

Collaborative Business Models and Efficiency

Potential Efficiency Gains in the European Union

Impulse Paper No. 07

European Commission
Internal Market, Industry, Entrepreneurship
and SMEs Directorate-General
Unit E3
Mr Neil Kay
BREY 06/175
1049 Brussels / Belgium

Contact:

Dr. Vera Demary
Barbara Engels

Contact:

Dr. Vera Demary
Phone: + 49 221 4981-749
Fax: + 49 221 4981-99749
E-Mail: vera.demary@iwkoeln.de

Barbara Engels
Phone: + 49 221 4981-703
Fax: + 49 221 4981-99703
E-Mail: engels@iwkoeln.de

Institut der deutschen Wirtschaft Köln
Cologne Institute for Economic Research
P.O. Box 10 19 42
50459 Cologne / Germany

Content

1	Introduction	4
2	Properties of Online Platform Markets	4
3	Efficiency Gains of Collaborative Business Models	5
3.1	Accommodation Business Models	5
3.2	Business Process of Accommodation Providers	7
3.2.1	Stage 1: Before Stay	7
3.2.2	Stage 2: During Stay	10
3.2.3	Stage 3: After Stay	11
3.3	Efficiency Gains of Collaborative Platforms	12
3.3.1	Business Process Efficiencies.....	12
3.3.2	Other Efficiencies.....	17
4	Impact of the EU Environment on Collaborative Platforms.....	20
4.1	Growth of Collaborative Platforms in the US and the EU	20
4.2	Challenges to Growth for Collaborative Platforms.....	23
4.3	Policy Recommendations	27
	References	30
	List of Tables.....	34
	List of Figures	34

1 Introduction

With the advent of the all-embracing digitization, the internet-based collaborative economy, which harnesses the power of technology to connect people in transactions, is on the rise. It provides services in a different way than traditional economies: Traditional service providers typically adopt a pipe-like business model, employing staff within a single enterprise to supply a service directly to a particular segment of the market. The collaborative economy, by contrast, mainly consists of peer-to-peer (P2P) online platforms, which are characterized by network-based business models. The tremendous success of many collaborative platforms might be indicative of substantial efficiency gains that can be realized in collaborative business models, but not in traditional business models. The purpose of this impulse paper is twofold:

First, it examines whether there are efficiency gains in the collaborative economy by carrying out a comparative analysis of the business model of a collaborative platform and a traditional enterprise providing broadly the same service. Second, given the efficiency gains realized in the collaborative economy, the growth trajectories of a US-based and of a European collaborative platform are compared in order to single out potential barriers arising in the EU environment. Based on these barriers, policy recommendations are provided that could foster the growth of collaborative platforms and thereby the realization of efficiency gains.

The following chapter discusses the peculiarities of online platform markets, which form the theoretical basis for the analysis.

2 Properties of Online Platform Markets

Generally, a P2P online platform has two or more groups of users who obtain value from their interaction (EU Commission, 2015a). These users cannot capture the value from their mutual attraction on their own because of prohibitive transaction costs. Therefore, they rely on the platform, which allows them to interact, in order to create value (Evans/Schmalensee, 2007). Collaborative platforms often use different pricing strategies for the different sides (Demary, 2015a).

The market development of an online platform is mainly dependent on the factors *congestion*, *platform differentiation*, *multi-homing*, *network effects* and *economies of scale* (Evans/Schmalensee, 2007). These factors influence the relative size of the platform as well as market concentration in the respective markets.

Congestion may emerge in platform markets due to negative externalities caused by additional users, e.g. through an increase in search and transaction costs. *Platform differentiation* refers to an adaptation of the platform business model to heterogeneous user preferences. The more diverse these are, the easier it is for platforms to differentiate horizontally (different products of comparable quality) or vertically (different product qualities). *Multi-homing* is the practice of using several platforms to fulfil similar tasks. An example for this is when travellers use both Uber and BlaBlaCar for transportation, depending on the destination or time frame available. Capacity constraints of platforms due to congestion, the scope of platform differentiation and multi-homing counteract market concentration.

Economies of scale (EoS) refer to the fact that the initial costs of establishing the online platform are high, while variable and marginal costs are negligible (Shy, 2001). Because of EoS, online platforms are able to become large quickly once the initial costs are covered.

Direct and indirect *network effects* have a similar impact on the growth of platforms and hence market concentration. Direct network effects mean that the benefits that the individuals on one side of a platform obtain from using it increase with the number of users on that same side of the platform (Katz/Shapiro, 1985). In contrast, indirect network effects imply that users on one side of the platform indirectly benefit from an increasing number of users on their platform side, as this increase attracts more users on the other platform side (Haucap/Heimeshoff, 2014). Collaborative economy platforms tend to exhibit mainly indirect network effects (Demary, 2015a). For example, a traveller aiming to find accommodation through a P2P online platform benefits from a large number of providers of such accommodation. These, in turn, face a larger probability of renting out their space if there are many travellers, meaning that demand is higher. Network effects also imply so-called positive feedback (Shapiro/Varian, 1999). Once the growth of a collaborative platform has gained momentum, it will automatically attract more users because they perceive the platform as attractive. Negative feedback in case of seemingly failing platforms is also possible.

Trust is crucial for online platforms to be able to attract sufficient demand and supply (Finley, 2013). Because face-to-face interaction typically does not occur in these settings and repeated interaction is rare, most collaborative platforms employ trust-building mechanisms (Demary, 2015b). These include ratings or reviews as well as a transparency of terms of business. The integrity of these mechanisms is paramount for the collaborative economy.

3 Efficiency Gains of Collaborative Business Models

This chapter compares the business processes of a traditional business-to-consumer enterprise and a collaborative platform offering a similar service. Thereby, efficiency gains from providing a service in a collaborative form are determined. In particular, efficiency gains of using a collaborative accommodation platform (such as Airbnb) instead of a traditional accommodation like a hotel are illustrated and quantified.¹

3.1 Accommodation Business Models

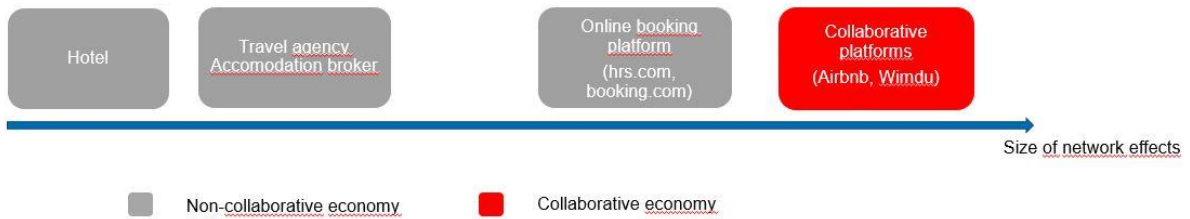
The collaborative and the hotel model are two extreme forms in the business model typology, being characterized by very large and zero network effects, respectively (see figure 3-1). Between these extreme forms, the differences in business process efficiency are presumably very large.

Figure 3-2 shows the success (measured in search queries) of the collaborative platform Airbnb compared to the booking platform booking.com. Even though their business models are similar (see figure 3-1), the number of search queries differs substantially from the end of the year

¹ Note that legal aspects with respect to the lawfulness of the business practice of the collaborative platform are not covered.

2013 onwards. The fact that Airbnb search queries have skyrocketed in recent years is indicative of the benefits that guests and hosts can realize in a collaborative accommodation model compared to a traditional one.

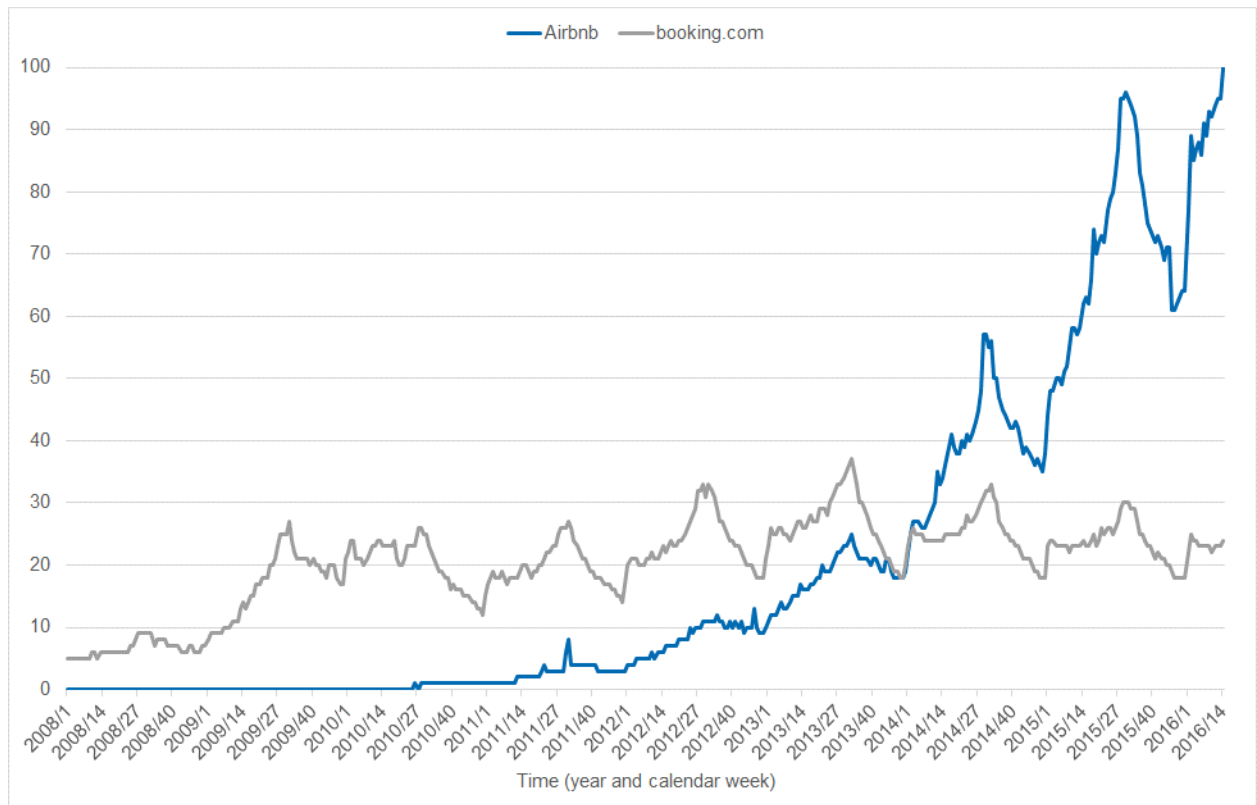
Figure 3-1: Business Models of Accommodation Enterprises



Source: Own illustration

Figure 3-2: Search Queries for Airbnb and booking.com

Number of worldwide Google search queries relative to highest number in the period



Source: Own illustration based on Google Trends data

3.2 Business Process of Accommodation Providers

The traditional market for accommodation involves private and business² travellers renting rooms from formal businesses, such as hotels. The collaborative accommodation market, by contrast, involves online platforms like Airbnb or its competitors which permit the large-scale rental of spaces from one ordinary person to another (P2P accommodation). In contrast to hotels, the platform provider has no ownership of the homes being listed on the platform. Instead, the platform simply enables potential hosts and guests to directly transact with one another. Its main costs therefore consist in the technological setup, fixed costs like servers and insurance costs and the running costs like salaries to permanent employees. Capital investment is low, marginal costs are close to zero. In the traditional model, fixed costs are much higher due to the establishment and upkeep of the hotel.

