MARKETING PERSPECTIVES ON SUPPLY AND DEMAND IN THE SHARING ECONOMY: WHO ARE THE TARGET GENERATIONS?

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Abstract

The sharing economy is an interesting socio-economic system that has been studied by many researchers worldwide. It is an area that will affect the patterns of behaviour, processes and thinking experienced in various fields. The sharing economy is specific in that some people who have an asset they do not fully use may be willing to share it with consumers who do not have the asset but need it for a specific reason but are unable to or do not want to buy it. Platforms operating in the sharing economy need to know whom to target with their marketing strategy to spend marketing costs effectively. We used cluster analysis, a chi-square test, a Kruskal-Wallis test and descriptive analysis of data collected from 684 respondents across Generations X, Y and Z within the Czech Republic. We identified who constitutes the general supply of and demand for unused assets. While the willingness to supply prevails among Generation Y, the willingness to demand prevails among Generation Z. For Generation X, the willingness to supply and the willingness to demand are almost equal. Using cluster analysis, we defined three basic groups of participants in the sharing economy: double-sided active participants, one-sided active participants and inactive participants. We summarise new findings from not only a theoretical but also a practical perspective.

Implications for Central European audience: Platforms active in the sharing economy may better understand Czech customers regarding their supply of and demand for unused assets. The results could also be useful for managers in other countries of the Central European region. The findings may help enrich the theoretical knowledge of the sharing economy and its impact on marketing. Platforms can save money on marketing communications by focusing their marketing communications on a specific generation.

Keywords: Demand; Generation X; Generation Y; Generation Z; marketing strategy; sharing economy; supply

JEL Classification: D16, E21, M31

Introduction

The sharing economy has been booming since the beginning of the 21st century. We can describe it as one of the most important economic trends attracting worldwide attention (Frenken, 2017). While in 2014, the total value of the global sharing economy was worth

US$15 billion, it is expected to reach a global value of US$335 billion in approximately 2025 (Mazareanu, 2022).

The market in the sharing economy differs from that in the market economy. In a traditional market economy, a business acts by offering its products to a customer. In this so-called B2C market, supply of and demand for a particular product are met. Marketing communications aim to attract and entice the consumer to buy the marketed item. In the sharing economy, the market works differently. The sharing economy usually involves three actors: those who own the asset, the platforms and those who need the asset (von Richthofen & von Wangenheim, 2021). Those who need the asset are usually referred to as consumers. However, the sharing economy also involves prosumers, i.e., those who own the asset and provide the product and also need the products of the sharing economy. In the sharing economy, the customer can have one of two roles: consumer or prosumer (Lang et al., 2020). Platforms are intermediaries for sharing, i.e., they operate between the asset owner and the one who needs the asset. Ownership of the asset does not transfer to the platform (Benoit et al., 2017).

Knowledge of supply and demand plays a crucial role in the sharing economy, as platforms can better set their marketing strategy. Any temporary mismatch between supply and demand may mean that another entity enters the competitive market better to meet supply or demand (Rich, 2007). Platforms do not have an easy task in the sharing economy. They must develop effective marketing communications to reach not only the side of demand, as is common in a market economy, but also the side of supply to attract those who own assets but do not fully use them and want to share them (Benoit et al., 2017).

Proper targeting will be crucial to platforms in the sharing economy. Platforms will need to properly define the customer segment they want to target with marketing communications (Aljukhadar & Senecal, 2011). At the same time, platforms will have to consider external factors that influence marketing communications. As a result of globalization, large advertising companies are introducing communication standards, and markets, segments and consumer behaviour are changing, all of which affect marketing communications (Bozhkova et al., 2018). According to Horbal et al. (2017), the changing internal and external economic environment also affects marketing communications. Ecological pressure (Bezakova, 2016; Mikhno et al., 2021) and low-carbon pressures are also emerging, as well as a positive impact of circular economies (Ungerman & Dědková, 2019) and sharing economies (Heinrichs, 2013) on the environment and resources. All these factors will change the content of marketing communication concerning the target customer segment.

Generally, each generation of the population has its own specificities, especially in the green and sustainability area (Casalegno et al., 2022; Ham et al., 2021). However, we do not know how each generation behaves in the sharing economy environment concerning their willingness to supply and demand unused assets. The literature offers no opinion on this issue, so this study can be considered ground-breaking. The basis for this analysis was a marketing survey conducted from December 2021 to March 2022, involving 741 respondents across Generations X, Y and Z from the Czech Republic.

We chose the generational approach in the sharing economy because there are several studies where the authors disagree on whether the typical customer of the sharing economy (in their case, car sharing) is a young, affluent person (Burkhardt & Millard-Ball, 2006) or whether it is an older (Ye et al., 2019) and poorer person (Kumar Mitra, 2021). According to

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the available sources, supply-side characteristics have not been addressed in the academic literature.

