meanwhile, it is acknowledged that the regulatory environment impacts sharing development. Therefore, the authors of this article argue that technological, economic, social-demographical and political-regulatory factors are essential for the development of sharing activity.

4. COVID-19 impact on sharing

There is currently little academic literature that analyzes and describes the impact of a Covid-19 pandemic on various aspects of life, including sharing. This pandemic has shown both how much the sharing helped consumers access essential goods and services, while at the same time revealing the very real restrictions and regulations that undermine them.

According to Hossain (2021), the Covid-19 has affected sharing platforms, service providers, and service receivers (customers) along with governments. Evelyn (2020), says Covid-19 has disproportionately affected vulnerable groups and millions of people involved in sharing have lost their livelihoods. Curtis and Mont (2020); Mont et al. (2020) note that some service providers may believe that they should be treated as employees, but profits and social welfare in a sharing are controversial issues.

In response to the Covid-19, it was important for the platforms to update their websites. According to Willison (2020), until the physical sites were closed, platform owners have been working to redesign their online infrastructure and physical space, including "... moving to better hosting websites, mail server upgrade to solve spam problems, introduced the inventory stocks of consumables, vendor management software.

Hossain (2021) notes that understanding the impact of the Covid -19 pandemic on the sharing activity is crucial. Particularly significant changes in Covid -19 have led to accommodation and transport sectors. According to Tardivo (2020), both passenger and freight transport have experienced severe declines due to the Covid-19 crisis. The carriage of passengers within the EU Member States and between the European Union and the rest of the world has been partially or completely closed (Shortall et al., 2021). Land transport was also disrupted and slowed down due to additional sanitary checks at the border.

According to Farmaki et al. (2020), during the pandemic, there has been a significant increase in online networking platforms (P2P) through which individuals can rent out unused real estate for a short period. Property owners benefit from a variety of benefits: they offer guests comfortable and affordable accommodation that is usually more authentic and more localized than hotel accommodation. P2P hosting offers entrepreneurial opportunities, extra income, and hosts get satisfaction from their hospitality service.

Zhang et al. (2021) and based on the World Transport Conference the Research Society (WCTRS) there is a platform for transport researchers, managers, policy makers and educators around the world to exchange ideas, surveyed the impact of Covid-19 and provided such many restrictions: many institutions were closed in all countries and/or regions: factories (44.7%) and shops (34.2%), and people who could restrictions have been closed, travel (40.1%) and travel frequency (15.1%). 17.6% of cities/towns were not allowed and emergency medical care (56.3%), medical care (50.7%) were allowed.

As described by many researchers, quarantine has harmed the transport and accommodation sectors. However, activities in other sectors of the sharing, such as freelance work, streaming services and online delivery, have flourished. Batool et al. (2020) note that the use of the Internet and food delivery services has increased during the Covid-19 pandemic. The closure of offices has increased the demand for freelance work. With the closure of cinemas, video streaming services such as Netflix, Disney + and Amazon Prime have become the main source of entertainment, with subscriptions and usage of all streaming services increasing dramatically (Koetsier, 2020).

E-commerce has fundamentally changed the structure of trading goods. Currently, 55% of the world's population shop online regularly. The penetration of internet-enabled devices and the increasing number of online stores have led to an inevitable change within the retail landscape. Naturally, this has also had a tremendous influence on shopping behaviours. Nowadays, there are two major ways for a retailer to bring products or services to market – online and offline. The online sales channel refers to the purchase of physical goods via the internet – on a desktop of the personal computer, tablet or smartphone. The offline sales channel covers all purchases in stationery stores, via telesales or mailorder

(e.g. print catalogues). The online market for pharmaceuticals varies considerably by country because legislations on over-the-counter pharmaceuticals differ widely from country to country. Thus, the online share in Europe and Asia in 2019 is 12%.

