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Peer-to-peer accommodation in destination life cycle: the case of Nordic countries

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ABSTRACT

Internet platforms, enabling short-term rental of private houses, are an increasingly important provider of tourist accommodation. The largest peer-to-peer accommodation platform is Airbnb. To date, most geographical studies on Airbnb investigated spatial patterns and effects of platform activity on large cities. This study attempts to expand the understanding of the role of Airbnb in various types of urban and non-urban tourism destinations. It employs Tourism Area Life Cycle model to investigate the differences in the quantity of peer-to-peer accommodation in destinations in various stages of their life cycles. Five Nordic countries are used as the study setting. A database of 61 thousand active non-hotel Airbnb listings is compared with statistical data obtained from national statistical institutions on regional (74 NUTS-3 regions) geographical scale. The results show that peer-to-peer rental supply and use is concentrated in destinations characterised by the quick increase in the number of tourist visits.

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Peer-to-peer accommodation; Airbnb; tourism area life cycle; tourism accommodation; Nordic countries

Introduction

Tourism areas are dynamic systems where the number, structure and behaviour of visitors, as well as activity and performance of various private and public actors involved in tourism economy change over time. Evolution paths of tourism destinations are shaped by a variety of factors including changing types and motives of visitors, institutional and environmental dynamics (Christaller, 1964; Stansfield, 1978). To understand the temporal changes in destinations, tourism geographers often refer to the model of Tourism Area Life Cycle (TALC) by Butler (1980, 2006). It is based on the marketing concept of product life cycle and predicts a series of stages of development of tourism reception area with changing dynamics of tourism arrivals. Later studies built on the TALC model e.g. by employing the theory of evolutionary economic geography which gives more insight into the complex and non-linear nature of destination evolution and helps to understand the turning points in destination life cycle (Brouder et al., 2017; Ma & Hassink, 2013; Sanz-Ibáñez & Clavé, 2014).

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One of the recent phenomena that have a profound impact on the dynamics of evolution of many tourism areas is the spread of Internet platforms enabling short-term rental of private homes and apartments. In 1995 Vacation Rentals By Owners (Vrbo, now a part of Expedia Group) platform was founded as the first of this kind (Vrbo, 2019). Airbnb, created in 2008, implemented the idea of tourist home rental in cities and quickly became the largest of several peer-to-peer accommodation platforms that exist (Hajibaba & Dolnicar, 2018), offering for rent more than 7 million private homes, apartments and rooms in almost all countries of the world (Airbnb, 2020). At the beginning, Airbnb was designed to enable renting out spare room in one's home (Gallagher, 2017). Later, the offer of professionally hosted rental homes and apartments, as well as hotel rooms, dominated the platform (Adamiak, 2019; Dolnicar, 2019).

From tourism destination perspective peer-to-peer accommodation platforms, including Airbnb, play two roles: act as an intermediary in commercialising existing tourism accommodation offer and, more importantly, create a new accommodation capacity. Accommodation offered via peer-to-peer services is often cheaper than in traditional hotels and lodges, and large apartments better suit the needs of some travellers, e.g. families (Gunter & Önder, 2018). Thus, the users of Airbnb platform travel more than the others because they spend less on accommodation (Tussyadiah & Pesonen, 2016). It implies that the entrance of peer-to-peer rental platforms may absorb increase in the tourism flow to a destination. However, accommodation offers via Airbnb also engage in a competition with incumbent accommodation businesses, particularly budget hotels, hostels and bed and breakfasts (Dogru et al., 2019; Hajibaba & Dolnicar, 2017; Koh & King, 2017).

It may be expected that the actual local impacts of new accommodation created by the peer-to-peer platforms differ depending on the stage of life cycle of the destination (Avdimiotis & Poulaki, 2019). Airbnb's own marketing materials and research reports emphasise that the platform enables to redirect tourists from tourist centres to city districts which had not been often visited by tourists before (Guttentag, 2015). Airbnb would thus play an important role in destinations in the stages of exploration and involvement, where traditional hotel businesses are not yet developed. By creating and marketing accommodation the platform could help such destinations to enter the growth path. Some researchers notice that the possibility to expand Airbnb supply without investments makes it useful to fill the gap created by underdeveloped tourism infrastructure in areas with quick growth of tourism arrivals in the development stage (Kneževič Cvelbar & Dolnicar, 2017). Most research studies on peer-to-peer accommodation, however, focus at mature destinations, primarily urban ones that can be placed in the stage of consolidation or even stagnation in the tourist area life cycle model. In such areas, additional accommodation capacity created in private apartments and rented on Airbnb may cause the number of tourists to grow beyond destination carrying capacity causing negative social impacts, contemporarily referred to as overtourism (Capocchi et al., 2019; Nilsson, 2020). Also, Airbnb competes against hotels, which negatively impacts the economic results of hotel activity (Dogru et al., 2019; Dogru et al., 2020; Zervas et al., 2016). However, other studies show that the platform does not affect the demand for existing accommodation services (Farronato & Fradkin, 2018; Heo et al., 2019) and have positive overall impact on tourism industry as a whole (Dogru et al., 2020; Fang et al., 2016; Sigala & Dolnicar, 2017). It may be particularly the case in destinations in development

or consolidation phase as the growth of platform creates additional accommodation capacity in parallel with the growth of other accommodation sectors and other tourism businesses.