The paper first provides a literature review related to the issue under analysis. This review is followed by development of hypotheses, description of the method, presentation and analysis of the results. Finally, we outline possible areas for further research.

1 Literature Review

In this section, we first make clear what sharing economy means. Then, selected publications focused on the sharing economy are commented on. Scientific hypotheses for our research will also be formulated.

1.1 Sharing economy definition

The sharing economy has been recently gaining attention of numerous people and companies (May et al., 2017). The sharing economy functions according to the notion of someone offering the unused capacity of an asset they own for sharing with others who need the asset but do not want to purchase it outright (Schor & Frenken, 2019). The difference between owning and sharing a product lies in cost-effectiveness (Dowling et al., 2021). Traditional business models are no longer valid in the sharing economy. As such, the sharing economy is not only a challenge to traditional providers of products and services; it is a formidable task for owners of assets and people who want to enable sharing (Vith & Höllerer, 2020).

Defining the sharing economy is not straightforward (Reich & Yuan, 2019). Various authors apply different terms to describe the sharing economy, for example, collaborative consumption (Tussyadiah & Pesonen, 2016) or collaborative economy (Lowitt, 2013), and this creates a problem. This has been noted by Botsman (2015). Her definitions of the concepts relating to the sharing economy are given, for example, by Schneider (2017, p. 26). Collaborative consumption is *"the reinvention of traditional market behaviours – renting, lending, swapping, sharing, bartering, gifting – through technology, taking place in ways and on a scale not possible before interned. Good examples: Zopa, Zipcar, Yerdle, Getable, ThredUp, Freecycle, eBay."* The term collaborative economy means *"an economic system of decentralized networks and marketplaces that unlocks the value of underused assets by matching needs and haves, in ways that bypass traditional middlemen. Good examples: Etsy, Kickstarter, Vandebron, LendingClub, Quirky, Transferwise, Taskrabbit."* The sharing economy is described as *"an economic system based on sharing underused assets or services, for free or for a fee, directly from individuals. Good examples: Airbnb, Cohealo, BlaBlaCar, JustPark, Skillshare, RelayRides, Landshare."* The difference between these terms is apparent, but authors often use them interchangeably. For example, Thebault-Spieker et al. (2017) refer to the TaskRabbit platform as a part of the sharing economy, not collaborative economy.

Following these findings, we perceive the sharing economy as a system that allows the owner of an asset (e.g., a car or an apartment) that is not fully used to provide the asset for use to someone who is unable to buy a similar asset for financial reasons or who does not find it worthwhile (e.g., needs the car only once a week to go to the doctor).

1.2 Supply and demand in the sharing economy in marketing perspectives

Although there is product sharing in the sharing economy, from a marketing point of view, it is the marketing of services, i.e., mediation of sharing and marketing communication to the entities operating in the sharing economy. Marketing of services is specific, especially in the online environment. The success of the marketing message then depends on the company's ability to understand the wishes of the potential customer in an environmental, social, consumer and technological context. It is crucial for companies to target a group of potential customers that will become real customers. The content of marketing messages must be relevant to that group of potential customers (Grewal et al., 2016).

The online environment holds great potential for companies in terms of marketing. Through the online environment, companies have an unprecedented opportunity to reach many customers, which they can then segment according to different criteria (age, location, consumer behaviour, etc.). Reaching customers through online tools not only affects the number of potential customers reached, but the marketing message reaches these customers almost instantaneously (Andrews et al., 2016).

In a market economy, marketing communication strategies are triggered by the producer trying to create demand for their products. In a sharing economy environment, the producer is replaced by the owner of an unused asset who wants to offer this asset for sharing through a platform. The owner of the unused asset creates a supply. The demand is created by the customer who needs the unused asset for a certain period of time.

The literature on supply and demand in the sharing economy does not describe these economic phenomena together. Experts focus on the supply side or the demand side in different contexts. Pham et al. (2021) examine Generation Z's demand for fashion sharing. Özek (2021) shows knowledge-sharing differences between Generations X, Y and Z, but focuses on the supply side of knowledge sharing, i.e., intangible assets. Xiang et al. (2022) also address the supply of shared accommodation but focus on motives. Their research covers different age generations but does not work with generational labels in their study. Tian et al. (2019) address the demand for car sharing in terms of the preferred use time of these services. Carrese et al. (2019) examine Generation Z in car sharing but focus on their pro-environmental attitude, not their willingness to demand these cars. Therefore, it is unclear who creates supply and demand in the sharing economy, as existing academic research has only focused on the part of the market. Bahles and Cook (2017) mention that it will be more important for Generation Z to have access to sharing (they mention cars) than to ownership.

