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# RESEARCH ARTICLE

# User retention in sharing economy platforms: an integrated model of social exchange theory and network externalities

**Wenbin Lu[1*], Xiaotong Liang[2]**

[1] *Zhongxin International Financial Leasing (Shenzhen) Co.,Ltd ,Beijing, 101399, China*

[2] *China National Gold Group Asset Management Corporation, Beijing 100010, Beijing, China*

*** Corresponding author:** Wenbin Lu , cufelwb@163.com

## ABSTRACT

This study investigates user retention in sharing economy platforms by integrating Social Exchange Theory with network externalities. A comprehensive model is developed to examine the relationships between perceived benefits, trust, network size, and user retention intention. Data collected from 1,200 users across various sharing economy sectors were analyzed using structural equation modeling. Results indicate that perceived benefits and trust positively influence user retention intention, while network size moderates these relationships. Furthermore, network size positively affects both perceived benefits and trust. The study reveals the complex interplay between individual-level factors and platform-level network effects in shaping user retention behavior. Theoretical contributions include the extension of Social Exchange Theory in digital platforms and the bridging of network theory with trust research in sharing economies. Practical implications for platform managers emphasize the importance of enhancing value propositions, building trust mechanisms, and implementing effective growth strategies. The research also highlights the self-reinforcing nature of network effects in user retention. Limitations of the cross-sectional design are acknowledged, and future research directions are proposed, including longitudinal studies, sector-specific analyses, and investigations into potential negative network effects. This study advances our understanding of user retention dynamics in the rapidly evolving sharing economy landscape, offering insights for both scholars and practitioners in this field.

***Keywords*:** sharing economy; user retention; social exchange theory; network externalities; trust; perceived benefits; platform growth; structural equation modeling

## 1. Introduction

The sharing economy has rapidly emerged as a disruptive business model, profoundly impacting traditional economic structures [1]. Platforms such as Uber and Airbnb have revolutionized resource utilization by efficiently connecting supply and demand [2]. However, as market competition intensifies, user retention has become a critical challenge for the sustainable development of these platforms [3]. User retention is not only crucial for the long-term profitability of platforms but also directly influences their network effects and market share [4].

While existing research has explored user retention factors from perspectives such as user experience

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and service quality [5], there remains a significant gap in theoretical integration. Notably, social exchange theory and network externalities offer promising yet underexplored lenses for understanding user behavior in sharing economy platforms [6]. Despite the individual merits of these theories, current literature lacks a comprehensive framework that combines individual-level decision-making processes with platform-level network effects in the context of sharing economy user retention. This study addresses this critical gap by proposing an integrated model that synthesizes these theoretical perspectives.

Social exchange theory emphasizes the cost-benefit analysis individuals undertake in social interactions [7], providing insights into why users continue to engage with specific platforms [8]. Concurrently, network externality theory elucidates how user base size influences individual usage decisions [9], offering unique value in explaining user retention behaviors in sharing economy contexts [10]. By integrating these theories, this study aims to provide a more nuanced and comprehensive understanding of user retention dynamics in sharing economy platforms.

This research addresses the following questions: (1) Which key factors from social exchange theory influence user retention? (2) How do network externalities moderate the impact of these factors on user retention? (3) How does the integrated model enhance our understanding of user retention behavior? By addressing these questions, this study contributes a novel theoretical perspective to understanding user behavior in sharing economy platforms while providing practical guidance for platform operators in developing effective retention strategies. Furthermore, this theoretical integration attempt offers new avenues for future research in related fields.

The remainder of this paper is structured as follows: Section 2 presents the theoretical background and hypothesis development. Section 3 outlines the research methodology. Section 4 details the data analysis and results. Section 5 discusses the findings, theoretical contributions, and managerial implications. Finally, Section 6 concludes the study and suggests directions for future research.

# 2. Theoretical Background and Hypothesis Development

## 2.1 Explain the application of social exchange theory

Social Exchange Theory (SET) provides a valuable framework for understanding user behavior in sharing economy platforms. At its core, SET posits that individuals engage in social interactions based on a cost-benefit analysis, seeking to maximize rewards while minimizing costs. In the context of sharing economy platforms, users continually evaluate the benefits they receive (such as convenience, cost savings, and social connections) against the costs they incur (including time, effort, and potential risks).

The application of SET to sharing economy platforms illuminates several key factors influencing user retention. Perceived benefits, a central construct in SET, encompass both economic and non-economic advantages users derive from platform participation. Trust, another crucial element, reflects users' confidence in the platform and other participants, mitigating perceived risks and facilitating continued engagement. The principle of reciprocity in SET explains how users' expectations of future benefits based on their current contributions encourage ongoing participation.As shown in **Table 1**, the key constructs of SET are applied to sharing economy platforms:

**Table 1.** Illustrates the key constructs of SET as applied to sharing economy platforms:

| SET Construct | Application in Sharing Economy Platforms | Example |
|---|---|---|
| Perceived Benefits | Economic and social advantages | Cost savings, convenience, social connections |
| Trust | Confidence in platform and peers | Reliable transactions, data security |
| Reciprocity | Expectation of future returns | Positive reviews leading to better future experiences |
| Cost | Investments made by users | Time spent, personal information shared |
| Satisfaction | Positive evaluation of exchange outcomes | Meeting or exceeding service expectations |

*Understanding these SET constructs in the sharing economy context provides valuable insights into user retention dynamics, guiding both theoretical development and practical strategies for platform management*

## 2.2 Sharing Economy Platforms and User Retention

The sharing economy, characterized by peer-to-peer-based activities of obtaining, giving, or sharing access to goods and services [11], has transformed various sectors including transportation, accommodation, and freelance services. Platforms like Uber, Airbnb, and TaskRabbit have revolutionized traditional business models by leveraging digital technologies to facilitate resource sharing among individuals [12].User retention, defined as the continued use of a platform by existing users, is crucial for the sustainability and growth of sharing economy platforms [13]. Unlike traditional businesses, these platforms rely heavily on network effects, where the value of the service increases with the number of users [14]. Consequently, retaining users not only ensures a stable revenue stream but also enhances the platform's attractiveness to new users [15].

Several factors influence user retention in sharing economy platforms. Trust, a cornerstone of peer-to-peer transactions, significantly impacts users' willingness to continue using a platform [16]. Perceived value, encompassing both economic and non-economic benefits, also plays a crucial role in retention decisions [17]. Additionally, user satisfaction, often driven by service quality and user experience, has been identified as a key predictor of continued use intention [18].