Apart from guests, the customers of collaborative accommodation platforms also entail hosts who want to earn money and/or get to know new people. As guests can be hosts and vice versa, network multiplier effects raise the number of transactions in a disproportionately high fashion.

The processes of searching, booking and using an accommodation through a collaborative platform and through a traditional hotel can be divided into three stages: before, during and after the stay. Stage 1, the process prior to the stay, is illustrated in figure 3-4, stage 2 (during the stay) in figure 3-5. In the following, the three stages are analysed in detail, focusing on potential efficiencies and inefficiencies.

3.2.1 Stage 1: Before Stay

Initial Steps

Guests and hosts are required to create a platform profile. Membership to the site is free and there is no cost to post a listing (low entry barrier). There are no technical capacity constraints that could limit the number of hosts or guests. Hosts can promote their accommodations to potential guests via the platform's technological infrastructure. Freelance photographers paid by Airbnb contribute to a professional accommodation profile. Platforms tackle the marketing challenge of attracting users to the website, thereby overcoming the difficulty host face in making their accommodation known to potential guests. Hosts can effortlessly enter the tourism accommodation sector and compete with traditional accommodation enterprises for guests from around the world.

In contrast to the collaborative case, there is generally no prior registration needed for booking a hotel through its website, which might attract guests that do not want to register.

Search for Accommodation

The prospective guest conducts a search on the collaborative platform or, in the traditional case, searches hotels through a search engine. The collaborative platform provides an overview

² Note that many business travellers still focus on hotels due to their corporate travel policies and loyalty programmes.

of accommodations according to the user's search criteria (destination, travel dates, party size, price, neighbourhood, amenities). Then the individual listings can be looked at for greater detail, generally consisting of a description, photographs and public reviews from previous guests. The level of transparency of the information is relatively high. In the traditional case, guests have to look at the hotels' websites. The available information is mostly generated by the hotel itself and hence not very comparable and transparent. Also, the search can be cumbersome, because guests have to switch back and forth between a hotel's website and the search engine.³ Because of its user-friendly interface and a high level of transparency, it is generally easier to pick accommodation through the collaborative platform. Transaction costs⁴ are lower in the collaborative case.

Choice of Accommodation

The guest chooses the accommodation. The variety of accommodations offered is much larger in the collaborative case, which is one of its main value propositions. Spaces range from a living-room futon to an entire island (Wortham, 2011). Locations are also much more diverse than in the hotel case. Zervas et al. (2015) show that the distribution of Airbnb apartments in Austin, Texas, looks much more scattered than the one for hotels, which focuses on few main areas. How scattered Airbnb rentals are also becomes apparent on insideairbnb.com, where maps for various cities are available (Inside Airbnb, 2016). Furthermore, the distribution of prices is considerably larger. Guests will mostly pay a lower price to stay in a private home than in a hotel. Airbnb hosts are able to price their spaces very competitively because the hosts' primary fixed costs (e.g. rent and electricity) are already covered, and because the hosts have minimal labour costs and are not fully dependent on their Airbnb revenue (Guttentag, 2015).⁵

According to 2015 Airbnb data, the average price for an Airbnb accommodation in Berlin is 55 Euros per night (at the accommodation's minimum occupancy), which is below the average price of around 80 Euros for a hotel room in Berlin. Overall, about 60 percent of all offers are cheaper than 55 Euros (Skowronnek et al., 2015). This enables tourists to spend less money or to extend their stay.⁶ The collaborative economy considerably fosters price efficiency, making supply and demand meet in a flexible way through real-time information and price adjustment. Dynamic pricing itself is also used by hotels, however.

Figure 3-3 compares the prices of accommodation offerings for the weekend of 14-5-2016 for two people in Berlin, Paris, London, New York and Tokyo. The offerings are the first 30 shown on Airbnb and the 30 most popular on the booking platform hrs.com. Clearly, most Airbnb offerings fall into the lower price categories, while hotels have their largest share of offerings in the highest price category.

³ This search process can be facilitated by a booking platform like booking.com. However, the extreme forms of accommodation booking are focused on here.

⁴ See Coase (1937) for theoretic background on transaction costs.

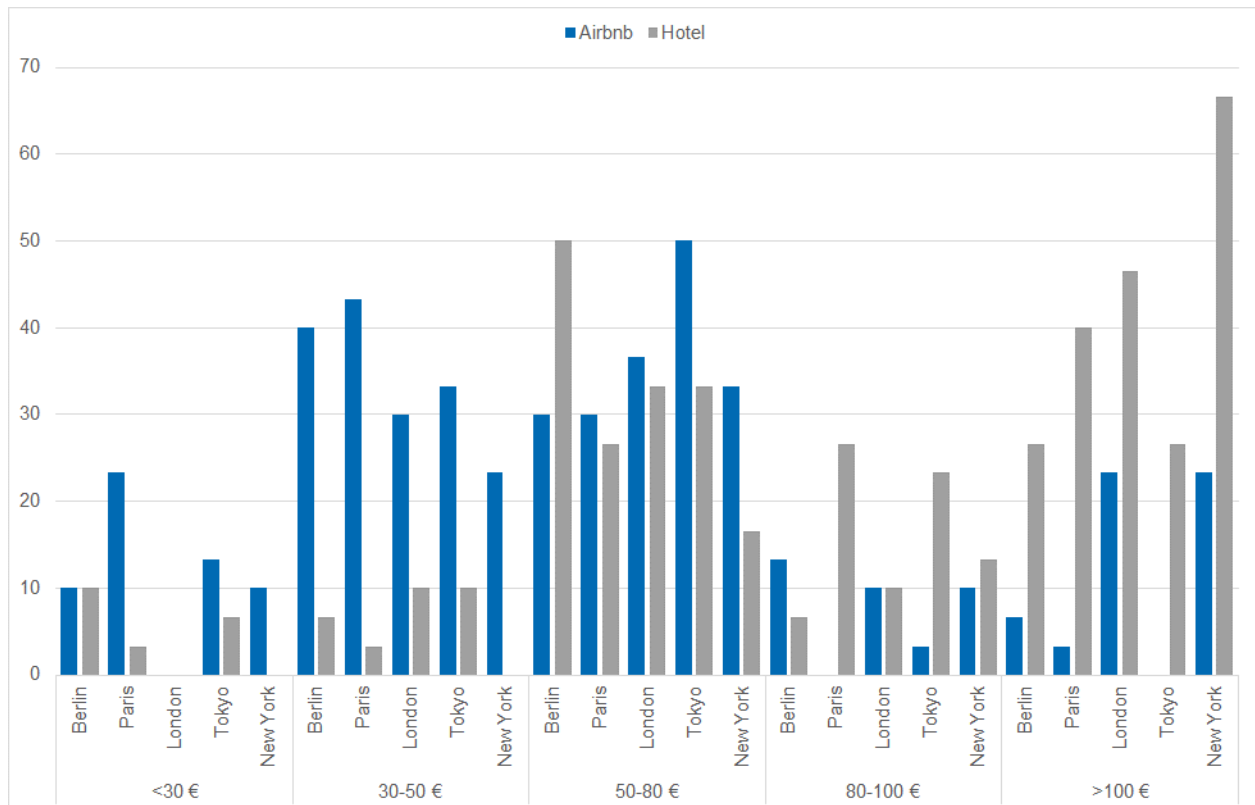
⁵ Hosts might for example divert their accumulated reputational capital into the rental price, i.e. increase the price because of their good reputation, or they may price their property below the market price so that they can choose their guests from a wider pool of candidates.

⁶ A study Airbnb commissioned to examine the economic activity generated by its guests in San Francisco between April 2011 and May 2012 found Airbnb guests stayed an average of two days longer than the average tourist (5.5 vs. 3.5 days) which might be due to low accommodation costs (Airbnb, 2012).

Figure 3-3: Collaborative versus Traditional Accommodation Prices

Share of accommodation offerings for two persons (excluding breakfast; including service and cleaning fees) in different price categories. Prices per person per night for 14/15-5-2016 as found on 21-3-2016.

Example: More than 20 percent of Airbnb accommodation in Paris fall into the cheapest price category, while only less than 5 percent of the hotels do.

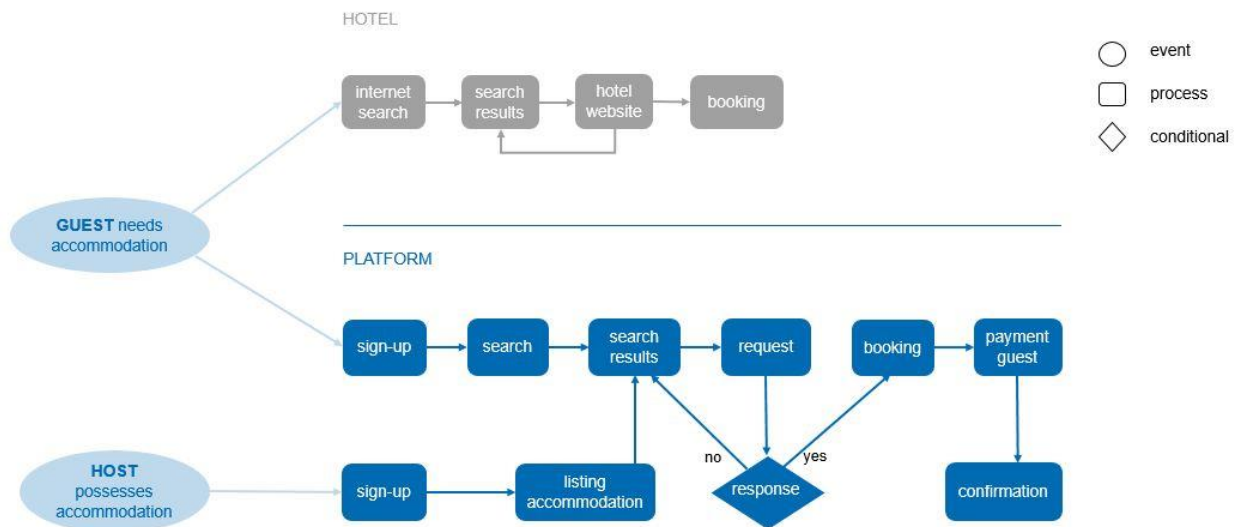


Sources: Own calculation based on airbnb.com, hrs.com

Booking

The prospective guest sends a request to the host through the collaborative platform. The host decides whether he wants the guest to stay at his apartment or not – judging from the guest's profile including comments on the guest by other hosts.⁷ If the host accepts the guest, both communicate through the platform on further details. Payments are made through the platform. Airbnb charges both hosts (3 percent) and guests (6 to 12 percent) per stay, which defines the main part of the platform's revenue streams. In the traditional case, the guest books a room and immediately receives confirmation from the hotel, which is generally more reliable than the confirmation by a private host. The host-guest messaging implies that more time and effort is needed in the collaborative than in the traditional booking. However, mobile P2P communication reduces reaction time and permits a constant and transparent exchange of information.

