Shared economy accommodation services in coastal vs. city destinations in Denmark

Jie Zhang and Carl Henrik Marcussen,

Center for Regional and Tourism Research, Denmark, www.crt.dk

Abstract

Being a part of Danish research project "Innocoast", the main aims of this conference paper are 1) to address the frameworks of social and economic impact of Airbnb; 2) to give a review of relevant literature; 3) to discuss both a geographic distribution of Airbnb and the nationalities of the guests; 4) to analyse and estimate the number of nights and daily spending by Airbnb guests on accommodation and other spending categories; 5) to apply the Danish inter-regional economic model to evaluate the economic effects of Airbnb tourists in the coastal regions and in the cities.

As a completed Airbnb dataset has not finalised in this stage, this paper presents two cases studies, Copenhagen and Bornholm based on the available data. Research question is "Does Airbnb have the same economic impacts in the coastal areas as in the urban areas"?

The evidence may show that the income received by the hosts of Airbnb is used to pay their mortgage and rent. It might also be that some hosts have the motives of getting income to spend on the other private consumption categories. Whatever, from the framework of a regional economic model, this will give an increase in local private consumption by the host communities. The increase in the expenditure, both by Airbnb hosts and guests will have a positive impact on the regional economy. The model results show the changes in regional income, employment and governamental incomes, and comparison between the tourism multiplier in the cities and in the coastal regions.

Key words: Airbnb; spending patterns; motives (among guests and hosts); experiences (according to reviews); geographic and demography of Airbnb guests; economic impact of Airbnb.

Introduction

The original idea of Airbnb is the 'bed and breakfast' services through a digital flatform, which allows individuals to rent out their dwelling (rooms or whole apartments and houses) to visitors and travellers both for private or business purposes or might be residents who have lack of residence in a period.

This paper focuses on the analysis of Airbnb - one of popular forms in sharing economy. The rise in Airbnb must be induced by the demand for a short-term rental of accommotion which is possible on the basis of popular online service and digital platforms. The owners of houses or apartments (hereafter call 'hosts') can efficiently offer through the digital online platform their unoccupied houses or apartments (idle rooms) for short-term rental; other individuals (hereafter call 'guests') can search for available houses or apartments to rent idle rooms through a such platform for a short-term use. 'Airbnb.com' provides such a platform that matchs hosts and guests at the same time hosts obtain extra income by renting out their idle resource, while guests can book accommodations at a lower price than other accommodation service at the destination where they stay overnight.

There is an increasing tendency that Airbnb and similar online service should be regulated. However, how to impose regulation becomes highly a popular policy topic; it needs an avidence to set up regulation on this new activity, otherwise, regulation is blind without a complete understanding the benefit and drawbacks generated by this new activity.

The purpose of this paper is, firstly to address the frameworks of social and economic impact of Airbnb and literature review; secondly, to collect Airbnb data through different sources and to discuss the geographic distribution of Airbnb listings, listering prices and the other indicators. The analysis is based on the available data of daily spending for overnight and other spending by Airbnb guests and estimated number of nights and revenue, as far as the patterns of expenditure by Airbnb tourists can be identified. Data is one of critical issues among the analysis on Airbnb. Airbnb is a new phenomenon, there is no historical data and Airbnb company so far is not willing to provide data to the research purpose. Thirdly, this paper intends to shed light on the reseach of Airbnb, focusing on its social and economic impacts. Finally, the Danish inter-regional economic model i.e. LINE tourism model is applied in order to evaluate the economic effects of Airbnb through tourist spending in the coastal

regions and in the cities. The LINE tourism model has been used on tourism economic consequences for several years in Denmark. Due to the fact that a plenty of tourism data is available through many years' tourist survey activities in Denmark, the model can be applied both by the supplement to the Airbnb data and the comparative purpose in the evaluation of tourism impact on the regional economies.

Social and economic impact of Airbnb

Airbnb – one of popular forms in market mediated accommodation renting, has grown dramatically both by number of listings and the cities that have involved into this business. 'Airbnb.com' alone has grown from 120,000 listings worldwide two years ago to more than 300,000 listings in the summer of 2016, and over 18 million guests used the service and 75 million room night in 2015 (see figure 1). Airbnb has already spread over to 195 countries and 57 major cities in the world, Airbnb becomes one of 10 most influencing innovative ideas in recent years. Copenhagen follows this trend, Airbnb listing in Copenhagen from nearly 0 in 2011 grew to 14,000 listings in 2015 (see figure 2).

Due to the digital platform, it is possibel for the owners of houses /apartments to share their idle resources and give access to the users. Economic recession in recent years has given pressure on consumers to be more careful about their spending (Fellander, 2015), especially if they can save cost in case of travelling. Collaborative consumption is a new sociale-economic phynomenon that reflects the consumption trend. 'Cost saving' and 'better value for money' is the top reason for travellers who choose peer-to-peer online short rental form of accommodation instead of staying at hotels. Another argument is travellers want to maitina social connection with local residents and involve deeply into the local activities and have direct interreaction with hosts (Guttentag, 2013). The exponential growth of peer-to-peer accommodation rental calls for further investigations to evaluate potential impacts of this business model on local economic and social-environment and local travel industry and destinations.