Focusing on Generation X, Y and Z, it is unclear from academic papers which generation dominates supply and demand. For marketing communication purposes, these findings are crucial. The generational perspective on marketing decisions of organizations is a vital segmentation criterion (Chaney et al., 2017). Previous research has not focused on identifying who creates supply and demand in the sharing economy. The analysis has either concentrated on a particular generation or unused asset, but a comprehensive view of the issue is missing. Given the above, we define the following hypotheses:

- *H1: There is no significant difference between generations in their willingness to supply unused assets in the sharing economy.*

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- *H2: There is no significant difference between generations in their willingness to demand unused assets in the sharing economy.*

In marketing, there is also a lack of information on a more detailed segmentation of participants in the sharing economy. Existing research focuses on the importance of segmentation in marketing (Caruso et al., 2018; Ližbetinová et al., 2019; Venkatesan, 2008). A lack of research defines how large the customer segment is for which there will be high supply and demand (active participants) and for which, conversely, there will be low supply and demand (inactive participants) in the sharing economy. Platforms will have to incur lower costs per active participant in the sharing economy than per inactive participant. Given the above, we define the following hypotheses:

- *H3: There are no subsets in our observed data that are more like each other than the remaining data.*

This research brings essential information that is useful not only for current and appearing platforms but also for academia, as it shows the specificity of the sharing economy in a marketing context.

2 Data and Methodology

In this section, we provide more information on the design of the questionnaire, its content, data collection and the profile of the sample of respondents.

2.1 Questionnaire development

We constructed the questionnaire based on a literature search and findings from other related research to ensure content validity (Yusoff et al., 2021). A set of questions was submitted to two experts who assessed the degree of relevance of the questions in the questionnaire (Yusoff, 2019).

The questionnaire was divided into several parts. The first part of the questionnaire was to determine whether the respondents knew the meaning of the sharing economy. The second part investigated how mobile the respondents are and what possible sharing economy products they are willing to share – from the perspective of both the owner of the object and the one who needs the asset. This perspective was extended to include the attribute of whether the respondent would share something with someone they know or do not know. The third part of the questionnaire focused on car sharing and respondents' attitudes towards this issue. This section asked about the attributes the respondent considered important for owned and shared cars. At the same time, the motives for car sharing were explored in this part. The fourth part included the respondents' demographic characteristics. Demographic data (sex, year of birth, residence size, educational attainment) were also related to these questions. At the experts' suggestion, the question asking for the respondents' income was omitted. All the content validity indices were above the minimum value of 0.8 (Yusoff, 2019), i.e., the questionnaire achieved a satisfactory level of content validity. Only some key findings are presented in this paper.

The aim was to determine theoretical demand and supply using primary data. We defined nine product groups that were under investigation. These were supply and demand for: (1) cars; (2) other small vehicles; (3) special sports equipment or clothing; (4) garden equipment or tools; (5) real estate (apartment, house); (6) handbags, jewellery, watches; (7) gaming

consoles, computer equipment, cameras; (8) musical instruments; (9) pets. Respondents could express their willingness to offer and demand unused assets in the sharing economy on an ordinal scale as follows: (1) definitely not; (2) rather not; (4) rather yes; (5) definitely yes.

The middle option (3) was deliberately not used in the questionnaire to obtain a genuine willingness to offer or demand an unused asset and to avoid a "do not know" response. Some studies support using the middle point to avoid respondents leaning one way or the other (Furr, 2011) or argue that surveys with a middle point show higher reliability (Adelson & McCoach, 2010). Other studies, on the other hand, reject the use of the midpoint, arguing that the midpoint creates an opportunity for the respondent to avoid answering the question (Sturgis et al., 2014). We lean towards the view of Lucian (2016). He argues that one cannot have a neutral attitude because one automatically leans to one side. Nadler et al. (2015) state that it is unimportant in research whether it includes a midpoint, as both types of scales generate similar results.

We checked the data for reliability using Cronbach's alpha, which was 0.9357. The reliability of the data can be considered high as it exceeded the 0.7 threshold below which data are considered unreliable (Hair et al., 2013).

2.2 Data collection and sample profile

Data were collected across the Czech Republic from December 2021 to March 2022. A total of 794 respondents participated in the study. Of these respondents, 53 were discarded because they were not the target generations for the research. In addition, we discarded 57 questionnaires that were not fully completed with all the parameters under study. Six hundred eighty-four fully completed questionnaires were left. Details on the sample (684 respondents), Czech population (Generations X, Y, Z), Czech population 15+ (*) and Czech population 15+ to Generation X (**) are given in Table 1.

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Table 1 | Sample details

Demographic information		Generation X		Generation Y		Generation Z		Comparison (%)	
		N	%	N	%	N	%	Sample	Population
Gender	male	114	51.58	116	51.10	93	39.41	47.50	51.42
	female	106	47.96	108	47.58	141	59.75	51.42	48.58
	not important	1	0.45	3	1.32	2	0.85	1.08	x
City Size	up to 10000	81	36.65	44	19.38	69	29.24	28.61	52.12*
	up to 50000	65	29.41	58	25.55	47	19.92	24.70	20.91*
	up to 100000	34	15.38	59	25.99	32	13.56	17.54	8.03*
	over 100000	41	18.55	66	29.07	88	37.29	29.15	18.94*
Education	elementary	0	0.00	0	0.00	5	2.12	0.81	12.00**
	secondary	139	62.90	84	37.00	140	59.32	54.12	63.58**
	higher professional	15	6.79	18	7.93	5	2.12	5.40	2.27**
	university	67	30.32	125	55.07	86	36.44	39.68	22.15**

Source: Author, Census 2021, Ministry of the Interior of the Czech Republic

We collected data via an online Google form. Internet access was a prerequisite for respondents to participate in this study. Thus, people who did not have access to the Internet were automatically excluded from the sample.