⁷ Some hosts offer an instant booking feature and do not select guests. Edelman and Luca (2014) find that discrimination based on race, gender, and religion may take place during this selection process. By contrast, hotels generally do not discriminate against certain guests.

Figure 3-4: Business Process Stage 1, Before Stay

Source: Own illustration

3.2.2 Stage 2: During Stay

Once the guest arrives at the location, he checks in either at the reception (traditional case) or with the host. The traditional economy might have a competitive advantage in terms of staff friendliness and professionalism. Collaborative accommodations provide various benefits that come from staying in a residence. Guests receive local advice and might have access to residential amenities such as a kitchen and a washing machine (Guttentag, 2015).

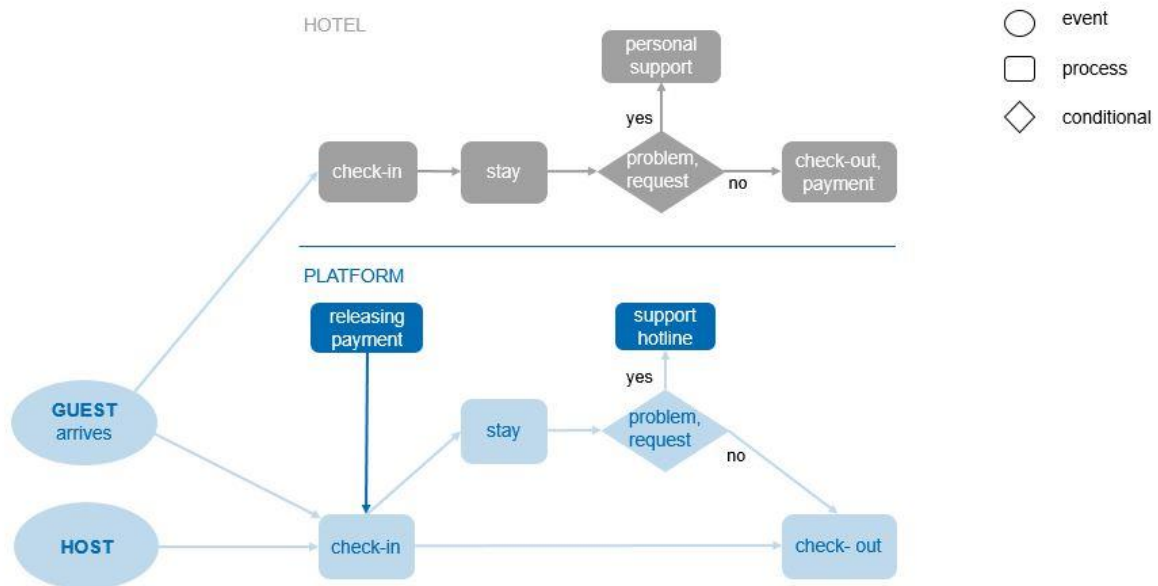
With Airbnb, the host receives the payment through the platform 24 hours after the guest has checked in. In case of major problems, the money is not released to the host.

In case of problems, the reception desk of a hotel might be more accessible than Airbnb's 24-hour telephone hotline⁸. Also, unlike private homes, hotels are subject to high security and hygiene standards, resulting in unambiguous accountability. To tackle insecurities associated with staying with a stranger, collaborative platforms have established identity verification mechanisms. Moreover, Airbnb offers insurance for hosts that covers million-dollar theft and damage.⁹

At the end of the stay, guests check out with the hosts in the collaborative case or at the reception in the traditional case.

⁸ Note that the hotline can also be used by hosts.

⁹ However, the true cost of these incidents lie with the potential damage to the platform's reputation.

Figure 3-5: Business Process Stage 2, During Stay

Source: Own illustration

3.2.3 Stage 3: After Stay

After the stay, the guest has the opportunity to publicly evaluate the accommodation either through a booking platform in the traditional case or through the collaborative accommodation platform itself. For the collaborative platform, this is an important trust-establishing mechanism that substantially reduces information asymmetries. Accordingly, the host can rate and review the guest as well.¹⁰ The reputation mechanisms allow the two parties to learn more about one another before agreeing to a transaction, and create an incentive for both parties to conduct themselves in an acceptable manner (Jøsang et al., 2007). Low quality accommodations and unpleasant guests are driven out of the market.

Positive experiences with the collaborative platform trigger a cascade of self-energizing effects. The perceived quality of the accommodation services and the demand for accommodation increases. New hosts sign up and again increase the quality of services, relying on extensive network effects. More bookings decrease the costs and hence the prices. Overall welfare increases.

¹⁰ Although the rating procedure is double-blind (both parties do not know how the other party rated them until both reviews are published), the ratings are likely upward biased (Zervas et al., 2015).

3.3 Efficiency Gains of Collaborative Platforms

This section determines the efficiency gains that arise in the collaborative accommodation economy.¹¹ First, efficiency gains that stem from the differences of the business processes of the traditional and the collaborative economy are discussed by comparing input and output on each business stage.¹² Second, macroeconomic and other efficiencies that are not directly related to the business process are explained.

3.3.1 Business Process Efficiencies

Table 3-1 shows the input factors and the output of the first stage of the business process (prior to stay).¹³ The collaborative accommodation business produces more output and more valuable output with less input. The platform setup costs are spread over a large number of users, while a hotel only serves a very limited number of guests. One main efficiency gain of the collaborative model is the reduction of information asymmetry, which enables a better matching of demand and supply and fosters *market efficiency* (market players act rationally and based on same information). The other main efficiency gain lies in the network effects that both hosts and guests benefit from and that foster *allocative efficiency* (optimal distribution of goods according to preferences).

Information asymmetry means that the amount and quality of information are not identical for all parties involved in a business transaction. Information asymmetries generally entail costs for both sellers and buyers, one reason being that transaction prices are distorted.¹⁴ While the quality of hotel service is hard to judge for the guest beforehand, for example, a hotel misses information on the typical conduct of a certain guest. This can lead to fewer transactions (Cohen/Sundararajan, 2015).

An online P2P accommodation platforms reduces such information asymmetries in many different ways: Hosts have to follow guidelines while setting up the information about their accommodation, as do guests. Both parties evaluate each other after the stay which allows them to build a reputation on the platform. This facilitates further transactions and possibly makes them less costly since information asymmetries are reduced. In the long run, the economy might benefit

¹¹ There are several other potential efficiency gains realized in different markets than the accommodation market, i.e. in the car-sharing market. Commenting on these extensive efficiency gains would, however, go beyond the scope of this paper.

¹² A precise quantification of the production input and output could not account for the very diverse pricing schemes and different macroeconomic environments that exist throughout the EU and the US. Also, it would be heavily case-dependent. Therefore, it is avoided. Note also that a direct comparison is partially misleading since the accommodation services are not fully comparable.

¹³ In contrast to the description of the business process, this comparison of input factors and output also considers the initial business setup.

¹⁴ The first fundamental theorem of welfare economics states that in a competitive economy with no externalities, prices would adjust so that the allocation of resources would be optimal in the Pareto sense. A key assumption for the theorem to hold is that the characteristics of all products traded on the market should be equally observed by all agents. When such assumption fails to hold, i.e. when information is asymmetric, prices are distorted and do not achieve optimality in the allocation of resources. The reduction of information asymmetries promotes the appropriate price for exchanges, since there is better information and less risk.

from this for two main reasons: First, when the number of overnight stays increases, more people make a living from such services. Second, the associated tax revenue increases as well. The collaborative platform itself has an incentive to decrease information asymmetries in order to be able to expand. Only if users are able to interact efficiently, the platform will be able to reach a certain size. This leads for example to voluntary screenings of drivers in case of the ridesharing platform Lyft and to large units dealing with customer service and the promotion of trust and safety in case of Airbnb (Cohen/Sundararajan, 2015).

Allocative efficiency entails producing exactly the amount and quality of the good or service that consumers demand, i.e. a perfect match of consumer preferences and production. In the collaborative case, the platform and the associated transparency of information contribute to this efficiency. Take the online P2P accommodation example: A host listing his apartment on the platform gets direct feedback on the attractiveness of his service and can adjust it accordingly. If there are no bookings, he can adjust the price. If guests positively comment on the provided amenities after the stay, the host can use this information to tailor his service even better to consumer preferences and include information on the provided amenities in the description of the accommodation.

In general, consumers benefit from allocative efficiency by being able to pick a service that exactly meets their preferences. This makes the service and hence the platform itself more attractive, possibly resulting in more bookings. This, in turn, positively affects the economy due to positive effects on the labour market and on tax revenue.

The benefits of collaborative platforms for consumers and providers increase with the size of the platform, i.e. the number of users. Large-scale platforms offer a wider variety of choices and consequently are able to meet consumer preferences in a better way than smaller platforms. At the same time, they are more attractive to providers, which results in a self-reinforcing effect. Allocative efficiency in particular can be accomplished more easily if the number of users of a platform is high. Reputation-building mechanisms of collaborative platforms more effectively decrease information asymmetries if the platforms operate on a large scale. The more users contribute to these mechanisms, the smaller is the effect of outliers and the better is the fit with the actual quality of the service and the actual behaviour of the users.

Table 3-1: Input Factors and Output for Stage 1 of the Business Process (Before Stay)

Case study: Hotel versus online P2P accommodation platform

		Traditional Economy	Collaborative Economy
Input	Capital	<ul style="list-style-type: none"> Hotel: very high; e.g. economy hotel development costs per room estimated to be 87,000 US-\$ (Hotel Online 2015)¹⁵; incl. land, construction, soft costs (interests, fees), furniture, equipment, pre-opening and working 	<ul style="list-style-type: none"> Platform: high costs for initial technological setup incl. servers; low capital costs with regard to property, land, etc.