The desk research is made for collecting different arguments concerning Airbnb and describes which are the main aspects worthwhile be examined. The media comments reflect both the positive side and negative sides of Airbnb services. For example, besides Airbnb is *cost-saving* for the users, *improving resources allocation and utilization, increasing productivity and being a new economic*

activity in the regions are also often mentioned as positive aspects. The negative side of Airbnb is hosts of Airbnb is *self-interested* rather than sharing; it is being *predatory and exploitative*, *lack of regulation* in this new activities. Airbnb has the potential to re-shape the traditional supply modes in the accommodation services (Pairolero, 2016) and disturb the house market.

Table 1 provides a list of arguments and comments from the media. The list is grouped by the actors or interested groups of airbnb market.

Table 1 Airbnb actors and different interested groups

Interested groups	Points needed to be examined	Reference
Tourists /users	Users profile: age, eudation, family types, leisure or business; Number of nights: arrivals, length of stay and party size; Daily spending: at airbnb and other categories; Activities at destinations: in order to describe which market segments they belong to.	Cost-saving; Cheaper than hotels; Closed to the local residents and daily activities.
Hosts /lender	Host profiles: age, eduation and family; Apartment types: shared rooms or entire apartment /house; Listing price: including the quality Location: centre or urban; Number of review and rating:	Extra income; Tax free for the amound below 36.000 kr.; Getting some guests.
Neighborhood	Social impacts from neighborhood; Disturb or noise from tourists; Issure on public safety, etc.	Noise and disturb; Don't like strangers in the nighbourhood; Unsafety;
Hotel organisations	Unfair competition; calling for regulation and restriction; Investigation effects of Airbnb on hotel branch.	Unfair competition; Airbnb should operate as registered tax payer of businesses.
Other businesses	Investigation effects of Airbnb on other businesses; if Airbnb is the new market, it brings new business to other sectors as well, such as restaurant business, attraction (museums and amusement parks).	Extra demand and revenue.
Governement	Regulatory issues; Liability issures;	Some publications show that the

	Taxation issues; Public security issues; Impact on house market; Impact on social relations and welfare;	percentage of Airbnb rental is too small to have an influence on house prices.
Professors, academics and consultants	**Airbnb has positive side in the following points:** Effectively re-allocating of unused resources; Increasing in extra income for individuals; Increasing productivity; Increasing competitiveness by offering new supplers; Saving transaction costs and lowere prices in some products and service; Indirect and induced effects from the extra incomes; Positive social impacts. **Airbnb has negative side in the following points:** Unfair competition, therefore it needs regulations; Disorder the social relationship if some residents do not agree with short-term rental;	Utilise the idle resources; increase in productivity and competition; economic impacts; However, unfair competition; social impacts on society; effects on house market and influence on house prices.

Note: The arguments is summary from different media publication, especially in Danmark Radio home pages.

From the online blogging and media information, it summarizes these points among different actors and interested groups that are worthwhile exploring further.

1)   *Study on Airbnb tourists / users is vital important*. The studies place on understanding why tourists choose to stay in the Airbnb form of accommodation instead of hotels. The studies on their motives show that primary reason is economical one (i.e. Airbnb is cheaper than hotels), however, the studies also show that some tourists like to stay at Airbnb, because they feel like staying at home, Some of tourists seek to have social contact, like to know more about sociaty and neighborhood.

2)   *Hosts studies is also important*. One of motives for renting out idle rooms or apartments is also driven by economic motive, i.e. extra income to compensate the expenditure on rent and other costs. Host profiles are also worthwhile to analyse, for example, age, gender, education, and family types; as well as the types of apartments /house; renting out the whole apartment or just a room. For the economic evaluation, it is best to have information of where the income spend on,

for example, the hosts spend the income on paying bills on rents and utilities, grocery and other household spending, for example, some hosts use money on their traveling expenses.

3)   *Neighborhood*: the opinion and attitudes of local residents towards the Airbnb guests is extreamly important. The association of tenants will have a big influence on allowing (or not) the apartments to be rented out. The public safety and neighborhood's order is the main considerations. Exmaple of comments in the media:

> "There is man who lives somewhere in Copenhagen - around 30's in a one-bedroom apartment, but he lived there not for long, then he rented out regularly his apartment through Airbnb, when he was abroad, or by his girlfriend. His neighbors were irritated by the noise and the strange people in the hallway and complained to the owner" (quotede by 21. september 2016 *Jyllands-Posten*).

> "Tourists with rolling suitcases, here at the East Side Gallery is a sight many Berliners have had enough of when neighboring apartments each weekend filled by a new group of travelers." (quotede by 8. maj 2016 *Politiken*).

The neighbors' complains have encouraged the city policy-maker to make a strict regulation again Airbnb rental. This has already happened in New York, Berlin, Paris and Amsterdam, where they have regulated by a limit number of nights needed to be rented the rooms or apartment out in a year's period.