In order to obtain as many responses as possible, quota and snowball sampling were used in a short period of time and also to reach respondents from Generations X, Y and Z, who under normal circumstances could be difficult to reach by random selection. As Kirchherr and Charles (2018) reported, snowball sampling can be useful in these cases.

The sample reflects the gender structure of the Czech population (Generations X, Y, Z) and partly the educational structure of the Czech population. The comparison of the sample relative to the Czech population in terms of education is partly biased because the official statistics include a large number of the population aged 15–17 who have primary education but did not participate in the survey. We focused on the adult part of the population, i.e., people aged 18 and over.

Other statistical comparisons of the population can partially remedy this shortcoming. The higher a person's education, the higher the number of Internet users. Statistical information from 2021 showed that people with elementary education (25+) are users of ICT at 47.328%, people with secondary education are users of ICT at 88.781%, and people with tertiary education are users of ICT at 95.917% (CEIC, 2021). It is not clear from the available statistical data what proportion of Internet users are between 15 and 25 years old, i.e., it is impossible to accurately identify Internet users in this age range concerning education. For this reason, we assume only the general fact that the higher the education level of users, the more likely they are to use the Internet and become part of the sharing economy.

We reflected on the generation structure. We used the classification of the generations by their year of birth based on the classification used by the Pew Research Center (Dimock, 2022), i.e., the generations are defined as follows: (1) Generation X: 1965–1980, (2) Generation Y: 1981–1996, (3) Generation Z: 1997–2012. The Czech Republic had 26.02% of people from Generation Z, 33.94% from Generation Y, and 40.04% from Generation X at the beginning of 2022. In our sample, we had 34.50% of people from Generation Z, 33.19% from Generation Y and 32.31% from Generation X.

As for city size, the sample is not fully representative. We base this on the percentage of the Czech population aged 15+, as other detailed statistics are unavailable. Although the data do not match perfectly, the structure of the particular strata shows that they are fairly representative.

The questionnaire was placed on Facebook and distributed by the respondents to other respondents via the Internet. We measured the supply and demand on the same experimental unit, i.e., we considered the data as "matched pair data" (Dunnigan, 2013).

We used three statistical methods to verify the results: cluster analysis, the chi-square test of independence, and the Kruskal-Wallis test. Using cluster analysis, we defined different groups of participants in the sharing economy. We used the K-means algorithm, which iteratively searches for vector values by minimizing the mean deviation (i.e., the distance of a point from the cluster mean) between a given dataset and the vectors that have the smallest Euclidean distance to those data and partitioning them into a predetermined number of clusters. We used the chi-square test of independence to test for differences in the frequencies in the contingency table, which compares the observed frequencies with the expected frequencies in the case of independence of traits. Using the p-value of the significance test, we can evaluate whether there is a dependence on the traits in the table (if the p-value is less than the 0.05 significance level). Then we have shown a statistically significant difference in frequencies by observed traits. In order to compare the differences in levels of the observed variable for a multi-categorical variable, i.e., between multiple groups, the Kruskal-Wallis test was used when non-parametric testing was required. In our case, the condition of normal distribution of data tested by the Shapiro-Wilk test was not confirmed; therefore, it is necessary to use non-parametric methods such as this one for further analysis. Using the p-value of the significance test, we can evaluate whether there is a dependence on the level of the observed variable in the categories (if the p-value is below the significance level of 0.05). Then we have shown a statistically significant difference in the level in each group. We complemented the calculations with descriptive statistics. The evaluation was performed using standard statistical programs (Statistica, SPSS) and Microsoft Excel.

3 Results

In this section, we present the statistical treatment of the data obtained, which will lead to confirmation or rejection of our hypotheses. First, we will examine supply and demand concerning Generations X, Y and Z. Then, we examine supply and demand concerning clusters.