¹⁵ An older estimate is that of Gellersen (2009), who estimates the costs to amount to about 32,000€ per room. Pfeiffer (2014) speaks of at least 25,000€ per room.

		capital; marketing	<ul style="list-style-type: none"> Host: minor equipment costs (extra linen etc.)
		Lower capital input in collaborative case	
	Labour/time	<ul style="list-style-type: none"> Hotel: website setup (incl. photos; once); IT support for website; receptionist answering requests; support staff, e.g. for marketing Guest: search costs depending on familiarity with internet search and travel destination/hotel brands, level of pickiness/special requests; communication with hotel (booking) 	<ul style="list-style-type: none"> Platform: website setup (once); extensive IT support for website; costs for maintaining community; possibly support staff, e.g. for marketing; photographers; no receptionist needed; capital and labour costs spread over large number of users (marginal costs close to zero) Host: profile setup (once); communication with guest; storing personal belongings Guest: profile setup (once); search costs; communication with host
	Other input	<ul style="list-style-type: none"> Hotel: community not important; big data processing not applicable (except for very large hotel chains) 	<ul style="list-style-type: none"> Platform: number of users/community extremely important due to network effects; big data to improve search algorithm; trust
		Lower labour operating input in collaborative case	
	Output	<ul style="list-style-type: none"> Accommodation offer with dynamic pricing options Reliable booking 	<ul style="list-style-type: none"> Very diverse and flexible accommodation offer (12,609 active Airbnb listings in Berlin (Airdna, 2016)); low entry barrier to extended market Reduced information asymmetry; low transaction costs; guests and hosts benefit from network effects Discrimination based on profile possible
	Efficiency advantages	More reliable; lower initial coordination costs between hotel and guest (but also more information asymmetry)	Reduced transaction costs (search) despite higher coordination requirements; market efficiency; allocative efficiency

Source: Own compilation

The factors involved with the second stage of the business process are summarized in table 3-2. Again, the collaborative business seems to be more efficient than the traditional one, although a comparison is particularly difficult at this stage. The services provided at the location

are different and appeal to different guest preferences. Though capital and labour input is higher in the traditional case, it cannot be determined what this means for efficiency since the output is difficult to define. Diffuse externalities also contribute to this. However, against the backdrop that allocative efficiency is achieved in the collaborative case since idle assets (vacant apartments) are put to work, it can be assumed that the collaborative economy is more efficient.

Table 3-2: Input Factors and Output for Stage 2 of the Business Process (During Stay)

Case study: Hotel versus online P2P accommodation platform

		Traditional Economy	Collaborative Economy
Input	Capital	<ul style="list-style-type: none"> Hotel: maintenance/operating costs of hotel Guest: price for accommodation 	<ul style="list-style-type: none"> Platform: maintenance/operating costs of offices; automated payment handling (basically at zero cost), insurance fees; extensive negotiations with municipalities worldwide about regulation concerning taxes, accountability etc. Host: operating costs of accommodation (energy) Guest: price for accommodation (often lower than for hotel)
	Lower capital input in collaborative case		
	Labour/time	<ul style="list-style-type: none"> Hotel: very high operating labour costs for service, cleaning, security, management etc. Guest: check-in/-out, problem-solving 	<ul style="list-style-type: none"> Platform: 24h hotline in different languages, IT specialists, management Host: check-in/-out, guest advice, attendance in case of problems; investments in trust Guest: check-in, problem-solving (potentially more time-intense than in hotel case), self-service (cleaning)
Lower labour input in collaborative case			
Output		<ul style="list-style-type: none"> High level of security, hygiene, professionalism, accountability; No significant negative externalities on neighbourhood No avoidance of tourism taxes Allegedly no significant effect of increasing number of hotels on number of tourists (unless demand was higher than supply) Disinvestments in hotels 	<ul style="list-style-type: none"> Guests: local experience; access to useful amenities, budget-conscious Hosts can earn additional income for idle assets (Berlin: 2,520 €/year (GEWOS, 2014); NYC, 5,110 US-\$/yr (Airbnb, 2015a)); environmental and economic sustainability Negative externalities: diminished housing supply, higher competition for public goods; noise; free-riding; un-

		clear legal situation <ul style="list-style-type: none"> • More tourism (non-touristy areas)¹⁶ • Investments in private apartments
Efficiency advantages	Professionalism; safety; internalization of externalities	Allocation efficiency; price efficiency

Source: Own compilation

The third stage of the business process (after stay) is summarized in table 3-3. While labour input is allegedly higher in the collaborative case because hosts and guests are likely to publicly evaluate their counterpart, this input leads to a significant output: the reduction of information asymmetries that – in the long run – drives “lemons” out of the market and thereby increases overall welfare (Akerlof, 1970). Here, the collaborative economy is clearly more efficient.

While labour input might be lower in the traditional economy than in the collaborative economy, labour input in the collaborative economy is presumably less productive. Scale is a factor here because most of the providers in the collaborative case operate on a fairly small scale. While hotels work hard to design their processes in the most efficient way, hosts on online P2P accommodation platforms oftentimes deal with comparatively few guests. Consequently, their processes are probably far less organized and efficient. Take cleaning linens, for example. A hotel typically outsources this activity to a specialized company that picks up the linens, cleans them in an industrialized setting and delivers the cleaned linens to the hotel. The host in the collaborative case most probably cleans the linens himself or at a dry cleaner which is more time-consuming. Collaborative economy accommodation is still generally cheaper than hotel accommodation despite the higher labour input since the service quality is presumably lower and allocative efficiency plays its part.

Table 3-3: Input Factors during Stage 3 of the Business Process (After Stay)

Case study: Hotel versus online P2P accommodation platform

		Traditional Economy	Collaborative Economy
Input	Capital	<ul style="list-style-type: none"> • Hotel: replacement of damaged/missing equipment 	<ul style="list-style-type: none"> • Host/platform: replacement of damaged/missing equipment if discovered
	Capital input similar in the traditional and collaborative economy		
	Labour/time	<ul style="list-style-type: none"> • Hotel: cleaning 	<ul style="list-style-type: none"> • Host/guest: evaluation • Host: cleaning

¹⁶ San Francisco Airbnb guests averaged greater total trip expenditures than hotel guests (1,100 vs. 840 US-\$) and were particularly likely to visit and spend money in areas outside of the tourist core since many Airbnb guests stayed in those areas (72 percent of the city’s Airbnb listings were located outside of the six central zip codes, as compared with 26 percent of the hotels) (Airbnb, 2012; Lawler, 2012).

		Lower labour input in traditional case	
Output	<ul style="list-style-type: none"> Hotel quickly available for new guests 	<ul style="list-style-type: none"> Accommodation available for host or new guests Information on accommodation experience 	
Efficiency advantages	Professionalism	Reduction of information asymmetries: low quality driven out of the market	

Source: Own compilation

3.3.2 Other Efficiencies

There are some potential inefficiencies at the macro-level in the collaborative case. These centre around negative externalities and long-term effects on the supply of housing inventory.

Negative externalities on the neighbourhood include noise, the loss of local authenticity and an increased competition for rivalrous public resources like parking (Gottlieb, 2013; see table 3-2). The fact that the municipalities follow different laws regarding short-term rentals increases these inefficiencies as the variety of regulations fosters non-compliance due to ignorance.

Since short-term rentals are oftentimes financially more attractive than long-term rentals, they may reduce the residential housing supply and thereby raise rents in the long run. Collaborative platforms allegedly fuel the rent hike by enabling landlords to offer de facto commercial holiday flats, removing regular rental flats from the market, for example in Berlin (Skowronnek et al., 2015).¹⁷ As a result, flats on Airbnb are more and more frequently rented on a commercial level. Around 10 percent of Airbnb users in Berlin offer more than one unit for rent. 1.3 units are offered by any user on average (Skowronnek et al., 2015). The fastest growing category of Airbnb rentals are managed by hosts owing multiple accommodations, accounting for almost 40 percent of its revenues (O’Neill/Ouyang, 2016).

Another inefficiency consists in the avoidance of tourism taxes (table 3-2). In the collaborative economy, tourists become free riders who benefit from the destinations’ tourism promotion efforts without paying for them. However, there are already agreements in place that also tax Airbnb accommodation in certain cities, e.g. in Paris and Amsterdam.

Macro-level efficiencies implied by the collaborative accommodation economy include the fact that underused assets and personal capabilities can be used more efficiently, and resources are more efficiently allocated. This contributes to environmental and economic sustainability. Collaborative accommodation can easily absorb demand spikes and lows without the cost and impact of new buildings, while hotel rooms are limited and less flexible. Economical accommodation might foster visitation (table 3-2), which positively influences the broader tourism economy (Guttentag, 2015), especially since collaborative listings are more scattered than hotels and

¹⁷ Although offering a rental flat as a vacation flat has been outlawed in May 2014 (“Zweckentfremdungsverbot”), the number of such offers is still estimated to be very high.

guests disperse their spending to non-touristy neighbourhoods (Porges, 2013). Traditional players are forced to innovate and improve their services for the benefit of the consumer.

Hosts run a very low risk, have basically no capital investment and are able to earn a substantive additional income through renting out their apartments (tables 3-1, 3-2). This might increase the apartment investment, since the return on investment is potentially higher. On a macroeconomic level, these private investments might be offset by disinvestments. Hotels may not be built, enlarged, or renovated due to shrinking demand.

Also, the possibility of entering the tourism market at low risk and costs, may promote entrepreneurship. The share of hosts with multiple listings compared to the share of hosts with only one listing can be used as an indicator for the degree of entrepreneurship potentially created by an online P2P accommodation platform, since hosts with multiple listings are more likely to be running a business. This aspect is illustrated in table 3-4 for four major cities using Airbnb data. Between around 18 and nearly 38 percent of all listings in these cities were made by hosts with multiple listings. These hosts are more likely to be running a business. A single host in these cities has up to 229 listings. As a consequence, the income of the hosts with multiple listings probably exceeds the average income from Airbnb hosting as indicated in table 3-4 by far. Being a host on Airbnb allows individuals to test how it is to be an entrepreneur without facing massive initial investments, risks, and administrative burdens like registering a business.

Table 3-4: Multiple Listings on Online P2P Accommodation Platforms

Data from Airbnb for selected cities, February 2016

	Berlin^{*)}	Paris	London	New York
Total number of listings	15,373	41,476	33,715	35,957
Share of multiple listings in percent	26.0	18.3	37.8	24.3
Share of single listings in percent	74.0	81.7	62.2	75.7
Maximum number of rentals per host	40	172	229	41
Estimated average income per host per month	592 €	733 €	639 £	1,271 US-\$

^{*)} Data from October 2015.

For Tokyo, there is no data available.

Source: Inside Airbnb, 2016

The collaborative economy also promotes entrepreneurship via financing. Crowd-financing platforms enable start-up companies to raise the needed capital. The Swedish crowdfunding platform FundedByMe, for example, has raised more than 18.7 million euros for 440 companies since 2011 (FundedByMe, 2016). The German crowd-investing platform Companisto has funded 38 start-ups and raised more than 13.1 million euros between 2012 and 2015 (Companisto,

2015). These start-ups employ 278 people, cater to 1.66 million customers and have an annual turnover of 9.76 million euros.

To sum up, collaborative platforms eliminate frictions in travel accommodations, saving money for travellers and putting the largest class of idle assets – vacant apartments – to work. The collaborative accommodation economy yields clear efficiency gains compared to the traditional accommodation economy. It is very likely that these efficiency gains also occur when comparing other forms of collaborative business models to traditional ones.

