Chapter 9
Cooperatives in the Age of Sharing

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Introduction

The sharing economy has been hyped up recently and many "new" business models like Uber or Airbnb have evolved, which allow people to share their cars or flats. A different perspective would interpret these new offers as a kind of supply of mobility and housing solutions, i.e. new supply in traditional markets. Other applications of the sharing principle can be found in numerous markets like cloud computing, the joint use of goods and machines and especially in sharing information goods. These new applications should not blur the fact, that sharing is not a really new idea and is having a long tradition. Centuries ago farmers jointly bought and shared agricultural machines to cultivate their land, because they could not afford to own these machines individually. Every kind of renting goods is a kind of sharing, which is frequently offered by professional companies like car rental firms. So the idea of sharing is not new, but part of the economic life for a long time. Therefore, it is important to identify the economic core of the sharing economy, which distinguishes the sharing economy from traditional parts of the economy.

In the section "Defining and Characterizing the Sharing Economy" we will define the sharing economy and we will give an economic characterization of the sharing economy. It will turn out, that the platforms that connect supply and demand in the sharing economy constitute a significant governance challenge. A cooperative ownership structure could mitigate the problems originating from this platform. Thus, the section "Basic Economic Characteristics of Cooperatives" will explain the characteristics of a cooperative. Finally, the section "Conclusion and Practical Implications"

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will show how a platform in the form of a cooperative could improve the functioning and the economic welfare of these markets and will also present the limits of this model.

Defining and Characterizing the Sharing Economy

Definition and Delineation

The "Sharing Economy" is frequently ideologically overrated by declaring it an alternative to the capitalist economy. This type of reasoning claims that in the future the *use* of goods will dominate, instead of *owning* them overlooking that even if people just use goods there will still be an ultimate owner of these goods. Just using goods is therefore not an alternative to ownership, but at most an alternative application of ownership. Even worse sometimes sharing of goods is interpreted as "collaborative consumption" in contrast to the common individualistic consumption and because the collaborative consumption is striving for social coherence and community it is morally superior to the ordinary consumption that simply pursues profit maximization. These ideas and interpretations are lacking a solid foundation and (intentionally?) leave out a precise economic definition and delineation of the sharing economy. Defining the term "sharing economy" is difficult, since it has been extended to various areas, although some of these are hardly connectable to the sharing idea. Ride-hailing business (e.g. Uber, Lyft, BlaBlaCar) or renting out rooms (e.g. Airbnb, Wimdo, InstantOffices) are some activities that are mostly considered to be part of the sharing economy. Renting other goods on platforms like Frents or Leihdirwas.de could also be considered to be part of the sharing economy. Sometimes social networking platforms (like Facebook, Instagram) are also assigned to the sharing economy, because people exchange information or pictures that can be used by other participants in these networks. What makes this sharing different is the digital nature of the shared information. Sharing these "information goods" does not prevent the use of the shared information by the owner. On the other hand some sources extend the scope of the sharing economy to more businesses like crowd-working (e.g. Upwork, Clickworker), peer-to-peer-lending (e.g. Auxmoney, Kickstarter) or streaming services (e.g. Netflix).[1] But which of these businesses are to be considered to be part of the sharing economy and which are not? In order to delineate and later on to define the sharing economy we suggest three questions that will help us to carve out the economic characteristics of businesses belonging to the sharing economy:

- Which are the goods that are shared between the individuals?
- Who shares these goods (individuals or professional suppliers, i.e. companies)?
- Are the participants connected by a platform, i.e. how does demand meet supply?

[1] For this extended view see for example PwC (2016), p. 3.

The first question refers to *the objects of sharing* i.e. the type of exchange. For the ride-hailing business a combination of sharing a good (here: car) and a service (driving the car) can be observed. Because the ride-hailing includes the sharing of the car, it is part of the sharing economy. In contrast crowd-working does not meet the criterion of exchanging goods. People "share" their work capacity or provide services, which is the usual way of earning money. The difference is that people are not employed with long-term contracts, but on the basis of small bits of work for which they apply on a platform. So crowd-working meets the third criterion but not the first one. In a similar way the sharing of capital in peer-to-peer lending does not include the provision of goods and therefore it is not part of the sharing economy. The exclusion of crowd-working and peer-to-peer-lending is based on the same reason, that providing capital (human capital and monetary capital, respectively) is not characterising the sharing economy.

The goods that are available for sharing can be further differentiated. Non-durable consumer goods (like chocolate) are ill-suited for sharing, because they are used up during the process of consumption. Durable consumer goods, that are used in consumption (like cars) are the goods that are available for sharing. This does not preclude the degradation of these durable consumer goods, while they are used. For example a car needs more maintenance if it is used more intensively in order to minimize the degradation effects of the use. In some rare cases the degradation effect is close to zero and therefore sharing these goods comes with very little additional costs for the suppliers of these goods. Computing power is an example for a good, where additional use causes almost no degradation.[2] Similarly, sharing information in social networking platforms results in no losses due to the digital nature of the goods (e.g. photos). The use of durable consumer goods in for-profit activities of the sharing economy turns them—temporarily—to capital goods. That means that the nature of a good is determined by the purpose of its use. If it is used in private, it remains a consumer good, but employing the same good by offering it to other individuals makes it an investment good due to the for-profit intention of the sharing activity.