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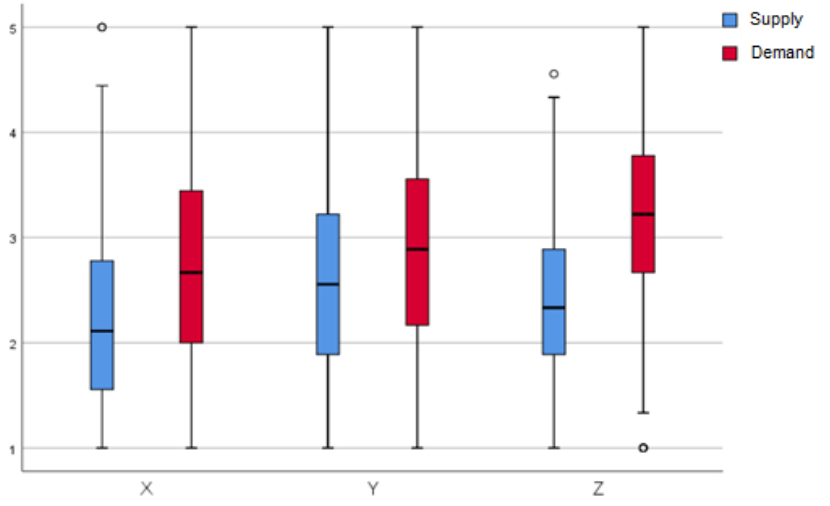
3.1 Supply and demand concerning generations

To test whether there is a statistically significant relationship between generations in their willingness to supply or demand unused assets in the sharing economy, we used the chi-square test of independence and the Kruskal-Wallis test.

First, we constructed a proxy means for the willingness of providers to supply unused assets across all products, as well as the willingness of customers to demand unused assets. We compared these variables across generations. Demand is greatest for Generation Z (mean value of 3.16) and least for Generation X (mean value of 2.73). Supply is greatest for Generation Y (mean value of 2.57) and least for Generation X (mean value of 2.25). Mean values around the missing middle value of 3 indicate that respondents are more likely to lean towards the do not supply/do not demand side if the values are less than 3. If the values are greater than 3, this result indicates that respondents are more likely to lean towards the supply/demand side.

Moreover, according to the Kruskal-Wallis test, these generational differences are statistically significant. For the willingness to supply, it is (χ^2 (2, N=684) = 15.181, p = 0.001), and for willingness to demand it is (χ^2 (2, N=684) = 23.248, p = 0.000). The average levels of demand and supply are statistically significantly different between generations. The differences are also evident in the box plots in Figure 1 and in Table 1.

Figure 1 | Box plots of supply and demand



Source: Author

Table 1 | Willingness of generations to supply and demand unused assets

Generation	Supply [1]	Demand [1]	Difference [1]
X	2.25 (0.89; 1.0; 5.0)	2.73 (0.98; 1.0; 5.0)	-0.48 (1.22; -4.0; 4.0)
Y	2.57 (1.00; 1.0; 5.0)	2.91 (1.03; 1.0; 5.0)	-0.34 (1.20; -4.0; 4.0)
Z	2.37 (0.71; 1.0; 4.6)	3.16 (0.85; 1.0; 5.0)	-0.80 (0.86; -3.4; 2.1)
Total	2.40 (0.88; 1.0; 5.0)	2.94 (0.97; 1.0; 5.0)	-0.54 (1.12; -4.0; 4.0)
P-value [2]	0.001	0.000	0.000

Source: Author

The willingness to supply unused assets is greater if the difference is positive. A negative difference indicates a greater willingness to demand unused assets. If the difference is zero, then demand and supply in the sharing economy are in equilibrium. In the whole population, there are more than two-thirds (69.4%) of those who have more demand than supply, less than a quarter (23.5%) of those who have more supply, and less than a tenth (7%) of those who have demand and supply entirely in balance. When we break these groups down by generation, we find that Generation X has a much higher proportion of those with higher demand than supply (81.8%). Generation Y has a higher proportion of those with higher supply than demand (29.1%). We identified a balanced supply/demand ratio for Generation Y (8.8%) and Generation X (8.6%). Moreover, this difference in the distribution of customer groups between generations is statistically significant according to the chi-square test of independence (χ^2 (4, N=684) = 26.086, p= 0.000).

Based on these statistical estimates, we reject the null hypothesis at the 5% significance level and accept the alternative hypothesis, which demonstrates the statistical dependence of each generation on its willingness to supply or demand unused assets.

From a marketing perspective, this means that if a platform needs to increase supply, it will be better suited to reach out to Generation Y with its marketing communications. Contrariwise, suppose it wants to increase demand for unused assets. In that case, reaching out to Generation Z will be more appropriate.

3.2 Supply and demand concerning clusters

In the next section, we examined whether some groups are similar in the sample population regardless of generation. Using cluster analysis, specifically with the k-means algorithm, we tested multiple variants with different numbers of clusters. We based our analysis on customers' average willingness to supply and demand unused assets. The total SSE by the number of clusters was as follows: 2 clusters = 766; 3 clusters = 527; 4 clusters = 576; 5 clusters = 370. We could consider 3 or 5 clusters as knee (elbow) points. We evaluated these alternative clusters in terms of their composition and applicability for marketing purposes. We found the alternative with 3 clusters to be the best.