4 Impact of the EU Environment on Collaborative Platforms

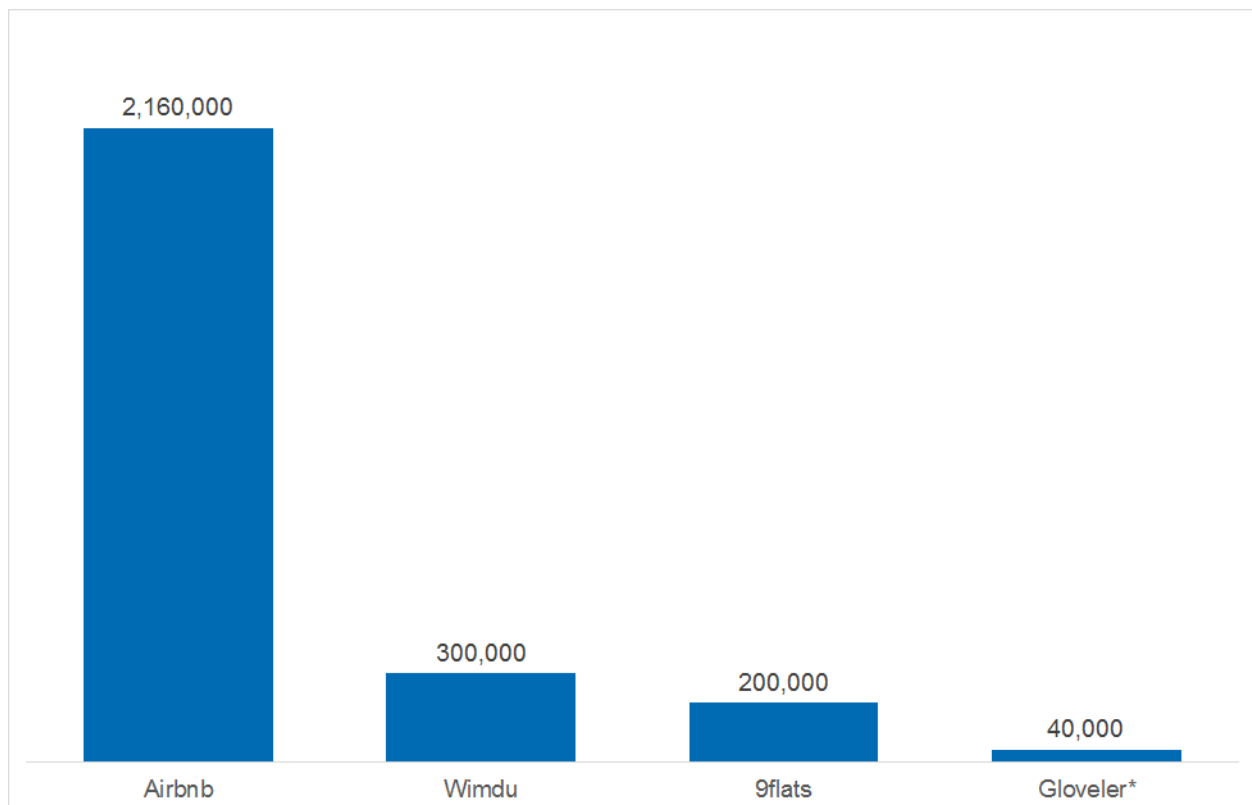
Large collaborative platforms are mainly US-based enterprises (e.g. Airbnb, Uber). This observation suggests that European platforms face barriers to growth possibly created by the EU environment. This chapter analyses this suggestion using the example of online P2P accommodation platforms. It provides policy recommendations at EU level that help enable collaborative platforms to scale up more quickly.

4.1 Growth of Collaborative Platforms in the US and the EU

Europe is lagging behind the United States with respect to the collaborative economy (Demary, 2015a). This observation holds with regard to the number and development of such businesses. In the collaborative accommodation market, the US-company Airbnb currently is the most successful platform (see figure 4-1). Compared to its European competitors Wimdu, 9flats or Gloveller, it offers a far greater number of accommodation listings. To be exact, the number of Airbnb listings exceeds the number of listings of the biggest competitor Wimdu by factor seven. Airbnb also leads with respect to other size indicators such as funding or the number of countries covered by the platform.

Figure 4-1: Size of Online P2P Accommodation Platforms

Number of accommodations listed worldwide, 2015



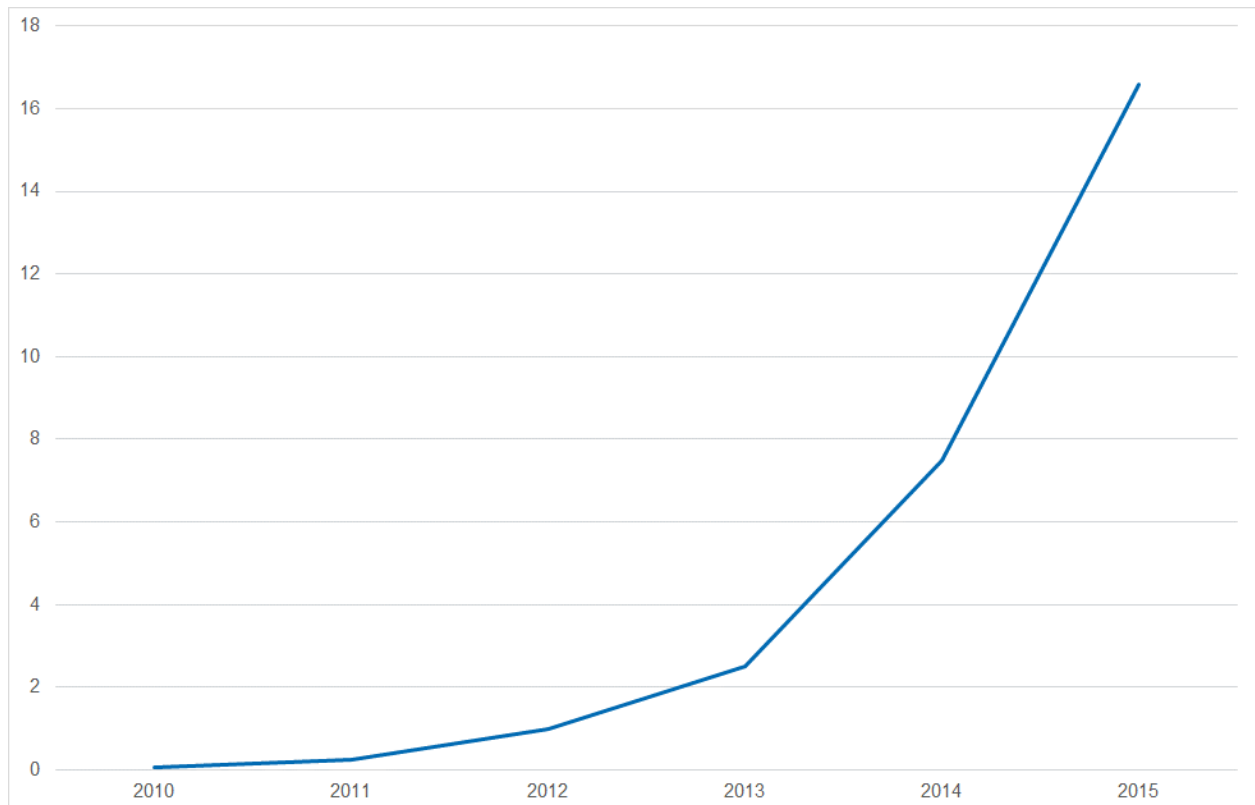
* Data from 2013.

Sources: Gloveller, 2013; 9flats, 2015; Statista, 2015; Wimdu, 2015

Since its foundation in 2008, Airbnb has grown tremendously (see figure 4-2). Between 2010, when around 45,000 guests used the platform in the summer, and 2015, the number of guests has multiplied by 353 (Airbnb, 2015b). The company's valuation has increased to 24 billion US dollars in 2015 (Winkler/MacMillan, 2015), an increase of 140 percent compared to 2014 (Spector et al., 2014; own calculation).

Figure 4-2: Growth Trajectory of Airbnb Summer Guests

Number of guests in the summer, in millions



Source: Own illustration based on Airbnb, 2015b

Google Trends data allow a comparison of the growth trajectory of Airbnb and its biggest European competitor Wimdu (see figure 4-3). They reflect the number of search queries for the terms “Airbnb” and “Wimdu” since 2004 in relation to the highest number of queries in the period. Because Wimdu was founded three years later than Airbnb, the data was transferred from weekly data with exact dates to the number of weeks after the foundation of the respective company in order to make the data comparable. Four main results can be derived:

1. The number of search queries for Airbnb exceeds those for Wimdu by far. Even during their peak, Wimdu searches only made up six percent of Airbnb's search peak.
2. While the number of searches for Airbnb has increased dramatically since its foundation, queries for Wimdu have relatively stagnated.
3. After the foundation of the company, Wimdu was off to a better start than Airbnb at this point. During the first 100 weeks, Wimdu was searched for more often in relative terms.

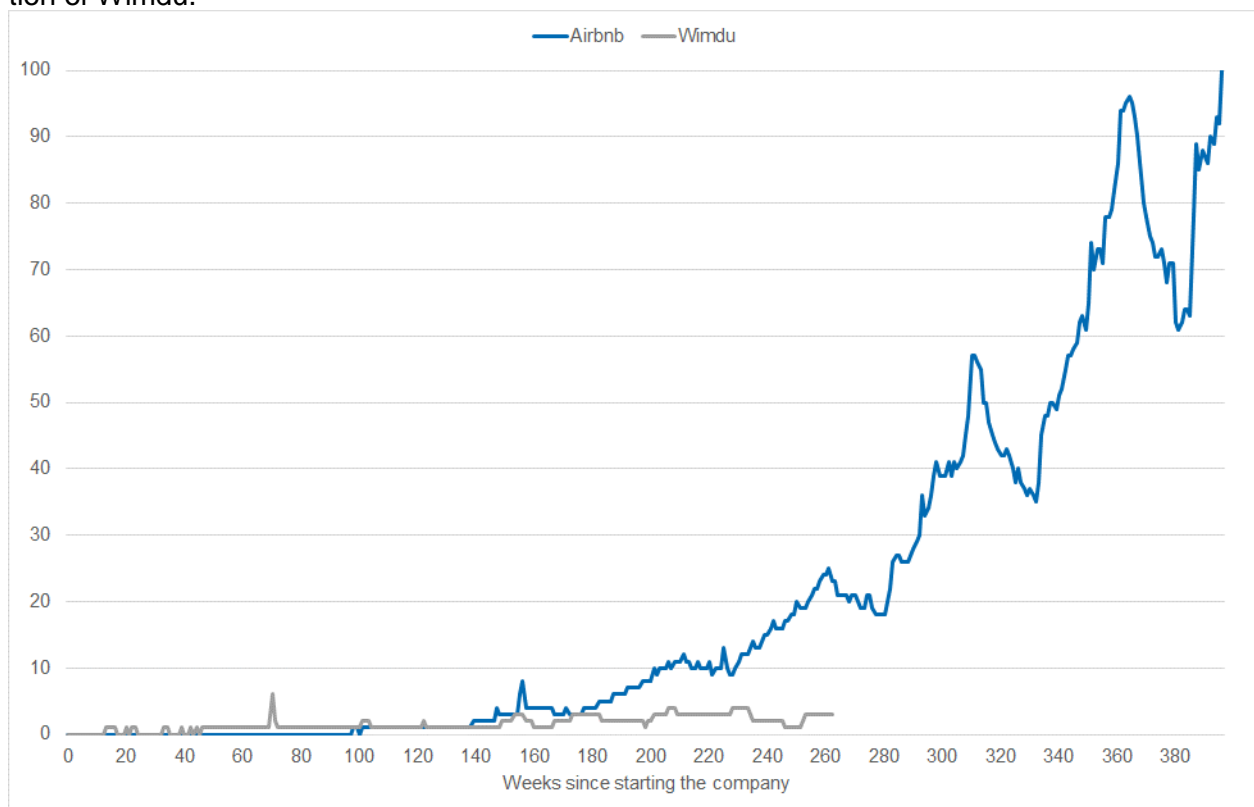
Possibly, Wimdu held a second mover advantage because the concept of an online P2P accommodation platform had already been established by Airbnb.