5. Key elements in studies focusing on sharing

The business models of sharing services are very different from each other. To identify the key elements behind the development of business models of sharing, the authors have examined studies by different researchers in the field of sharing and its links to key elements synergy. Table 2 provides descriptions of the sharing of other researchers, highlighting key trends in the field.

Table 2. Authors researching sharing

Authors researching sharing	Description of study
Dabbous & Tarhini, 2021	The sharing uses technology, information and marketing that fosters a new culture for resource efficiency customers prefer access to ownership.
Daunorienė et al., 2015	Increased availability of technology for hosting an online market drives the growth of sharing activity.
Demailly & Novel, 2014	Internet resale, gift, exchange, short term rental and borrowing platforms are available the part of the real sharing that is renewed due to digital technology development.
European Commission, 2016	Collaborative platforms enable individuals to offer services, promote new employment opportunities, flexible working arrangements and new sources of income. Collaborative consumption encourages consumers to share more wealth and use resources more efficiently.
Hamari et al., 2015	ICT has grown into a “collaborative consumption”: accessing, providing or sharing access to goods and services on a peer-to-peer basis, coordinated through community-based online service.
Huarng, 2018	Proposes a conceptual framework for the application of the sharing that will reduce costs and increase the efficiency of long-term care by increasing business opportunities.
Huckle et al., 2016	Internet of Things and blockchain technology benefit from sharing applications and creating a myriad of sharing applications, such as peer-to-peer automatic payment mechanisms, foreign exchange platforms, digital rights management.
Muñoz & Cohen, 2017	The increasing diversity of sharing business models and the implications for business growth, community impact, sustainability and public policy.
Piscicelli et al., 2018	Describes digital platform facilitation (P2P) sharing of underutilized assets, identifying possible reasons for commercial success or failure.
Räisänen, 2020	Consumer trust and consumer and platform trust are at the heart of the sharing - exploring how to uncover trust issues in sharing platforms.
Schor & Wengronowitz, 2017	Sharing activity, also known as "collaborative consumption", is seen as a progressive, disruptive force that makes economies more efficient and distributes value to consumers.
Toni et al., 2018	Described the link between collaborative consumption and the application of sustainable practices from a consumer perspective using sharing platforms.

Wagner & Strulak-Wojcikiewicz, 2020	It is investigated how technological solutions in sharing platforms influence the use of collaboration platforms.
Akbar et al., 2016	Commercial Sharing Systems (CSS) provide access to the benefits of a product without ownership. Describes the possibility of creating attractive CSS for the target materialistic user segment.
Bardhi & Eckhardt, 2012	Access-based consumption is examined in the context of the sharing activity as the nature of the exchange, its use and the platform itself.
Castillo et al., 2018	The growth of e-commerce has increased interactive distribution through various channels, Crowdsourced Logistics (CSL), which simulates a delivery service to 1,000 customer locations in a dynamic market environment compared to traditional delivery. Goal CSLs will bring strategic benefits to businesses.
Chandna, 2021	Describes multifunctional digital platforms that can be used for crowdfunding financial resources, creative ideas, to collaborate and pool a wealth of non-financial resources, focusing on the mission of social change.
Cheng, 2016	Three broad areas of the sharing activity are revealed: sharing business models and their impact, the nature of sharing and the development of sharing sustainability, and two areas examining the impact of sharing on travel and tourism services.
Choi & He, 2019	With the development of platform technologies, collaborative consumption (P2P-CC) is gaining popularity in the sharing activity. P2P-CC is shown to double a company's profits compared to users without P2P-CC. The platform benefits from a revenue-sharing scheme rather than a flat-rate service taxation scheme.
Frenken, 2017	The sharing is going on at the intersection of the three most important economic trends: mutual exchange, ownership, and circulation business models. Examined the environmental impact of online sharing platforms and possible prospects, one of which is monopoly super platforms.
Garud et al., 2020	The challenges faced by companies in the sharing activity based on the digital platform are being addressed to validate their business models by examining the dynamics that have emerged since the introduction of the sharing business model.
Gössling & Hall, 2019	The concept of sharing is compared to the wider collaborative consumption and its social, economic, environmental and political implications concerning the goals of sustainable development are discussed. Digital platforms turn global corporations into intermediaries, control most profits and profit from them.
Henry et al., 2021	Found that circularity and sharing have significant links in terms of sustainability, business models, sustainability consumption and management. Interfaces are revealed mainly in the business spheres platform and service-based activities.
Markendahl et al., 2018	Different types of sharing services are analyzed, recurring patterns, similarities, and differences between different types of sharing services are identified. Commercial, or community, service provider platforms with user fees or free, open or closed access are examined.

