UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

COLLABORATIVE CONSUMPTION
Business-to-consumer sharing and its economic impact on consumers

Authors:
Malin Höglund
Ida Wikman

Supervisor:
Andreea Mitrut

Abstract

Collaborative consumption, which strives to increase the use of underused goods, has the potential to change the unsustainable trend of consumption while still benefitting consumers economically. Yet, the collaborative initiatives where businesses offer consumers temporary access to shared goods have not been theoretically examined on a general scale. We develop a simple model to evaluate the impact business-to-consumer sharing has on consumers. Our findings suggest that (i) goods are utilized more when they are shared, (ii) introducing a sharing market may decrease consumption of new goods, despite enabling new consumers to enter the market, and (iii) consumer surplus increases when the sharing price is lower than the ownership price. The paper also expands on the terminology around collaborative consumption, and highlights the differences between renting and sharing. The distinction is identified as a difference in the decision making, where the choice to share is made *ex ante* while decision to rent is made *ex post*.

Table of contents

List of figures

1. Introduction

In the last couple of years, collaborative consumption, often referred to as the "sharing economy", has gained a lot of attention in both media and academic research. There are now multimillion-dollar companies that qualify as collaborative initiatives (examples include Airbnb, Lyft and Zipcar[1]) and a Eurobarometer poll from 2016 suggests that 52% of consumers in the EU are familiar with the term "collaborative economy".

One of the main issues collaborative consumption addresses is the under-utilization of durable assets, and overconsumption in general (Botsman and Rogers, 2010). Currently, the goods and services used by humans every year require the regenerative capacity of 1.6 earths (WWF, 2016), and changing the trend will require substantial shifts in consumer behavior (Moore, Cranston, Reed and Galli, 2012). A solution offered by collaborative consumption is services which enable consumers to access, rather than own, goods. The idea is that by shifting towards access-based consumption, consumers' needs can be met without overexploiting the earth's limited resources.

Research suggests that economic incentives play a significant role in consumers' decision-making around consumption (Eckhardt, Belk, Devinney and Black, 2010; Hamari, Sjöklint and Ukkonen, 2016; Lamberton and Rose, 2012), and comprehending some of the key economic aspects is what we aim to do in this paper. In this paper, we focus on initiatives that promote access over ownership, and particularly on how consumers are affected when a sharing market is introduced next to a traditional one. Although some economic implications of temporary access have been studied before, the research is almost exclusively centered around so-called peer-to-peer markets (see e.g. Weber, 2016; Horton and Zeckhauser, 2016). In peer-to-peer markets, more specifically peer-to-peer renting markets, consumers rent out their privately owned goods to other consumers, which means that they can earn income on personal assets (Weber, 2016). Conversely, in a business-to-consumer market, businesses are always the providers of shared and rented goods, and are thus the only ones who earn revenues from owning. We believe the difference between a peer-to-peer market and a business-to-consumer market to be significant, as research on peer-to-peer networks has suggested that the prospect of earning money on owned assets affects consumers' incentives

---

[1] Airbnb is an online platform that enables consumers to rent out their living spaces to other consumers (Zervas, Proserpio and Byers, 2014), Lyft is an app-based peer-to-peer ridesharing service (Feeny, 2015), and Zipcar is a company which provides access to cars in exchange for a membership fee ("How Does Zipcar Work, 2017).

and thereby the economic outcomes (Weber, 2015). Therefore, we hope to contribute to the field by developing a theoretical model of business-to-consumer sharing. The model is a first attempt to demonstrate the impact a sharing market has on consumers.

The main goal of this paper is to investigate how collaborative initiatives that promote access over ownership impact consumers. Specifically, this study theoretically examines whether an introduction of a sharing market will: (i) increase the use of underused goods, (ii) decrease consumption of new goods and (iii) increase consumer surplus. Additionally, we expand the terminology around collaborative consumption and highlight the differences between renting and sharing.

We show that when the price to share is less than the ownership price, consumers who are willing to share will benefit economically, since the lower price of sharing will increase consumer surplus. The sharing market will introduce new consumers to the market, however, consumption of new goods may still decrease since the goods are shared. Because of the innate property of sharing, shared goods will be used more.

The disposition of the paper will be as follows: in section 2, collaborative consumption is defined, concluding with four terms to further separate different types of systems for access over ownership. With the new terms in mind, we delve into previous research on the subject in section 3, finding that there is a lack of research on business-to-consumer sharing and its impact on consumer surplus. Our model, which can be found in section 4, therefore attempts to present this kind of relationship, examining producers' and consumers' decisions with and without a sharing market. Finally, section 5 concludes and discusses areas for further research.

2. What is collaborative consumption?

Collaborative consumption was first defined by Felson and Spaeth (1978) as consumption happening while in the company of others. The concept has since then been redefined and is now more associated with the collaborative, largely platform-based, initiatives (e.g. Airbnb) that have emerged in the last few years. According to Botsman and Rogers (2010), collaborative consumption is "a system activating untapped value of assets" (p. 24), and it occurs in forms of renting, lending, swapping, sharing, bartering or gifting on markets that appear on the side of traditional markets

However, the term collaborative consumption is surrounded by uncertainty, since it lacks a universally agreed upon definition. Hamari, Sjökling and Ukkonen (2016) and the European Commission (2016) describe collaborative consumption as peer-to-peer interactions that are strictly happening on online platforms, thereby excluding offline as well as centralized markets. Weber (2016) uses the terms collaborative consumption, sharing economy and peer-to-peer economy interchangeably to illustrate the shift from ownership to access of products. In an article by Belk (2014), he refers to collaborative consumption as when people collaborate to obtain and distribute goods for some kind of compensation, however not for free.