4. Wimdu was founded in Germany. Even in its home market, the above results change only slightly. In relative terms, Wimdu's peak of queries made up 69 percent of Airbnb's. However, Airbnb exhibits a strong dynamic, while the number of Wimdu searches is more or less constant.

Figure 4-3: Development of Search Queries for Online P2P Accommodation Platforms

Number of worldwide Google search queries relative to highest number in the period, as of 11-03-16

Example: Relative to the highest number of searches for Airbnb (in week 396 after its foundation), searches for Wimdu made up only 6 percent of this maximum in week 70 after the foundation of Wimdu.

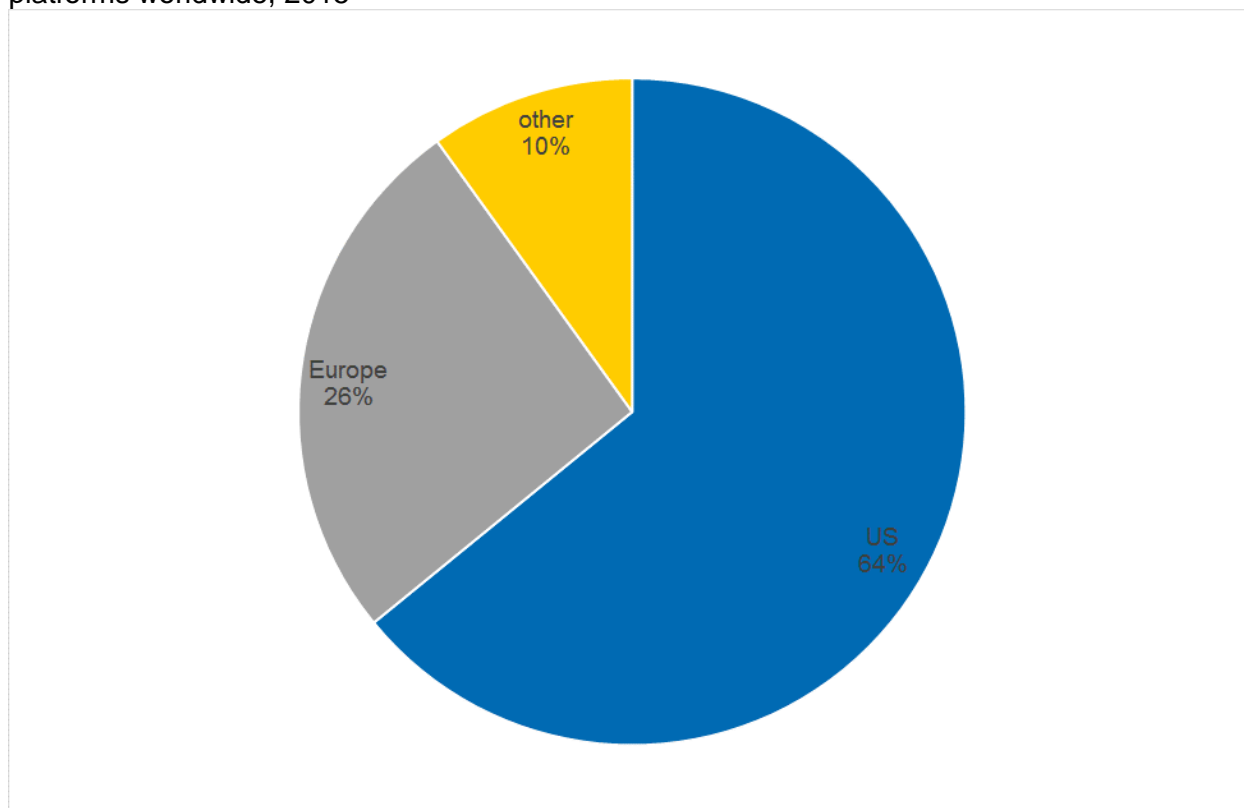


Source: Own illustration based on Google Trends data

The relatively higher importance of the US as a market for collaborative platforms can be illustrated by comparing the number of such platforms in the US and in Europe (see figure 4-4). Ten of the top 20 cities that collaborative platforms worldwide are based in are in the US, only five are in Europe. Of the nearly 500 collaborative platforms in this sample collected by JustPark, a British shared-parking platform, 64 percent are based in the US. Despite Europe's comparatively weak overall position, London ranks third after San Francisco and New York with respect to the number of collaborative platforms (Davidson, 2015).

Figure 4-4: Collaborative Platforms in Europe and the US

In percent of all collaborative platforms in the 20 cities with the highest numbers of collaborative platforms worldwide, 2015



Source: Davidson, 2015; own depiction

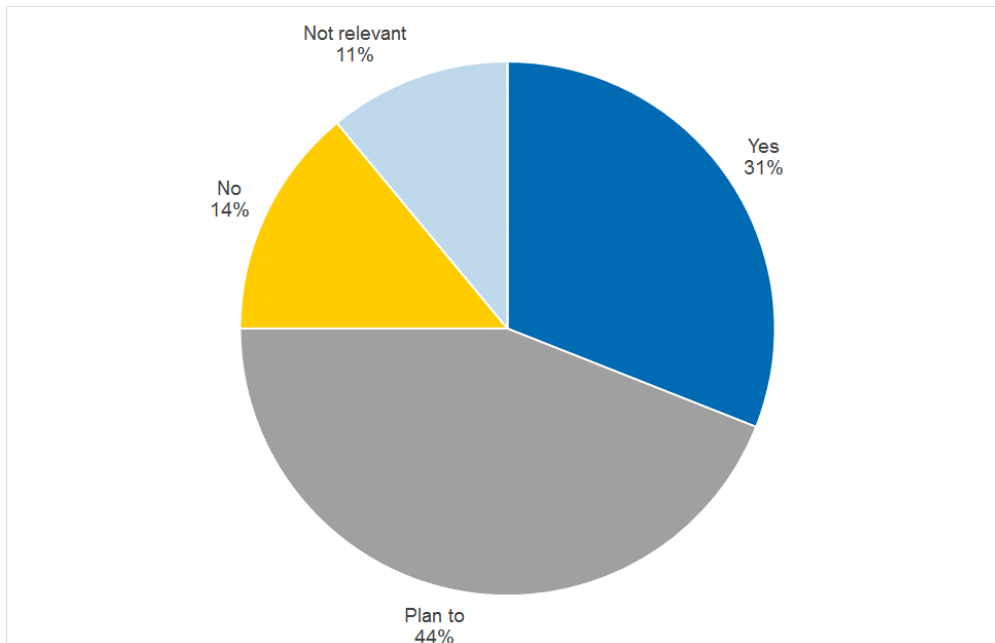
4.2 Challenges to Growth for Collaborative Platforms

Expanding their business is important for most collaborative platforms, especially against the backdrop of the importance of network effects (see figure 4-5). The majority of 100 collaborative platforms surveyed in 2014 saw a need to grow across borders (see figure 4-6).

Collaborative platforms based in Europe face particular difficulties with respect to business development, especially compared to businesses in the US. The challenges in Europe can be categorized in three groups discussed in the following. The main obstacle in the EU with its 28 member states is that it is considerably more heterogeneous than the US market.

Figure 4-5: Scaling Up Collaborative Platforms

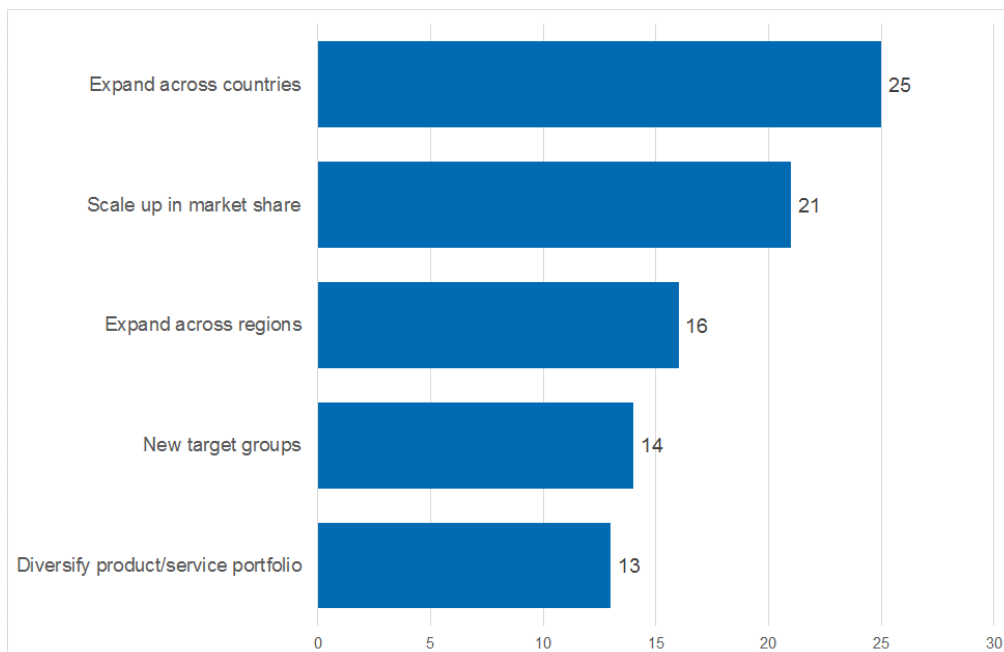
In percent, 2014, survey of 110 collaborative platforms in North America, Europe and Latin America; question: "Have you scaled up your initiative?"