[1] Mean (standard deviation; min; max)
[2] Kruskal-Wallis test

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Based on the previous results, we assume that there will be three basic groups of participants in the sharing economy:

- double-sided active participants (with high demand and supply),
- one-sided active participants (with higher demand or supply),
- inactive participants (with low demand and supply).

These clusters are similar within the cluster and different from the other clusters. Respective numbers of observations are in Table 2.

Table 2 | Clusters

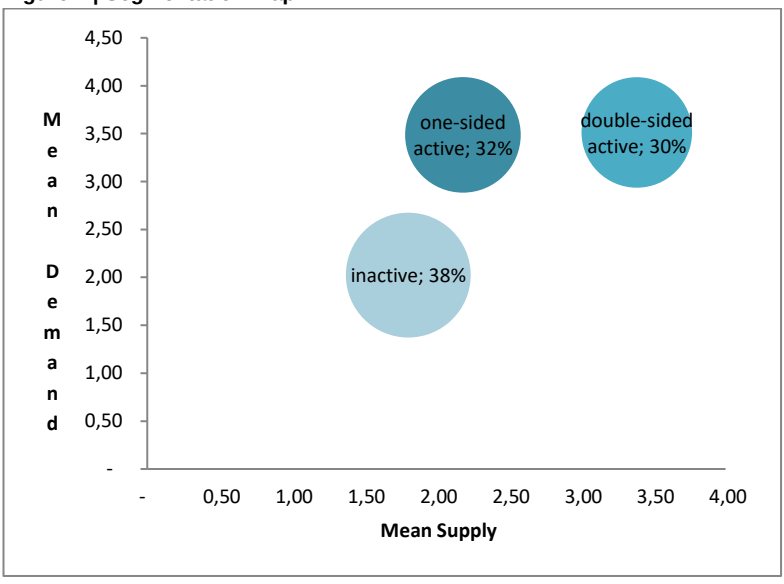
	Clusters	N	%	SSE/Cluster
1	One-sided active participants	222	32.5	115
2	Double-sided active participants	203	29.7	198
3	Inactive participants	259	37.9	214
	Total	684	100.0	527

Source: Author

The Euclidean difference in distance between Cluster 2 ((X_1, Y_1) = (3.39, 3.51)) and Cluster 3 ((X_2, Y_2) = (1.81, 2.02)) is the greatest (2.17175). The minimum difference (1.210165) is between Cluster 1 ((X_1, Y_1) = (2.18, 3.49)) and Cluster 2 ((X_1, Y_1) = (3.39, 3.51)). Cluster 1 ((X_1, Y_1) = (2.18, 3.49)) and Cluster 3 ((X_2, Y_2) = (1.81, 2.02)) have a difference in distance of 1.51585.

We created a segmentation map for these segments (Figure 2) and all these three segments are described in Table 3.

Figure 2 | Segmentation map



Source: Author

Table 3 | Cluster description

	Clusters	Generation (N; %)			Total
		X	Y	Z	
1	One-sided active participants	69; 31.08	66; 29.73	87; 39.19	222
2	Double-sided active participants	47; 23.15	85; 41.87	71; 34.98	203
3	Inactive participants	105; 40.54	76; 29.34	78; 30.12	259
	Total	221	227	236	684

Source: Author

The difference in the distribution of clusters between generations is statistically significant according to the chi-square test of independence (χ^2 (4, N=684) = 9.488, $p < 0.001$). Based on these statistical estimates, we reject the null hypothesis and accept the alternative hypothesis, which demonstrates that subsets of our observed data are more like each other than the remaining data.

In the following, we will describe the individual clusters and their detailed characteristics.

Cluster 1: One-sided active participants

One-sided active participants are a group whose demand is higher than supply. The mean supply is 2.18, and the mean demand is 3.49. In Table 3, we can see that Generation Z (39.19%) has the largest representation in this cluster, confirmed by the generational comparison and previous research. From a marketing perspective, Generation Z appears to be the most promising if platforms need to increase demand for unused assets.

Cluster 2: Double-sided active participants

The second group is the most important for marketing. This group typically has higher supply (mean = 3.39) and demand (mean = 3.51). Given the marketing costs, we can assume that this group will be the cheapest to reach to increase demand or supply on the platform. We decided to use cluster analysis, specifically with the k-means algorithm, to explore this cluster in detail. We tested two variants with different numbers of clusters: 2 and 3 clusters. The total SSE by the number of clusters was as follows: 2 clusters = 110; 3 clusters = 85. We could consider 2 clusters to be knee (elbow) points. We evaluated these alternative clusters in terms of their composition and applicability for marketing purposes. We found the alternative with 2 clusters to be the best.

We explored these clusters and assumed two groups of double-sided active participants in the sharing economy:

- supplying double-sided active participants (with higher supply than demand),
- demanding double-sided active participants (with higher demand than supply).

These clusters are similar within the cluster and different from the other clusters. Respective numbers of observations are in Table 4.