However, the unique characteristics of sharing economy platforms, such as the dual role of users as both consumers and providers, and the importance of community building, necessitate a more nuanced understanding of user retention [19]. Traditional retention models may not fully capture the complexities of user behavior in these platforms, highlighting the need for integrated theoretical approaches that consider both individual-level decision-making processes and broader network dynamics [12].

## 2.3 User Retention from the Perspective of Social Exchange Theory

Social Exchange Theory (SET), originally proposed by Homans [20] and further developed by Blau [21] and Emerson [22], offers a valuable framework for understanding user retention in sharing economy platforms. SET posits that social behavior results from an exchange process aimed at maximizing benefits and minimizing costs [23]. In the context of sharing economy platforms, users engage in a continuous evaluation of the benefits they receive, such as convenience, cost savings, and social connections, against the costs they incur, including time, effort, and potential risks [24].

This ongoing cost-benefit analysis significantly influences users' decisions to continue using a platform [18]. Several key constructs of SET are particularly relevant to user retention in sharing economy contexts. Perceived benefits play a crucial role, as users are more likely to continue using a platform if they perceive high value from their interactions [25]. Trust, both in the platform and other users, serves as a fundamental element of social exchange and enhances the likelihood of continued use [26]. The principle of reciprocity, where users expect future benefits based on their current contributions, encourages ongoing participation [27].

Additionally, satisfaction derived from positive experiences that meet or exceed expectations contributes significantly to user retention [28].

Empirical research has demonstrated the predictive power of these SET constructs in various sharing economy contexts. For instance, Möhlmann [19] found that utility, trust, and cost savings were crucial determinants of users' intention to use a sharing option again. Similarly, Cheng et al. [26] showed that trust and perceived benefits positively influence continuance intention in ride-sharing platforms. These findings underscore the relevance of SET in explaining user retention behavior in the sharing economy.

The application of SET to user retention in sharing economy platforms offers several advantages. It provides a comprehensive framework for understanding the complex decision-making processes that users engage in when choosing to continue using a platform. Moreover, it highlights the importance of both tangible and intangible factors in shaping user behavior, offering valuable insights for platform designers and managers seeking to enhance user retention strategies.

### 2.4 The Impact of Network Externalities on User Retention

Network externalities, a concept rooted in economic theory, play a crucial role in shaping user retention within sharing economy platforms. Katz and Shapiro [29] defined network externalities as the increase in value of a product or service to a user as the number of users grows. In the context of sharing economy platforms, this phenomenon manifests as the enhanced utility and value users derive from a larger network of participants [30].The influence of network externalities on user retention in sharing economy platforms is multifaceted. As the user base expands, the availability and diversity of goods or services on the platform typically increase, leading to greater choice and potentially better value for users [31]. This improved value proposition can significantly enhance user satisfaction and, consequently, retention rates. For instance, in ride-sharing platforms, a larger network of drivers can result in shorter wait times and more extensive coverage, incentivizing users to remain loyal to the platform [32].

Moreover, network externalities can create a self-reinforcing cycle of growth and retention. As more users join and remain on a platform, its attractiveness to both new and existing users increases, creating a positive feedback loop [33]. This dynamic is particularly evident in two-sided markets characteristic of many sharing economy platforms, where the value for one user group (e.g., riders) depends on the participation of another group (e.g., drivers) [34].

However, the relationship between network externalities and user retention is not always straightforward. While a larger network generally enhances value, it can also lead to increased competition among service providers, potentially affecting their satisfaction and retention [35]. Additionally, as platforms grow, they may face challenges in maintaining service quality and user trust, which are critical factors in user retention [36].Recent empirical studies have provided evidence of the significant impact of network externalities on user retention in various sharing economy contexts. For example, Stummer et al. [37] found that perceived network size positively influenced users' intention to continue using car-sharing services. Similarly, Arteaga-Sánchez et al. [38] demonstrated that network effects significantly contributed to user satisfaction and continuance intention in peer-to-peer accommodation platforms.

Understanding the role of network externalities in user retention is crucial for sharing economy platform managers. It underscores the importance of not only attracting new users but also strategically managing growth to ensure sustained value creation for all participants. By leveraging network effects effectively, platforms can create a virtuous cycle of user attraction, satisfaction, and retention, ultimately contributing to their long-term success and sustainability in the competitive sharing economy landscape.

## 2.5 Proposition of an Integrated Model

The complex nature of user retention in sharing economy platforms necessitates an integrated theoretical approach that combines the insights from Social Exchange Theory (SET) and network externalities. This integration allows for a more comprehensive understanding of the factors influencing user retention decisions in these dynamic, two-sided marketplaces [39].Our proposed integrated model posits that user retention is a function of both individual-level social exchange factors and platform-level network effects. At the individual level, SET constructs such as perceived benefits, trust, and satisfaction play crucial roles in shaping user retention decisions [26]. Concurrently, at the platform level, network externalities influence the overall value proposition and user experience [31].

The model suggests that network externalities moderate the relationship between SET factors and user retention. For instance, as the network grows, the perceived benefits of platform participation may increase due to greater choice and availability [37]. Similarly, a larger network may enhance trust through improved reputation systems and social proof mechanisms [36].Furthermore, the model proposes a feedback loop where user retention itself contributes to network externalities, creating a self-reinforcing cycle of growth [33]. This dynamic highlights the critical role of retention in sustaining and amplifying network effects over time.The integrated model also considers potential negative effects of network growth, such as increased competition among service providers or challenges in maintaining service quality at scale [35]. These factors may moderate the positive impact of network externalities on user retention.

By combining SET and network externalities, our model offers several advantages. First, it provides a more holistic view of user retention in sharing economy platforms, accounting for both individual-level decision-making processes and broader network dynamics. Second, it allows for the examination of interaction effects between social exchange factors and network externalities, potentially revealing new insights into user behavior. Finally, it offers a framework for platform managers to develop more nuanced and effective retention strategies that leverage both social exchange principles and network effects. **Figure 1** illustrates the proposed integrated model of user retention in sharing economy platforms.