The object of sharing is usually not part of the efforts to define the sharing economy. Peitz and Schwalbe (2016) mention, that a durable good must be object of the sharing activity.[3] In contrast Miller (2016) extends sharing also to "services, space and money."[4] Sundararajan (2014) also includes the provision of labour to the sharing economy.[5]

The sharing of goods can be carried out in different ways. The most common way to share a good is the offering of the good by one individual who owns the good to another individual to use the good for a specified time. In this case sharing means that the individuals sequentially or jointly use goods, which are owned by

[2] This only refers to the CPU use, for which it makes no difference whether the processor is running idle or is actually computing.

[3] Peitz and Schwalbe (2016), p. 233.

[4] Miller (2016), p. 150.

[5] Sundararajan (2014).

one individual. Sometimes the provision of the goods is part of the problem, i.e. the number of available goods is insufficient. In this case another type of sharing could be applied. The individuals could jointly own the goods and then use the goods from the pool of goods according to pre-specified rules. For example the individuals could jointly own a pool of cars, which they use if needed, which will reduce the ownership costs for the individuals.[6]

The second question refers to the *acting subjects* of the sharing economy, which are individuals. Therefore, Netflix or other streaming services are not part of the sharing economy, because the supplier of the movies (and owner of the copyrights) is a firm. The idea, that streaming could be a sharing activity, stems from the comparison of the previous activities. People bought DVDs to watch a movie or CDs to listen to music. By the same token we have to exclude other professional providers from the traditional economy. Renting cars or holiday flats is part of the traditional economy. The agents of the sharing economy are implicitly part of some definition attempts, because they emphasize the peer-to-peer characteristic of the sharing economy.[7]

The third question refers to the *way of connecting individuals* in the sharing economy. The path-breaking innovation, that allows the connection of individuals at low costs, is the creation of platforms in the internet. The platform-connection characterizes all of the examples above, and is a distinguishing characteristic, which delineates the sharing economy from traditional rental services. Platforms are part of almost all definition attempts and are the origin of the governance challenges that we will observe later on, but not all platforms are part of the sharing economy.[8] Thus, platforms are a necessary, but not a sufficient requirement for the sharing economy.

From the description above we derive a tentative definition of the sharing economy. We define as the sharing economy all activities, which

- are carried out by individuals on a peer-to-peer basis,
- by using a connecting platform in the internet
- for sharing (physical) goods with each other.

We consider this definition well-suited in order to focus on the substantial features of the sharing economy and to set aside activities that mainly have the platform characteristic. Admittedly, the definition is quite narrow but will allow for more stringency in considering the phenomenon of the sharing economy.

These characteristics will be further analysed in the following subsections. We will have to explain, what determines the individuals' ownership decision, what peer-to-peer activities imply for markets and which economic effects platforms will have.

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[6] This differentiation follows Demary (2015) or Rauch and Schneider (2015), p. 11, who discriminate between peer-to-peer sharing and asset hubs.

[7] See for example Katz (2015), p. 1073 explicitly mentioning the peer-to-peer characteristic.

[8] See for example Dittmann and Kuchinke (2015), p. 245, Peitz and Schwalbe (2016), p. 235, Fraiberger and Sundararajan (2015), Katz (2015), p. 1070.

Determinants of Ownership

If people deliberately choose a sharing arrangement to use goods instead of buying them, they have to base their decision on cost-benefit considerations that guide them to the decision of sharing the goods, i.e. it must be beneficial for them to only temporarily possess the good. Surprisingly, this question has not been part of economic analysis up to now. This could be explained by the limited decision making options for individuals in traditional markets. With the recent establishing of peer-to-peer markets renting and renting out goods becomes a relevant decision option for *individuals* that requires a closer economic introspection.[9] The buy-or-rent decision resembles the make-or-buy problem that firms have to solve and for which extensive research exists.[10] We use this line of research to transfer and adapt the results to the problem of sharing or owning faced by individuals. There are five main determinants for the individual's decision to own or to share a good:

- *Frequency of use*: The more often people use a good, the more they will be inclined to buy and own a good. For instance a mobile phone, that is used every day or every minute, is probably ill-suited as a device that could be used by sharing it. The reason is the size of transaction costs. Although modern platform technologies lower these costs, they have to be incurred for every transaction, i.e. for every use of the mobile phone. For every transaction a sharing partner has to be found, the good has to be supplied, and—at least for more complex products—it has to be ensured, that the good is of sufficient quality. Buying a good and then frequently using it drastically reduces the costs per use for the good. An example of different transaction types for the same good could be a car. If you use your car very often (for example for professional purposes), you will probably prefer to own the car instead of going through the (costly) process of finding an appropriate vehicle every day. If you need a car just once in a while, you will probably prefer a sharing solution. Closely related to the frequency of use is the problem of availability (see below). When using a good frequently by sharing arrangements the likelihood of unavailability of the good increases with the number of uses, that means you are not able to use the good or have to accept delays in the use. This results in waiting costs or search costs for other options.
- *Availability/option benefits*: Ownership of a good ensures that the good can be used any time. Consequently, the user of the good is not dependent on other market participants to provide the good. This is a particular problem in peak times, i.e. when demand for the good is temporarily very high. This does not immediately result in unavailability but in price surges which make the market solution more expensive. Sometimes, the immediate use of a good is not the primary objective

[9]Horton and Zeckhauser (2016) is one of the rare papers discussing the ownership-rental decision in an economic model, but is not taking into account the criteria listed below.