Most studies on the impacts of peer-to-peer accommodation on destinations focus on a single area, usually a city. A few that has compared multiple regions noticed important differences in the size, structure and possible impacts of Airbnb offer in areas of different characteristics of tourism market (Adamiak et al., 2019; Domènech et al., 2019). This study continues this line of research by analysing the distribution and development of Airbnb offer in various regions of the Nordic countries. It tries to answer the question whether there are differences in the size of Airbnb offer in regions in different stages of their life cycles. If the answer is positive it will add to the debate on how the emergence of peer-to-peer accommodation affects the evolution of these destinations and managerial implications (Avdimiotis & Poulaki, 2019). Possible answers to this question, and thus working hypotheses are as follows: (H1) Airbnb offers are relatively numerous in destinations with low tourism intensity and dynamics (at the involvement stage of their life cycles), thus Airbnb's claim of the spreading of tourism to other destinations is warranted. (H2) Airbnb offers are numerous in areas with growing tourism (at development and consolidation stages), thus they mainly follow along growth in other aspects of tourism. (H3) Airbnb offers are numerous in areas with high but stable tourism (at stagnation stage), so they mainly contribute to the overcrowding of primary destinations. The numbers of Airbnb offers in regions on each stage of life cycle are compared to the capacities of other forms of tourism accommodation: hotels and similar establishments and second homes, which play an important role in Nordic countries (Hall et al., 2009; Müller, 2007). In the case of these two traditional forms of accommodation, both their absolute numbers and growth in the period of activity of Airbnb (since 2008) were taken into account in the comparison.

Five Nordic countries, including their dependent territories, divided into 74 territorial units are used as the study area. Such geographical scope enabled to perform a large-scale international comparison with the use of relatively small spatial units of analysis representing different types of tourism destinations (e.g. urban, coastal, mountain destinations). In the first stage of the analysis, the geographic units were assigned to the stages of TALC based on the current intensity and recent growth in the number of tourist overnight stays. According to a simplified interpretation of the TALC model, each stage of destination development is characterised by a different intensity and different pace of growth of tourism arrivals. After the exploration stage, in the involvement stage the number of tourists is relatively low and increases relatively slowly. In the following development stage the number of tourists grows quicker. In the consolidation stage the growth remains dynamic, and the total number of tourist arrivals is much higher. In the next stagnation stage the growth slows down, but the current number of tourists remains high (Table 1). Considering long history and wide geographical scope of tourist

Table 1. Working definition of the stages of destination life cycle.

	Growth of tourism below average	Growth of tourism above average
Current tourism intensity below average	1. Involvement	2. Development
Current tourism intensity above average	4. Stagnation	3. Consolidation

activity, no Nordic region can be attributed to the first exploration phase. Also, the last hypothetical stages of decline and rejuvenation were not considered as no evident decline of tourism can be noticed in any Nordic region and the rejuvenation can be treated as the beginning of another cycle of growth of a tourism destination. In the second stage of the analysis the number, structure and location of Airbnb listings in the regions of the Nordic countries was presented. The last part of the analysis included the comparison of regions representing four stages of destination life cycle in terms of the numbers and the dynamics of tourism accommodation of different kinds: hotel accommodation, second homes and non-hotel Airbnb listings. The last section discusses the conclusions from the study.

Destination life cycle of Nordic regions

For the purpose of the study, Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) were divided into 71 NUTS-3 regions (Eurostat, 2019) and three other territorial units: Svalbard, Faroe Islands and Greenland. Data on population, distribution of hotels and second homes and the use of commercial accommodation in each of these regions were derived from the databases of national statistical offices (SCB, 2019; Statistics Denmark, 2019; Statistics Faroe Islands, 2019; Statistics Finland, 2019; Statistics Greenland, 2019; Statistics Iceland, 2019; Statistics Norway, 2019). Where possible, data for the years 2008 and 2018 were used to measure the time trend (if they were not available, data for other years were used, see footnotes under Table 2).