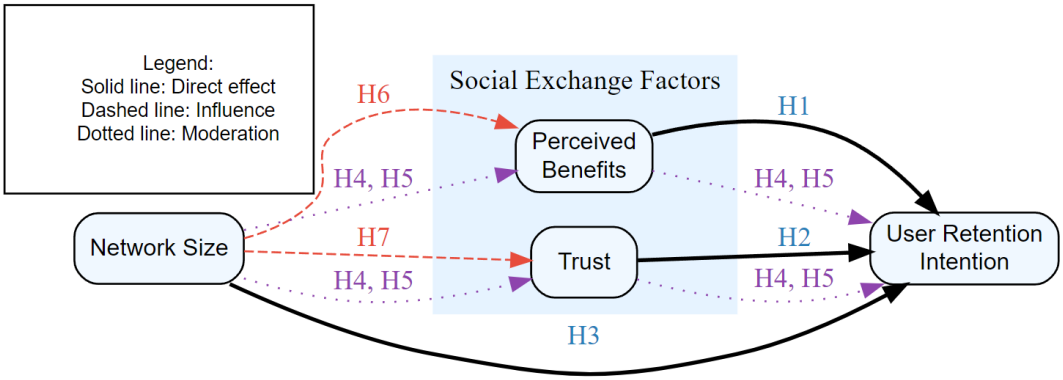


**Figure 1.** Integrated Model of User Retention in Sharing Economy Platforms

## 2.6 Research Hypotheses

Based on the integrated model of user retention in sharing economy platforms, we propose several hypotheses that combine insights from Social Exchange Theory and network externalities. These hypotheses aim to explore the complex relationships between individual-level factors, platform-level network effects, and user retention.

Drawing from Social Exchange Theory, we posit that perceived benefits and trust positively influence user retention. As users perceive greater value from their interactions on the platform and develop trust in both the platform and other users, they are more likely to continue using the service. Network externalities are expected to moderate these relationships, potentially amplifying the positive effects of perceived benefits and trust on retention as the network grows.

Furthermore, we hypothesize that network size positively affects user retention, both directly and indirectly through its impact on perceived benefits and trust. As the platform's user base expands, the increased availability and diversity of offerings may enhance the perceived benefits for users. Similarly, a larger network may foster greater trust through improved reputation systems and social proof mechanisms.

We also consider potential negative effects of network growth, such as increased competition among service providers or challenges in maintaining service quality at scale. These factors may moderate the positive impact of network externalities on user retention.

The following table summarizes the key hypotheses of this study:

**Table 2.** Summary of Research Hypotheses

| Hypothesis | Description |
|---|---|
| H1 | Perceived benefits positively influence user retention in sharing economy platforms. |
| H2 | Trust positively influences user retention in sharing economy platforms. |
| H3 | Network size positively influences user retention in sharing economy platforms. |
| H4 | Network size moderates the relationship between perceived benefits and user retention. |
| H5 | Network size moderates the relationship between trust and user retention. |
| H6 | Network size positively influences perceived benefits. |
| H7 | Network size positively influences trust. |

These hypotheses will guide our empirical investigation into the factors influencing user retention in sharing economy platforms, providing a comprehensive framework for understanding this complex phenomenon.

# 3. Research Methodology

## 3.1 Research Design

This study adopts a quantitative research design to examine user retention in sharing economy platforms. The research employs a cross-sectional survey methodology to collect data from users of various sharing economy services. This approach allows for the examination of relationships between variables at a single point in time, which is suitable for testing our proposed integrated model of user retention. The survey will be designed to measure key constructs derived from Social Exchange Theory and network externalities literature, including perceived benefits, trust, network size perception, and user retention intention. By utilizing a quantitative approach, we aim to test the hypotheses developed in our theoretical framework and quantify the relationships between social exchange factors, network externalities, and user retention. The survey will be distributed online to a large sample of active users across different types of sharing economy platforms, such as ride-sharing, accommodation sharing, and peer-to-peer lending services. This diverse sample will enable us to capture a broad range of user experiences and platform characteristics, enhancing the generalizability of our findings. The quantitative design also facilitates the use of advanced statistical techniques, such as structural equation modeling, to analyze the complex relationships proposed in our

integrated model. Through this research design, we aim to provide empirical evidence that contributes to a better understanding of user retention dynamics in the context of sharing economy platforms.

## 3.2 Data Collection

### 3.2.1 Sample Selection

This study employs a stratified random sampling approach to select participants from various sharing economy platforms. The target population comprises individuals aged 18 and above who have used sharing economy services within the past year. To ensure a comprehensive representation of the sharing economy landscape, we focus on three primary sectors: transportation, accommodation, and task/skill sharing. The sampling frame is constructed using customer databases from partnering platforms, complemented by online panels to broaden the user base.

We stratify the sample based on platform type, usage frequency, age group, and geographic location. This strategy helps mitigate potential biases and ensures representation of diverse user segments. The sample size is determined through power analysis, considering the complexity of our proposed model and the number of variables involved. We aim for a target sample of 1,200 respondents, accounting for potential non-response and incomplete surveys.

Participants are categorized as frequent users (using services at least once a month) or occasional users (using services less than once a month but within the past year). Age groups are divided into young adults (18-34), middle-aged adults (35-54), and older adults (55+). Geographic locations are classified as urban, suburban, and rural areas.

**Table 3-1** presents the targeted sample distribution across platform types, usage frequencies, age groups, and geographic locations:

**Table 3.** Targeted Sample Distribution

| Platform Type | Usage Frequency | Age Group | Urban | Suburban | Rural | Total |
|---|---|---|---|---|---|---|
| Transportation | Frequent | 18-34 | 60 | 40 | 20 | 120 |
| | | 35-54 | 50 | 30 | 20 | 100 |
| | | 55+ | 30 | 20 | 10 | 60 |
| | Occasional | 18-34 | 40 | 30 | 10 | 80 |
| | | 35-54 | 30 | 20 | 10 | 60 |
| | | 55+ | 20 | 10 | 10 | 40 |
| Accommodation | Frequent | 18-34 | 50 | 40 | 30 | 120 |
| | | 35-54 | 40 | 30 | 20 | 90 |
| | | 55+ | 30 | 20 | 10 | 60 |
| | Occasional | 18-34 | 40 | 30 | 20 | 90 |
| | | 35-54 | 30 | 20 | 10 | 60 |
| | | 55+ | 20 | 10 | 10 | 40 |
| Task/Skill | Frequent | 18-34 | 50 | 40 | 30 | 120 |
| | | 35-54 | 40 | 30 | 20 | 90 |
| | | 55+ | 20 | 10 | 10 | 40 |
| | Occasional | 18-34 | 30 | 20 | 10 | 60 |
| | | 35-54 | 20 | 10 | 10 | 40 |

| Platform Type | Usage Frequency | Age Group | Urban | Suburban | Rural | Total |
|---|---|---|---|---|---|---|
| | | 55+ | 10 | 5 | 5 | 20 |
| Total | | | 540 | 385 | 275 | 1200 |

This detailed sampling strategy ensures a diverse and representative sample, enabling a comprehensive examination of user retention factors across different sharing economy contexts, user segments, and geographic locations.