[10]This research is based on the pathbreaking contributions by Coase (1937), Williamson (1985) for a transaction cost perspective and Hart (1995) for a property rights view. A textbook presentation extending the number of criteria can be found in Picot, Dietl, Franck, Fiedler, and Royer (2015), p. 70.

of owning the good. People may derive an option benefit from the good, i.e. they derive utility from the fact, that the good is available for them, when they decide to use it.

- *Avoiding dependencies*: Ownership of goods reduces the dependencies on others. When using platforms of the sharing economy the consumer of the goods depends on the supply of the good by another individual. This is exactly the problem markets are supposed to solve. Therefore, the participants of a sharing platform crucially depend on the functioning of this platform. If there is a sufficient number of suppliers in the market, the dependencies and the costs associated with these dependencies are low. Thus, the better these markets work, the lower the dependency costs for the participants will be. Nevertheless, the dependency costs of the sharing platforms will always be higher than the costs of ownership, where these costs are zero due the independence created by the ownership.
- *Avoiding uncertainties*: Owning a good gives complete control over the good to the user. This especially relates to the quality of the good. Since the owner of the good knows what he has done with good in the past, he is able to assess the quality of the good. By using goods supplied by sharing platforms uncertainty concerning the quality of the good arises. In response to this information asymmetry the platforms of the sharing economy try to implement instruments that reduce these asymmetries. Typically, the platforms establish rating systems where users have to evaluate each other and users share their experience with the other suppliers (and consumers) of goods. Other signalling options are photos or films that try to appropriately describe the state und the quality of the good.
- *Costs of the good*: The advantages of ownership are subject to costs of acquiring the goods. Of course it would be highly appreciable to own a holiday flat in numerous locations, because the flats would be available at any time and at the exact quality the user wishes to have. Unfortunately, this extensive ownership is subject to a budget constraint for most people. Therefore, renting a holiday flat is usual way to use a holiday flat.

The items above mainly focus on the demand for goods provided by sharing platforms. On the other hand we also have to explain, what determines the owners' willingness to give away their property by sharing it with other people. Unsurprisingly, similar reasons apply. The main driver to supply goods is of course the additional income that could be created by sharing the good. Existing capacities could be better utilized and would generate profits for the suppliers. Concerning the frequency of use, the suppliers of goods will be more inclined to share those goods that they do not use frequently, because these goods are more readily available for other people's use.[11] Handing over one's property to another person is subject to similar information asymmetries as for the demand side. When renting out a room, the supplier wants to be sure, that the room will not be destroyed after the guests have left the room. Therefore, the rating systems of the platform can also be used to assess and rate the consumers of goods.

[11] One exception is the joint use of products like for BlaBlaCar, where the supply od the service can only be offered if the owner uses the good (in the case of BlaBlaCar the car).

Now, that we know the main influencing forces for deciding whether to own or to rent a good, we can answer the question, which developments have changed the relative costs and therefore helped to create the sharing economy, i.e. a movement from owning goods to not owning and (only) using these goods. This observation resembles a similar line of research in the theory of the firm, which explains that new information technologies and the connection of people via the internet reduces the transaction costs of market transactions and therefore transactions are no longer carried out within the boundaries of the firm but are turned into market transactions (Move-to-the-market hypothesis).[12] The same idea also applies to the sharing economy, where the acting subjects are individuals instead of firms. Information technologies and the internet are able to significantly change some of the costs for owning or renting a good. The platforms, which have been identified to be constitutive for the sharing economy, reduce the information asymmetries between suppliers and consumers and reduce the threats of unavailability of goods. Providing information about a good and researching information about it has become much simpler with the use of the internet. Thus, because of the reduced information asymmetries more people are willing to provide goods on these platforms and on the other hand more people are also willing to rent goods temporarily, since the platforms reduce the probability of receiving a bad quality product. Moreover, because more people are willing to provide their property to other people via the sharing platform, the availability of goods for rent on these platforms increases. Therefore, it becomes less likely that a good will be unavailable shrinking the costs associated with unavailability.

In consequence, the internet and the creation of platforms which reduce information costs and connect individuals have a similar effect for the decision between owning and renting a good as it can be observed for the make-or-buy decision of firms. Therefore, it is necessary to analyse the economic characteristics of these platforms and whether they may come along with new costs for the individuals.

The Economic Characteristics of Platforms

The platforms of the sharing economy, which connect the individuals supplying and demanding goods, exhibit the characteristics of two-sided markets. The term "two-sided market" may sound tautological, since every market has two sides, demand and supply. However, the analysis of two-sided markets considers the establishing of such markets as a separate entrepreneurial effort and analyses factors that influence the creation of these markets.[13]

An essential feature of two-sided markets is the existence of network externalities. When joining a network an individual benefits from the connections in this network.