Table 4 | Clusters for double-sided active participants

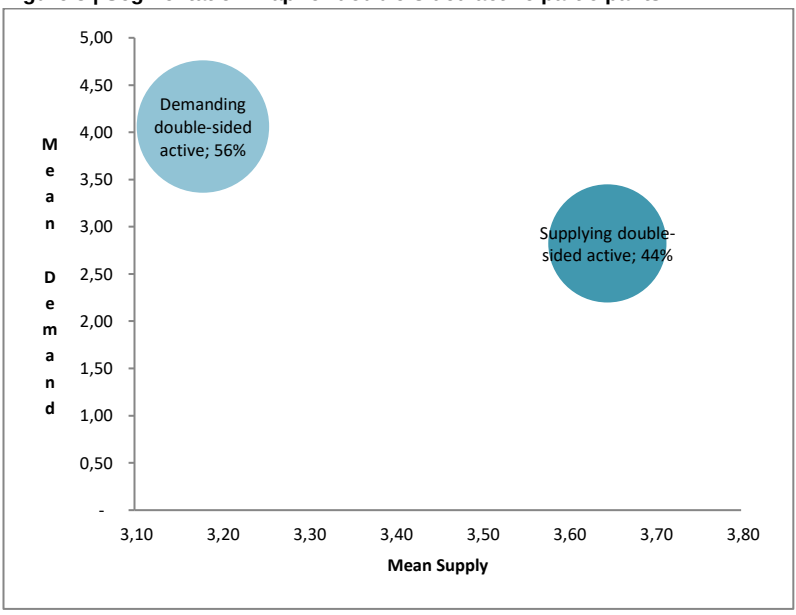
	Clusters	N	%	SSE/Cluster
2a	Supplying double-sided active participants	90	44.3	56
2b	Demanding double-sided active participants	113	55.7	54
	Total	203	100.0	110

Source: Author

The Euclidean difference in distance between Cluster 1 ((X_1, Y_1) = (3.65, 2.82)) and Cluster 2 ((X_1, Y_1) = (3.18, 4.06)) is 1.326084.

We created a segmentation map for these segments (Figure 3) and the two segments are described in Table 5.

Figure 3 | Segmentation map for double-sided active participants



Source: Author

Table 5 | Cluster description (double-sided active participants)

	Clusters	Generation (N; %)			Total
		X	Y	Z	
2a	Supplying double-sided active participants	27; 30.00	44, 48.89	19; 21.11	90
2b	Demanding double-sided active participants	20; 17.70	41; 36.28	52; 46.02	113
	Total	47	85	71	203

Source: Author

In the cluster of supplying double-sided active participants, Generation Y is dominant. In the cluster of demanding double-sided active participants, Generation Z is dominant. This conclusion is confirmed by Table 1, which summarizes the results of the descriptive statistics.

Cluster 3: Inactive participants

We called the third group inactive participants. Their supply and demand are so low that they will probably never become participants in the sharing economy. Generation X is the most represented generation (40.54%).

Summary

Finally, we compiled a summary of information about each cluster concerning the generations that can use the platform for their marketing communications. We based this on our analysis, specifically on each cluster's mean supply and demand, minimum and maximum. For each

cluster, we identified the dominant generation to reach out for marketing communication. A detailed overview is in Table 6.

Table 6 | Summary

	Clusters	Supply		Demand		
		Mean	Min; Max	Mean	Min; Max	Dominant generation (%)
1	One-sided active participants	2.18	1.00; 2.89	3.49	2.44; 5.00	Z (39.19)
2	Double-sided active participants	3.39	2.44; 5.00	3.51	1.00; 5.00	Y (41.87)
2a	Supplying double-sided active participants	3.65	2.89; 5.00	2.82	1.00; 4.00	Y (48.89)
2b	Demanding double-sided active participants	3.18	2.44; 5.00	4.06	3.11; 5.00	Z (46.02)
3	Inactive participants	1.81	1.00; 4.11	2.02	1.00. 3.33	X (40.54)

Source: Author

Knowing whether the platform wants to increase the supply or demand side for marketing communication is crucial. If the platform targets its marketing communications at Generation Z, there will likely be an increase in the demand for unused assets. If the platform directs its marketing communication towards Generation Y, there will likely be an increase in the supply of unused assets. If the platform directs its marketing communications to Generation X, there will likely be an unnecessary expenditure, as reaching this generation is unlikely to increase the supply or demand for unused assets.

4 Discussion

In this section, we will focus on the research implications, limitations and future research directions.

4.1 Research implications

It is generally acknowledged that the sharing economy has affected and will affect the field of marketing. In the marketing field, the sharing economy will have an impact on so-called institutions (which include, e.g., consumers, companies, distribution channels and regulators), processes (which include, e.g., innovation, branding and customer experience), and value creation (which include, e.g., how value is created for consumers, companies and humanity in general) (Eckhardt et al., 2019). However, many academics have not addressed the specific effects of the sharing economy on the marketing theory experienced so far.