4)   *Hotel organisations* argue Airbnb carries out a unfair compitition with hotel branches and they urge the parlement to put restriction on development of Airbnb. There are so far several cities has prohibited Airbnb with some strict condition for renting as Airbnb apartments, such as in New York, San Francisco, Barcelona and Amsterdam. HORESTA, a hotel branch organisation in Denmark, asked Danish Parlement to set a regulation on Airbnb, as they argued that it should distinguish private renter and business renter of Airbnb; they argued that renters should pay income taxes just like other accommodation businesses.

5)   *Other businesses* in gerenal are welcome Airbnb activities, as the new arriving tourists will create new demand and revenue for the other businesses.

6)   *The opinion from the government is mixed.* They are interested to evaluate the impacts of Airbnb – both social, economic and environmental impacts of Airbnb and other forms of sharing economies, such as GoMore, Uber.

7)   *Public and other interested groups* are acknowledged that sharing economic can re-allocate resources and better utilize the non-used resources. They support this new created form of activities, as it is claimed that Airbnb and other digital form of online service is quite innovativ activities that happened in the recent years. Besides the new activities can bring the extra income to the regions.

It is found the following paradoxes from the above arguments:

Paradox 1: amongst the local residents: Airbnb helps some residents to rent out their idle houses or rooms to compensate their expenditures on the houses or apartments; at the same time, other residents might be disturbed by the tourists in the neighbourhood where normally no tourists presence:

Paradox 2: for hotel organisation and other tourism businesses: Airbnb sometimes do supplement lacking of room during the period of special events in the destination (in case if not enough vancent hotel rooms), it is not possible to hold such a event in the small city or towns; at the same time hotel organisations are worried about Airbnb's unfair competition, so that hotels lose their market shares. For the other relevant businesses (e.g. restaurants and tourist attractions), new arriving tourists to their regions will bring more demand for their businesses.

Paradox 3: for politicians and decision makers, Airbnb can help local tourism destinations to release the so-called "high-price power" of hotel sector, as higher demand for hotel rooms during the tourism's peak seasons, it might cause monopolistic prices. On the other hand, decision makers worry about the market disorder in house markets and house-renting market; as well as the influences on residents welfare associated with their living conditions.

We are actually in the midst of changes in our society, one of the innovative activities known as structural business called 'sharing economy' or 'platform economy'. Sharing economy reflects the fact that citizens have become more aware the concept of resources-saving that resources should be utilised more efficiently. It will be cheaper for the individual (either tourists or residents), when the traditional employers are removed in the distribution chain by the user and the producers provide goods and services via digital platforms. For example, you can buy products via online shopping, you can rent the

apartment out if you are away in a period, or give a ride in your car if you have vacant seat. The latter two types are comsumers-to-consumers trade directly online. The idea of shairing is that comsumers are sharing the same resources without switch the ownership.

When a user requests an accommodation opportunity or a lift via a digital platform, the user saves a little money compared with the traditional way of purchase, and the seller earns a little extra money. And both parts can spend these extra money in other consumption categories, whereby the growth of the economy rises, increasing prosperity which in turn can translate into increased welfare and better education. Sharing economy provides a better resource utilization, increased productivity and competitiveness, lower prices and better service. When facing the growing demand for online trade via digital platforms, it is difficult to imagine that this trend will go on without disturbing the existing market system. It is no doubt there are challenges in the sharing economy, therefore we must make legislation to guide and gear the new development and to set up a framework for it, so that an fair competition is guarenteed.

It is understandable that there is a certain skepticism within the industries and businesses that they are feeling a pressure from the new structture and the new business models. Therefore, in all our interests that the legislation be structured so that the sharing economy is regulated in a fair way, where the benefits of sharing economy and platform economy will be mutually beneficial. For example, in the online blog about Airbnb, some people mentioned that type of "Host-Resident - Private Room Rental" (mini-B&B) is generally benign, do not create problems for neighbors, do not deplete the stock of month-to-month rental housing (except for long-term roommate rentals). In contrast, Airbnb "Host-Absent - Entire Place" rentals (a type of vacation rentals) create problems for neighbors, deplete the stock of month-to-month rentals (reference xx.) and are the source of most Airbnbs horrible stories. The purpose of this blog (as shown by xx) is to provide information and resources to the people and cities around the world working to appropriately regulate airbnb.

The negative side of Airbnb are shown by a series of problems, such as disturbing the neighbours' normal lifes by bringing tourists into the neighbourhood; citizens are worring about public safety; potential threat to the house market; pushing the rent price up in the renting market; hosts of Airbnb slip from paying taxes; as well as the hotel organisation claims of unfair competition from Airbnb business. Due to these negative stories, some cities have already put strict regulations on Aribnb rental.

Restriction might be different, such as short-term rental has to be at least 30 days per year; some cities simlply prohibit short-term rental; they will give a big fine if some people make a short-term rental.

