

## Article

# Knowledge Sharing Practices for Corporate Sustainability: An Empirical Investigation of Sharing Economy Firms in Japan

Ye-Chan Park<sup>1</sup> and Paul Hong<sup>2,\*</sup> <sup>1</sup> Faculty of Economics, The University of Tokyo, 3-34-3 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan<sup>2</sup> John B. and Lillian E. Neff College of Business and Innovation, The University of Toledo, Toledo, OH 43606, USA

\* Correspondence: paul.hong@utoledo.edu; Tel.: +1-419-530-2054

**Abstract:** Qualitative studies of sharing economy research are mostly descriptive case studies in the context of the United States and Europe. Although Asian economies are vibrant and expanding, rarely sharing economy research focuses on Asian contexts. Furthermore, quantitative analysis of sharing economies is rare. For this reason, our research aim is to examine the corporate sustainability of sharing economy companies through qualitative and quantitative analyses. It also shows how knowledge-sharing practices affect corporate sustainability in the context of emerging sharing economy firms in Japan. The contribution of this paper is threefold: (1) to provide a conceptual framework for sharing economy practices in general; (2) to present a specific research model in a Japanese context; (3) to report the qualitative case study findings and discuss the empirical results of testing of hypotheses with statistical validation. The research results suggest that the knowledge creation context has a positive effect on both explorative and exploitative knowledge-sharing practices. Explorative knowledge sharing has a positive effect on sustainability which in turn shows a negative effect on financial performance in the short run but a positive impact in the long run. Theoretical and managerial implications provide valuable insight into how sharing economy firms achieve sustainability goals. Future research issues are also summarized.

**Keywords:** knowledge sharing; corporate sustainability; sharing economy firms; knowledge creation capability; Japan



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## 1. Introduction

There has been a steady stream of research on sustainability from diverse perspectives [1]. An emerging theme is a sharing economy (SE). Its active role in the service sectors has drawn operations research attention as well [2]. A key issue is how to ensure the long-term viability of these sharing economy companies through their consistent financial performance. Although Asian economies are vibrant and expanding, rarely sharing economy research focuses on Asian contexts. Furthermore, quantitative analysis of sharing economies is rare. For this reason, our research aim is to examine the corporate sustainability of sharing economy companies through qualitative and quantitative analyses. It also shows how knowledge-sharing practices affect corporate sustainability in the context of emerging sharing economy firms in Japan. The contribution of this paper is threefold: (1) to provide a conceptual framework for sharing economy practices in general; (2) to present a specific research model in a Japanese context; (3) to report the qualitative case study findings and discuss the empirical results of testing of hypotheses with statistical validation.

Traditional manufacturing firms derive their competitive advantage from their technological competence and asset ownership (e.g., large land, production facilities, and financial resources). On the other hand, sharing economy firms mainly use their service platforms that connect customers and asset owners. Airbnb, for example, uses technology platforms to connect people who have underutilized resources (e.g., houses, cabins, condos) and those who seek homestays for vacation rentals, and tourism activities. Airbnb competes

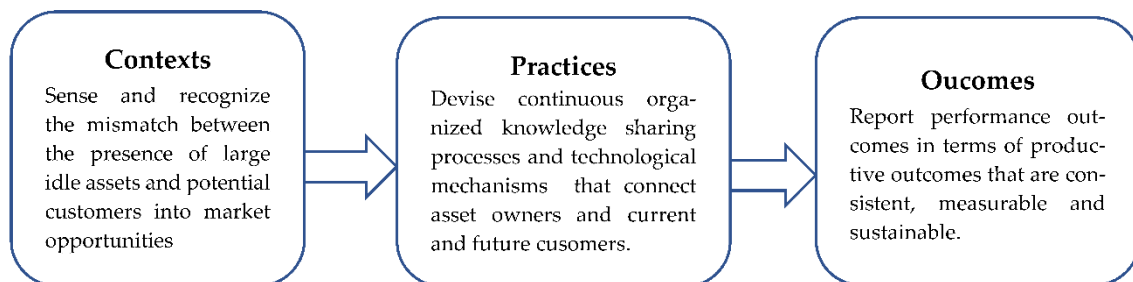
with its know-how (i.e., technology platforms) to capture rising market opportunities with evolving needs of those with idle assets [3]. Hence, the knowledge creation context (e.g., market opportunities) and knowledge-sharing ability through technology platforms are crucial for their business success.

At the same time, such sharing economy firms like Airbnb require consistent financial performance to sustain their existence (i.e., corporate sustainability). Even non-profit SE organizations (e.g., MOOCs, NPOs) can continue their operations with their reliable financial performance. Since research on sharing economy firms is mostly about US firms (e.g., Airbnb, Uber), this study aims to examine how SE firms operate in Japan. To examine how SE firms survive and thrive in Japan, a conceptual framework defines drivers, practices, and outcomes based on the literature on sharing economy, operations management, and corporate sustainability. The research model shows specific variables that explain the causal relationships. For the empirical tests, hypotheses are presented. Research methods describe the selection criteria of sample respondents and data collection procedures and statistical analyses. Research implications are summarized to highlight the relevance and contribution of this study. Future research issues are also discussed.

## 2. A Conceptual Framework of Sharing Economy Firms

This section presents unique features of sharing economy in terms of key assumptions such as business contexts, technological accessibility, and motivation of asset owners (e.g., freedom, flexibility, and income needs) [4–6]. Often scholars use a conceptual framework to present key research concepts, study background and theoretical foundation [7–10].

Figure 1 describes sharing economy firms in terms of contexts, practices, and outcomes. Sharing economy firms operate in knowledge-intensive service sectors. By nature, sharing economy is about increasing the level of utilization of idle assets in the large ecosystem for productive use, not by individual or small group efforts, but by digitally connected ecosystem mechanisms [11–14]. Qualitative studies of sharing economy research are mostly descriptive case studies in the context of the United States and Europe [11–15].