In this paper, we define collaborative consumption as all initiatives that result in *an increase in the use of underused assets and reduction of wast*e, similar to Botsman and Rogers (2010). For an in-depth explanation of the terms used as alternatives for collaborative consumption, see Dredge and Gyimóthy (2015).

Botsman and Rogers (2010) categorize collaborative consumption into three categories: (i) redistribution markets, (ii) collaborative lifestyles and (iii) product service systems. The first category, markets for redistribution, enables unwanted goods to be sold, exchanged or given away for better use instead of being thrown away. The second category, collaborative lifestyles, provides an opportunity for exchanging and trading intangible assets such as time, skills and space, that are not used to their full capacity. Finally, the third category, product service systems, is a structure that simplifies sharing[2] of assets by offering consumers temporary access to goods rather than ownership over them. This service enables multiple

---

[2] In this paper, the term *sharing* has a more specific meaning than just being a verb. However, in this context, it describes how goods are used by more than one person – regardless of whether it is "shared" or "rented".

users to share the benefits of a good. The goods are underused, be it because of their idling capacity, diminished value after the first use, or their temporary demand (Botsman and Rogers, 2010). Examples include a car that sits in the garage the majority of the time, a book that will only be read once, or baby clothes which are only used for a short period of time. The service can be offered by a company or an institution, like a library, or it may be shared between peers, such as a local tool pool. For the systems to be successful, there is a need for a critical mass who believes that sharing is better than owning and who trust that the participants will take care of the assets (Botsman and Rogers, 2010).

With Botsman and Roger's (2010) three types of collaborative consumption in mind, we have decided to further separate product service systems, i.e. markets which give consumers temporary access to a good, into four categories. These categories depend on who owns the good and how the good is accessed. The owner is either a business or a consumer, and the good can be accessed either through renting or sharing. The four types of markets are *peer-to-peer renting*, *peer-to-peer sharing*, *business-to-consumer renting* and *business-to-consumer sharing*.

Peer-to-peer (P2P) renting

In peer-to-peer renting, a consumer owns the good and rents it out to other consumers, so called "peers", when they are not using it. A frequently used example of P2P renting is Airbnb.
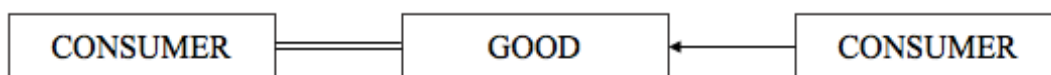

Figure 2.1 *Peer-to-peer renting*
Lines == symbolize ownership, arrows → symbolize access.

Peer-to-peer (P2P) sharing (shared ownership)

Peer-to-peer sharing, or shared ownership, is when two or more consumers own the good together and share both access and costs between them. For example, a group of friends who jointly buy a toolbox.
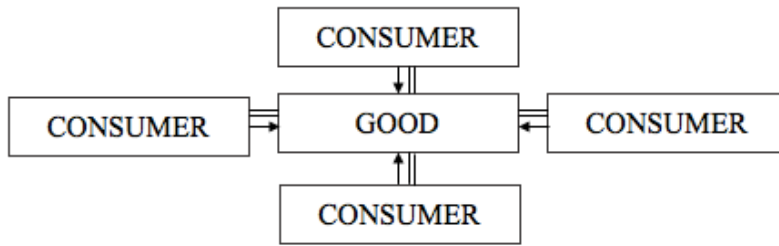
Figure 2.2 *Peer-to-peer sharing*
Lines == symbolize ownership, arrows → symbolize access.

Business-to-consumer (B2C) renting

In business-to-consumer renting, a business owns the good and rents it out to consumers who want access. Common examples include car rental services and hotels.
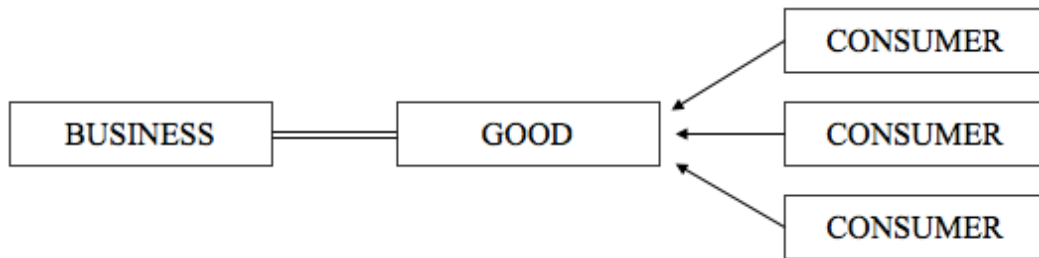

Figure 2.3 *Business-to-consumer renting*
Lines == symbolize ownership, arrows → symbolize access.

Business-to-consumer (B2C) sharing

Business-to-consumer sharing is similar to business-to-consumer renting in that a firm owns the good which it lends out to consumers. The difference between the two services is that in business-to-consumer renting, the decision to rent is made *ex post* the specific need for the good has occurred. For example, if a consumer needs a car at a specific date, they rent a car for that date. In business-to-consumer sharing, however, the decision to "rent" is made *ex ante*. Instead of renting a car for a specific date, the consumer joins a carpool where he or she pays a monthly fee in order to gain access to the car whenever they need it. Additional well-known examples include libraries and bike share programs such as Citibike.
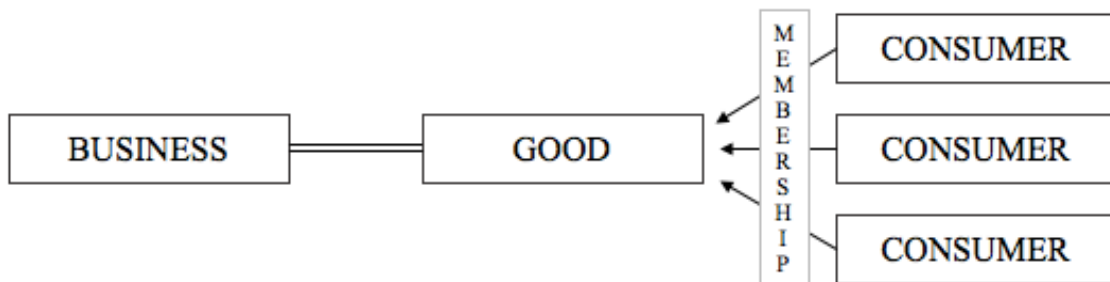

Figure 2.4 *Business-to-consumer sharing*
Lines == symbolize ownership, arrows → symbolize access.