[12]Cf. Malone, Yates, and Benjamin (1987) and Malone (2004). Clemons, Reddi, and Row (1993) provide are more detailed analysis of transaction cost in make-or buy decisions of the firm.

[13]The characteristics of two-sided markets have been analyzed extensively in Armstrong (2006) and Rochet and Tirole (2006).

In addition to this benefit all other existing members of the network gain from the further network member, because they receive one additional potential partner for exchange within the network. These gains of the other network members are not internalized by the newly joining member and require compensation schemes for achieving an optimum network size. For two-sided markets these network effects are more complicated, because they take the shape of indirect network externalities.[14] This indirect effect refers to the observation that the externalities occur on the other side of the two-sided market. For instance, if a new consumer joins the platform, this will be a benefit for the suppliers on the other side of the market, because they have one additional (prospective) customer to serve, and if a new supplier is joining the network, this exhibits positive effects for the consumers, because this increases their choices. This mutual relationship can turn into a virtuous circle for the platform, because new customers attract new suppliers to the platform and new suppliers will attract new customers, which results in an upwards spiralling growth of the platform. Of course this spiralling effect may also work in the opposite direction. If there are only a few suppliers, the platform is unattractive for consumers, who will leave the platform, which will again turn the platform less attractive for suppliers and so on. These indirect network externalities are crucial for the working of the platform. Notice, that a new consumer joining the platform also creates negative effects for all other consumers, because it is an additional competitor competing for the same supply. Thus, it is necessary, that the consumers as a whole benefit from the indirect externalities on the other side of the market, which increases the supply due the more attractive demand base of the platform.

These two-sided markets are not new and we find them not only in the internet. Examples of two-sided markets are credit cards (cardholders and merchants), for-free newspapers (readers and advertisement customers) or in the internet e.g. Ebay (customers and suppliers). The art of creating a platform is the balancing of the demand and supply side in order to maintain the virtuous circle and to prevent it tilting into a vicious circle. These indirect network effects and as a consequence the virtuous circle of the spiralling growth imply economies of scale for the operation of the platform. The bigger a platform is, i.e. the more consumers and suppliers can be reached on the platform, the more attractive it is for new platform members. Even if there were competing platforms, the bigger platform would attract more and more members from other platforms due to its larger benefits it can offer created by its bigger size.[15] Thus, these platforms show a tendency to end up in a monopoly or at least an oligopoly. However, a monopoly platform creates new dependencies for the platform members and may increase the costs of using the platform for the platform members. As long as there is a sufficient number of suppliers und buyers using the platform, the owner of the platform will be able to appropriate the monopoly rents and will create the new dependencies mentioned above. This fact has to be distinguished from the platform's price setting behaviour in order in initiate the

[14] For a more detailed differentiation of indirect network externalities see Peitz (2006).

[15] Rare exemptions are smaller platforms that create additional value for their members like a certain specialization, which over-compensates the size benefits of larger platforms.

virtuous circle to balance the number of suppliers and buyers on the platform to increase the platform's attractiveness for both sides of the market. This price-setting scheme has distributional consequences between buyers and suppliers but should not be confused with the monopoly rent extracted by the platform owner.

The burden of a monopoly platform would be less harmful, if the platform market (i.e. the competition between platforms) was contestable. In a contestable market the market power of a monopoly cannot be applied to increase prices because increasing prices would immediately attract new competitors entering the market and thus lowering the prices. Unfortunately, the very nature of the platforms are the economies of scale due to the indirect network externalities. Therefore, new contesting competitors that start as a small platform are lacking the size which is a necessary production factor to become a new competitor in the market. Consequently, platform markets are mostly not contestable which increases the risks of exploitation by a monopoly platform. Moreover, switching to another platform can be further impeded by platform specific investments that have been made by platform members in the past. Such specificities are for example the ratings that a platform member gets for his supplies. A good rating allows platform members to charge higher prices. Such ratings usually cannot be transferred to a competing platform. Thus, if a member changed the platform, he would start without his reputation capital, which results in lower prices he could charge for his products and which will deter him from changing the platform. Another mechanism that could slightly reduce the exploitation risk is multi-homing. If more than one, similar sized platforms have evolved over time, consumers and suppliers may use all the platforms for their operations, i.e. they are homing their supply or demand on all platforms. Evidently this only works, if the homing costs of a platform are relatively low. In such an oligopoly the prices of the platforms are contained by the few remaining competitors. The disadvantages of separate ratings for each of the platforms remain and are another disadvantage for the multi-homing platform members.[16]

Peer-to-Peer Relationships and Power Law Effects

Closely related to the electronic platforms are so-called power law effects. These power law effects describe for example the distribution of supplies in a market. Typically, such supply distribution takes the shape of a hyperbola. An example is shown in Fig. 9.1. Let us assume that we would like to describe the room capacities of a city and we are sorting the capacities offered according to the size of the room suppliers. We start on the left with the largest hotels in town and then move downwards to smaller hotels, boarding houses and B&B-offers. At the end of the sorting we will find single room offerings that can be supplied by individuals. Without internet platforms, which facilitate the search for rooms, the supply of single rooms by individuals would be inconceivable and they would therefore stay out of the market.