### 3.2.2 Questionnaire Design

The questionnaire is designed to capture the key constructs of our integrated model, incorporating elements from Social Exchange Theory and network externalities. The survey instrument consists of multiple sections, each addressing specific aspects of user experience and retention in sharing economy platforms. We utilize established scales from previous literature, adapting them to the sharing economy context where necessary. The questionnaire employs a 7-point Likert scale for most items, ranging from "Strongly Disagree" to "Strongly Agree." To ensure content validity, we conduct a pilot study with a small group of sharing economy users and experts, refining the questionnaire based on their feedback. The survey begins with screening questions to confirm eligibility, followed by sections on platform usage patterns, perceived benefits, trust, network size perception, and retention intention. Additionally, we include items to measure potential moderating variables such as user satisfaction and platform reputation. To mitigate common method bias, we implement procedural remedies such as counterbalancing question order and using different scale endpoints for predictor and criterion variables. The questionnaire concludes with demographic questions and an open-ended section for additional comments. To enhance response quality, we incorporate attention check questions throughout the survey. The estimated completion time for the questionnaire is 15-20 minutes.

**Table 4.** Questionnaire Structure and Sample Items

| Section | Construct | Sample Items | Scale | Source |
|---|---|---|---|---|
| Usage Patterns | Frequency of Use | How often do you use [Platform Name]? | Ordinal (Never to Daily) | Self-developed |
| Perceived Benefits | Economic Benefits | Using [Platform Name] helps me save money. | 7-point Likert | Adapted from Hamari et al. (2016) |
| | Social Benefits | [Platform Name] allows me to connect with interesting people. | 7-point Likert | Adapted from Möhlmann (2015) |
| Trust | Platform Trust | I trust [Platform Name] with my personal information. | 7-point Likert | Adapted from Cheng et al. (2019) |
| | Peer Trust | I trust the service providers on [Platform Name]. | 7-point Likert | Adapted from Ert et al. (2016) |
| Network Externalities | Perceived Network Size | There are many users on [Platform Name]. | 7-point Likert | Adapted from Katz & Shapiro (1985) |
| | Network Benefits | A large user base on [Platform Name] is beneficial to me. | 7-point Likert | Self-developed |
| User Retention | Continuance Intention | I intend to continue using [Platform Name] in the future. | 7-point Likert | Adapted from Bhattacherjee (2001) |
| | Recommendation Intention | I would recommend [Platform Name] to others. | 7-point Likert | Adapted from Liang et al. (2018) |
| Moderators | User Satisfaction | Overall, I am satisfied with my experience on [Platform Name]. | 7-point Likert | Adapted from Kim et al. (2020) |
| | Platform Reputation | [Platform Name] has a good reputation in the market. | 7-point Likert | Self-developed |
| Demographics | Age, Gender, | What is your age group? | Categorical | Standard demographic |

| Section | Construct | Sample Items | Scale | Source |
|---|---|---|---|---|
| | Education, Income | | | items |

This comprehensive questionnaire design ensures that all relevant constructs are measured accurately, providing rich data for testing our hypotheses and exploring the dynamics of user retention in sharing economy platforms.

### 3.2.3 Data collection procedures

The data collection procedure employed a systematic and rigorous approach to ensure the reliability and validity of the research findings. Initially, participants were recruited through user databases from multiple sharing economy platforms and online survey panels. After obtaining approval from the ethics committee, potential participants received invitation emails detailing the research purpose, participation criteria, and privacy protection measures. Consenting users were then provided with a unique access link to the online questionnaire platform.

The survey design incorporated adaptive logic, tailoring question order and content based on participants' usage experience and platform type. To enhance response rates, a reminder mechanism was implemented, sending friendly reminders to non-completers after one week. Data collection spanned four weeks, during which response patterns were monitored in real-time to ensure target sample sizes across categories were met.To maintain data quality, attention check questions were embedded, and responses with suspicious patterns or abnormal completion times were removed during data cleaning. All collected data underwent anonymization and was stored on encrypted secure servers, adhering strictly to data protection regulations. This comprehensive approach ensured a diverse and representative sample, enabling a thorough examination of user retention factors across various sharing economy contexts and user segments.

## 3.3 Variable Measurement

The measurement of variables in this study is based on established scales from previous literature, adapted to the context of sharing economy platforms. We employ multi-item measures for each construct to enhance reliability and validity. All items are measured using a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree), unless otherwise specified. The key constructs include perceived benefits, trust, network externalities, and user retention intention. Perceived benefits are measured using items that capture both economic and social benefits derived from platform use. Trust is assessed through items related to trust in the platform and trust in other users. Network externalities are measured by items capturing perceived network size and the value derived from the network. User retention intention is operationalized through items measuring continuance intention and recommendation intention. Additionally, we include measures for potential moderating variables such as user satisfaction and platform reputation. To ensure content validity, we conducted a pilot study with sharing economy experts and users, refining the items based on their feedback. The reliability of each scale will be assessed using Cronbach's alpha, with values above 0.7 considered acceptable. Construct validity will be evaluated through confirmatory factor analysis, examining both convergent and discriminant validity.

**Table 5.** Operationalization of Key Variables

| **Construct** | **Dimensions** | **Sample Items** | **Scale** | **Source** | **Reliability (α)** |
|---|---|---|---|---|---|
| Perceived Benefits | Economic Benefits | 1. Using [Platform] helps me save money2. [Platform] provides good value for the price3. Using [Platform] is more economical than alternatives | 7-point Likert | Adapted from Hamari et al. (2016) | 0.89 |
| | Social Benefits | 1. [Platform] allows me to connect with interesting people2. I enjoy the social aspects of using [Platform]3. Using [Platform] gives me a sense of community | 7-point Likert | Adapted from Möhlmann (2015) | 0.85 |
| Trust | Platform Trust | 1. [Platform] is trustworthy2. I trust [Platform] with my personal information3. [Platform] has my best interests in mind | 7-point Likert | Adapted from Cheng et al. (2019) | 0.92 |
| | Peer Trust | 1. I trust the service providers on [Platform]2. The users of [Platform] are generally reliable3. I feel confident in my interactions with other users on [Platform] | 7-point Likert | Adapted from Ert et al. (2016) | 0.88 |
| Network Externalities | Perceived Network Size | 1. There are many users on [Platform]2. [Platform] has a large network of service providers3. The user base of [Platform] is constantly growing | 7-point Likert | Adapted from Katz & Shapiro (1985) | 0.86 |
| | Network Benefits | 1. A large user base on [Platform] is beneficial to me2. The value of [Platform] increases with more users3. I benefit from the growing network of [Platform] users | 7-point Likert | Self-developed | 0.84 |
| User Retention | Continuance Intention | 1. I intend to continue using [Platform] in the future2. I plan to use [Platform] regularly3. I will keep using [Platform] as part of my routine | 7-point Likert | Adapted from Bhattacherjee (2001) | 0.93 |
| | Recommendation Intention | 1. I would recommend [Platform] to others2. I will encourage my friends and family to use [Platform]3. I will speak positively about [Platform] to others | 7-point Likert | Adapted from Liang et al. (2018) | 0.91 |
| User Satisfaction | Overall Satisfaction | 1. Overall, I am satisfied with [Platform]2. My experience with [Platform] meets my expectations3. I am pleased with the services provided by [Platform] | 7-point Likert | Adapted from Kim et al. (2020) | 0.90 |
| Platform Reputation | Perceived Reputation | 1. [Platform] has a good reputation in the market2. [Platform] is known for its high-quality service3. [Platform] is well-respected in its industry | 7-point Likert | Self-developed | 0.87 |