3. Related literature

Most of previous research on what effect access instead of ownership has on consumers has focused on business-to-consumer (B2C) renting and peer-to-peer (P2P) renting. While the listed articles often use "sharing" instead of "renting" to describe the market interactions, the definitions from section 2 are used below.

Regarding B2C renting, most articles have concentrated on one type of rented goods, rather than on the market at large. Shelton (1968) and Reiss (1972) both examine how consumers decide between renting and buying property, finding that the demand depend on the costs related to the two options as well as on the future expectations about price and rent. For rented software, Choudhary, Tomak and Chaturvedi (1998) claim that demand increases due to positive network externalities[3], which in turn increases consumer surplus. Flath (1980) offers a more comprehensive analysis of when renting is preferred over buying, for example when the consumer expect to use the good infrequently, but does not discuss what effect the decision has on the traditional market.

The effect a peer-to-peer renting market has on demand has been given plenty of attention. Weber (2015) argues that since there is an opportunity to earn money on the products you buy, demand to own a good may increase, given that it is a high-cost product. In the same vein, Horton and Zeckhauser (2016) suggest that, depending on rental rates and purchasing prices, a P2P renting market could either increase or decrease ownership. The two papers reflect the results made by Miller (1974) and Benjamin and Kormendi (1974) who analyzed the effect of a second-hand market on the price of a durable good and concluded that consumers increase their willingness to pay for a first-hand good.

Building on Weber's (2015) analysis, Weber (2016) showed that consumer surplus always will increase when there is P2P renting. Similar results have been obtained by Benjaafar, Kong, Li and Courcoubetis (2015) along with Horton and Zeckhauser (2016), and Fraiberger and Sundararajan (2015).

Conversely, a study by Jiang and Tian (2016) suggests that introducing peer-to-peer renting alongside a monopoly market decreases consumer surplus. Jiang and Tian (2016) argue that a

---

[3] The more people who have the good, the more valued is it, for example a telephone (Choudhary et al., 1998)

P2P market incentivizes firms to improve their quality, thereby driving up prices, and that the raised price will improve firms' profits and lead to a decline in consumer surplus. However, Jiang and Tian (2016) find that if transaction costs are low, social welfare will improve at large as producer surplus increases.

The studies by Benjaafar et al. (2015), Horton and Zeckhauser (2016) and Fraiberger and Sundararajan (2015) all offer explanations as to who benefits the most from a P2P renting market. Benjaafar et al. (2015) argue that the largest gains are obtained by those who – in the absence of a renting market – are indifferent between owning and renting, and similarly Horton and Zeckhauser (2016) suggest that non-users who value the good almost as high as owners have the greatest gains in surplus. Results from both papers indicate that goods where the decision of whether to own depends on a consumer's income, rather than for example taste or expected usage, could offer the highest gains in surplus. Fraiberger and Sundararajan (2015) add to this notion by explicitly suggesting that consumers with below-median incomes gain the most from P2P renting.

When it comes to business-to-consumer (B2C) sharing, quantitative papers are less abundant. Although some papers have conceptualized B2C sharing qualitatively (Bardhi and Eckhardt 2012), or explored consumer behavior surrounding it (Hwang and Griffiths 2017), little research has been carried out in terms of market effects.

Varian (2000) and Ordover & Willig (1978) studies B2C sharing of information goods, such as books and films, and its effect on the traditional market. Both find that consumer surplus will increase with the existence of a sharing market. Varian's (2000) main findings are that consumers will pay a lower price per use when there is a possibility to form a sharing club and that each item will be used more, thereby increasing consumer welfare. Ordover & Willig (1978) found in a pilot study on five economic journals that four of them could increase their library subscription price and lower personal subscription price to increase consumer surplus, while producer surplus stays the same.

While the paper most resembles Varian's (2000), his approach fails to address B2C sharing in a more general sense. Therefore, the paper aims to contribute to the field by developing a theoretical model for all kinds of B2C sharing.

4. Model

Our model describes the decisions made by producers and consumers when a sharing market is introduced, i.e. when consumers can choose to access a good through a sharing service instead of owning it. The products supplied in the sharing market are homogeneous in feature and quality to the ones which you can own. When the option to share does not exist, everybody who wants to use a good must own it. First, the price setting strategy by suppliers in a perfect competitive market is illustrated. Second, consumer choice and demand is discussed. With the help of these analyses, equilibrium price and quantity with and without a sharing market is presented, as well as the effects in consumer surplus.

4.1 Producer costs, price and supply

Without loss of generality, the total cost to produce a good for ownership is assumed to be a constant cost c for each product. Consequently, the marginal cost and price for ownership p_o will be c, regardless of the existence of a sharing market, because of the nature of perfect competition. The quantity of owned goods Q_o is plainly the number of people n_o who wants to own the good.

$$MC_{use\ without\ sharing\ market} = MC_{own} = c = p_o \quad (1)$$

In a sharing market, the quantity of goods Q_s depends on the number of consumers n_s who are interested in the service, divided by the number of people k who can share one item. For example, if five people can share a car and 30 people want to have access, there is a need for six cars. k is a discrete variable which is exogenously determined and therefore it has to be at least two, otherwise an item will not be shared[4]. This suggests that if at least two consumers share the good, the good will be used more than if it had been owned.