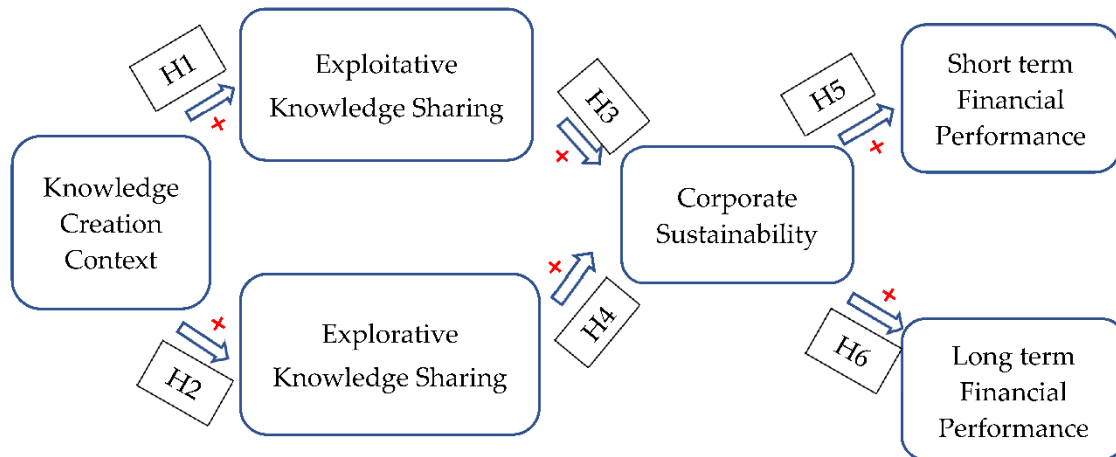
**Figure 1.** Drivers, Practices, and Outcomes of Sharing Economy Firms.

Key drivers are creating market opportunities that translate the mismatch between the presence of huge untapped available assets and potential customers into market opportunities [5,6]. The key practices are related to organizational system processes and technological mechanisms (e.g., mostly digital platforms) that enable offline transactions between users [8,9,16–19]. They facilitate peer-to-peer transactions, where both the providers and the consumers are private individuals, not businesses or professional operators [16,17]. They emphasize temporary access rather than ownership [4,16,17,20]; and (4) they are focused on the use of underutilized capacity (e.g., physical assets, resources, skills, or time) [20,21].

Although not all SE firms carry all these features, the realistic combination of these characteristics is the precondition of any SE firm in different economic systems. The above conceptual framework provides general background on how sharing economy operates. The next section presents a specific research model that defines key variables and their interrelationships.

### 3. Research Model

Figure 2 presents a specific research model. The first variable, knowledge-creating capability (KCC) is related to creating market opportunities.



**Figure 2.** Knowledge Sharing and Sustainability in Supply Chains.

#### 3.1. Knowledge Creation Context in the Sharing Economy Firms

Knowledge management is critical for organizations, and various ways to improve knowledge creation (KC) and management need to be studied [22,23]. KC has been recognized as a core competence for sustainable competitive advantage for global organizations as well as knowledge-intensive firms. For instance, a study posited that the capability to create and apply new knowledge successfully constitutes the true source of competitive advantage of the firm [24]. They analyze several levels of KC, starting from the knowledge creation context of individuals, then to that of teams/groups or organizations, and finally to the knowledge creation process between organizations through mutual interaction. As a theoretical framework, they suggest Socialization, Externalization, Combination, and Internalization (SECI) model to explain the knowledge creation process. Other studies analyze a variety of KC in terms of core competence [25–28].

To understand the function of KC in the SE context, this research model focuses on how knowledge sharing (KS) across corporate boundaries is a crucial process of KC.

Knowledge creation context (KCC) is an important theme for all organizations because it is a strategic structure for creating innovation for all organizations [29]. KCC is a dynamic asset created through continuous interactions with internal and external stakeholders. Knowledge creation context (KCC) is defined as “the environment of internal employees to access, absorb, and combine internal information, and to create value from that exchange”. In general, KCC plays a unique role in shaping the direction of firms’ knowledge activities (i.e., knowledge-sharing behaviors with downstream consequences on performance). A critical aspect of KCC is about sensing and securing market opportunities.

KCC is also an important organizational structure because global firms must not overlook its crucial role of it in relationships with external stakeholders as well as internal stakeholders. KCC is thought to affect the understanding of customer needs and cooperation with trading partners. Existing work suggests that organizations’ KCC explains their knowledge-sharing behavior with external stakeholders. In particular, internal and external KC is essential in order to create innovation at a low cost and in a short period of time. For example, scholars have found that KC leads to stabilized operational efficiency, effectiveness, and service quality via long-term stable partnership with stakeholders in the supply chain.

Similarly, in a field study of top management teams and knowledge workers from 72 technology firms, a study demonstrated that the rate of new product and service introduction was a function of organization members’ ability to combine and exchange knowledge [30]. They tested the existing knowledge of employees (their education levels

and functional heterogeneity), knowledge from member ego networks (number of direct contacts and strength of ties), and the organizational tendency for risk-taking and teamwork. To operationalize KCC, they measure employee access to the information within the organization, their ability to absorb and combine information, and their satisfaction with the value that comes from the information exchange and absorption process.

While research on the knowledge creation process has traditionally been confined to the boundaries of an organization, more recently, scholars have applied KS to the ecosystem context. The ecosystem view argued that a singular organization is embedded in an ecosystem, and much knowledge creation happens between organizations or industries, or by networks of organizations, including suppliers, users, competitors, universities, public research centers, etc. [31–33]. Likewise, firms are able to have co-created knowledge with external stakeholders during the innovation process to expand their knowledge base [33,34]. In terms of the supply chain, inter-organizational learning is the key to the completion of the knowledge co-creation process [33,35]. Therefore, we investigate knowledge potential to influence the firms' sustainability and performance in other non-traditional contexts such as firms in the sharing economy industry. Specifically, we examine the role of KS, which affects KCC.

### 3.2. Knowledge Sharing in Service Supply Chain Context

There are two types of KS: exploitative KS, which refers to the utilization of existing knowledge, and the explorative type of KS, which finds opportunities to create new innovations at higher risk [36]. KC and KS are connected through the organizational routine formation process [37–41].