However, a new trend like Airbnb does exist and this new activity do also bring an economic benefit to our society. Some economic analyses have pointed out that:

- Sharing economy is using idle resources (non-used apartments or cars / boats), i.e. no new capital investment to meet the new demand for accommodation or drive in taxi. From an economic point of view, this has spared resources and increased the welfare in the society;

- It is also good for environment. As sharing resources (a few resource, more consumption), so it is benefitial for the environment;

- This extra demand is newly created, that is to say, without this opening up for sharing resource, this demand would not exist; therefore it is assumed to be a new external inputs into the economy that will give a rise in production can create derived effect in the economies;

- Providing changes for small-median businesses or private persons to start business; For the renters, who earn extra income that will help their economic situation and increase their demand for other consumption.

- Increasing the competition in the market, for example, Airbnb might compete with hotel branche in the accommodation market, so that it prevents the higher prices on the hotel markets.

Politians in Denmark generally supports the Airbnb activity and they acknowledge Airbnb as an innovative and a creative activity. The Danish government has recently announced (ref. DR news, 19/9-2016) that the government will increase the amount for tax-free deduction in tax payment from 24.000 Dkr to 34.000 Dkr yearly. The government has also granted asset value taxes to the people who rent out their houses /apartments /summer houses by 1.33% of asset value as proposed; The intention is that Airbnb becomes a growth motor for the tourism economy.

Literature review

Analysis on the sharing economy concerns the effects of the goods and service that are consumed by multiple users. When goods and service in the situation called 'under-utilized' inventory, when they

are turned back into the supply-chain, the value created by using idle resources is economically welfare improvement. Seen from the demand side, consumers benefit from the sharing economy by renting goods and service at lower price or with lower transaction cost than buying or renting through a tranditional provider (Zervas, Proserpio and Byers, 2013).

Zervas, Proserpio and Byers (2013) analyse the effects of Airbnb supply on hotel revenue and they found that Airbnb might cause reduced demand for the small vocation hotels; on the other hand, the influence on the luxus hotel is limited. They claimed that Airbnb was taking over the role of low-cost hotel like bed-and-breakfast, as airbnb is most likely substitutes for the vocational tourists but not to the business tourists whose expenses will be reimbursed by their companies. Parirolero (2015)'s paper has set up a method to test the relationship between the sold houses and Airbnb development. His results found no evidence linking the short rental through Airbnb with the house market, neither on the house prices. Felländer, Ingram & Teigland (2015) believe that sharing economy can save transaction costs (for example, saving the intermediate costs which are replaced by the internet transaction which is much less cost; sharing economy can also save the bargining and other costs by online transaction. Franco, Kakar, Voelz & Wu (2016) have examined the relationship between the listing prices of Airbnb and race of hosts. They find a 9.6% lower list price for hispanic hosts and a 9.3% for Asian. Fang, Ye & Law (2016) provide their analysis on the airbnb's effect on local employment. The results showed that airbnb has positive constribution to tourism employment in the local economy, as tourists have increased the consumption on the local products and service. The drawback is airbnb could also give slightly decrease in low-end hotels.

Summary of the above literature review, several aspects should be taken into consideration when assessing the impact of Airbnb:

- From previous analysis, it is found that there is no evidence linking the short rental through Airbnb with house market; this means that there is no significant influence on house price in Denmark; (this point could be a new reseach topic, it might show the different conclusion).
- Airbnb can surely save some transaction costs, therefore price for overnight is cheaper at Airbnb than normal hotels;
- Airbnb will increase the frequencies of travel; it will also increase the length of stay at destination; it encourages tourists to be more actively participated into the activities;

- Airbnb tourists tend to spend more (in the whole trip at destination), they increase their spending not only at accommodation, but on various other consumption categories, for example, eating at restaurant, visiting museums and other attractions, participating other activities, etc.

- Airbnb is not necessarily a total replacement for the hotel tourists, it can be that it creates a new tourist market; without Airbnb or other forms of sharing accommodation service these tourists might not come to the destinations. There is an argument that Airbnb competes only with the low priced hotels, it will not influence business tourists and the tourists who stay in the luxury hotels.

Data collection and estimation process

Airbnb data is limited on availability due to this new phenomenon and not willingness for data sharing by the Airbnb company. However, there are some data sources avaible to Airbnb data and some of variables can be collected. The purpose of data collection is to get number of Airbnb nights tourists spent at the destinations and daily spending including for the accommodation and other categories.

In order to estimate the number of Airbnb nights, we need other information also, such as percentage of usage of Airbnb listings, renting frequency, length of stay and party size. The daily spending needs to calculate the spending per person per night on different consumption categories. The issue covers also the total expenses including the part that Airbnb charge, or only the part that renters received.

Length of stay is an important tourism indicator as a result of this strategc policy and business implication for tourism destination and the travel industry. Length of stay represents the "quantity" of vacation purchased by travellers as is has direct implication to tourist spending and consequently income generated for tourism destinations. It is shown that tourists at Aribnb has longer stay than normal hotles guests, such as Airbnb (2015) suggests that Airbnb guests stay longer than hotel guest in San Francisco (5.5 nights vs 3.5 night), in New York (6.4 night vs 3.9 nights) and in Berlin (6.3 night vs. 2.3 night, respectively).