Conclusion 1: When the number of consumers who can share a good is at least two, the good will be used more compared to if the consumers would have bought one good each.

The demand for sharing in the model only determines the number of people who want to have access to the good, and not the quantity that will be shared. We therefore define the costs in terms of sharers n_s.

---

[4] To make the concept of sharing goods more intuitive, we assume that the number of people who can share one item is discrete. However, in reality, it is possible for e.g. five people to share two cars, thus creating a continuous variable for k.

To provide a sharing service, the firm pays the price of the good c and the cost for maintenance m, for each good Q_s supplied. While maintenance costs, like insurance, storage and reparations, could also be dependent on factors such as time and use, we assume it is solely a fixed cost for each good. There is also a membership cost δ which is paid per person n_s who want to access the product. This could be thought of as administrational costs, the more people who want to access the product, the more administration is needed. Since the quantity of goods supplied depend on n_s and k, we can write the total costs as:

$$TC_{share} = (c + m)Q_s + \delta * n_s = \frac{(c+m)n_s}{k} + \delta * n_s \quad (2)$$

To determine the marginal cost, and price, of a sharing service, we take the partial derivative of (2) with respect to the quantity of people n_s requesting the service. The marginal cost is therefore the shared price and maintenance cost plus the membership cost.

$$MC_{share} = \frac{\partial TC_{share}}{\partial n_s} = \frac{c+m}{k} + \delta = p_s \quad (3)$$

Comparing the results from equation (1) and (3), it is evident that the sharing price p_s will be less than the owning price p_o if the membership cost δ is lower than the difference between the price of the good and the shared price and maintenance cost.

$$p_s < p_o \implies \frac{c+m}{k} + \delta < c \implies \delta < c - \left(\frac{c+m}{k}\right) \quad (4)$$

4.2 Consumer choice and demand

A consumer can choose to either buy the good, share or do neither. The total demand for being able to use an item is therefore the vertically added demand for sharing and owning. If sharing is not an option, the demand to own a good would equal the total demand to use it, as we assume that all consumers who are willing to share a good would buy it if the price is below their willingness to pay. The opportunity of being able to share the good therefore does not introduce new people to the market.

The usage demand is determined by the individual's utility, constrained by direct usage costs and a transaction cost. The utility u depends on the consumer's usage characteristics. The more a good is planned to be used, the more willing is the consumer to pay for it, compared to a consumer with the same attributes who has less use for it. If a consumer expects to extensively use a product, they will also be less willing to share. This assumption is supported by Varian's (2000) and Flath's (1980) analysis of individuals' decisions to own or rent.

The direct cost of usage depends on whether the product is owned or shared. The ownership cost is the sum of the price to own the good c and maintenance costs m. These maintenance costs m, as well as the ownership price c, are split among k people who can share the good. As discussed above, the price for a shared good also includes a membership cost δ which is paid per person. Given that individuals otherwise have the same characteristics, people will choose to share if the cost of sharing is lower than the cost of owning. The opposite is true if consumers decide to own. With the existing cost constrains, the condition of when to share is:

$$\frac{c+m}{k} + \delta < c + m \quad (5)$$

Three conclusions can be drawn from (5) about the conditions for preferring to share under the given cost constraints. Consumers will share if (i) the maintenance cost is higher than the difference between the sharing price and owning price, (ii) the owning price is higher than the difference between the sharing price and maintenance cost and (iii) the membership cost is less than the difference between ownership cost and shared price and maintenance. Rewriting (5) in terms of prices and maintenance costs the result is:

$$m > \frac{c+m}{k} + \delta - c \Longrightarrow m > p_s - p_o \quad (6)$$

A consequence of (6) is that consumers prefer to share even when the price of a sharing service p_s is higher than the price to own p_o, but only if the maintenance cost is higher than the price difference. This stems from the fact that the cost of ownership adds the maintenance cost to the price, while the cost of sharing only includes the price of the sharing service.

Apart from the direct costs of usage identified above, there is an additional transaction cost t for sharing in the form of inconvenience. For consumers who choose to own a product, this transaction cost is inhibitive, given that all other aspects remain unchanged.

In sum, the demand to use a product will depend on the utility, price, maintenance costs and transaction costs, regardless of whether the good is shared or owned. Consumers are for example more likely to own a product if they have high utility, if the product has low maintenance costs and a low price. The opposite is true for sharing, which is also preferred when the transaction costs are low and the cost of membership is low.

$$D_{use}(u, c + m) = D_{own}(u, c + m, t) + D_{share}\left(u, \frac{c+m}{k} + \delta, t\right) \quad (7)$$

4.3 Equilibrium in the market

In the analysis above, the prices for owning and for sharing have been determined, along with the factors affecting the demand for owning and sharing. Assuming that the market clears in both the sharing and the owning market, the equilibrium quantity of people who want to use the good is where the price and demand intersect.