[16] See Monopolkommission (2016), no. 1233 on the impediments of switching platforms.

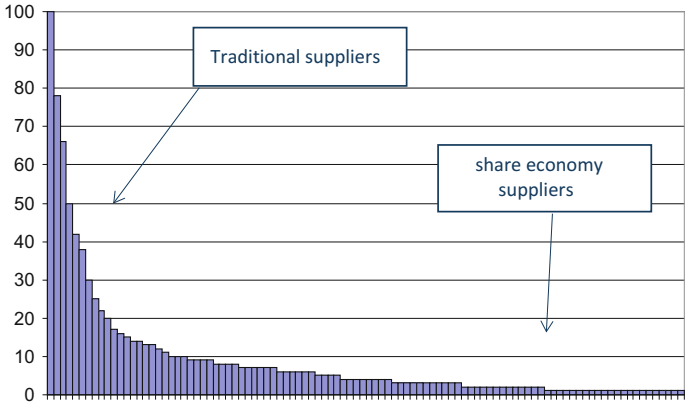

Fig. 9.1 Power law effects in the sharing economy

In order to bring their offerings to the market significant marketing expenditures would be necessary, which could not be recouped by renting out just one room. The platforms of the sharing economy have reduced information cost (here: signalling costs of suppliers). Therefore, the entry barriers to these markets have been lowered allowing more suppliers to participate in these markets. These new market participants are (private) individuals bringing their goods to the market and increase the supply in these markets. Consequently prices in these markets will fall, which allows new consumers to use these goods. Since these long tails of the distribution may accumulate a large number of new products, the available capacities may increase significantly having considerable effects on prices.[17]

Traditional markets are marked by their B2B or B2C characteristic, i.e. at least one exchange partner is classified as "business", which means a professional company that provides goods to the market. The distinctive feature of the sharing economy platforms is the inclusion of (private) individuals as suppliers in the markets. They are creating C2C markets, where some consumers temporarily put on the hat of business and offer their products to other people and in the next period they put on their hat as a consumer and use the product they own themselves. These (supplying) consumers turn themselves into hybrids acting on different sides of the markets and become "prosumers", a combination of producers and consumers. The new "prosumer" characteristic of individuals is one of the main challenges for regulation in markets. As prosumers the individuals take temporarily the role of a supplier, but evade many regulations that apply to their professional competitors.

Thus, the sharing economy is not creating new markets, but it is bringing new participants to existing markets. Similar developments have been observed for other (internet) platforms. Ebay was a platform that addressed the long tails of markets, for which it has been economically unattractive to offer their goods before. For the first time individuals received a marketing and sales platform that allowed them to

[17] These power law or long-tail effects have been initially described by Anderson (2006).

offer their products at low transaction costs. Interestingly, the platform has developed over time and today individuals share the platform with smaller professional shops. Similar developments could also be expected for some platforms of the sharing economy.

Interim Conclusion

The sections above described how new information technologies and especially platforms have changed the transaction costs for individuals and that consequently the boundary between ownership and renting has shifted towards renting. The basic economic characteristics of the sharing economy have been carved out. It has been shown that the platforms that enable the sharing economy have a tendency towards a monopoly. Thus, the positive effects of integrating more people to the market and allocating existing capacities more efficiently is accompanied by the detrimental creation of a monopoly, which will acquire parts of the rents created in the platform by the participants of the platform. Since the participants of the platform are individuals there will be no countervailing power to contain the platform monopoly.

One way to counter these monopolies would be the application of the usual regulations against the abuse of market power, which will take a long time that the platform may use to extend its reach. In the following section we will present a different solution for the problem of the structural monopolization of the platform. The problem of a platform monopoly could be easily resolved, if the users own their platform. Therefore, a platform taking the shape of a cooperative will be analysed.

Basic Economic Characteristics of Cooperatives

Cooperatives have been invented and developed in Germany in the 19th century and are usually not associated to be part of innovative business models of the information technology sector. This should not blur the fact that cooperatives have been a business innovation themselves and were a necessary basis for a blossoming German economy in the 19th century and still are the backbone of the German economy's SMEs.

The distinctive mark of cooperatives is the unification of owner and customer.[18] The owners of the cooperative are at the same time customers of the cooperative, which is in contrast to other corporations, where owners and customers are separate and follow different interests. In these corporations the customers are a vehicle to generate profits for the owners providing the capital to the firm. While the owners are interested in higher profits, for example by increasing prices, the customers usually favour lower prices. Thus, the owners' and the customers' expectation of the value for

[18] In cooperatives demand or supply can be bundled. In the following we will confine ourselves to the demand side. Nevertheless, all arguments also apply to supply-side cooperatives.

money go into opposite directions. In a market economy this conflict of interests is contained by market forces. Exploiting a more powerful position as a firm by raising prices will attract new suppliers, which will lower the prices again and if prices are too low additional customers will drive up prices again. Problems arise if there are market failures, i.e. if market forces fail to contain the contradicting interests. Here cooperatives come into play and could provide a solution. Because in a cooperative all customers are at the same time owners, the conflict is resolved. In a cooperative the owners (which are customers), generate their profits with the customers (which are owners) or—to put it differently—at worst they are exploiting themselves by increasing or decreasing prices or the efforts they spend. Therefore, cooperatives provide a solution in situations when markets fail. These failures could take different forms:

- Providing products to consumers is unattractive for companies and no supply of products is available for consumers. Therefore, consumers could organize the supply themselves by founding a cooperative which produces the products.
- Due to production technology there are no competitors and monopolies occur. This is a well-known situation in the agricultural sector, where local farmers depend on a local dairy company or a local supplier of seeds. Thus, a most common governance form for these transactions is a cooperative. Here the customers prevent the exploitation by the monopolist by owning the monopolist themselves.