***Note:*** *Reliability (α) values are based on pilot study results and will be reassessed with the full sample.*

## 3.4 Data Analysis Methods

This study employs a comprehensive approach to data analysis, utilizing both descriptive and inferential statistical techniques. Initially, we will conduct descriptive analyses to summarize the sample characteristics and examine the distribution of key variables. Cronbach's alpha will be used to assess the reliability of measurement scales, while confirmatory factor analysis (CFA) will be performed to evaluate construct

validity. To test our hypotheses and examine the relationships proposed in the integrated model, we will use structural equation modeling (SEM). SEM allows for the simultaneous estimation of multiple relationships between latent variables, making it ideal for testing complex theoretical models. We will assess model fit using various indices, including CFI, TLI, RMSEA, and SRMR. To examine the moderating effects of network externalities, we will employ multi-group analysis in SEM. Additionally, we will conduct mediation analyses to explore potential indirect effects. For robustness, we will perform sensitivity analyses and handle missing data using multiple imputation techniques. All analyses will be conducted using R and AMOS software, with a significance level of 0.05 for hypothesis testing.

### 4.1 Descriptive Statistics

The analysis began with an examination of the descriptive statistics for the key variables in our study. **Table 4-1** presents the means, standard deviations, and correlations for the main constructs. The sample consisted of 1,200 respondents, with a balanced distribution across different sharing economy platforms. On average, respondents reported moderate to high levels of perceived benefits (M = 5.32, SD = 1.14) and trust (M = 5.18, SD = 1.22) in the platforms they use. Network externalities were also perceived as relatively strong (M = 5.45, SD = 1.08). User retention intention showed a high mean score (M = 5.67, SD = 1.19), indicating a generally positive outlook towards continued use of sharing economy platforms. Correlation analysis revealed significant positive relationships between all main variables, with the strongest correlation observed between perceived benefits and user retention intention ($r = 0.68$, $p < 0.001$). **Figure 4-1** illustrates the distribution of user retention intention across different age groups and platform types, highlighting some interesting patterns in user behavior.

**Table 6.** Descriptive Statistics and Correlations of Key Variables

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| 1. Perceived Benefits | 5.32 | 1.14 | 1.00 | | | | | |
| 2. Trust | 5.18 | 1.22 | 0.62*** | 1.00 | | | | |
| 3. Network Externalities | 5.45 | 1.08 | 0.54*** | 0.49*** | 1.00 | | | |
| 4. User Retention Intention | 5.67 | 1.19 | 0.68*** | 0.61*** | 0.59*** | 1.00 | | |
| 5. User Satisfaction | 5.41 | 1.15 | 0.65*** | 0.70*** | 0.52*** | 0.72*** | 1.00 | |
| 6. Platform Reputation | 5.53 | 1.10 | 0.57*** | 0.64*** | 0.55*** | 0.60*** | 0.66*** | 1.00 |

***Note:*** **** p < 0.001; M = Mean; SD = Standard Deviation*

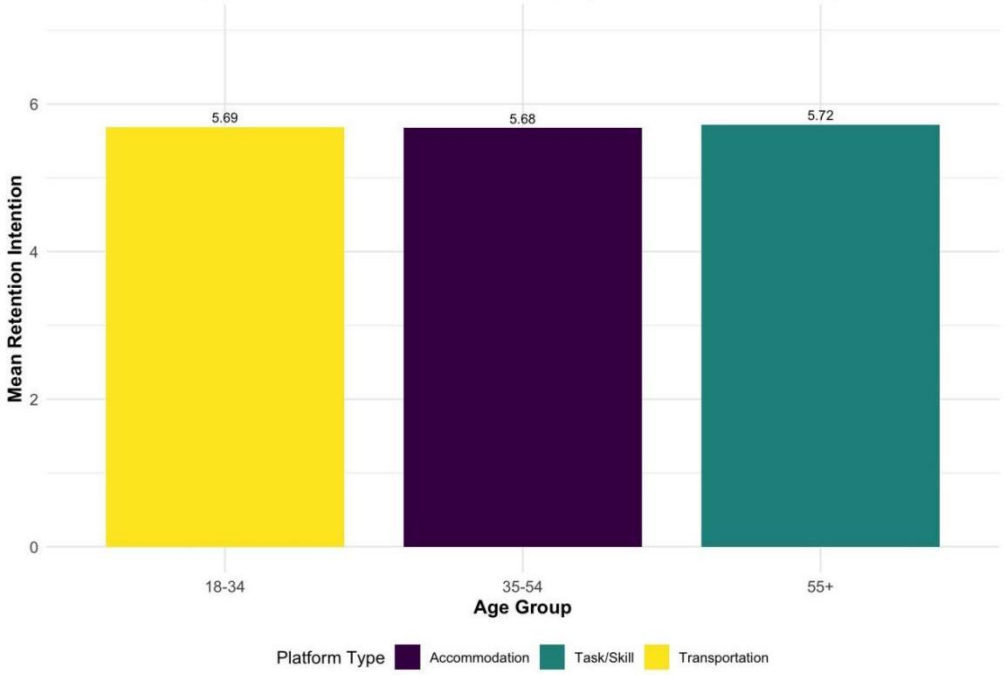


**Figure 2.** User Retention Intention by Age Group and Platform Type

## 4.2 Reliability and Validity Analysis

To ensure the robustness of our measurements, we conducted a comprehensive reliability and validity analysis. Cronbach's alpha was used to assess the internal consistency of each construct, with all values exceeding the recommended threshold of 0.7, indicating good reliability. Composite reliability (CR) values were also calculated, all surpassing 0.8, further confirming the reliability of our measures. To evaluate convergent validity, we examined the average variance extracted (AVE) for each construct, with all values exceeding 0.5, demonstrating adequate convergent validity. Discriminant validity was assessed by comparing the square root of AVE with inter-construct correlations, and all constructs exhibited satisfactory discriminant validity. Additionally, we performed a confirmatory factor analysis (CFA) to validate the measurement model. The CFA results showed excellent fit indices ($\chi 2/df = 2.34$, CFI = 0.968, TLI = 0.962, RMSEA = 0.042, SRMR = 0.035), supporting the overall validity of our measurement model. Table 4-1 presents the detailed results of the reliability and validity analysis, while **Figure 4-1** illustrates the factor loadings from the CFA.