Figure 4.1 portrays the equilibrium price and quantity without a sharing market, which means that everybody who wants to use a good must own it. Thus, the price to use is the same as the price to own c and the equilibrium quantity of owned and used items Q_u is equal to the number of people who want to own and use it n_u.
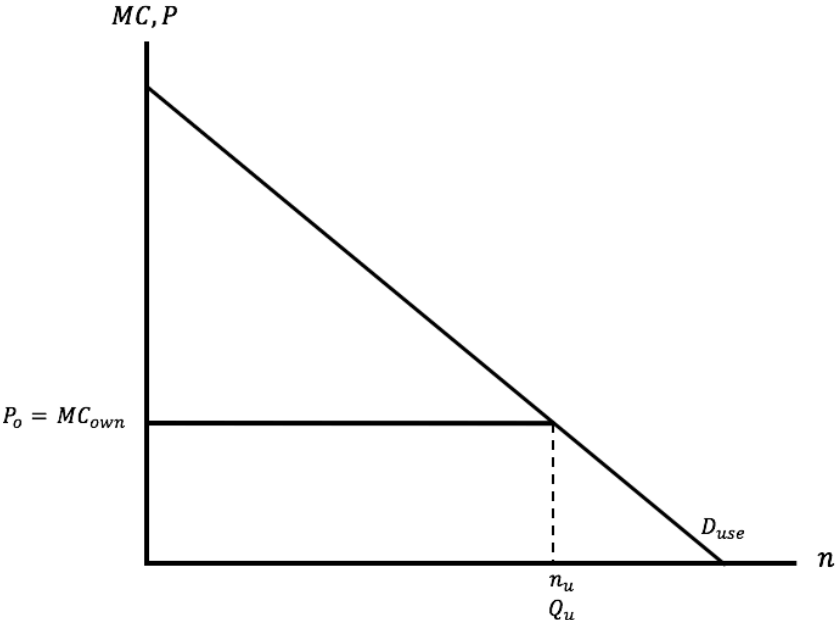

Figure 4.1 *Equilibrium without a sharing market*

If a sharing market is introduced, the demand to use will be divided among consumers who want to share D_{share} and the ones who want to own D_{own}. The demand to use D_{use} is the vertically added demand of D_{share} and D_{own}. Without loss of generality, the assumption in Figure 4.2 is that more people want to own than share a good. It also shows that sharers have a willingness to pay comparable to owners, due to the homogenous nature of the goods, which is why the demands have the same intercept. Likewise, we assume that the membership δ is relatively low so that the price to share p_s is lower than the price to own p_o using (4). However, as was shown in (6), consumers can still choose sharing over owning – even if the price to share is higher.
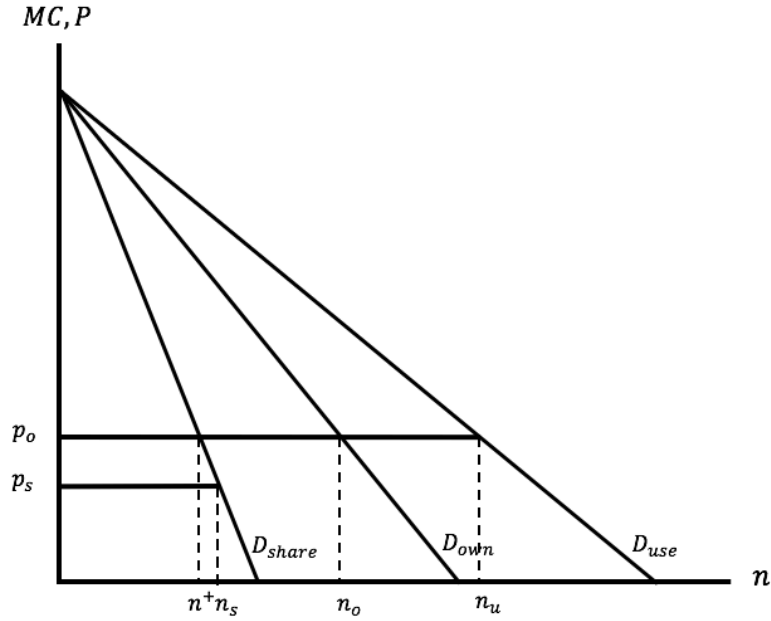
Figure 4.2 *Equilibrium with a sharing market*

Here, the total number of people who use the product is $n_s + n_o$, which is greater than n_u. As mentioned before, n_s represents the total amount of sharers in the market. n^+ represents the people who would have owned the item at price p_o in absence of a sharing market, but now share it. From now on this group of consumers is referred as converted sharers. Therefore, the added number of users is $n_s - n^+$. Since the quantity of shared items depends on the number of consumers who can share one good, and the quantity owned is just the number of owners, the total quantity that the two markets supply is $\frac{n_s}{k} + Q_o$, compared to Q_u when there is no sharing opportunity. The total quantity supplied in the presence of a sharing market will be less than without one as long as the shared quantity $Q_s = \frac{n_s}{k}$ is smaller than the previously owned items $Q^+ = n^+$. Rewriting the statement, we get this expression:

$$k > \frac{n_s}{n^+} \quad (8)$$

Under the condition that the ratio of sharers to converted sharers is smaller than the number of people per shared product, the sharing market can add users, but still decrease consumption. Since k must be at least two, the sharing market must at least double the amount sharers to converted sharers, for consumption to increase. For example, if 30 out of the 60 sharers are converted, then k has to be larger than 2, i.e. every item must be shared by at least three consumers, in order for consumption of new goods to decrease. If each good had been shared

by two consumers, the quantity of new goods would have been the same as without the sharing market.

Conclusion 2: Consumption of new products will decrease if the shared good is shared by a higher number of people than the ratio of total sharers to converted sharers.