Because cooperatives have two different relationships (provision of capital as owners and buying goods provided for them by the cooperative), the governance of these relationships is more complicated than the one-dimensional relations in other companies. Cooperatives provide a member value to their members, which consists of three different elements. First, the component of the direct member value refers to the founding reason of the cooperative, the products or services that the members want to acquire but for which market failures exist. This part of the member value is linked to the customer relationship that members have with their cooperative. Second, the indirect member value addresses the members' role as owners of the cooperative which provide capital to their joint venture. Because they provide capital to the cooperative, they are entitled to receive a dividend on this capital. Third, the sustainable member value is associated with the dynamics of a cooperative. Since substitutive providers are not available, the cooperative's members have a special interest in the sustainability of the cooperative's business. If the cooperative cedes to exist, they would lose their access to the products that are provided by the cooperative and which have been the founding reason. Consequently, they are willing to forgo some profits and leave some money in the cooperative. Due to these three types of member value the members have to decide how they weigh the components, i.e. the cooperative's profit is split into three parts and the ratios for the split have to be decided by the members.

The double relationship that the members have with their cooperative leads to another governance challenge. In other (one dimensional) corporations voting rights are allocated according to the capital that shareholders provide to the corporation. Applying this rule to a cooperative would ignore the twofold relation that members

have with the cooperative. Moreover, such rule would not take into account that the economic relationship is the pivotal driver of a cooperative and these interests have to be reflected in the voting rights. Thus, most cooperatives allocate their voting rights on a per head basis, i.e. one man, one vote. Some exemptions are made for those cooperatives whose members are legal and not natural persons. This voting scheme guarantees that the owner relationship (providing capital) will not dominate the customer relationship (buying products).

While cooperatives are well-suited to respond to monopoly power or lacking supply of goods, they also show some challenges in their governance. Because the customers of the cooperative are also their owners, the communication between customers and owners is more complex than in other corporations, since they have to decide on the implementation of the three components of the member value. This is a minor problem as long as the members are homogeneous in their preferences. If their preferences are similar, they will have similar needs and therefore will come to similar conclusions for the provision of goods by the cooperative. As soon as the members become more heterogeneous the decision-making costs will increase, because longer discussions and intensified negotiations are to be expected. Moreover, in the case of heterogeneous members it will be more likely that the members come up with a decision that is against the preferences of some members and these members then have to bear these external costs of being outvoted. The probability of heterogeneous members will increase with the number of members of the cooperative. In order to manage this heterogeneity and to contain the costs of heterogeneity the cooperative should implement distinct rules on the topics and procedures of voting. When evaluating these governance costs of cooperatives, the correct reference has to be identified and sometimes a market solution is taken as a reference. This ignores the unavailability of a market solution, which was the starting point for establishing a cooperative. An appropriate comparison has to take into account the solutions that can be implemented subject to the production technology and market determinants. Since the cooperative is a reaction to a market failure, the relevant alternative is a monopoly associated with much higher costs for the individuals or the non-supply of goods with the costs of non-availability for the individuals.

The cooperative is financed by its members who contribute the capital by taking their function as owners of the cooperative. This works fine as the size of the cooperative is in proportion to its members' needs and may grow with number of members. However, this also assumes that investments are easily scalable and can be sliced into small parts. Some investments do not have this property. Thus financing the cooperative needs complementary instruments especially if large up-front investments are necessary. Typical financing of young and quickly growing companies by external equity investors are not available for cooperatives. Therefore, their growth will be slower but also more sustainable than the growth of other companies, because it depends on the number of members, i.e. customer demand.

Cooperatives as an Organizational Solution for Platforms in the Sharing Economy

In the section "Defining and Characterizing the Sharing Economy" we explained that platforms are essential for the sharing economy and these platforms exhibit a tendency towards monopolization. It has also been shown that these monopolies cannot be contested and the pricing behaviour will not be disciplined by potential competition. Creating countervailing market power by aggregating the demand (or supply) of the platform users is also hard to implement, since another trait of the sharing economy is the atomistic structure of their users, who bring small units of demand and supply to these platform markets. Moreover the application of regulation against the abuse of market power is a lengthy process and hard to implement. It is doubtful whether these actions could be successful and unclear how these actions could look like. Splitting up a platform in order to increase competition will reduce the positive indirect network externalities and will shrink the benefits that the users can receive from the platform. A price control as another regulatory instrument would also be hard to implement. Thus, the problem remains that on the one hand people wish to have these platforms for exchanging goods or information, which will increase their welfare, and on the other hand the platforms will automatically monopolize, which will be detrimental for the users of the platform.