As a result of the phenomenal growth of the sharing economy in the travel industry, the potential impacts on both travellers and tourism destination is of paramount importance. Firstly, from

the travellers' side, they desire to travel more, experience more in the local tourism destination and actively paricipate into the activities in the authentic settings. It is also possible when the reduction in accommodation cost has allowed traveller to stay longer, travel often than before.

Airbnb data sources:

Airbnb data is collected via the main two data sources – Inside Airbnb and Tom Slee's Airbnb data. Besides, some data can be collected by airbnb.com and airdna.com. Some indicators are obtained through Airbnb yearly report on Copenhagen. It is concentrated in this paper so far on the two geographical regions, i.e. Copenhagen and island of Bornholm. It is found that most Airbnb listing started from 2015 (accounts for 42%, while 31% started from 2014). The number of listing in Copenhagen is up to 16,178 (until June 2016), in which 82% of them are for entire apartments (houses/summer houses).

Variables in Airbnb dataset:

Variables in the dataset contains the room_ID; host_ID; type of room (entire home/apartment, private room, and shared room); location (neighborhood); number of review; satisfaction; accommodate; number of bedrooms; number of bathrooms; price; min_stay; and latitude and longitude.

Methods for obtaining data from Airbnb dataset:

The method is to utilize the dataset is to find it out number of reviews, this is dummy variables of number of rented out nights; size of travel groups and length of stay. Another method is to estimate the average spending for overnight.

Estimation of bed night at Airbnb from demand side, namely by calculating number of tourist arrivals:

$$Number\ of\ bed\ nights\ at\ Airbnb \\ = number\ of\ arrivals \times average\ length\ of\ stay\ \times size\ of\ group$$

$$Total\ tourist\ spending\ at\ Airbnb \\ = number\ of\ bed\ night \times average\ spending\ per\ person\ per\ bed\ night$$

The average spending of airbnb tourists on other consumption categories is assumed to be the same as the small hotel guests.

Number and facts of Airbnb in Copenhagen:

- Airbnb in Denmark 2015 (one year):
- Listings: 16,000;
- Average age of hosts is 37 years old, and 42% of men and 58 % of women. The average listing prices in the host homepage is 627 Dkr. It is estimated that average host earn around 13,800 Dkr yearly via Airbnb.
- Guest arrivals: 405,000 from foreign countries and 337,000 from other regions in Denmark
- Length of stay: 4.2;
- Average group size: 2.4.

- Airbnb in Copenhagen 2015 (one year):
- Listings: 16,100;
- Guest arrivals: 320,000;
- Length of stay: 3.3;
- Average group size: 2.

It is found by the data sources above that there are 22 nights per active host during the year 2015-2016, except that the Copenhagen. This average, 22-24, is assumed to apply throughout whole Denmark also in the year 2016. The average for Copenhagen and Frederiksberg municipalities are around 30. It is found that the average number is lower than in the regions that are outside Copenhagen and Frederiksberg municipalities, namely around 20. Besides, the average of the 22 actually applies only to listings that were on airbnb.com already at the beginning plus they must have received at least one booking during the year. There is a significant difference between the number of listings (gross) and the number of listings that have received at least one booking during the year. - In addition, a large proportion of the number of listings has come up during the last year. The summary of Airbnb estimated numbers, average listing price, etc. data is included in the Table 2-5.

We assume that number of nights outside Copenhagen and Frederiksberg municipalities be the same. It might be higher number of nights have been rented out in the more popular tourist municipalities than the less popular tourist municipalities.

From the site www.airbnb.com can man read average listing price exclusive 12% booking fee. This is approximately done in the regions that are outside Copenhagen and Frederiksberg

municipalities, where there is no information on the number of listings from airdna.co (para. 4), the number of listings per. municipality approximately calculated based on screenshots from airbnb.com.

As there are plenty records for Copenhagen and Frederiksberg, the average price is calcuated by weighted average by the number of reviews and the source inside airbnb.

List of key words for Airbnb hosts and guests when analysing Airbnb hosts and guests from the geographical aspects:

Hosts: property, insurance, tax payment, regulation on renting, city rules and others; spperance in listing; prices, reviews; quality.

Guest: home /apartment, money saving, online bookings, origin, accommodation choice, hospitality and tourism destination choice; communities, etc.

Place: Sharing economy, business model, technology, development / opportunities; industry; social and economic impacts.

Government: taxation for the hosts; house market and housing prices; regulation; social, environmental and economic impacts.

Data estimation procedures are including 1) estimating review rates – how many percent of listing is reviewed? ") number of bookings is estimated by the number of review multiplied with the review rates; 3) number of bed nights per booking is estimated; 4) rates (prices) per bed night; 5) party size (how many persons traveling together;, 6) price per person per room night; 7) number of total bed nights.

The eviedence was found that Airbnb tourists spend in general more days at destination than hotel tourists; airbnb tourists also spend more per day than other tourists, as they have saved money on the spending of overnight. (airbnb, 2014). On the other hand, Airbnb tourists spend on other categories of consumer goods and service, such as eating in the restaurants, visiting attractions and purchasing in shops, etc.