Our research shows that it will be necessary to identify the supply and demand side in terms of customer characteristics in the sharing economy environment. The supply and demand research that we found in the context of the sharing economy has generally focused on either the supply side (Xiang et al., 2022) or the demand side (Cheah et al., 2020; Tian et al., 2019). Research on individual generations has tended to be somewhat sporadic, focusing only on the supply side (Özek, 2021) or the demand side (Pham et al., 2021) rather than on the supply and demand side from the perspective of generations simultaneously.

The generational perspective on the marketing decisions of organizations is a vital segmentation criterion (Chaney et al., 2017). We believe that platforms can save their

marketing costs by targeting their marketing communications at those generations of customers who are more likely to become providers or customers of unused assets.

The results of this study suggest that generational segmentation of customers in a sharing economy environment will be necessary. Each generation has a different willingness to offer or demand unused assets. On closer examination of providers' willingness to supply and customers' willingness to demand, we found that demand is greatest for Generation Z and least for Generation X, while supply is greatest for Generation Y and least for Generation X. From a marketing perspective, this means that it will be more suitable for the platform to reach out to Generation Y with its marketing communications to increase supply. Contrariwise, suppose it wants to increase demand for unused assets. In that case, reaching out to Generation Z will be more appropriate.

When we compared the supply and demand side, regardless of generational differentiation, we found that the demand for unused assets slightly dominates in the sharing economy. From a marketing perspective, our research suggests that platforms need to entice owners of unused assets with marketing messages to be able to meet their demands.

It is important to note that different actors make up the supply and demand sides in a sharing economy and in a market economy. For this reason, we believe that platforms in the sharing economy must use all marketing opportunities to attract new customers. If platforms fail to maintain symmetry between supply and demand, the sharing economy will hit its limits: the customers themselves.

This research is necessary as it combines familiar theoretical assumptions with new insights and applies its findings to the sharing economy, a phenomenon that has been much discussed in recent years and will influence marketing communication in the 21st century. This study contributes, academically and practically, to other important insights related to the impact of the sharing economy on marketing, or in this case, marketing communications. From a marketing point of view, these findings are valuable for platforms operating or planning to operate in the sharing economy to set their marketing strategy right and minimize marketing communications costs.

4.2 Limitations and future research

Our research is subject to constraints that open the way for future research in this area. An important limitation is that the data were collected only in the Czech Republic. The supply and demand situation in other countries is likely to differ, as awareness of the sharing economy is relatively lower in the Czech Republic. It will likely be possible to identify supply and demand asymmetries in each country, albeit for different products.

We are aware of several limitations of this study. Firstly, the analysed sample was relatively small and thus does not allow generalization of the study results. Secondly, it is not possible to evaluate in some demographic factors whether the sample is representative of the Czech population 15+, as some statistics are missing. Some statistics include respondents from the age of 15, others from the age of 25, and then there are no statistics on Internet users by municipality size. As the survey was done using the snowball method, we could not determine its response rate.

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We chose the generational approach in the sharing economy. However, there is a possibility that future research will show that the reason for different behaviour on sharing markets is not generation (age) but some other variable, which has not been tested.

We can imagine conducting a more extensive research investigation in a country where the sharing economy attains higher financial value. It will be interesting to test marketing strategies in conjunction with a specific platform that can transfer theoretical knowledge to a real-world setting and demonstrate the actual effect of marketing strategies in a sharing economy environment.

Conclusions

As this study showed, we face an asymmetry of supply and demand in the sharing economy environment. The reasons for the lower supply need to be investigated more deeply. The first cause we can see is information asymmetry (Vosooghidizaji et al., 2019), where the supply side is not sufficiently informed about how they can value their unused assets. Related to this is the second cause of lower supply in the sharing economy, collectively referred to as fears or barriers (Hazée et al., 2017). Barriers to entering the sharing economy are greater than barriers preventing actors from leaving the sharing economy (Bradley & Pargman, 2017). We see the third cause of lower supply in the legislative non-anchoring of the field, as the sharing economy faces legislative barriers (Sidorenko, 2020).

The platform can partially address the first two causes through effective marketing communications. We use the word partially deliberately because there will always be a group of people who will not want to participate in the sharing economy, despite having enough information about it and explaining their concerns.

The results of this study provide valuable insights for platforms dealing with supply and demand intermediation in the sharing economy. It shows that it is appropriate to target marketing activities only to specific generations, not the whole population. These findings reduce marketing costs and make platforms' marketing communications more effective. We recommend that platforms should target Generation Y to increase supply. Marketing communication towards Generation Z is likely to increase demand.

Generation Y is the most represented among the double-sided active participants and supplying double-sided active participants of the sharing economy, i.e., the marketing costs of reaching them can be lower compared to other generations to increase supply. It should not be costly to market to Generation Z to increase demand for unused assets. We assume that unnecessary marketing costs would be spent on reaching out to Generation X, which makes up the largest share of inactive participants in the sharing economy.

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