First, exploitative KS is the exchange of knowledge between firms to seek short-term rewards, focusing on the survival needs of selected functions and pursuing risk-averse behaviors [42]. Organizational context and structure determine the practices. In the context of knowledge-intensive environment, exploitative KS is mainly directed at fine-tuning and incremental improvement, attenuating for customers. However, the premise of such fine-tuning and incremental improvement is the identification and the proposal of timely and efficient proposals for remedies, the latter of which largely depends on the capability to create solutions within the firm. Knowledge creation That capability directly influences the effective sharing of such problems and solutions among their stakeholders. Although the knowledge-sharing literature has mainly focused on the connection from KCC to explorative KS [22,27,43–45], we maintain that a positive knowledge creation context is more likely to engage in knowledge-intensive activities in innovative problem-solving of existing known needs.

Thus, the first hypothesis states,

**Hypothesis 1 (H1).** *Knowledge creation context (KCC) has a positive influence on exploitative knowledge sharing (KS) in the corporate supply chain.*

Second, exploratory knowledge sharing is the exchange of knowledge between firms to seek long-term rewards, focusing on the survival of the system as a whole, and pursuing risk-taking behaviors [42]. Explorative knowledge sharing creates organizational routines. Previous research shows that knowledge affecting decision-making can be seen as a routine generating process in the organization of KC. Stene (1940) defined organizational routines as interaction patterns related to the coordination of organizational activities [46]. On the other hand, Nelson & Winter (1982) defined organizational routines as the organizational capacity to evaluate and select new solutions through exploration [47]. Since the exploration of new solutions generates new organizational routines from existing organizational routines, new solutions are continuously discussed within the organization. As individuals acquire new knowledge, organizational routines change [48]. As employees create new knowledge, existing routines evolve and new organizational capabilities emerge [49,50].

The positive effect of KS on corporate performance can be applied to KS economy firms too. For example, the physical tool of communication is well-established for sharing economy firms which commonly operate as digital platforms. As Im and Rai (2008) extensively discuss, the fundamental instrument enabling such communication is the recent advance in information technology which has a critical role in the extended enterprise of supplier and customer relationships [42]. Contrary to some traditional medium size manufacturing firms that may still largely operate on a paper basis, which hinders the immediate transportation and sharing of timely knowledge, sharing economy firms are profiting precisely because of the convenient digital platform to which anyone can easily have access. Hence, the necessary conditions for tools of effective communication are well established.

They also define ontological commitment in a long-term relationship as the reliance of partnering firms on digital boundary objects to span their knowledge boundaries [42]. By building upon the work of [51], they identified three knowledge boundaries between partners: syntactic, semantic, and pragmatic. These three boundaries are all meant to contain sufficient detail on terminology, protocol, and syntax to be understood by concerned parties when they move across firms. This is particularly important for platform-type firms, where the key determinant of success rests on how they streamline often disparate terminologies and transaction methodologies between the users and providers into a simple and common fashion to promote active participation.

Therefore, knowledge creation context (KCC) suggests the ontological commitment which facilitates new knowledge sharing of sharing economy firms [42]. Hence, explorative KS contributes to internal innovation and the construction of the organization's ability. Companies that value new ideas and welcome project failures in the course of searching for new growth opportunities appreciate explorative knowledge-sharing activities among teams and within organizational processes. The such conducive environment has contagious effect through supply chain members as well. Thus, the second hypothesis is stated as:

**Hypothesis 2 (H2).** *Knowledge creation context (KCC) has a positive influence on explorative knowledge sharing (KS) in the corporate supply chain.*

### 3.3. Knowledge Sharing and Corporate Sustainability

Next, we explain whether exploitative and explorative KS is associated with sustainability. Co-creation with customers and stakeholders is said to be an important strategy for a company's long-term growth [52–56]. In the 21st century, due to the spread of the Internet, customers have begun to actively interact with suppliers of products and services, and this interaction has had a major impact on the value-creation activities of individual companies [57]. By interacting with the knowledge and skills that customers have, companies can create their own competencies and drive sustainable growth. Prahalad & Ramaswamy (2002) believe that KS contributes to corporate sustainability [53].

KS is an important competence that supports the SE business. In a technology-driven competitive market, firms must gain a competitive advantage by combining both radical and incremental innovation [58,59]. The sharing economy industry, which is the focus of this study, also has a large number of platform businesses that utilize digital technology and is vulnerable to technological changes in the digital transformation (DX) era, hence their capability to share knowledge effectively is likely to predict organizational performance.

In certain organizational knowledge creation contexts (KCC), firms adopt explorative and exploitative KS with core partners in a company's supply chain will be important in order to achieve those sustainable competitive advantages. Sustainable competitive advantages do not depend on innovation itself but on the capability to create the tide of innovation, and managers must actively manage the cycles of technical change to build opportunities for new technologies [59,60]. In the context of innovation, this is to adapt the requirements of both incremental innovations pursuing efficiency and radical innovation-

seeking change in content. Likewise, in the context of KS, the balance of exploitative and explorative KS is critical for sustainable competitive advantage [25,36,59–61].

While the discussions of exploitation and exploitation were mostly related to innovation, Im and Rai (2008) extended the utilization of both exploitation and exploration to the knowledge-sharing context, arguing that balancing both with partners in the supply chain affects a company's long-term international relationships [42]. Through empirical analysis, they show that the balance between exploitative and explorative KS impacts relationship performance gains in customers and vendors. We assert that this long-term relationship performance of their study is closely related to the sustainable relationships we are focusing on here.

Thus, the next two hypotheses are stated,

**Hypothesis 3 (H3).** *The exploitative KS with partners in a supply chain has a positive influence on sustainability-seeking.*

**Hypothesis 4 (H4).** *The explorative KS with partners in a supply chain has a positive influence on sustainability-seeking.*

### 3.4. Corporate Sustainability and Firm Performance

Corporate sustainability is imperative for business today in that it is essential to long-term corporate survival and the delivery of market value across society. In other words, appropriate sustainability is a company's delivery of long-term value in financial, environmental, social, and ethical terms. Corporate sustainability starts with a company's value system and a principled approach to doing business. By incorporating sustainable principles into strategies, policies, and procedures, and establishing a culture of integrity, companies are not only upholding their basic responsibilities to people and the planet but also setting the stage for long-term success. Hence, by conducting business responsibly in accordance with international principles and taking actions to support the society around them, corporations are likely to have healthy and profitable long-term growth. In previous studies, creating shared value (CSV) activities related to sustainability have been analyzed by focusing on their relationship with financial performance, and the results of studies targeting overseas firms have confirmed that there exists a correlation between the implementation of such activities and financial performance [62].