It is estimated that there are approximately 320,000 bed nights in Copenhagen during the year 2015. Estimated daily consumption can be as a hotel guest, 1,150 Dkr. Or as a hostel guest, it is 628 Dkr. Per person per day. The two alternatives for the tourist revenue are estimeted as 368 million Dkr.

and 201 million Dkr. respectively. These are the inputs data into the model calculation as shown in Table 6.

Methodology for evaluating the Airbnb impacts on regional economies

In Denmark, the records show that there are 120000 household have rented out their private homes to tourists. 120000 means around 5% of household has been renting out their homes, it must be higher shares of households in the cities (e.g. Copenhagen) have rented their homes to tourists.

Point of departure for the economic impact analysis is that this overnight form does not only involve the traditional business form, such as a hotel or a food provider, so that the analysis can use the traditional input-output sectoral approach to estimation the business contribution to the regional economy; the Airbnb has involve private individual to private their rooms or apartment to guests, then the income from renting is not business income, meaning that it is personal private income which is not necessary to pay income taxes and they are not necessary back to the supply chain.

The Danish inter-regional macroeconomic model (called as LINE model) is applied in the analysis. The LINE model is a regional input-output with social accounting matrices (SAM) and the price due-circuit model as its modelling framework. The model is constructed based on the basic economic theories, for example, it has three main actors, namely producers, households and government. The producers produce and deliver products and services to other producers, government and household, while household delivery labor force (as a production factor) to producers, and government deliver public services to household. At the same time, government has to keep a certain welfare in the country through income taxes, cooperative taxes, products taxes including value-added taxes (VAT).

As an inter-regional model, the LINE model has distinguished geographical regions as "place of production", "place of residence" and "place of demand". SAM framework contains production sectors (J), factors (F), house types (H) and products and services (V), at the same time the LINE model system has a flexible degree of aggregation for sectors, factor (age, gender and education), household types and products and services.

Due to the feature in inter-regional macroeconomic model, the LINE model has a several linkages which actually formulate sub-model within the general model. For example, labor market sub-model

15

can make an analysis of labor supply and demand due to the very detailed register data for labor force and labor market through commuting matrices. Other linkages are shopping, trade and tourism flows (see Madsen and Zhang, 2010, Zhang, 2014a)

Tourism sub-model in the LINE model is constructed based on the detailed tourist bed night data from Statistics Denmark and tourism survey data from Visit Denmark (see Visit Denmark, 2014). Tourism destination is connected with "place of demand", while tourism consumption by domestic business tourist is connected with "place of production" and tourism consumption by domestic private tourists is connected with "place of residence". Tourism consumption by foreign tourists (both business and private) is actually Danish export in tourism services, however, as the consumption is carried out in the place of demand, it is also a part of private consumption at destination region.

In this analysis, we apply the demand approach, meaning that starting point is changes in demand. Based on the previous research and assumption, we assume that at a reduced VAT rate in hotel service equalizes to lower prices in hotel rooms and increase hotel competitiveness in both domestic and international markets. This will boost the demand for hotel with 10% of tourism demand at hotels (not including camping, holiday apartments and summer houses). The extra demand in hotels at tourism destinations will spread over to other economic sectors through hotel purchases, and eventually into all other sectors due to both direct and derived effects during the model simulation.

The simulation exercise is based on the balancing model framework, this is, the regional supply equals to regional demand in all products and services. The macroeconomic equilibrium is determined by the economy's capacity or need for financing with regard to investment and export (as exogenous variables), while demand from household – private consumption and governmental expenditure and intermediate consumption is endogenously determined by the economy's capacity. The model also assumes that domestic markets of goods and factors are perfectly competitive. Capital and labor are perfectly mobile among sectors and regions. The model analysis is on the basis of a short-term solution, as in the long-term the changes in technology or level of productivity will even out the short demand change and reach to a new equilibrium.

Economic effects from Airbnb tourists: city versus coastal region

This section presents the results from the economic effects of Airbnb tourists. The variables are includes employment, income (gross value added) and total governmental revenue in Copenhagen and Bornholm. The two tables allowed us to give a comparison between the two tourism destination by the direct and total effects on regional economies.

Table 7 shows the results from the model calculation for the two alternatives. Alternative 1 gives totally 502 full-time equivalent jobs and 203 million Dkr. gross value added as income. Government will obtain 24 million Dkr. as person's income tax and 69 million Dkr. as VAT and other taxes. Alternative 2 gives totally 253 full-time equivalent jobs and 106 million Dkr. gross value added. Government will obtain 12 million Dkr. as person's income tax and 36 million Dkr. as VAT and other taxes.

It is seen that through Airbnb tourist revenue, the city of Copenhagen can get 1.36 jobs by one million of revenue and 0.55 million of gross value-added (income), in the case of Airbnb tourist spends almost like a hotel tourist. If Airbnb tourist spend like a hostel tourist, they will give 1,26 job and 0,53 million income by a million of revenue.

Discussion and suggestions

Airbnb is a short-term rantal - one form in the sharing economy and a rather new phenomenon. It is believed to be continuing growing. Sharing economy will no doubt change our every day's life; it will change consumers' behavious with regards to travel, transport and choice for destinations.