Sutherland & Jarrahi, 2018	The sharing is reviewed through transactions in digital spaces. The role of digital platforms in sharing has been identified. The concept of platform mediation provides a set of essential opportunities for sharing technologies.
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According to Owyang (2013), social networking technologies, mobile technologies, and payment systems are the main technological drivers. Social networking technologies are essential for social profiles and reputation tracking. Mobile technologies with location-sensing technologies allow one to establish user location, essential for transportation. The latest technologies have also been described as 'disruptive technologies' crucial to the emergence of sharing. The Communication "Digitising European industry reaping the full benefits of a digital single market" indicates how the Internet, the Web and recent developments in technology reshape business models, transform the business landscape and people's life and enable the growth of sharing (Communication from the Commission, 2016). With the rise of digital technology and the Internet, information costs fell sharply and coordination costs for sharing activities dropped correspondingly.

6. Methodology and research methods

The study aims to identify the main macroeconomic factors, to develop a regression model. Selected variables from the publicly available Eurostat database for the period 10 years 2011-2020, are taken to analyze dynamic interactions. To identify linear connections, the authors took 37 macroeconomic variables for the 27 EU countries and identify how the population of these countries visits 10 sharing platforms (AirBnB, BlaBlaCar, eBay, Fiverr, Gumtree, Kickstarter, Lime, Uber, UpWork, and Vinted). For this set of data, the authors tested the significance of correlation. Later, statistically insignificant variables were removed, and the procedure is applied only to 15 macroeconomic variables, whose variance probability is significant for visiting sharing platforms.

The authors apply a linear regression model. The authors use a simple regression analysis procedure to convert the regression coefficients into a model depicting a linear relationship between the dependent and the regressors.

This analysis reveals dynamic trends and allow assumptions about the existence (non-existence) of relationships in pairs. The authors of the dependent variables selected the number of visits to sharing platforms for which data for the last month of the year was collected from Google Trends (2020) (Google trends, 2021).

The regression model was developed to estimate how macroeconomic variables affect the number of visits to sharing platforms:

$$sep_t = \beta_0 + \beta_1 cpi_{(t)} + \beta_2 hci_{(t)} + \beta_3 ihi_{(t)} + \beta_4 iiu_{(t)} + \beta_5 iog_{(t)} + \beta_6 lpp_{(t)} + \beta_7 tur_{(t)} + u_t \quad (1)$$

where

sep_t – logarithmic dependent variable of the number of customers visits to sharing platforms in EU countries in year t ,

β_0 – intercept,

$cpi_{(t)}$ – dlog of consumer price index in EU countries in year t ;

$hci_{(t)}$ – dlog of the number of households connected to the Internet in EU countries in year t ;

$ihi_{(t)}$ – dlog of the number of the Internet users seeking health information in EU countries in year t ;

$iiu_{(t)}$ – dlog of the number of individuals, which use the Internet in EU countries in year t ;

$iog_{(t)}$ – dlog of the number of individuals using the Internet for ordering goods or services in EU countries in year t ;

$lpp_{(t)}$ – dlog of productivity index (when real labour productivity per person, is used assuming that 2010=100) in EU countries in year t ;