On the other hand, long-term investments are required for corporate sustainability, and such investments may have a negative impact on a company's financial performance in the short term. In fact, a recent study shows that CSV activities in Japanese firms contribute to long-term effects, but do not contribute to short-term improvements in financial performance [62].

Thus, the final two hypotheses are stated,

**Hypothesis 5 (H5).** *Corporate sustainability-seeking has a positive influence on corporate long-term performance.*

**Hypothesis 6 (H6).** *Corporate sustainability-seeking has a negative influence on corporate short-term performance.*

To provide intuition on the statistical theory, we provide a simple example of a linear, one-mediator model drawn from the recent exposition of (Weiner et al., 2012) Consider the following relationship;

$$Y = d_1 + cX + \varepsilon_1 \quad (1)$$

$$M = d_2 + aX + \varepsilon_2 \quad (2)$$

$$Y = d_3 + c'X + bM + \varepsilon_3 \quad (3)$$

$$Y = d_4 + b_uM + \varepsilon_4 \quad (4)$$

where the variables defined are

- Y: dependent (outcome) variable.

- $M$ : Mediator
- $X$ : independent variable
- $c$ : the total effect of  $X$  on  $Y$  adjusted for  $M$
- $b$ : the effect of  $M$  on  $Y$  adjusted for  $X$
- $\varepsilon_1, \varepsilon_2, \varepsilon_3$ , and  $\varepsilon_4$ : residuals
- $d_1, d_2, d_3$ , and  $d_4$ : intercept

Equations (1) to (3) represent the classic formulation of a single-mediator model as in (Baron and Kenny, 1986), while Equation (4) represents the “unadjusted” effect of  $M$  on  $Y$  denoted by  $b_{ii}$ . Note that the single-mediator model decomposes the total effect,  $c$ , into the mediated effect  $ab$ , and the direct effect  $c'$ , leading to the equation relationship:

$$c = ab + c' \quad (5)$$

However, this relation is not necessarily true for non-linear models with multiple mediators. We consider an extension to our case below.

$$y = By + \Gamma x + \varepsilon$$

where the notations are

- $y$ : vector of endogenous (dependent) variables
- $x$ : vector of exogenous (independent) variables
- $\varepsilon$ : vector of residual terms
- matrix  $B$ : contains the coefficients (paths) between endogenous variables
- matrix  $\Gamma$ : contains the coefficients between the exogenous and endogenous variables

This, in principle, allows for arbitrary mediation relationships that can be represented by a linear transformation of the covariates and the other dependent variables. One observation that elucidates the flexibility of this framework is that if we want to allow for feedback loops, the elements above the diagonal of matrix  $B$  can be adjusted to non-zero elements. If we do not want to allow for such loops, we can simply predetermine them to be zero. While we suppress these notations below for simplicity, note that the regression relationships defined by this multidimensional model are implicitly considered.

## 4. Research Methods

### 4.1. An Overview

To conduct a nationwide survey of sharing economy firms in Japan, the first step was to define the relevant variables and develop the items based on the literature survey and the feedback of practitioners and academic researchers. Our research team has collaborated with Japan's Sharing Economy Association (JSEA), to which 183 sharing economy firms in Japan belong. Our analysis is based on the responses of these sharing firms. We also complement this statistical analysis with semi-structured interviews with several stakeholders of the SE in Japan, including CEOs and managers of venture capital funds who have deep insights into the managerial practices of sharing economy firms in Japan.

Second, we conducted interviews to corroborate our correlational findings and examine the potential causal role of KCC on sustainability and firm performance [62–64]. In most studies, the targets of such empirical search often differ (e.g., Uber and Airbnb) by involving different geographical locations and longitudinal heterogeneities between such research. Such research results often lead to the risk of different unobserved covariates and wide fluctuating distributions, resulting in higher risks of confounding effects and erroneous statistical conclusions. By contrast, in our study, the targets of our search are consistent for examining the drivers, practices, and outcomes. The empirical investigation was considered simultaneously for all individual firms, significantly reducing such risks. This is particularly important for actual applications of these theories for managers because it is often the case that when considering an investment in sustainable reformation of business strategy, there is always entailing risk, and having the roadmap from the antecedents

of sustainability to their goal of financial performance is crucial. Hence, our unifying framework is particularly important.

Third, to the best of our knowledge, this is the first research that used a nation-scale search to statistically evaluate and quantify the actual antecedents and consequents of sustainability for sharing economy firms. Due to long-standing criticism on the lack of empirical studies on sharing economy firms in Asian countries, recently there has been an increasing number of empirical research for SE [14,15,65]. However, the vast majority of them focus on the only an arbitrary selected number of firms, if not a single (most of them being mega tech firms, like Airbnb, and Uber. See [1] for the exhaustive survey on empirical approaches to sharing economy studies). We argue that such empirics on a single case study about an already successful firms are prone to heavy bias (selected bias, winner's bias) and are not fit to argue about sharing economies in general.

Therefore, the non-arbitrary survey targeting the entire universe of sharing economy firms in a single country is crucially important. We acknowledge the possible difficulties that we face, like the small sample size, and the restrictive nature of investigation on a single nation among many nations, but we will discuss the limitations extensively in the following sections, doing our best to uncover often overlooked biases. Overall, we hope this paper to be the baseline for more data-driven theoretical research on SE.

#### 4.2. Sample

The subject of this study is the Sharing Economy industry in Japan. Compared to other countries, Japan's Sharing Economy industry is historically short-lived, and the population of companies is currently small. To ensure statistical reliability and validity, the sample in this study is a member of Japan's Sharing Economy Association (JSEA), which is the platform of Japan's Sharing Economy industry.