As sharing economy is rather new, research in this filed has just started, a series investigation and research is needed. The topics for further investigations cover a wide array of fileds, such as in sociology, psychology, human behavior, cultural and economic effects, etc. The concreate topics are including such as in sociology investigation on host-guest relationship? What is the influence of photo in the listing on tourist choice for the apartment (Ert, Fleischer & Magen, 2016)? Is any influence of races of hosts (Franco, Kakar, Voelz & Wu, 2016)? In psychology and human behavior, how do hosts decide their listing prices? What are main factors that influence the listing prices? How does an Airbnb tourist choose destination? What kinds of tourists often choose Airbnb as the accommocation types.

Due to the new short-term rental form, is any change in tourist behaviour? Will airbnb tourists more actively participate into activities? Feel airbnb tourists home in other persons' home?

In social and economic aspects, for example, what is the consequences of Airbnb growth for the local house market and house prices? Har Airbnb rental influence the long-term rental market? What is impact of Airbnb on tourism industries and tourist destinations? Is any influence on the cultural changes in the local destination?

Peer-to-peer sharing accommodation rental har started to transform the current tourism system. It stresses the value of co-creation, co-experience and dynamics in the tourist supply and demand chains. It helps tourist destination to provide visitors with a wide arrange of products and service at a more affordable price. Airbnb facilitates authenticy and encounters between tourists and local residents and it contributes to employment and income to the local destinations.

Reference:

Airbnb (2015): Airbnb Summer Travel Report: 2015.

Belk, R. (2010): Sharing, *Journal of Consumer Research*, 36, 715-734.

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

Ert, E., Fleischer, A. & Magen, N. (2016): Trust and reputation in the sharing economy: The role of personal photos in Airbnb, *Tourism Management*, 55, 62-73.

Fang, B., Ye, Q. & Law, R. (2016): Effect of sharing economy on tourism industry employment, *Annals of Tourism Research,* 57, 264-267.

Fellander, A., Ingram, C. & Teigland, R. (2015): Sharing Economy – Embracing change with caution. *Entreprenörskapsforum*, 2015.

Franco, J., Kakar, V. Voelz, J & Wu, J. (2016): Effects of host race information on Airbnb listing prices in San Francisco. *Internet publishing* at https://mpra.ub.uni-muenchen.de/69974/.

Guttentag, D. (2015): Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector, *Current Issue in Tourism*, 18:12, 1192-1217, DOI: 10.1080/13683500.2013.827159.

Parirolero, N. (2015): Assessing the effect of Airbnb on the Washington DC houseing market. *Internet publishing* at http://unknown.

Tussyadiah, I. P. & Personen, J. (2015): Impact of peer-to-peer accommodation use on travel patterns, *Journal of Travel Research*, ? 1-19. DOI: 10.1177/0047287515608505.

Zervas, G., Proserpio, D. & Byers, J. W. (2013): The rise of the sharing economy: estimating the impact of airbnb on the hotel industry. *Internet publishing* at http://wiseconf.org/

Tables

Table 2 Number of listings, prices, length of stay, party size and estimated bed nights of Airbnb

	Number of listing	Average listing price	Average number of rented per apartment	Number of night (apartment)	Length of stay	Party size	Estimated nights
Copenhagen	17,714	680	30	529,412	4	2.2	1,164,706
Aarhus	2,004	495	20	40,080	4	2.2	88,176
Aalborg	505	443	20	10,100	4	2.2	22,220
Odense	524	442	20	10,480	4	2.2	23,056
Sum of 4 urban cities	20,747			590,072			1,298,158
Rest of other urban areas	4,201	636	20	107,969	5.2	2.9	260,608
Sum of rest coastal areas	9,389	574	20	187,780	5.2	2.9	538,928
Sum of Denmark	34,337			885,821			2,097,694

Table 3. Estimation for Airbnb listing in Copenhagen (1)

	1	2	3	4	5	6	7
Year	Listing	Review	Review rates	Bookings	Length of stay	Rate per night	Gross booking value (mil. DKK)
2011	81	492	65%	757	4,4	613	2
2012	362	2.211	65%	3.402	3,8	680	9
2013	1.129	7.610	65%	11.708	3,6	710	30
2014	2.809	20.193	65%	31.066	3,6	727	80
2015	7.773	57.285	65%	88.131	3,4	704	209
2016	14.000	118.900	65%	182.923	3,3	680	410

Data source: Inside Airbnb and own calculations

Table 4. Estimation for Airbnb listing in Copenhagen (2)

	8	9	10	11	12	13
Year	Gross booking value (mio DKK)	Peron per room	Price per person per night	Number of nights	Person nights	Arrival persons
2011	0,3	2,0	307	3.337	6.674	1.514
2012	1,2	2,0	340	13.057	26.114	6.803
2013	4,1	2,0	355	42.583	85.166	23.415

2014	11,0	2,0	363	110.527	221.054	62.132
2015	28,0	2,0	352	296.609	593.217	176.262
2016	55,0	2,0	340	603.646	1.207.292	365.846

Data source: Inside Airbnb and own calculations.