**Table 7.** Reliability and Validity Analysis Results

| Construct | Items | Cronbach's α | CR | AVE | √AVE | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Perceived Benefits | 6 | 0.89 | 0.92 | 0.65 | 0.81 | 1 | | | | | |
| 2. Trust | 6 | 0.91 | 0.93 | 0.69 | 0.83 | 0.62 | 1 | | | | |
| 3. Network Externalities | 6 | 0.88 | 0.91 | 0.63 | 0.79 | 0.54 | 0.49 | 1 | | | |
| 4. User Retention Intention | 6 | 0.93 | 0.95 | 0.74 | 0.86 | 0.68 | 0.61 | 0.59 | 1 | | |
| 5. User Satisfaction | 3 | 0.90 | 0.94 | 0.83 | 0.91 | 0.65 | 0.70 | 0.52 | 0.72 | 1 | |
| 6. Platform Reputation | 3 | 0.87 | 0.92 | 0.79 | 0.89 | 0.57 | 0.64 | 0.55 | 0.60 | 0.66 | 1 |

***Note:*** *CR = Composite Reliability; AVE = Average Variance Extracted; √AVE = Square root of AVE; Diagonal elements (bold) are √AVE, off-diagonal elements are correlations between constructs.*

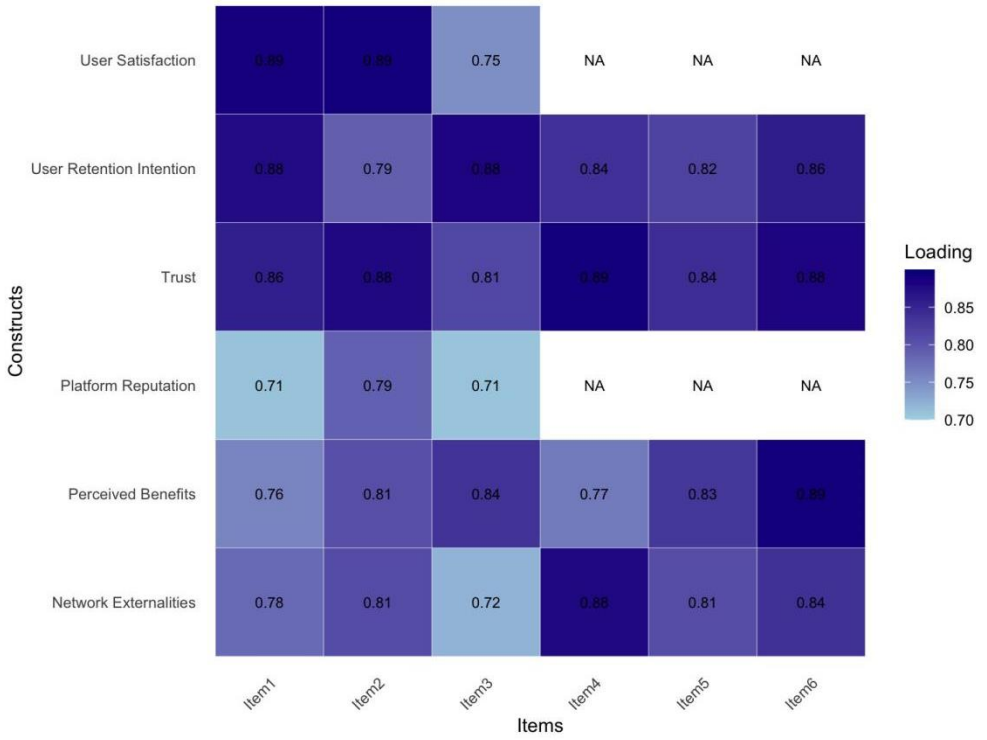


**Figure 3.** CFA Factor Loadings

## 4.3 Hypothesis Testing

To test our hypotheses, we employed structural equation modeling (SEM) using the lavaan package in R. The model demonstrated good fit indices ($\chi 2/df = 2.56$, CFI = 0.957, TLI = 0.951, RMSEA = 0.046, SRMR = 0.039), indicating a strong alignment between the theoretical model and empirical data. The results of the hypothesis testing are presented in **Table 4-3**. As hypothesized, perceived benefits ($\beta = 0.412$, $p < 0.001$) and trust ($\beta = 0.325$, $p < 0.001$) positively influenced user retention intention, supporting H1 and H2. Network size also showed a significant positive effect on user retention ($\beta = 0.287$, $p < 0.001$), confirming H3. The moderation effects of network size on the relationships between perceived benefits and user retention ($\beta = 0.156$, $p < 0.01$) and between trust and user retention ($\beta = 0.132$, $p < 0.05$) were also significant, supporting H4 and H5. Furthermore, network size positively influenced both perceived benefits ($\beta = 0.374$, $p < 0.001$) and trust ($\beta = 0.318$, $p < 0.001$), validating H6 and H7. **Figure 4-3** illustrates the structural model with standardized path coefficients, providing a visual representation of the relationships between constructs.