The assignment of regions into stages of destination life cycle is based on the numbers of tourist overnight stays in commercial accommodation establishments and second homes. Second homes are, however, not counted in tourist arrival statistics. So, the number of overnight stays in second homes was estimated assuming that each

Table 2. Tourist overnight stays in Nordic countries and territories.

Country/ territory	Overnights in commercial accommod. in 2018 (thousand)	Second homes in 2018 (thousand)	Estimated overnights in second homes in 2018 (thousand)	Total overnights in 2018 (thousand)	Overnights in 2018 per km^2 (thousand)	Overnights in 2018 per inhabitant	Overnights change 2008–2018
Denmark	39,157.8	222.1	27,027.2	66,184.0	1.53	11.4	+18.4%
Finland	21,826.3	500.7	60,921.4	82,747.7	0.25	15.1	+7.3%
Iceland	8,377.2	8.3	1,007.0	9,384.2	0.09	26.9	+243.0%
Norway	33,657.6	463.7	56,418.7	90,076.3	0.28	17.0	+13.4%
Sweden	63,208.2	576.7	70,166.5	133,374.7	0.30	13.0	+13.0%
Åland Islands	393.1	6.5	787.9	1,181.0	0.87	40.2	+1.4%
Faroe Islands	151.7	No data	No data	151.7	0.09	3.0	+129.4%
Greenland	262.9	No data	No data	262.9	0.00	4.7	+11.1%
Svalbard	155.0	0.2	24.6	179.6	0.00	64.5	+702.4%
Total	167,188.8	1,778.2	216,353.3	383,542.1	0.11	14.1	+14.6%

Iceland, Sweden and Greenland: data for 2017 instead of 2018.
Finland and Åland Islands: data on second homes for 2017 and numbers for 2008 extrapolated from data for 2005 and 2010.
Denmark: numbers of second homes in 2010 used instead of 2008.
Faroe Islands: change extrapolated from available data for 2013–2018.
Iceland: data for second homes from census 2011.

second home is inhabited on average by 1 person during one-third of the entire year (assumption based on e.g. Adamiak et al., 2017; Rye & Berg, 2011). Based on this estimation, the users of second homes in the Nordic countries spent 216 million nights at their second homes in 2018. Added to 167 million nights spent in commercial accommodation establishments, it adds up to 384 million tourist nights during the year, 14.6% more than ten years before (Table 2). The comparison between Nordic countries shows a particular dynamic of tourism in Iceland. Over three-fold increase in tourist overnights since 2008 has made the island one of the most tourism-intensive countries in the world with 26.9 tourist overnights per inhabitant. Similar dynamic growth in international tourism, in much smaller scale, can be seen in the archipelagos of Faroe Islands and Svalbard.

The current intensity of tourism in regions was measured by two indicators: the number of tourist overnights per square kilometre and per inhabitant. Areas, where the value of any of those two indicators surpassed the respective average value, were considered to be characterised with high current intensity of tourism. Relative to area, tourism arrivals are most concentrated in capital regions (Figure 1(A)). The numbers of tourist overnights per capita are relatively high in sparsely populated regions of the north of mainland Nordic countries and in the Finnish Lakeland. The highest rates are characteristic for the islands and regions with ski resorts (Figure 1(B)). Numbers of tourist arrivals have increased most quickly in capital cities, Iceland, Svalbard and Faroe Islands. The increase in tourism was relatively slow in central and southern Finland and most parts of central Sweden and Norway (Figure 1(C)).

Figure 1(D) presents the classification of Nordic regions into four groups based on the stage of destination life cycle. Regions of southern and central Sweden and Finland, as well as Danish islands outside of Copenhagen metropolitan area, are characterised by a relatively low level and growth of tourism (involvement stage). Low but increasing tourism intensity (growth stage) is typical for several urban regions (Helsinki, Gothenburg, Bergen) and Danish Jutland. High and growing intensity of tourism (consolidation stage) is characteristic for major capital cities on the one hand and sparsely populated regions of the north as well as archipelagos on the other hand. Most of southern Norway, Dalarna and Kalmar regions and Finnish Lakeland have high, but relatively stable, level of tourism (stagnation stage). Note that the assignment of regions to stages of destination life cycle should not be interpreted in terms of deterministic and linear evolution, but only current state and tendency in tourism development. In this understanding, regions can move between stages and not necessarily follow the original sequence presumed by TALC.