Table 5 Summary for Airbnb hosts and guests in Copenhagen

	Airbnb listing in Copenhagens	Airbnb listing in Denmark
Number of hosts	16,000	21,000
Number of guests (inbound)	320,000	405,000
Average earning for a typical host		13,800
Average length of stay	3.3	4.2
Average group size	2	2.5
Average prices of listing	672 Dkr.	

Data source: Inside Airbnb and Airbnb report, 2015.

Table 6 Estimated number of bed nights and tourist revenue at Airbnb in Copenhagen

	Alternative 1	Alternative 2
Number of bed nights (in 1000)	320	320
Estimated daily consumption (kr.)	1150	628
Estimated tourist revenue (mil kr.)	368	201

Table 7 Economic effects of Airbnb tourism in Copenhagen

	Alternative 1	Alternative 2
Direct employment creation	362	179
Total employment creation	502	253
Direct GVA effects (mil. kr.)	113	59
Total GVA effects (mil. kr.)	203	106
Personal income taxes (mil. kr.)	24	12
VAT and other taxes (mil. kr.)	69	36

Data source: LINE-Tourism model, CRT.

NUMBER OF GUESTS STAYING WITH AIRBNB HOSTS DURING THE SUMMER
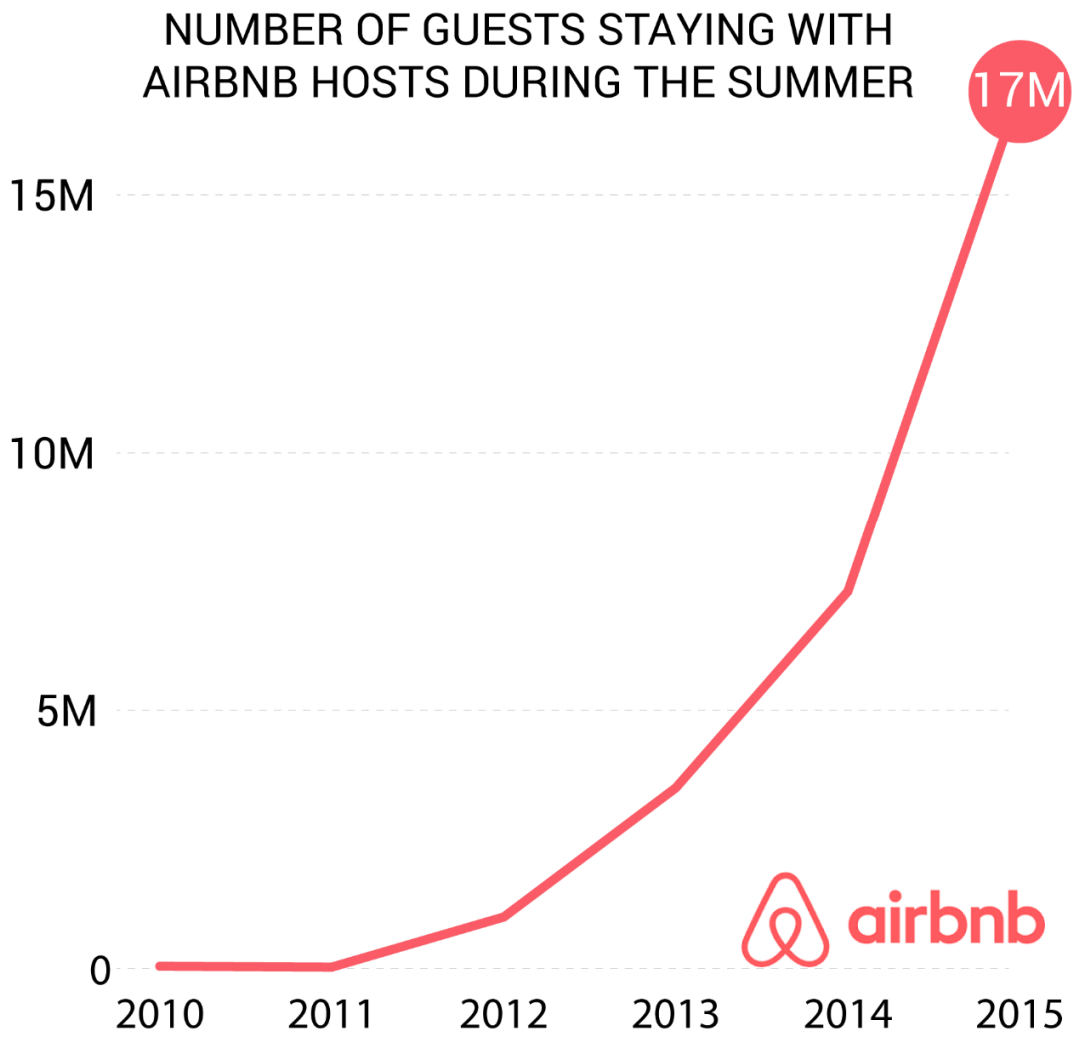
dadaviz.com

Number of listings in Copenhagen