4.4 Consumer surplus

Consumer surplus is a measure of welfare, and is determined by the total difference between consumers' willingness to pay and what they actually pay. Without a sharing market, the consumer surplus from using a product is the same as the surplus generated from owning it. In Figure 4.3, this is represented by the shaded area above the price and below the demand curve.
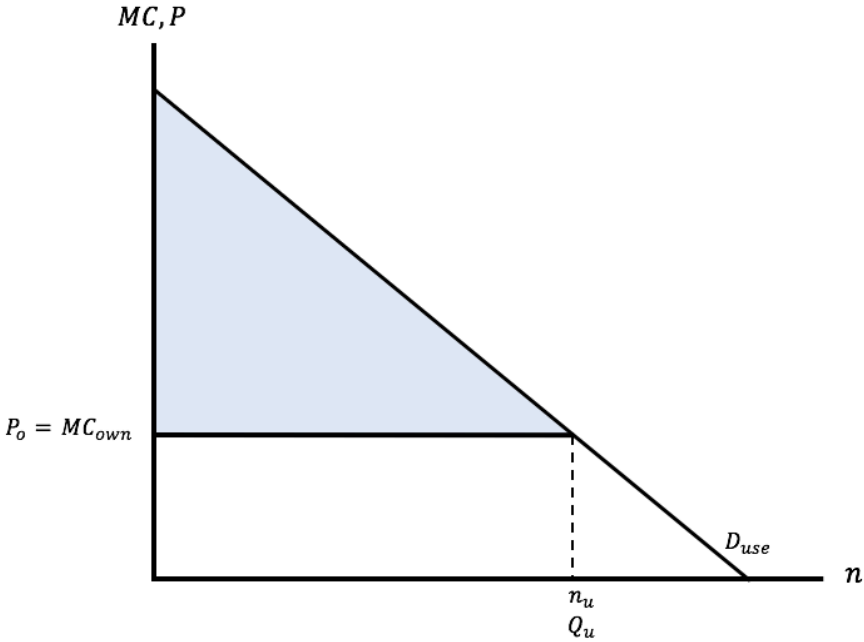

Figure 4.3 *Consumer Surplus without a sharing market*

More generally, the consumer surplus without a sharing market CS_{use} can be written as:

$$\int_0^{n_u} (D_{use}) \, dn - p_o * n_u \quad (9)$$

In the market where consumers can decide between owning and sharing a good, the total consumer surplus CS_{total} is obtained by adding the consumer surplus generated from owning CS_{own} and the surplus generated from sharing CS_{share}. Figure 4.4 illustrates the consumer surpluses from owning, area Ap_oB, and sharing, area Ap_sC.
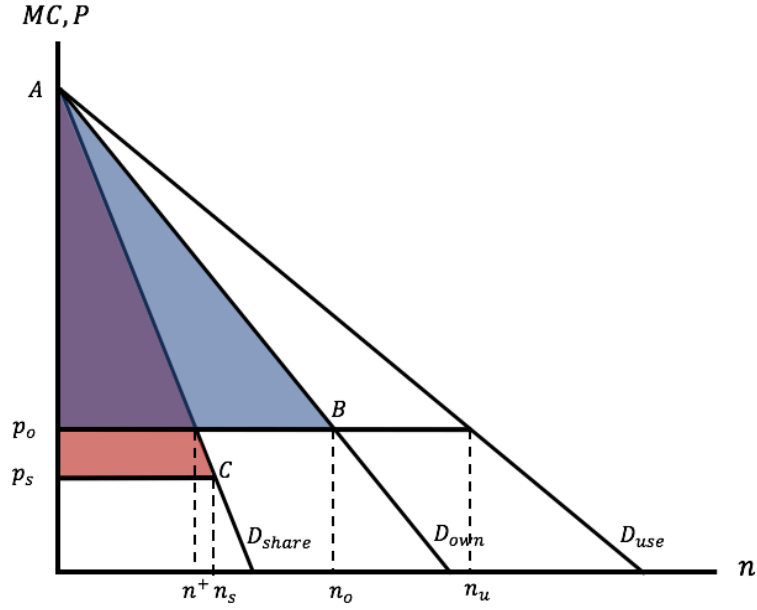
16

Figure 4.4 *Consumer Surplus with a sharing market*

The consumer surplus CS_{own} generated from owning when sharing is an option is:

$$\int_0^{n_o} (D_{own}) \, dn - p_o * n_o \quad (10)$$

Similarly, the sharing surplus CS_{share} can be expressed as:

$$\int_0^{n_s} (D_{share}) \, dn - p_s * n_s \quad (11)$$

Adding (10) and (11), the total consumer surplus with a sharing market CS_{total} is:

$$\left[\int_0^{n_o} (D_{own}) \, dn - p_o * n_o\right] + \left[\int_0^{n_s} (D_{share}) \, dn - p_s * n_s\right] \quad (12)$$

The gain in consumer surplus when adding a sharing market to a market without sharing, is obtained by subtracting (9) from (12).

$$\left(\left[\int_0^{n_o} (D_{own}) \, dn - p_o * n_o\right] + \left[\int_0^{n_s} (D_{share}) \, dn - p_s * n_s\right]\right) - \int_0^{n_u} (D_{use}) \, dn - p_o * n_u \quad (13)$$

Which, when simplified, creates the following expression for the net surplus gain:

$$\int_{n^+}^{n_s} (D_{share}) \, dn + p_o * n^+ - p_s * n_s \quad (14)$$

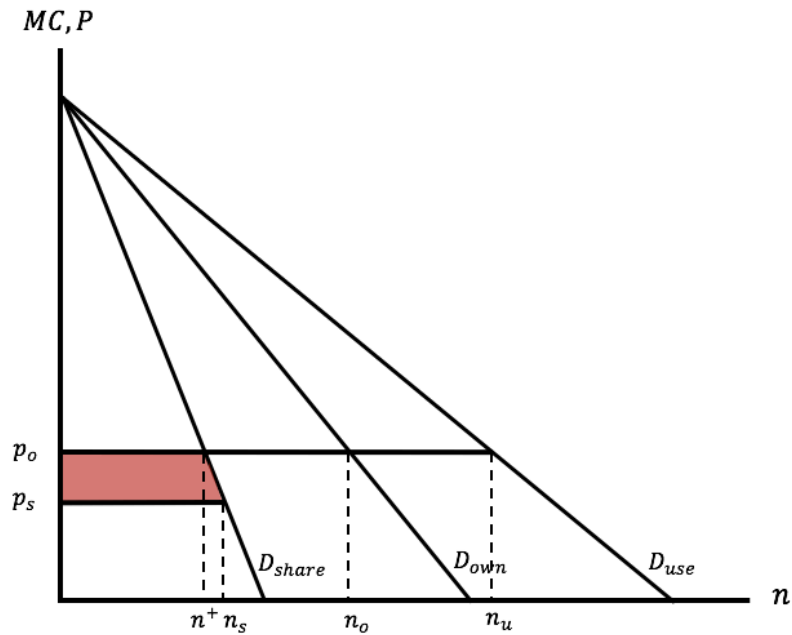The net gain is illustrated by the shaded area in Figure 4.5.

Figure 4.5 *Net surplus gain when introducing a sharing market*

If the price of sharing p_s is lower than the ownership price p_o, introducing a sharing market will always increase consumer surplus. As shown by (3), the sharing price depends on the size of "number of sharers" k. Because the cost c and maintenance m for a good is divided between the sharers, a higher k leads to a lower p_s, and thus a larger gain in surplus. Additionally, there will be a surplus increase if the membership cost is lower than the difference between price to own and shared price and maintenance (see (4)).

Conclusion 3: As long as the price of sharing p_s is lower than the price to own p_o, introducing a sharing market will always increase consumer surplus.

The way in which the total demand to use D_{use} is divided between sharing and owning also affects the size of the surplus. If demand for sharing is low, the demand curve D_{share} is steep, and the steeper the demand curve the smaller the surplus gain. Equally, the higher the demand, the flatter the slope and the larger the increase in surplus.

The only scenario where consumer surplus may decrease with a sharing market is when the price for sharing is higher than the price to own. As was demonstrated in (6), consumers still choose to share even if the price is higher, due to a large maintenance cost. The net loss in

consumer surplus is shown by the shaded area in Figure 4.6. Again, the magnitude of the loss depends on the slope of the demand curve for sharing along with factors affecting the price.
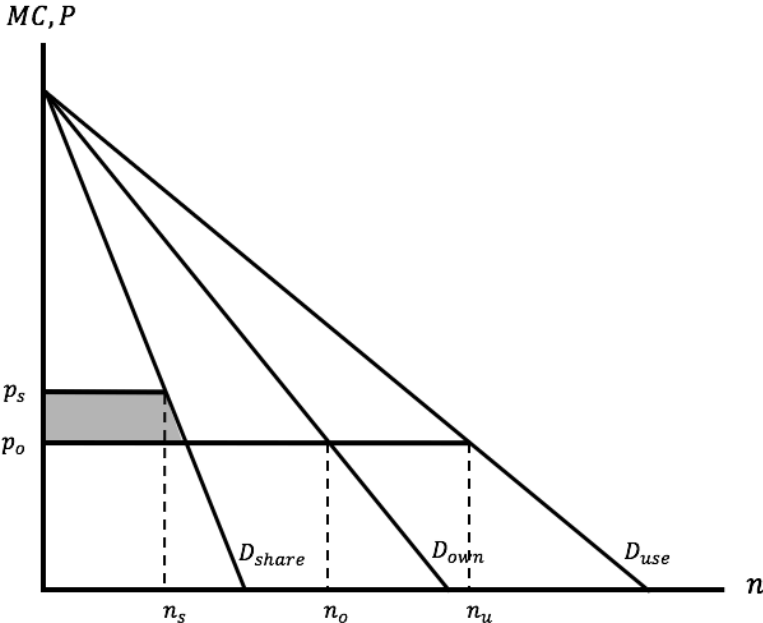
Figure 4.6 *Net surplus loss when introducing a sharing market*

5. Conclusion

This paper set out to theoretically study collaborative initiatives which give consumers temporary access to goods and its impact on consumers. More specifically, the paper examines whether business-to-consumer sharing succeeds in increasing the use of underused assets and decreasing consumption, as well as what effect an introduction of a sharing market has on consumer surplus.

In order to fulfill the purpose of the paper, a simple theoretical model was developed. The model resulted in three main findings. Firstly, the use of a shared good will increase, when the number of consumers who can share one good is at least two. Secondly, consumption of new goods will decrease if the number of people who share each good is higher than the ratio between total sharers and "converted sharers". Lastly, consumer surplus will increase when the price to share is lower than the price to own.

Our findings suggest that business-to-consumer sharing creates economic benefits for consumers who are willing to participate in a sharing market, as long as the price to share is lower than the price to own. Consumers who choose to own goods will not experience changes in benefits when a sharing market is introduced. When the price to share is lower, the sharing market will serve a new cohort of consumers who were previously unable to access the good because of their relatively low willingness-to-pay. However, because all "new" consumers will be allocated in the sharing market, consumption of new goods will not necessarily increase. Instead, the introduction of a sharing market will decrease overall consumption if the ratio of total sharers to converted sharers does not exceed the amount of people who can share one item.

A second key part of this paper was the development of a more definite terminology for services providing access to consumers. During the process of researching relevant literature, we found that essential terms often were used inconsistently and interchangeably. The absence of precise and consistent definitions for access over ownership markets made it challenging to compare and contrast the works of different scholars.

The distinction between sharing and renting was identified as a difference in the decision making, where the choice to share is made *ex ante* while decision to rent is made *ex post*.