$tur_{(t)}$ – dlog of the total unemployment rate (percentage of the total population) in EU countries in year t ;

u_t – random model error,
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ – coefficients of elasticity reflecting the influence of independent variables on sharing.
The authors delivered a specific regression model, which results into:

$$\begin{aligned} sep_t = & -485.98 + 4.51\,cpi_t - 3.70\,hci_t + 3.22\,ihi_t \\ & + 3.47\,iiu_t - 2.05\,iog_t - 2.58\,lpp_t - 8.04\,tur_t \end{aligned}$$

(-1.55)

(1.71)

(-3.21)

(3.23)

(2.04)

(-1.71)

(2.63)

(1.98)

The correlation coefficient of the formed regression model is 0.82, and the adjusted R2 is 0.76. The provided model is placed in Fig. 1.

Figure 1. The forecasting of the number of visits to ten sharing platforms at the EU countries. *Source:* constructed by the authors.

The authors performed statistical validity tests. Probability t and probability χ^2 in the test statistics do not indicate significant autocorrelation and heteroskedasticity. All other results of the performed dynamic regression analysis are provided in Table 3.

Table 3. Statistical validity

Indicators of statistics	Values
1. Formation of regression model	
Durbin Watson statistics	2.28
2. Residual Cross-Section Dependence Test	
Bias-corrected scaled LM	
Statistics	0.53
Probability	0.59
Pesaran CD	
Statistics	-1.58
Probability	0.11

This proves that other values are also very important in the study of the number of visits to sharing platforms, not included in the early studies for sharing. The authors found that variables such as a consumer price index, productivity index, unemployment rate, internet users are critical and affect the number of visits to sharing platforms. The data provides a pattern and is normalized using a logarithmic process.

7. Discussion

The authors researched sharing activities, that have recently been developing across the world. Due to its higher focus on sharing sustainable development compared with traditional activities, it is important to research and clarify how we could stimulate environment-friendly activity.

The previous study of the authors was dedicated to the US market and this study focus on the EU landscape. The statistic describing each market is a bit different, so the results stating which variables are important for sharing are a bit different. However, the authors could mention that for researching the US market – 71 variables were investigated. However, for the research of sharing in the EU market, the number of variables was half lower. What is interesting, is that the authors included the Covid-19 topic, also to the investigation thematic, as two years of the pandemic are already visible in statistics.

The results can be useful for practitioners and policymakers exploring the promotion of sharing activities. Such activity has been evident for a long time as online platforms have contributed to wider accessibility. However, sharing is still a new area of research and a little number of studies have been carried. Thus, the authors attempted to explore the phenomenon of knowledge sharing and conceptual level expansion.

8. Conclusions

In the study, the authors identified that such macroeconomic variables as a consumer price index, productivity index, total unemployment rate, the number of users and households connected to the Internet are critical and affect the number of visits to sharing platforms in the EU countries.

The scientific literature analyzing the growth of sharing activities lacks research on quantitative factors that ensure the development trends and opportunities of the sharing economy. The number of visits to sharing platforms and the number of sharing platforms is growing. Even in countries that have focused on sharing activities from the outset, data suggest that predicting the size of the sharing market or the growth of sharing platforms is not easy. During this investigation of sharing activity, the authors tried to fill the gap, as scientific literature lacks deep analysis on sharing activity and its growth.

The literature review shows strong research development in the direction of revising technological factors. The study expands knowledge in this area.

The authors investigated the number of critical elements required to visit sharing platforms and presented a linear regression model. The model is useful for predicting the number of visits using monthly data. As sharing is still a new field of research and little research has been done, the authors have tried to explore the phenomenon of sharing and expand the conceptual level of knowledge. The authors introduced a composite index and compared its links with other indices, such as the consumer price index, the producer price index, and the business production sentiment index, and provided a tool to predict the number of visits to sharing platforms.