First, in order to give an overview of the whole aspect of Japan's Sharing Economy industry, we sought the cooperation of the JSEA and grasped the actual situation of Japan's Sharing Economy industry.

Second, we distributed a questionnaire survey to 183 sharing firms registered with the JSEA. To ensure statistical reliability and validity, a questionnaire survey platform was designed and implemented in a process in which the JSEA sent its address to its members and accessed online to respond.

Out of the total population ( $N = 183$ ), 38 companies responded to the questionnaire. The response rate was 21%. The small sample size ( $n = 38$ ) is not unusual in view of the early development stage of sharing economy firms in Japan. A similar pilot study with small sample size is not uncommon in conducting empirical research on emerging fields [66,67]. Our analysis methods are appropriate with a small sample size [64,68].

Third, we conducted interview surveys on typical cases of the JSEA. Interviews were conducted using the semi-structural interview method, and basically, the same questions as the questionnaire were prepared (See Appendix A). While confirming the causality of the hypotheses in this paper, the interview was conducted by listening deeply to the explanation of the interviewee's manager about the special business environment of the case company. Interview surveys were conducted with three companies, with the exception of interviews with the JSEA, two of which are members of the JSEA, and one of which is a fund company that provides funds to members of the JSEA.

#### 4.3. Measures

To examine whether KCC increases explorative and exploitative KS and leads to corporate sustainability, we included the following measures in the survey.

##### 4.3.1. Independent and Mediating Variables

For KCC, adapting the original scale, we included three items for measuring the degree to which the firm had KCC [30]. Specifically, as shown in Table 1, all companies responded to the following questions on a 7-point scale: (1) Our workers have access to



people or groups with specialized information (access to parties), (2) Our workers are able to absorb and combine information that has been changed (combination capability), (3) Our workers are satisfied with the value from the exchange and combination process.

**Table 1.** All the measurement items of Variables.

Items	Sum	Questions
KCC	3	(1) Our workers have access to people or groups with specialized information (access to parties), (2) Our workers are able to absorb and combine information that has been changed (combination capability), (3) Our workers are satisfied with the value from the exchange and combination process.
Exploitative KS	6	(1) Our companies exchange knowledge related to refining the existing supply chain services process (EIKS1). (2) Our companies exchange knowledge related to improving compliance with short-term goals (EIKS2). (3) Our companies exchange knowledge to refine existing measures for assessing short-term performance goals (EIKS3). (4) Our companies exchange knowledge for low-risk, short-term improvements (EIKS4). (5) Our companies exchange knowledge related to refining a few selected parts of the supply chain services process (EIKS5). (6) Our companies exchange knowledge related to low-risk fine-tuning of existing information systems (EIKS6).
Explorative KS	6	(1) Our companies exchange knowledge related to experimentation (e.g., pilot tests) for new business opportunities (ERKS1). (2) Our companies exchange knowledge related to strategies for long-term success (ERKS2). (3) Our companies exchange novel ideas for the long-term success of the relationship (ERKS3). (4) Our companies exchange knowledge about innovation opportunities that involve significant risk and uncertainty (ERKS4). (5) Our companies exchange knowledge related to new approaches for end-to-end supply chain services process integration (ERKS5). (6) Our companies exchange knowledge related to restructuring information systems for end-to-end coordination of the supply chain services process (ERKS6).
Corporate sustainability	4	(1) Does the company have the policy to respect business ethics?; (2) Does the company show to use human rights criteria in the selection or monitoring process of its suppliers or sourcing partners?; (3) Does the company show an initiative to reduce, reuse, recycle, substitute, phase out, or compensate CO2 equivalents in the production process?; (4) Does the company have initiatives to recycle, reduce, reuse, substitute, treat, or phase out total waste?
Financial performance	2	The accounting returns; We set the time spectrum, as the accounting performance 1 year ago, and the long term as 3 years before, here also considering the long-term aspect.

Two mediating variables are used in examining exploitative KS. We similarly adopted six items for measuring the degree to which Exploitative KS was operationalized in the organization taken from Im and Rai (2008) [42]: (1) Our companies exchange knowledge related to refining the existing supply chain services process (EIKS1). (2) Our companies exchange knowledge related to improving compliance with short-term goals (EIKS2). (3) Our companies exchange knowledge to refine existing measures for assessing short-term performance goals (EIKS3). (4) Our companies exchange knowledge for low-risk, short-term improvements (EIKS4). (5) Our companies exchange knowledge related to refining a few selected parts of the supply chain services process (EIKS5). (6) Our companies exchange knowledge related to low-risk fine-tuning of existing information systems (EIKS6).

For explorative KS, we adopted six items for measuring the degree to which explorative KS was operationalized in the organization, taken from [42]. Specifically, respondents

responded to the following questions: (1) Our companies exchange knowledge related to experimentation (e.g., pilot tests) for new business opportunities (ERKS1). (2) Our companies exchange knowledge related to strategies for long-term success (ERKS2). (3) Our companies exchange novel ideas for the long-term success of the relationship (ERKS3). (4) Our companies exchange knowledge about innovation opportunities that involve significant risk and uncertainty (ERKS4). (5) Our companies exchange knowledge related to new approaches for end-to-end supply chain services process integration (ERKS5). (6) Our companies exchange knowledge related to restructuring information systems for end-to-end coordination of the supply chain services process (ERKS6).

#### 4.3.2. Downstream Consequences

For corporate sustainability, four items adapted from Eccles et al., (2014) measured the degree to which the organization engaged in sustainable practices [69]. Respondents responded to the following questions: (1) Does the company have the policy to respect business ethics?; (2) Does the company show to use human rights criteria in the selection or monitoring process of its suppliers or sourcing partners?; (3) Does the company show an initiative to reduce, reuse, recycle, substitute, phase out, or compensate CO2 equivalents in the production process?; (4) Does the company have initiatives to recycle, reduce, reuse, substitute, treat, or phase out total waste?