Source: Wagner et al., 2015; own depiction

Figure 4-6: Dimensions of Scaling Up

In percent, 2014, survey of 110 collaborative platforms in North America, Europe and Latin America



Source: Wagner et al., 2015; own depiction

Regulatory Challenges

The regulatory frameworks across the European member states are diverse. Oftentimes, there are even differences within countries or regions because some framework conditions are decided upon at a municipal level (e.g. with regard to certain aspects of providing accommodation). This especially affect collaborative platforms since they oftentimes act on more than one administrative level. Additionally, there is a tendency to aim toward fairly strict regulation for platforms. The result is a multitude of different conditions that platforms need to deal with if they aim to expand across borders. Digitization has increased this regulatory heterogeneity. A lack of understanding the different frameworks is a barrier to growth (Wagner et al., 2015) that is costly to overcome. This barrier constrains competition and limits the size of the market for collaborative platforms (Goudin, 2016). Heterogeneous frameworks also lead to legal uncertainty for collaborative platforms, in particular with respect to the access to and use of data. In some cases, continuing legal uncertainty might even endanger the companies.

The EU institutions have been working towards improving this situation. Part of their effort is the establishment of a Digital Single Market (DSM) that was initiated by the DSM strategy in May 2015 (EU Commission, 2015b). The main goal is to set framework conditions such that Europe is able to make use of the opportunities entailed in digital technologies. While this harmonization effort is commendable and necessary for collaborative platforms, the speed of European policy-making and of the development of the collaborative economy might be at odds. An example for this is the reform of the data protection legislation that was put forward in 2012 and will take effect only in 2018. Until then, the frameworks across the EU are quite different in their rigor. Also, national authorities will always keep some wiggle room.

The heterogeneity of the regulation for collaborative platforms in Europe also has an impact on platform users and providers. The more diverse regulation for collaborative platforms is, the harder it becomes for them to use a platform without violating the law. It is probable that many potential users are aware of this fact and therefore refrain from using a platform. Accordingly, potential platform providers might refrain from providing a platform.

From a collaborative economy perspective, jurisdiction at EU level is preferable compared to national frameworks because diverse national views on collaborative platforms might not be reconcilable at EU level. However, some parts of the existing EU framework might just need to be applied to the collaborative economy in a more appropriate way. An example for this is the Services Directive and its application to ridesharing services like Uber. As transport services, the Services Directive does not cover them. If they were instead classified as digital services, EU level jurisdiction would be warranted.¹⁸

The diverse European regulation also concerns the prerequisites that need to be fulfilled to start a business. Depending on the business model, establishing a collaborative platform might entail the foundation of subsidiaries abroad, including the registration of the business and the fulfillment of the accompanying requirements, such as public signage or presence on a public registry. Compared to the US, red tape still characterizes Europe in this respect. On average, it takes 11 days to start a business in the EU, compared to 6 days in the US (IMD, 2015).

¹⁸ It should be noted that there is a pending ECJ decision on this matter (Goudin, 2016).

Financial Challenges

Business expansion requires money. Due to the high risk involved, the access to financing poses a major challenge to collaborative platforms' growth. Venture capital (VC) plays a strategic role during the initial start-up phase as well as during later expansion phases. However, the availability of VC in Europe is relatively low. The total VC investment in Europe in 2014 amounted to 10.5 billion US-\$ (EY, 2015). In the US, by contrast, VC investment reached 52 billion US-\$. This corresponds to 12 and 60 percent of worldwide VC investment, respectively. The lack of financial support for start-ups is also reflected in a rather risk-averse European start-up culture that is far less developed than its American counterpart (Röhl, 2016). This includes the fact that investors in the US might simply be far more used to the platform business model. Typical platform companies such as Google or Facebook have been around for more than a decade. Consequently, investors in the US are possibly more familiar with platform characteristics such as network effects and economies of scale that easily lead to winner-takes-all-markets with one dominant player (Shapiro/Varian, 1999). According to the brand council Crowd Companies, among the top 15 funded start-up companies in the collaborative economy since 2002, nine are US-American, five are Asian and only one (BlaBlaCar) is European (Crowd Companies, 2015).

Cultural Challenges

The EU has 24 official languages, which form part of the cultural barrier that collaborative platforms face if they aim to scale up. Besides the multitude of languages, other cultural aspects differ immensely compared to the US. Europeans are generally more reserved about online activities (see table 4-1). Also, Europeans are much more reluctant to use credit cards for payment (Bagnall et al., 2014), which is oftentimes required for online transactions (TSYS, 2014). These cultural habits might lead to a smaller customer base of European collaborative platforms compared to US platforms.

Table 4-1: Online Activities in Europe

In percent of all individuals in the European Union, 2015, selected indicators

Regular internet users	
Overall	76
55 to 74 years old	53
Individuals who have never used the internet	
	16
Individuals with medium or high internet skills	
Overall	55
55 to 74 years old	31
Individuals ordering goods or services online	
	53
Individuals selling online	
	19
Individuals using online banking	
	46
Individuals uploading self-created content	
	29

Source: Eurostat, 2016

Furthermore, the establishment of trust is crucial for a collaborative platform's growth across borders. In the EU – as opposed to the much more homogenous US – the way that trust is formed differs between countries. As a result, the trust-building mechanisms of the platform might need to be adapted to the local requirements, which is a costly procedure. To deal with cultural issues like these, local teams dealing with marketing, customer services and legal issues might be necessary for a successful expansion of a collaborative platform in Europe.

The aforementioned barriers to growth for collaborative platforms hamper the speed of business development. In order for network effects to work efficiently, the prospect of a large user base is required. If platform growth is hampered and slows down or ceases, prospective users might perceive this as a sign of weakness or even failure of the business. Negative feedback then could lead to a rapid loss of users and result in a self-fulfilling prophecy.

Additionally, economies of scale occur due to virtually zero marginal costs for the platforms. If business development is only possible with significant continuous investments – in order to overcome cultural barriers, for example – this is no longer the case. Then, the platform loses one of its main competitive advantages, especially compared to traditional companies. The latter typically experience similar cultural or regulatory barriers, but no network effects and economies of scale. Consequently, the size of the business as well as the speed of its expansion are less important to them than to collaborative platforms. If barriers obstruct business development, this hits platforms much harder than traditional businesses. Additionally, digital technologies as the main driver of collaborative platforms operate without borders. To realize their full potential, collaborative platforms need to be able to do that as well.

Although the EU environment poses several challenges for collaborative platforms, it offers potential for synergies as well, especially compared to the US. Within the Eurozone, the common currency facilitates cross-border growth. The EU institutions provide guidance on the collaborative economy and set up a regulatory framework for many aspects of it. This framework covers 506 million Europeans that are potential consumers or providers of collaborative platforms (OECD, 2013). The European market is therefore much bigger than the US market, which covers a population of 316 million. Additionally, the population density in Europe is much higher than in the US (117 people per km² as opposed to 35; Eurostat, 2015; Worldbank, 2015), possibly resulting in lower distribution and marketing costs for the collaborative economy.

4.3 Policy Recommendations

In order to reduce the barriers to growth for the collaborative economy, action at EU level should include, but is not limited to the following policies.

Reduce policy fragmentation.

The heterogeneity of regulations for the collaborative economy on the national, sectoral, regional and local level poses a huge challenge for collaborative platforms that makes expansion very costly, if it is possible at all. A reduction of this fragmentation would consequently be extremely beneficial for the business development of collaborative platforms in the EU. For a reduction of fragmentation, a balance between the subsidiary principle and the practicability of common reg-

ulation needs to be found. Communities, regions and nations need to let go of parts of their sovereignty for this common cause.

Limit regulation for collaborative platforms while ensuring consumer protection.

In order to allow collaborative platforms to flourish, regulation on the part of the EU should be kept to a minimum. The ultimate goal should be a level playing field between collaborative platforms and traditional businesses. Due to the specific characteristics of collaborative platforms, such as the need for size, bespoke regulation for them might be preferable. At the same time, the EU needs to continue to guarantee a sound level of consumer protection. This is particularly important for collaborative platforms, which are heavily dependent on consumer trust.

Apply the Services Directive responsibly.

The Services Directive (2006/123/EC), which already covers many collaborative platforms, promotes the principles of proportionality and necessity. This might be at odds with some of the national or municipal regulation that has been imposed for collaborative platforms, e.g. online P2P accommodation platforms. The Services Directive should therefore be applied more responsibly on a national level, overseen by EU institutions.

Outsource control functions to collaborative platforms.

Because they routinely collect specific data, collaborative platforms could be enabled to relieve public authorities of certain control and legislative functions and in that way relieve them of some burdens. An example for this at the municipal level is the collection of the city tax in Amsterdam through the active Airbnb hosts (Lilico/Sinclair, 2016). The principle itself could possibly be extended to the EU level. Given the support of collaborative platforms, less regulatory action is required, which, in turn, enables platforms to scale up more quickly.

Provide quick legal certainty.

The heterogeneity of framework conditions is not only a barrier to growth, but can also seriously endanger the business continuation of a collaborative platform. It is therefore paramount to provide legal certainty quickly. This also concerns the Privacy Shield agreement between the EU and the US that should take effect as soon as possible.

Emphasize the importance of venture capital.

In order to lower the financial barriers to scaling up and to improve the access to financing for collaborative platforms, the EU Commission should stress the importance of VC availability and offer guidance to the EU member states with underdeveloped VC markets by evaluating their situation and using best practice examples. Ultimately, a uniform EU-wide regulatory framework for VC funds through the envisioned Capital Markets Union would decrease the heterogeneity of the VC market further.

Support trust-building mechanisms of collaborative platforms.

In order to foster trust in reliable platforms, the EU could support trust-building mechanisms. This could be achieved by offering templates for transparent terms and conditions for new businesses. A seal of quality of collaborative platforms issued by an independent agency publicly endorsed by the EU could be very helpful. In some cases, even the public endorsement of an online platform could make sense (e.g. in the financial sector).

Leverage synergies by using big data in a smart fashion.

Collaborative platforms generate and collect data, often on a large scale. Despite the obvious need to guarantee data protection and respect data ownership, some of these data could possibly be used in order to reduce the work amount of public authorities. A ridesharing platform could – with the consent of the drivers – share data on the performance of drivers that are not licensed for passenger transportation with the appropriate agencies in the member states. That way, the drivers could – given that they drive responsibly – acquire such a license without undergoing the common administrative process of licensing. Instead, the data could be used for an ex-ante monitoring, so that drivers could become active right away without having to undergo a time-consuming licensing process. This also benefits the public authorities, whose processes are facilitated.