In the section "Basic Economic Characteristics of Cooperatives" we have shown under which circumstances cooperatives are a suitable solution to increase the individuals' welfare. Cooperatives are able to mitigate the problems stemming from the monopolies by combining consumers (or suppliers) and the monopoly in one company. Thus, we suggest that platforms could take the form of a cooperative that is owned by its users. In contrast to an administrative answer by applying competition law the organizational solution of forming a cooperative could maintain the positive effects of the platform (positive indirect network externalities) and at the same time could control the vertical dependencies on the monopolistic platform. Three different types of cooperatives are feasible solutions for platforms of the sharing economy.[19]

Type Ia: Suppliers (or Consumers) Jointly Own the Platform

In this first model one side of the market owns the platform, for instance the suppliers of goods found a cooperative, which operates the platform. In a (fictitious) example we could assume the Uber drivers own the Uber platform. Even if the platform gains market power, the exploitation of the suppliers is limited by the fact that the platform is owned by suppliers. So at most they would exploit themselves. Thus, the negative effects of the platform's market power would be eliminated. The missing disciplining competition effect on the platform would be substituted by the vote channel within

[19]Type I and type II cooperatives resemble the peer-to-peer sharing and the asset-hubs by Demary (2015) or Rauch and Schneider (2015), p. 11.

the cooperative. Even if the management of the cooperative would try to increase prices at the expense of the suppliers, the members could intervene by voting against the management in their function as owners of the platform to improve their relationship to the platform in their function as customers. Changes of the platforms offerings are not enforced by market pressure (e.g. offers by other platforms, which could not exist due to the characteristics of the production technology of platforms), but directly through interventions by the members, who can influence the scope and the quality of the platform's service. Appropriately implemented, a cooperative will have a superior relation to its customers (here: the suppliers), because they own the platform cooperative. Necessary information flows between the customers and the platform are facilitated, since the customers' reticence to reveal the information is reduced due to their ownership relation. They are benefitting themselves by revealing the information and consequently are improving the functioning of the platform. This information flow could only be hampered by free-rider behaviour of some members. Since all members benefit from the information flows even if they do not contribute to the information flow, their incentives to actively provide the information decrease. Therefore, additional transparency between the members, rules and communication are necessary to stabilize the information channel, which improves platform's performance.

The type Ia cooperative only solves the market power problem for one side of the market. For the other side if the market (here: the consumers) the market power problem remains. The relevance of this problem depends on the structure of the two-sided market. As mentioned in the section "The Economic Characteristics of Platforms" the platform operator has to balance the two sides of the market in order to create a virtuous circle by applying fees to the two sides. In many platforms just one side of the market has to pay the fees, while the other side may use the platform for free. In the case of such a platform that offers its service for one side of the market without charging the customers the market power problem is not existent for the customers on this side of the market. Therefore, a type Ia cooperative would be an appropriate solution for the sharing economy platform and mitigates the problems that are associated with the operation of such a platform.

The structure of the members will also influence the success and the functioning of the platform. As mentioned in the explanation of cooperatives more homogeneous member structures will facilitate the functioning of the platform, since it results in more similar member needs and wishes. These similar needs will facilitate the decision making of the members to operate the platform. In order to create value for both sides to the two-sided market which is operated by the platform a large number of members is necessary. However, many participants in the platform increase the probability of more heterogeneous members and thus will complicate the operation of the platform. This effect can be mitigated, if the platform offers simple interlinking services with only limited additional services. The more complex the operations of the platform become and the more services the platform offers, the more relevant heterogeneous members will be for the decision making costs. Take the example of Uber. A simple service that Uber offers is the connection of people who need a ride and the car owners who will offer the ride by the Uber-developed app. But Uber could

extend its offerings. They could add insurance services for the car owners on their platform or could try to improve the social security service for the drivers. While most drivers will easily agree on the connecting app, there will be divergent opinions on the insurance issues, because some drivers enjoy social security protection because they are offering rides as a hobby, while others offer their service in a more taxi-driver-like fashion and would need these additional services, which leads to conflicts in determining the platforms activities.

Type Ib: Suppliers and Consumers Jointly Own the Platform

In a type Ib cooperative not only one side of the market owns the cooperative, but the participants on both sides of the market become owners of the platform. This type is an atypical cooperative. In the past cooperatives formed among the individuals of one side of the market. Including both sides of the market is a new approach. There are only a few examples of such cooperatives available.[20] As mentioned before the market power problem can arise for both sides of the markets and is relevant if the platform charges prices for both sides of the market. Then both sides of the market would be subject to the exploitation by a monopoly platform and both sides would be interested in restraining the platform's pricing power. Thus, a membership available to both sides of the market would be the immediate consequence.

By integrating the members of both sides of the market in the cooperative the heterogeneity automatically increases. Demand side and supply side will have similar interests in having a platform for using or suppling goods, but as consumers and suppliers they will have opposing preferences with respect to numerous parameters. Most obvious are their opposing interests concerning the price of the platform service. While being guided by the pricing guideline for two-sided markets to internalize the positive indirect network externalities, both sides of the markets will be tempted to reduce their burden at the expense of the other side, which will hamper the frictionless working of the platform because it disturbs the internalization mechanism. Moreover, providing information to the platform in order to improve the platform services could imply the provision of this information to the other side of the market, which could use it to the disadvantage of the information providers. These opposing interests are significant challenges for type Ib cooperatives and the platform success will crucially depend on managing this conflict of interests.