#### 4.3.3. Financial Performance

As discussed by Cochran and Wood (1984), there is mainly financial performance from the shareholder perspective and the accounting returns [70]. We use the latter mainly because many of the sharing economy firms are still new and many do not have public stocks available. Cochran and Wood (1984) also agree that accounting returns can be the best proxy for financial performance [70]. We set the time spectrum, as the accounting performance 1 year ago, and the long term as 3 years before, here also considering the long-term aspect.

## 5. Analysis and Results

### 5.1. Hypothesis Verification

We tested the hypotheses using the data collected from the questionnaires. The results partially support H1.1 and H1.2 which specified the direct effects of the KCC on the two forms of KS. While KCC had a positive effect both on exploratory and exploitative KS, exploratory KS showed stronger relationships between those two variables. H2.2 predicted that exploratory KS has a positive effect on sustainability while exploitative KS has a negative effect on sustainability. For the measurement model, we used the Likert method and added up all the questions scores to create a whole score to create a score for a concept. Confirmatory factor analysis was used to validate the measures of our survey.

Following the analysis method of Gefen and Straub (2005), we calculated the descriptive statistics and correlations among the variables for each data set, which are shown in Tables 2 and 3 [66]. Composite reliability and Cronbach's alpha for each construct exceeded the suggested minimum of 0.70 [71]. The average variance extracted for each construct was greater than the suggested minimum of 0.5 [72].

**Table 2.** Dimensionality, composite reliability, and validity of constructs.

Constructs	Average Variance Extracted	Composite Reliability	Cronbach's Alpha
KCC	0.63	0.75	0.73
Exploitative KS	0.55	0.72	0.71
Explorative KS	0.57	0.80	0.77
Corporate Sustainability	0.62	0.74	0.72
Short-term Performance (P1)	0.67	0.79	0.77
Long-term Performance (P2)	0.69	0.79	0.77

**Table 3.** Means, Standard Deviations, and Correlations.

Variables	Mean	S.D.	Cronbach's Alpha	1	2	3	4	5	6
1. KCC	5.541	2.16	0.73		0.4879	0.3897	0.0004	0.0651	0.1098
2. Exploitative KS	15.590	4.97	0.71	0.4879		0.6964	0.1890	−0.1143	0.1056
3. Explorative KS	15.760	5.19	0.77	0.3897	0.6964		0.4221	−0.1097	0.1262
4. Corporate Sustainability	17.240	3.74	0.72	0.0004	0.1890	0.4221		−0.6301	0.0083
5. Short-term Performance (P1)	2.514	1.73	0.77	0.0651	−0.1143	−0.1097	−0.6301		−0.1309
6. Long-term Performance (P2)	2.676	1.70	0.77	0.1098	0.1056	0.1262	0.0083	−0.1309	

<M = 39; Fit statistics are as follows: CFI (comparative fit index) 0.910; TLI (Tucker–Lewis index) 1.043; *p*-value; 0.001; RMSEA (root-mean-square residual) 0.100>

According to Table 4, results show that indeed exploratory KS has a positive effect ( $0.4 > 0$ ) with the *p*-value showing high significance. On the other hand, the estimated effect from the exploitative KS on the sustainability index showed a negative value ( $−0.15$ ) with an insignificant *p*-value, and hence we could not validate our hypothesis 2-1.

**Table 4.** Results of Regression Analyses.

Model and Variables	Estimated Value	S.E.	<i>p</i> -Value	Results of Hypothesis Test
KCC->Exploitative KS	4.204	1.919	0.027	Hypothesis 1-1 supported
KCC->Explorative KS	5.084	1.906	0.008	Hypothesis 1-2 supported
Exploitative KS->Corporate Sustainability	−0.154	0.154	0.320	Hypothesis 2-1 not supported
Explorative KS->Corporate Sustainability	0.407	0.148	0.006	Hypothesis 2-2 supported
Corporate Sustainability->Short-term Performance (P1)	−0.290	0.059	0.000	Hypothesis 3-1 supported
Corporate Sustainability->Long-term Performance (P2)	0.004	0.075	0.959	Hypothesis 3-2 not supported

Similarly, with Hypothesis 3, we could accept our hypothesis that sustainability has a negative effect on the firm financial performance in the short term with high significance, but we could not accept our hypothesis 3-2 that sustainable activities connect to positive outcomes in the long term because of the insignificance of the *p*-value despite the estimated value is positive.

We see this failure to accept our hypothesis mainly from the perspective of low power due to the small sample size. Although in traditional multivariate analysis, the recommended data size was around 200 [73], recently such criteria have been revised greatly, and Wolf et al., (2013) suggest that the sample size can range from a minimum

of 30 to a maximum of 450, with 4 latent variables [67], and the recent empirical work that Sideridis et al., (2014) conducted validates them, which showed sufficient power with around 50 samples where the latent variables are over four [74]. Although we agree that our sample size is not idealistic, we maintain that the most harm will be done to our hypothesis being slightly conservative, but nevertheless, our empirical result holds validity shown in the multiple indexes like TLI, or CFA index listed in Table 2.

## 5.2. Case Study of Two SE Firms

To further validate the empirical results, we also conducted two case studies of SE firms. These two SE firms examine further the context of SE firms and consider how they achieve their corporate sustainability.

### 5.2.1. Coconala

Coconala started in 2012 as a platform for matching transactions where people can list and purchase their specialties such as knowledge, skills, and experience as a service. As of 2021, it offers an online platform, one of the largest skill markets in Japan. Chairman Minami, one of the founders of Coconala, explains his experience when he founded the company. He started out as a healthcare company. His previous job was at Advantage Partners.

“That’s when I came up with a healthcare business model. I was thinking about life after the earthquake. I quit the company like crazy. When I was actually preparing for health care, one of the founders, Mr. Shinmyo, suggested that sharing skills might be interesting. I rejected the idea at first. When I was listening to people in the healthcare field, I heard that nutritionists always make meals at hospitals. There was an opinion that it would be nice if we could discuss that. I thought there was a need to help someone in the background. I came to think that being able to be financially independent and being mentally satisfied are social issues. From the point of view that they could earn their pocket money simply in the context of the Internet, their view suddenly broadened as if it were a huge market.”

Having experience as an NPO before founding the company, the three founders who also wanted to solve social problems were able to connect through Twitter. The three met on Twitter between 2009 and 2010. The two founders were engaged in NPO activities and formed a group that wanted to solve social problems.