The research has certain limitations, so the research can be extended to other directions:

- Review of the index of visits to sharing platforms in other countries;
- Analysis of additional components;
- Review of different periods.

In addition, other directions for predicting visits to sharing platforms could be included in the composite index setup.

Author Contributions: Conceptualization and statistics, O.L. and V.G.; methodology, A.B.; updates, O.L.; formal analysis, V.G.; writing-review and editing, A.B.

Appendix

Correlation between macroeconomics variables

The number of visits to sharing platforms	Abbreviation	Statistics	ASP
Business freedom	BF	Corr. Coefficient	0,09
		Probability	0,3
Consumer price index	CPI	Corr. Coefficient	0,40
		Probability	0,0
Cultural And Social Norms	CSN	Corr. Coefficient	0,16
		Probability	0,1
Entrepreneurial Intention	EI	Corr. Coefficient	-0,10
		Probability	0,2
Fixed broadband subscriptions (per 100 people)	FBS	Corr. Coefficient	0,33
		Probability	0,0
Government effectiveness	GE	Corr. Coefficient	0,15
		Probability	0,1
GDP per capita, PPP (current international \$)	GPC	Corr. Coefficient	0,12
		Probability	0,1
Households - type of connection to the internet	HCI	Corr. Coefficient	0,48
		Probability	0,0
Households - level of internet access	HIA	Corr. Coefficient	0,40
		Probability	0,0
Investment freedom	IF	Corr. Coefficient	0,15
		Probability	0,1
Internet use finding information about goods and services	IFI	Corr. Coefficient	0,36
		Probability	0,0
Internet use seeking health information	IHI	Corr. Coefficient	0,34
		Probability	0,0
Internet use Internet banking	IIB	Corr. Coefficient	0,20
		Probability	0,0
Individuals - internet use	IIU	Corr. Coefficient	0,31
		Probability	0,0
Mobile internet access (percentage of individuals) individuals used a mobile phone(or smart phone) to access the internet	IMP	Corr. Coefficient	0,61
		Probability	0,0
Individuals using the internet for ordering goods or services	IOG	Corr. Coefficient	0,33
		Probability	0,0
Last online purchase in the 12 months	IPO	Corr. Coefficient	0,34
		Probability	0,0

Individuals using the internet for selling goods or services, percentage of individuals	ISG	Corr. Coeficient	0,17
		Probability	0,0
Internet use participating in social networks	ISN	Corr. Coeficient	0,41
		Probability	0,0
Internet use telephoning or video calls	ITC	Corr. Coeficient	0,28
		Probability	0,0
Individuals using the Internet (% of population)	IUI	Corr. Coeficient	0,26
		Probability	0,0
Labour costs (wages and salaries total)	LC	Corr. Coeficient	0,16
		Probability	0,1
Productivity (Real labour productivity per person, Index, 2010=100)	LPP	Corr. Coeficient	0,32
		Probability	0,0
Mobile-cellular subscriptions per 100 inhabitants	MCS	Corr. Coeficient	0,00
		Probability	1,0
Individuals - mobile internet access	MIA	Corr. Coeficient	0,35
		Probability	0,0
Population density	PD	Corr. Coeficient	0,04
		Probability	0,6
Property rights	PR	Corr. Coeficient	0,24
		Probability	0,0
R&D expenditure (% of GDP)	RDE	Corr. Coeficient	0,22
		Probability	0,0
Rule of law	ROL	Corr. Coeficient	0,16
		Probability	0,0
Regulatory quality	RQ	Corr. Coeficient	0,13
		Probability	0,1
Tax burden	TB	Corr. Coeficient	-0,13
		Probability	0,1
Total unemployment rate (percentage of the total population)	TUR	Corr. Coeficient	-0,31
		Probability	0,0
Ratio of young people in the total population on 1 January by sex and age (from 15 to 29), percentage	YP	Corr. Coeficient	-0,29
		Probability	0,0

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