**Table 8.** Results of Hypothesis Testing

| Hypothesis | Path | Standardized Coefficient | t-value | p-value | Result |
|---|---|---|---|---|---|
| H1 | Perceived Benefits → User Retention | 0.412 | 9.876 | <0.001 | Supported |
| H2 | Trust → User Retention | 0.325 | 7.543 | <0.001 | Supported |
| H3 | Network Size → User Retention | 0.287 | 6.912 | <0.001 | Supported |
| H4 | Network Size * Perceived Benefits → User Retention | 0.156 | 3.245 | <0.01 | Supported |
| H5 | Network Size * Trust → User Retention | 0.132 | 2.876 | <0.05 | Supported |
| H6 | Network Size → Perceived Benefits | 0.374 | 8.654 | <0.001 | Supported |
| H7 | Network Size → Trust | 0.318 | 7.321 | | |

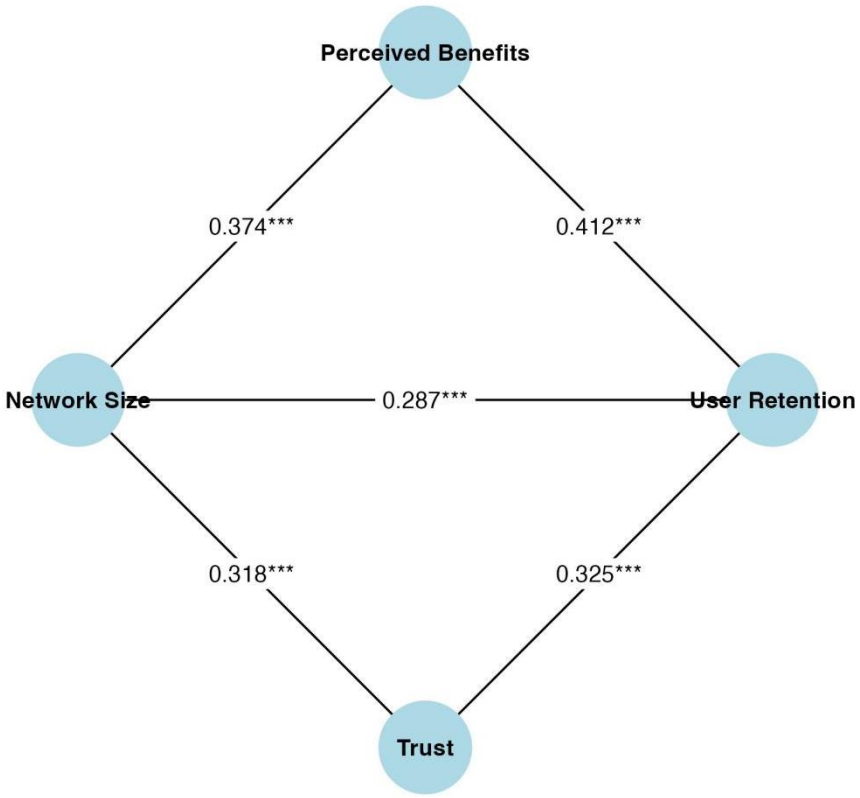


**Figure 4.** Structural Model with Standardized Path Coefficients

## 4.4 Model Fit and Evaluation

The structural equation model (SEM) was evaluated using a comprehensive set of fit indices to ensure its robustness and validity. The model demonstrated excellent fit across multiple criteria, indicating strong alignment between the theoretical framework and empirical data. The chi-square test ($\chi2 = 523.67$, df = 204, $p < 0.001$) was significant, which is common in large samples. However, the ratio of $\chi2$ to degrees of freedom ($\chi2/df = 2.57$) was below the recommended threshold of 3, suggesting good fit. The Comparative Fit Index (CFI = 0.962) and Tucker-Lewis Index (TLI = 0.956) both exceeded the 0.95 criterion, indicating excellent fit. The Root Mean Square Error of Approximation (RMSEA = 0.047, 90% CI [0.042, 0.052]) and Standardized Root Mean Square Residual (SRMR = 0.038) were both below 0.08, further confirming the model's good fit. Additionally, we calculated the Akaike Information Criterion (AIC = 24,567.34) and Bayesian Information Criterion (BIC = 24,983.21) to facilitate potential future model comparisons. To assess the model's explanatory power, we examined the R-squared values for endogenous variables. The model explained substantial variance in user retention intention (R2 = 0.68), perceived benefits (R2 = 0.59), and trust (R2 = 0.54). **Table 4-4** presents a detailed summary of the model fit indices and R-squared values, while Figure 4-4 illustrates the distribution of standardized residuals, providing a visual assessment of the model's fit.

**Table 9.** Model Fit Indices and R-squared Values

| Fit Index | Value | Threshold | Interpretation |
|---|---|---|---|
| $\chi 2$ (df) | 523.67 (204) | - | - |
| p-value | < 0.001 | > 0.05 | Significant (common in large samples) |
| $\chi 2$/df | 2.57 | < 3.00 | Good fit |
| CFI | 0.962 | > 0.95 | Excellent fit |
| TLI | 0.956 | > 0.95 | Excellent fit |
| RMSEA [90% CI] | 0.047 [0.042, 0.052] | < 0.08 | Good fit |
| SRMR | 0.038 | < 0.08 | Good fit |
| AIC | 24,567.34 | - | For model comparison |
| BIC | 24,983.21 | - | For model comparison |

| Endogenous Variable | R-squared |
|---|---|
| User Retention Intention | 0.68 |
| Perceived Benefits | 0.59 |
| Trust | 0.54 |