At first, Mr. Minami created a non-profit organization for social education using music called blast beat. It is to operate a live event. It is a program in which participants can learn what it is to learn the business and earn money. The students who participated there changed. Adults run by volunteers also change. He created an NPO called a second business card that he could use to help someone outside the company. This is the origin of Coconala. In this way, Chairman Minami created Coconala’s platform because he wanted to contribute to solving social problems.

At Coconala, the knowledge creation and sharing mechanism currently allow 130 employees to communicate and share information on a digital platform. In Coconala, all communication is online, so there is a log. Therefore, if new employees come in later, they will be able to see the latest method. They do not use paper or e-mail. They do not use PowerPoint or Excel. They only use a Google spreadsheet. Mr. Minami thinks that if everyone is not visible, it will be harmful. He thinks employees should communicate with each other in a place where everyone can see. He explained that the purpose of the one-on-one e-mail is to create politics and slow down information sharing. He explained, “Good people make mistakes. Is the information insufficient or the purpose wrong?”

Growth is more responsibility. As a company grows, the growth of the business comes first, and the organization comes later. If CEOs leave it alone, everyone’s skills will improve. Under such circumstances, the scope of responsibility will increase. If employees work in a growing company, they will grow.

Coconala was online before COVID-19 and even on the job. They went to work and chatted in the next seat. Because of COVID-19’s influence, it did not matter if they suddenly

stopped coming to work. However, it's important to see each other to build trust, and it's also important to see each other because it can generate ideas from small conversations.

Coconala is a marketplace and e-commerce site, with listings first and buyers later. It depends on whether customers buy first or list first. Coconala is a low variable cost model. For this reason, collaboration and communication between sellers and buyers are increasingly contributing to the search for new services. It leveraged existing knowledge to bolster its knowledge-sharing platform and added new knowledge from the platform to help the company grow.

Chairman Minami was determined that Sharing Economy's business model would lead to solving social problems and contributing to society. SDGs (Sustainable Development Goals), which have been popular in recent years, can be said to be a respect for individuality. In Japan, local people and women can do decent work. That is the very center of what Coconala does. Mr. Minami said, "Even if you reach retirement age in the company, you have to do something by yourself when you live more than 100 years. It's one of the answers. Social problems in Japan are all caused by the low birth rate and aging society. There are many elderly people in rural areas. A total of 20–30% of the land becomes a state of sunset. Public services will no longer be expected. At that time, there is no choice but to become a society where people support each other. Not public help, but self-help. If we don't do the sharing economy properly, Japanese society won't have it".

Coconala's Knowledge Creation and Sharing platforms not only contribute to their own sustainability but also the sustainability of Japanese society over the long term. However, Coconala, which is now 10 years old, is still in the middle of building its platform and raising customer awareness, and still needs to invest in its financial performance.

### 5.2.2. Equipp

Equipp operates an online marketplace 'Equipp' for the sharing and trading of used precision equipment. Equipp also enables asset management of idle assets and handles repairs. At first, it was a rental business, but now its main business is trading. Therefore, it can be called a sharing economy company in a broad sense. In Japan, there are many facilities in manufacturing industries and universities, but they tend not to sell machines due to cultural problems such as the trouble of passing the internal Ringi system, which refers to the bottom-up decision-making process in the Japanese management system. Another problem is whether universities are allowed to sell equipment purchased with tax money, such as research grants.

Some universities record gains and miscellaneous income from the sale of these assets. Some universities offer points that they can use within Equipp instead of money to buy another device. The founder, President Matsumoto says we need to change this culture of leaving our assets idle.

Mr. Matsumoto worked as a researcher until graduate school and then as an engineer. He was originally the one who threw away these devices. He said, "If I don't use up my budget, my budget will be cut, so I buy things I don't need. And throw it away. Don't say that reuse is troublesome. People have come to think of this as a social problem in the context of the so-called recycling-oriented economy and the sharing economy. I was talking about the fact that I was throwing away the equipment as a matter of course, but I thought it was strange. I had prior knowledge at the start of the business, but as I continue to do business, my knowledge is getting deeper and deeper".

Although KCC was founded by two founders in the early days, Equipp's platform was built to allow it to expand its new business model through interactions with its trading partners, including banks. The impetus for building a platform for machine tools in recent years has been to attend industrial and electrical organizations and to be contacted through introductions such as through financial institutions, where Knowledge Sharing led to the expansion of the first Platform. More specifically, information that Mr. Matsumoto wants to sell at small factories that use machine tools has been received through Jonan Shinkin Bank and other organizations.

## 6. Discussion

This study has limitations common to all empirical studies that use survey data. The sample population ( $N = 200$ ) and the final selected sample size ( $n = 38$ ) are relatively modest. To complement the small sample size, additional two case studies considered the organizational process of SE companies. Even so, generalizing the findings of this study requires caution. Despite these limitations, the research results provide meaningful implications to better understand SE firms in Japan and to conduct follow-up future research.

### 6.1. Theoretical Implications

This research considers the three crucial requirements of research in terms of relevance, rigor, and results. Examining knowledge-sharing practices of Japanese sharing economy firms through case studies and survey questionnaire provides several valuable theoretical implications.

First, exploitative knowledge-sharing practices of sharing economy firms for current customer needs and their competitive capabilities. Different from existing research on sharing economy, this study examines the role of two types of knowledge-sharing practices (i.e., exploitative and explorative). The subjects of this study are members of Japan's Sharing Economy Association (JSEA). These firms have a shorter history, and their size is small compared to the US and European counterparts. Even in the early days of their businesses, these firms use exploitative knowledge sharing to support their current business models and achieve productivity requirements (e.g., overall cost reduction) for their current customer needs and thus improve the chance of their business success through competitive capabilities.