References

Airbnb, 2015a, Data on the Airbnb Community in NYC, <https://www.airbnbaction.com/data-on-the-airbnb-community-in-nyc/> [30-3-2016]

Airbnb, 2015b, Airbnb Summer Travel Report: 2015, <http://blog.airbnb.com/wp-content/uploads/2015/09/Airbnb-Summer-Travel-Report-1.pdf?bce17c> [22-3-2016]

Airbnb, 2012, Study finds that Airbnb hosts and guests have major positive effect on city economies, <https://www.airbnb.de/press/news/study-finds-that-airbnb-hosts-and-guests-have-major-positive-effect-on-city-economies> [31-3-2016]

Airdna, 2016, Airbnb Data and Analytics Berlin April 2016, http://www.airdna.co/city/de/berlin?report=de_berlin [1-4-2016]

Akerlof, George A., 1970, The Market for Lemons: Quality Uncertainty and the Market Mechanism, in: Quarterly Journal of Economics, Vol. 84, No. 3, pp. 488–500

Bagnall, John et al., 2014, Consumer Cash Usage. A Cross-Country Comparison with Payment Diary Survey Data, ECB Working Paper Series, No 1685, Frankfurt

Coase, Ronald H., 1937, The Nature of the Firm, *Economica*, Vol. 4, No. 16, pp. 386–405

Cohen, Molly / Sundararajan, Arun, 2015, Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy, in: The University of Chicago Law Review Dialogue, Vol. 82, pp. 116–133

Companisto, 2015, Crowdfunding-Performance-Monitor, Berlin

Crowd Companies, 2015, Collaborative Economy Funding (2002-Present) – Graph: Top 30, https://docs.google.com/spreadsheets/d/12xTPJNvdOZVzERueyAdlLGTtL_KWKTbmj6RyOg9XXs/edit#gid=1748340913 [29-4-2016]

Davidson, Lauren, 2015, Mapped: how the sharing economy is sweeping the world, The Telegraph, <http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/11882122/Mapped-how-the-sharing-economy-is-sweeping-the-world.html> [29-4-2016]

Demary, Vera, 2015a, Competition in the Sharing Economy, IW policy papers, No. 19, Cologne

Demary, Vera, 2015b, The Platformization of Digital Markets. Comments on the Public Consultation of the European Commission on the Regulatory Environment for Platforms, Online Intermediaries, Data and Cloud Computing and the Collaborative Economy, IW policy paper, No. 39, Cologne

Edelman, Benjamin G. / Geradin, Damien, Forthcoming, Efficiencies and Regulatory Shortcuts: how should we regulate Companies like Airbnb and Uber?, in: Stanford Technology Law Review

Edelman, Benjamin G. / Luca, Michael, 2014, Digital Discrimination: The Case of Airbnb.com, Harvard Business School NOM Unit Working Paper No. 14-054

European Commission, 2015a, Regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy, <http://ec.europa.eu/digital-agenda/en/news/public-consultation-regulatory-environment-platforms-online-intermediaries-data-and-cloud> [22-3-2016]

European Commission, 2015b, A Digital Single Market Strategy for Europe, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, {SWD(2015) 100 final}, COM (2015) 192 final, 6.5.2015, Brussels

Eurostat, 2016, Information Society. Comprehensive Database, <http://ec.europa.eu/eurostat/web/information-society/data/comprehensive-database> [6-4-2016]

Eurostat, 2015, Population density. Persons per km², <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tps00003&plugin=1> [6-4-2016]

Evans, David S. / Schmalensee, Richard, 2007, The Industrial Organization of Markets with Two-sided Platforms, in: Competition Policy International, Vol. 3, No. 1, pp. 151–179

EY – Ernst & Young, 2015, Venture Capital insights – 4Q14. Global VC investment landscape, [http://www.ey.com/Publication/vwLUAssets/Venture_Capital_Insights_4Q14_-_January_2015/\\$FILE/ey-venture-capital-insights-4Q14.pdf](http://www.ey.com/Publication/vwLUAssets/Venture_Capital_Insights_4Q14_-_January_2015/$FILE/ey-venture-capital-insights-4Q14.pdf) [12-11-2015]

Finley, Kate, 2013, Trust in the Sharing Economy: An Exploratory Study, Centre for Cultural Policy Studies, University of Warwick, Warwick

FundedByMe, 2016, Crowdfunding for intelligent growth, <https://www.fundedbyme.com/en/> [25-4-2016]

Gellersen, Christoph, 2009, Kostenschätzung für ein Muster-Hotel, http://www.christoph-gellersen.de/MUSTER_2009_FF-E_Kostenschätzung_CG.pdf [7-4-2016]

GEWOS, 2014, Airbnb und der Berliner Wohnungsmarkt, <http://www.airbnbaction.com/wp-content/uploads/2014/12/AirbnbundderBerlinerWohnungsmarkt.pdf> [30-3-2016]

Gloveler, 2013, Zahlen und Fakten, <http://gloveler.de/geschichte> [14-3-2016]

Gottlieb, Charles, 2013, Residential short-term rentals: Should local governments regulate the ‘industry’?, in: Planning & Environmental law, Vol. 65, No. 2, pp. 4–9

Goudin, Pierre, 2016, The Cost of Non-Europe in the Sharing Economy. Economic, Social and Legal Challenges and Opportunities, Study, European Parliamentary Research Service, European Added Value Unit, Brussels

Guttentag, Daniel, 2015, Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector, in: Current Issues in Tourism, Vol. 18, No.12, pp. 1192–1217

Haucap, Justus / Heimeshoff, Ulrich, 2014, Google, Facebook, Amazon, eBay: Is the Internet Driving Competition or Market Monopolization?, in: International Economics and Economic Policy, Vol. 11, No. 1-2, p. 49–61

Hotel Online, 2015, Hotel Development Cost Survey 2014/15, https://www.hotel-online.com/press_releases/release/hotel-development-cost-survey-2014-15 [30-3-2016]

Inside Airbnb, 2016, Inside Airbnb – Adding data to the debate, <http://insideairbnb.com> [22-4-2016]

Institute for Management Development – IMD, 2015, IMD World Competitiveness Yearbook 2015, Lausanne

Jøsang, Audun / Ismail, Roslan / Boyd, Colin A., 2007, A survey of trust and reputation systems for online service provision, in: Decision Support Systems, Vol. 43, No. 2, pp. 618–644

Katz, Michael L. / Shapiro, Carl, 1985, Network Externalities, Competition, and Compatibility, in: American Economic Review, Vol. 75, No. 3, pp. 424–440

Lawler, Ryan, 2012, Airbnb: Our guests stay longer and spend moer than hptel guests, contributing \$56m to the San Francisco economy, TechCrunch, <http://techcrunch.com/2012/11/09/airbnb-research-data-dump/> [31-3-2016]

Lilico, Andrew / Sinclair, Matthew, 2016, The Cost of non-Europe in the sharing economy, Research paper by Europe Economics at the request of the Impact Assessment Unit of the Directorate for Impact Assessment and European Added Value, within the Directorate General for Parliamentary Research Services (DG EPRS) of the General Secretariat of the European Parliament, Brussels

9flats, 2015, <https://www.9flats.com/de/> [14-3-2016]

OECD, 2013, Population Statistics, <http://stats.oecd.org/#> [6-4-2016]

O'Neill, John W. / Ouyang, Yuxia, 2016, From Air Mattresses to Unregulated Business: An Analysis of the Other Side of Airbnb, Pennsylvania State University, www.ahla.com/uploadedFiles/_Common/pdf/PennState_AirBnbReport_.pdf [16-3-2016]

Pfeiffer, Elmar, 2014, Hotelprojekte – Gestehungskosten, <http://www.stalys.de/data/hotkos2.htm> [31-3-2016]

Porges, Seth, 2013, The Airbnb effect: Bringing life to quiet neighbourhoods, Forbes, <http://www.forbes.com/sites/sethporges/2013/01/23/the-airbnb-effect-bringing-life-to-quiet-neighborhoods> [24-3-2016]

Röhl, Klaus-Heiner, 2016, Entrepreneurial culture and start-ups – Could a cultural shift in favour of entrepreneurship lead to more innovative start-ups?, IW policy paper, No. 2, Cologne

Shapiro, Carl / Varian, Hal R., 1999, Information Rules. A Strategic Guide to the Network Economy, Boston

Shy, Oz, 2001, The economics of network industries, Cambridge, UK

Skowronnek, Alsino / Vogel, Lucas / Parnow, Jonas, 2015, Airbnb vs. Berlin – What data tells us, www.airbnbvsberlin.com [29-3-2016]

Sparks, Beverly / Browning, Victoria, 2011, The impact of online reviews on hotel booking intentions and perception of trust, in: Tourism Management, Vol. 32, No. 6, pp.1310–1323

Spector, Mike / MacMillan, Douglas / Rusli, Evelyn M., 2014, TPG-Led Group to Invest in Airbnb, The Wall Street Journal, <http://www.wsj.com/news/articles/SB10001424052702303847804579481870807094740> [22-3-2016]

Statista, 2015, Kennzahlen zu Airbnb weltweit Stand 2015 , <http://de.statista.com/statistik/daten/studie/419494/umfrage/globaler-ueberblick-von-airbnb/> [14-3-2016]

TSYS – Total System Services, 2014, 2014 Consumer Payments Study, Columbus

Wagner, Thomas / Kuhndt, Michael / Lagomarsino, Jeffrey / Mattar, Helio, 2015, Listening to Sharing Economy Initiatives

Wimdu, 2015, Über Wimdu. Wimdu in Zahlen, <http://www.wimdu.de/aboutus#about-us-about-us> [14-3-2016]

Winkler, Rolfe / MacMillan, Douglas, 2015, The Secret Math of Airbnb's \$24 Billion Valuation, The Wall Street Journal, <http://www.wsj.com/articles/the-secret-math-of-airbnbs-24-billion-valuation-1434568517> [22-03-2016]

Worldbank, 2015, Population density (people per sq. km of land area), <http://data.worldbank.org/indicator/EN.POP.DNST/countries?display=default> [6-4-2016]

Wortham, Jenna, 2011, Room to rent, via the web, The New York Times, <http://www.nytimes.com/2011/07/25/technology/matching-travelers-with-rooms-via-the-web.html> [24-3-2016]

Zervas, Georgios / Prosperio, Davide / Byers, John W., 2015, A First Look at Online Reputation on Airbnb. Where Every Stay is Above Average, available at SSRN: <http://ssrn.com/abstract=2554500> [7-4-2016]

List of Tables

Table 3-1: Input Factors and Output for Stage 1 of the Business Process (Before Stay)	13
Table 3-2: Input Factors and Output for Stage 2 of the Business Process (During Stay)	15
Table 3-3: Input Factors during Stage 3 of the Business Process (After Stay)	16
Table 3-4: Multiple Listings on Online P2P Accommodation Platforms	18
Table 4-1: Online Activities in Europe.....	26

List of Figures

Figure 3-1: Business Models of Accommodation Enterprises	6
Figure 3-2: Search Queries for Airbnb and booking.com	6
Figure 3-3: Collaborative versus Traditional Accommodation Prices	9
Figure 3-4: Business Process Stage 1, Before Stay	10
Figure 3-5: Business Process Stage 2, During Stay	11
Figure 4-1: Size of Online P2P Accommodation Platforms	20
Figure 4-2: Growth Trajectory of Airbnb Summer Guests	21
Figure 4-3: Development of Search Queries for Online P2P Accommodation Platforms.....	22
Figure 4-4: Collaborative Platforms in Europe and the US.....	23
Figure 4-5: Scaling Up Collaborative Platforms	24
Figure 4-6: Dimensions of Scaling Up	24