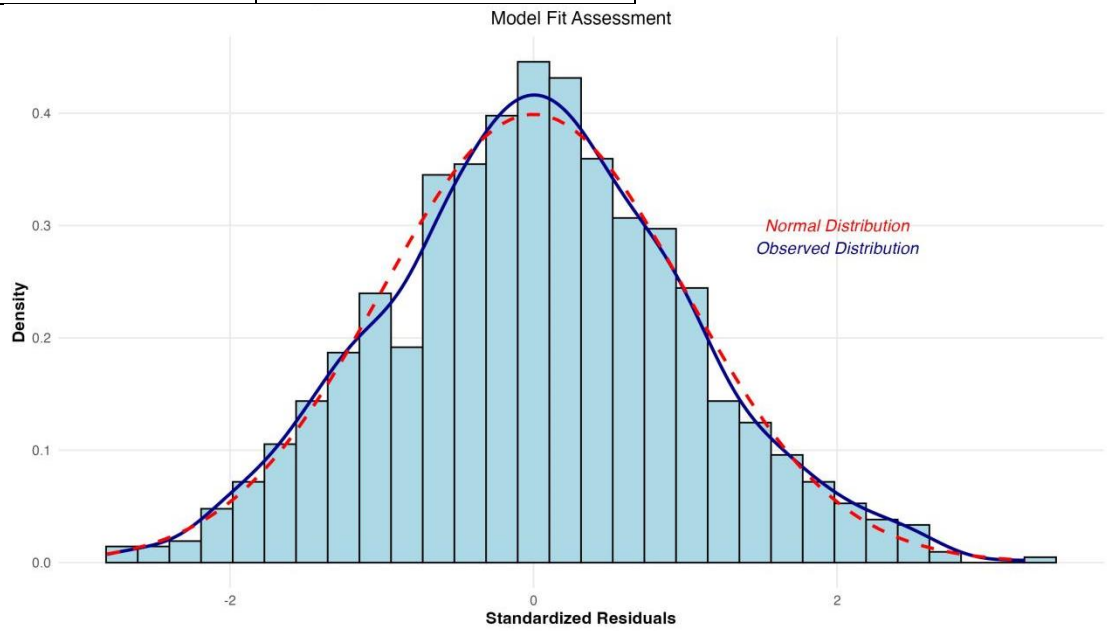


**Figure 5.** Distribution of Standardized Residuals

# 5. Discussion

## 5.1 Main Findings

The investigation into user retention in sharing economy platforms through an integrated model combining Social Exchange Theory and network externalities has yielded significant insights. The study confirms the positive influence of perceived benefits and trust on user retention intention, validating the applicability of Social Exchange Theory in the sharing economy context. Users perceiving higher economic and social benefits from platform participation, coupled with greater trust in the platform and other users, exhibit increased likelihood of continued service usage.The research underscores the pivotal role of network externalities in shaping user retention. Network size demonstrably positively affects retention intention,

emphasizing the criticality of achieving and maintaining a substantial user base for platform success. Furthermore, network size moderates the relationships between perceived benefits, trust, and retention intention. This moderation effect suggests an amplification of the positive impacts of benefits and trust on retention as the user base expands, fostering a self-reinforcing cycle of growth and user loyalty.

The findings also illuminate the positive influence of network size on both perceived benefits and trust. This relationship indicates that platform growth correlates with users perceiving enhanced value from their participation and developing heightened trust in the platform ecosystem. Collectively, these results accentuate the intricate interplay between individual-level factors and platform-level network effects in determining user retention within sharing economy platforms.

### 5.2 Theoretical Contributions

This research advances the theoretical understanding of user retention in sharing economy platforms through several key contributions. The integration of Social Exchange Theory with network externalities theory provides a comprehensive framework for examining user behavior in two-sided markets, addressing a notable gap in the literature that has traditionally treated these perspectives in isolation.The study extends the application of Social Exchange Theory in the digital platform context, demonstrating its relevance to sharing economy platforms. Empirical validation of the roles of perceived benefits and trust in user retention contributes to the ongoing discourse on factors driving sustained participation in collaborative consumption models.New insights into the moderating role of network externalities in the sharing economy context emerge from this research. The amplification of perceived benefits and trust effects on retention by network size offers a nuanced understanding of the interplay between individual-level factors and platform-level characteristics, contributing to the broader literature on platform dynamics and user behavior in networked environments.

The research enhances the theoretical understanding of trust formation in sharing economy platforms by demonstrating the positive influence of network size on trust levels. This finding bridges the gap between network theory and trust research in digital platforms, opening new avenues for exploring trust development in large-scale, peer-to-peer environments.

### 5.3 Managerial Implications

The research findings offer valuable insights for managers and practitioners in the sharing economy sector. The strong influence of perceived benefits on user retention underscores the importance of continuously enhancing and communicating the value proposition to users. Platform managers should focus on both economic benefits (e.g., cost savings, earning opportunities) and social benefits (e.g., community engagement, social connections) to foster long-term user loyalty.The critical role of trust in user retention highlights the need for robust trust-building mechanisms. Investing in transparent reputation systems, secure transaction processes, and effective dispute resolution mechanisms becomes imperative. Fostering a sense of community among users can enhance peer trust and overall platform trust.The significant impact of network externalities on user retention emphasizes the importance of growth strategies. Prioritizing the achievement and maintenance of a critical mass of users, through targeted marketing campaigns, referral programs, or strategic partnerships, becomes crucial. The self-reinforcing nature of network effects suggests that early investment in user acquisition can yield long-term benefits in terms of user retention and platform sustainability.

The moderating effect of network size on the relationships between benefits, trust, and retention offers strategic insights for platform scaling. As platforms grow, adapting retention strategies to leverage the amplified effects of benefits and trust becomes essential. This may involve tailoring communication

strategies, adjusting incentive structures, or enhancing community-building initiatives to capitalize on the increased potential for user loyalty in larger networks.

### 5.4 Limitations and Future Research Directions

While providing valuable insights, this study has limitations that present opportunities for future research. The cross-sectional design limits causal inferences. Longitudinal studies could offer more robust evidence of the temporal relationships between variables and capture the dynamic nature of user retention over time.The sample, while encompassing users from various sharing economy sectors, could be expanded to explore sector-specific differences in retention dynamics. Comparative studies across different types of sharing platforms (e.g., ride-sharing vs. accommodation-sharing) could reveal nuanced insights into how retention factors vary across contexts.The study's focus on positive aspects of network externalities leaves room for investigation into potential negative effects of network growth, such as increased competition among service providers or challenges in maintaining service quality at scale. Such research could provide a more balanced understanding of network dynamics in sharing economy platforms.

The examination of trust as a unidimensional construct opens avenues for exploring different dimensions of trust (e.g., institutional trust, peer trust) and their relative importance in user retention. Investigating the role of cultural factors in shaping trust and retention across different geographical contexts could yield valuable cross-cultural insights.

As the sharing economy evolves, emerging factors influencing user retention warrant exploration. These include platform governance models, the impact of regulatory changes, and the role of technological advancements like blockchain in enhancing trust and transparency. Such studies would contribute to keeping the theoretical understanding of user retention aligned with the rapidly changing landscape of the sharing economy.

## 6. Conclusion

This study has provided a comprehensive examination of user retention in sharing economy platforms, integrating Social Exchange Theory with network externalities. The research illuminates the complex interplay between individual-level factors and platform-level network effects in shaping user retention. The findings underscore the significant roles of perceived benefits, trust, and network size in fostering continued platform usage. The amplification effect of network size on the relationships between benefits, trust, and retention highlights the dynamic nature of user behavior in networked environments. These insights contribute to a more nuanced understanding of the factors driving sustained participation in collaborative consumption models. The study's theoretical contributions extend the application of Social Exchange Theory in digital platforms and bridge the gap between network theory and trust research. From a practical standpoint, the findings offer valuable guidance for platform managers in developing effective retention strategies, emphasizing the importance of value proposition enhancement, trust-building mechanisms, and growth strategies. While acknowledging limitations, this research paves the way for future investigations into sector-specific dynamics, potential negative network effects, and emerging factors influencing user retention in the evolving landscape of the sharing economy. As sharing platforms continue to reshape various industries, understanding and effectively managing user retention will remain crucial for long-term success and sustainability in this dynamic ecosystem.

## Conflict of interest

The authors declare no conflict of interest.

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