Another important factor in defining the services was whether the good was owned by a business or a consumer. Four categories were created; peer-*to-peer renting*, *peer-to-peer sharing*, *business-to-consumer renting* and *business-to-consumer sharing*. In our opinion, agreeing on mutual and precise definitions is necessary in order to advance research of collaborative consumption. Future studies should be attentive in this regard.

Due to the lack of academic work on business-to-consumer sharing, the area could prove fruitful for further research. The model presented in this paper was a first attempt to illustrate the effect a sharing market has on consumers, and it could usefully be expanded and made more complex to make more robust conclusions. Further research may explore different market structures, such as a monopoly, and the sharing market's effect on decisions and surpluses from producers' point of view. By developing a theoretical model of producer and consumer surplus, conclusions could be drawn regarding overall social welfare, as well as potential deadweight loss. Another interesting implication could be to include certain differences between shared and owned goods in the model, for example by having a maintenance cost dependent on time or use. It would also be interesting to gather empirical material and compare it to our theoretical framework.

Collaborative consumption provides an alternative way of consuming, and what it has to offer may very well be a step towards sustainability. This paper implied that an introduction of a sharing market has the potential to achieve what it sets out to do, namely decrease consumption and increase the use of underused goods. Business-to-consumer sharing will particularly benefit consumers who are willing to participate in the sharing market, but only when the price of the sharing service is less than the price to own.

References

Bardhi, F., & Eckhardt, G. M. (2012). Access-based consumption: The case of car sharing. *Journal of Consumer Research*, *39*(4), 881-898.

Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, *67*(8), 1595-1600.

Benjaafar, S., Kong, G., Li, X., & Courcoubetis, C. (2015). Peer-to-peer product sharing: Implications for ownership, usage and social welfare in the sharing economy. *Working paper*.

Benjamin, D. K., & Kormendi, R. C. (1974). The interrelationship between markets for new and used durable goods. *The Journal of Law and Economics*, *17*(2), 381-401.

Botsman, R., & Rogers, R. (2011). *What's mine is yours: how collaborative consumption is changing the way we live*. London: Collins.

Choudhary, V., Tomak, K., & Chaturvedi, A. (1998). Economic benefits of renting software. *Journal of Organizational Computing and Electronic Commerce*, *8*(4), 277-305.

Dredge, D., & Gyimóthy, S. (2015). The collaborative economy and tourism: Critical perspectives, questionable claims and silenced voices. *Tourism Recreation Research*, *40*(3), 286-302.

Eckhardt, G., Belk, R., Devinney, T., & Black, Iain. (2010). Why don't consumers consume ethically? *Journal of Consumer Behaviour, 9*(6), 426-436.

European Commission (2016). *European Agenda for the Collaborative Economy – Supporting Analysis*, Commission staff working document COM(2016) 365 Final.

European Commission (2016). *Flash Eurobarometer 438*. The use of collaborative platforms.

Feeney, M. (2015). Is Ridesharing Safe? *Cato Policy Analysis*, *767*, 2.

Felson, M., & Spaeth, J. L. (1978). Community structure and collaborative consumption: A routine activity approach. *American Behavioral Scientist*, *21*(4), 614-624.

Flath, D. (1980). The economics of short-term leasing. *Economic inquiry*, 18(2), 247-259.

Fraiberger, S. P., & Sundararajan, A. (2015). Peer-to-peer rental markets in the sharing economy. *Working paper*.

Hamari, J., Sjöklint, M., & Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology*. *67*(9), 2047-2059

Horton, J. J., & Zeckhauser, R. J. (2016). *Owning, Using and Renting: Some Simple Economics of the "Sharing Economy"* (No. w22029). National Bureau of Economic Research.

How Does Zipcar Work?. (2017). Retrieved from: http://www.zipcar.com/how [2017-05-16]

Hwang, J., Hwang, J., Griffiths, M. A., & Griffiths, M. A. (2017). Share more, drive less: Millennials value perception and behavioral intent in using collaborative consumption services. *Journal of Consumer Marketing*, *34*(2), 132-146.

Jiang, B., & Tian, L. (2016). Collaborative consumption: Strategic and economic implications of product sharing. *Management Science*, Articles in Advance, 1-19.

Lamberton, C., & Rose, Randall L. (2012). When is ours better than mine?: A framework for understanding and altering participation in commercial sharing systems. *Journal of Marketing, 76*(4), 109-125.

Miller Jr, H. L. (1974). On killing off the market for used textbooks and the relationship between markets for new and secondhand goods. *Journal of Political Economy*, *82*(3), 612-619

Moore, D., Cranston, G., Reed, A. & Galli A. (2012). Projecting future human demand on the Earth's regenerative capacity. *Ecological Indicators, 16*, 3-10.

Ordover, J. A., & Willig, R. D. (1978). On the optimal provision of journals qua sometimes shared goods. *The American Economic Review*, *68*(3), 324-338.

Reiss, F. J. (1972). Buying versus renting farmland. *Illinois Agricultural Economics*, *12*(1) 37-40.

Shelton, J. P. (1968). The cost of renting versus owning a home. *Land Economics*, *44*(1), 59-72.

Varian, H. R. (2000). Buying, sharing and renting information goods. *The Journal of Industrial Economics*, *48*(4), 473-488.

Weber, T. A. (2015, January). The question of ownership in a sharing economy. In *System Sciences (HICSS), 2015 48th Hawaii International Conference on* (pp. 4874-4883). IEEE.

Weber, T. A. (2016). Product Pricing in a Peer-to-Peer Economy. *Journal of Management Information Systems*, *33*(2), 573-596.

WWF (2016). *Living Planet Report 2016*. Risk and resilience in a new era. WWF International, Gland, Switzerland

Zervas, G., Proserpio, D., & Byers, J. W. (2014). The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry. *Journal of Marketing Research*.