Second, explorative knowledge-sharing practices of sharing economy firms for caproate sustainability. These firms also adopt explorative knowledge-sharing practices to serve potential customers for expanding their future business. In doing so, they strive to sustain their market position. Explorative knowledge sharing is to innovate business models and expand the potential customer base. In doing so, sharing economy firms search for business growth opportunities and thus sustain their future market position. In interviews with case companies, the respondents suggest that investment for creating future business is costly and thus there is a negative factor in the impact on financial results and performance in the short run. It is worth noting that SE firms achieve overall positive financial outcomes by combining the positive outcomes of exploitative knowledge sharing for current business success (e.g., utilization of existing infrastructure) and allocating additional capital resources for explorative knowledge sharing (e.g., development of new sharing platforms) for future business opportunities.

Our findings are in line with previous studies [75–79]. Knowledge creation and sharing have become a source of sustained competitive advantage. For example, the knowledge creation process (KCP) positively influences the organizational resilience capabilities and knowledge donation and collection have positive effects on technology business incubators.

However, our paper for the first time analyzes the relationships between knowledge creation and sharing and performances in terms of Japanese firms. Furthermore, we find the relationship between sustainability and performance is different according to the short or long term. As shown in our analysis of Hypotheses, sustainability has a negative effect on the firm financial performance in the short term with high significance, but sustainable activities connect to positive outcomes in the long term.

### 6.2. Managerial Implications

Sharing economy firms utilize idle or underutilized assets. This research considers the role of knowledge assets as a crucial element of the success of sharing economy firms. Managerial implications, therefore, are related to the intangible nature of business model innovation in sharing economy.

First, managerial attention to intangible knowledge-sharing practices of sharing economy firms. Sharing economy is about creating and delivering value through idle and underutilized tangible assets. Interestingly, the success paths of sharing economy do not lie in the number of tangible assets but in the innovation of business models of in-

tangible knowledge assets [80,81]. In this regard, business leaders are more likely to experience the success of their sharing economy firms by paying attention to exploitative knowledge-sharing practices for innovative problem-solving of current needs (e.g., service productivity enhancements and cost reductions). Investment decisions build on the explorative knowledge-sharing practices for creating new growth engines for future business. For this purpose, sensing market trends and searching for business opportunities through experimenting and selecting innovative products and services are important knowledge-intensive activities. In this sense, the better use of senior executive time is not to micro-manage current management practices but to develop business engines by staying close to market opportunities and potential customers.

Second, knowledge-intensive digital transformation for corporate sustainability of sharing economy firms. In post-pandemic environment, more companies use a diverse form of digital platforms. However, without taking into consideration of knowledge-creating capability (KCC), mere investment in digital platforms does not generate desirable results. To reap the benefits of digital transformation, sharing economy firms need to expand both the scale of engagements and the scope of their innovation frontiers [59,82,83]. Business value delivery is related to comprehensive value offerings through new products, services, and business solutions whereas operational improvement and productivity enhancement focus on incremental innovation of existing processes. Senior management requires to expand its customer base through the global digital ecosystem. Beyond offline and online marketing strategies, digital transformation involves greater engagements both internal (e.g., cross-functional business units and shareholders) and external stakeholders (e.g., expanded network of suppliers, customers, and stakeholders).

### 6.3. Future Research

Corporate sustainability is about winning and losing short-term battles but winning in the long-term war of business longevity in the sustainable world. In recent years, Japanese manufacturing firms have experienced serious competitive challenges from Korean and Chinese manufacturing firms [60,61]. It is critical for Japanese firms to consider the potential of diverse forms of the sustainable economy (e.g., sharing economy, circular economy) to capture new growth engines [84–87]. It is worth investigating a business case for sharing economy firms in the manufacturing industry [75,76].

This study covers just under 20% of the population of Japan's Sharing Economy industry. Refining out an initial survey questionnaire, and conducting a comparative study with European and American companies would result in fruitful research outcomes. Future studies may examine diverse forms of sharing economy in Asian contexts including Korea, China, India, and other emerging economies. In the future, we would like to try a comparative survey between countries.

## 7. Conclusions

This research started discussing the role of knowledge-sharing practices in sharing economy firms. A conceptual framework provides a general model of sharing economy with drivers, practices, and outcomes, whereas a research model defines key variables with testable hypotheses. The research design considers Japanese sharing economy firms which are relatively small but growing in recent years. In addition to case studies, explorative interview surveys and nationwide statistical analysis provide valuable research insight for future research. The result of this study confirms the role of knowledge creation context (KCC) in the sharing economy (SE) industry and that this KCC positively affects knowledge sharing (KS) with suppliers in the supply chain. Knowledge sharing (KS) with suppliers in the supply chain has a positive impact on corporate sustainability (CS). By highlighting the Japanese context of sharing economy research this study opens more research opportunities in the sustainable economy of emerging economies as well.

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## Appendix A

### Interview Questions

Question 1: How did your workers access, absorb, and combine internal information, and create value from internal or external?

Question 2: How did your company share knowledge with partners in a supply chain?

Question 3: Does the company have the policy to respect business ethics or human rights criteria in the selection or monitoring process of its suppliers or sourcing partners or show an initiative to reduce, reuse and recycle in the production process?

Question 4: How did the total system development costs required for the year increase or decrease as the number of service users and registered users of your company increased?

Question 5: As the number of service users/registered users of your company increased, how did the server cost burden per service user (the value obtained by dividing the total server cost by the number of users) increase or decrease?

Question 6: How did the number of officers (directors, auditors, executive officers) increase or decrease as the number of service users and registered users of your company increased?

Question 7: As the number of service users and registered users of your company increases, the number of middle managers (managers, managers, team leaders, etc. who have multiple subordinates) will increase.

Question 8: How did the percentage of unauthorized users increase or decrease as the number of service users/registered users of your company increased?

Question 9: How did the complaint rate increase or decrease as the number of service users/registered users of your company increased?

Question 10: How did advertising costs increase or decrease as the number of users and registrants of your company's services increased?

Question 11: In relation to all the questions so far, as the number of service users and registered users of your company increases, the total cost per user (including all direct costs, indirect costs, SG&A costs, etc.) How did the value divided by the number of users) increase or decrease?

Question 12: Regarding all the questions so far, as the number of service users and registered users of your company increases, the total cost per user (including all direct costs, indirect costs, SG&A costs, etc.) What is the reason for the increase or decrease in the value divided by the number of users?

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