[20] One example is OSADL eG. OSADL is a cooperative that produces open source software solutions for companies of the machinery industry. Members of the cooperative are companies from the machinery industry (demand side) and IT companies programming the software (supply side).

Type II: Suppliers or Consumers Own the Platform and Jointly Own the Goods

The type II cooperative refers to a different understanding of ownership. While for type I cooperatives we assume that the goods, which will be shared, are owned by the individuals, in a type II cooperative the goods will be property of the cooperative and the members of the cooperative will share the ownership of the goods by becoming a member of the cooperative. The joint ownership of type II substitutes for the individual ownership of type I cooperatives. Because of this movement from individual to collective ownership the type II cooperatives lack the typical peer-to-peer characteristic of other sharing platforms. Yet, it is still part of the sharing economy because the individuals share the use of the goods, but add the sharing of ownership of the goods to their sharing activities. This kind of "double sharing" will be applied if the acquisition and ownership of the goods is very expensive and individual ownership is not affordable. The joint ownership also implies that the platform does not show the usual indirect network externalities, because the supply is provided by the cooperative itself (i.e. jointly by the users). Instead we observe direct network externalities. On the one hand additional members may increase the cooperative's pool of goods, on the other hand the additional member are new competitors for the limited number goods in the cooperative. So in the case of shared ownership the platform has a different nature and different economic characteristics. Nevertheless the dependency issues remain. Since the consumers are not able to own the goods individually, they depend on the supply by third parties, which again could have monopoly or oligopoly characteristics. Therefore, a cooperative will protect against exploitation as long as disciplining market mechanisms are not available. Other renting solutions are conceivable but could create new dependencies for the users.

Because the cooperative owns the (mostly expensive) goods the type II cooperative of sharing is usually confined to local areas but could grow into larger regions or countrywide over time. Therefore, due to this anchoring of the platform in the real economy it does not exhibit the characteristic quick platform expansion. Nevertheless, the type II cooperatives look back to a long tradition. In the agricultural sector joint ownership and joint use of machines has been common for centuries. Another example is Mobility, a Swiss car renting cooperative, which owns a large pool of cars and rents out these cars to their members.

Although the cooperative model is very convincing in containing the effects of the platform's market power especially for the type I cooperatives, there are some significant disadvantages of this model in implementing it for platforms in the sharing economy. Due to the indirect network externalities and the implied economies of scale, it is necessary that the platform grows quickly in order to generate these network externalities that benefit the platform users. This is in contrast to the ownership function of cooperative members, where customers have to become owners and contribute capital to the platform. Especially those users having free access to the platform will not be willing to listen to lengthy explanations about platform ownerships, rights and duties and they will be even less inclined to contribute capital.

Because the cooperative model requires more explanation and a monetary contribution, it hampers the quick growth of the platform, which is detrimental in a market, where speed is one of the success factors.

Moreover, some of the platform models of the sharing economy need some upfront investments, e.g. to buy infrastructure or to advertise the platform in order to become a winner in the platform competition. Again such investments are harder to finance for a cooperative that covers its financing needs by the equity provided by the members. The cooperative—like any other company—can of course use debt for financing but also the debt financing depends on the amount of equity that is provided by the members.

It will crucially depend on the individuals' preferences whether these impediments will restrict the use of cooperatives as a governance scheme for platforms. Up to now the convenience of easy access to platforms and the overwhelming opportunities they offer seemingly outweigh the benefits of further control over the monopolist. Nevertheless, recent scandals like the data abuse at Facebook may be a starting point to rethink these preferences, which would open the way for more complex governance structures.

Conclusion and Practical Implications

The sharing economy is an interesting new way to allocate existing goods among people. It is not creating new markets but the platforms of the sharing economy are able to bring new suppliers and consumers to the markets and give them beneficial access to these markets. Nevertheless, these platforms exhibit production characteristics that tend to monopolize market structures. In order to overcome the problems of monopolies without losing the advantages of platforms we analysed the applicability of cooperatives as an organization of the platforms. Organizing platforms as cooperatives eliminates the negative monopoly effects of the platforms, while the positive platform effects are preserved. Thus, the cooperative is—theoretically—the superior type of organization for platforms of the sharing economy. However, different markets of the sharing economy may require different cooperative structures which are subject to some disadvantages of the cooperative like heterogeneity of the members or a detrimentally slow speed of growth. Thus, further introspection into different types of markets and innovative financing mechanisms of platform cooperatives is still needed.

Although the idea of having a cooperative ownership is—up to now—purely theoretical, it should encourage a broader discussion of the platforms' governance structures. Due to the immanent competition restricting characteristics of platforms the currently existing platforms are not able to fully exploit the opportunities of the new technologies that are used in these platforms and they are dangerously redistributing rents from the individuals to the monopolistic platforms. The growing relevance of peer-to-peer activities will also require a rethinking of the economics how individuals form there buy-or-rent decisions.

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