Distribution of Airbnb listings

Airbnb does not publish any information on its activity other than enigmatic market reports. However, data on the location and use of Airbnb listings can be obtained thanks to web scraping techniques and dedicated websites, so they are widely used in geographic research. In the Nordic context, Strommen-Bakhtiar and Vinogradov (2019) found that the regional supply of Airbnb listings in Norway is determined by the supply of apartments, commercial tourism activity and ICT development, while Jokela and

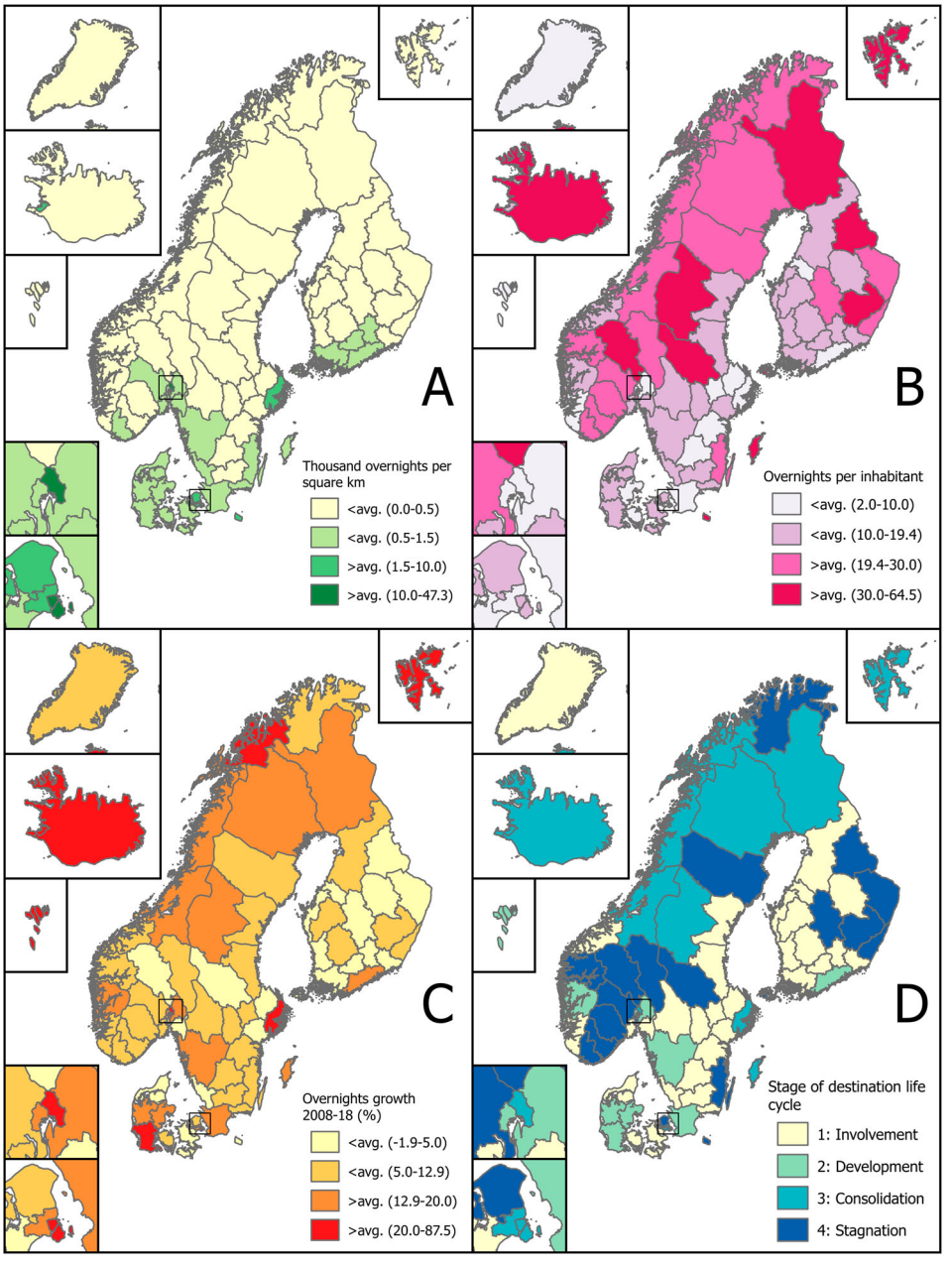

Figure 1. Current intensity (in 2018) and dynamics (2008–2018) of tourism arrivals in regions of Nordic countries.

Minoia (2020) examined spatial characteristics and local impacts of peer-to-peer accommodation in Helsinki.

In the current study, data about Airbnb offers in Nordic countries was obtained from Airbnb website using a web-scraping script published by Slee (2018). The data collection was performed twice in early fall of consecutive years 2018 and 2019 (28–29.09.2018 and

12–14.09.2019). The resulting database includes the coordinates of the listings, information on listing type (entire home/property, private room, shared room or hotel room), number of reviews and total number of listings hosted by the owner of the particular listing. In total, 88,090 listings were saved in the dataset in 2018 and 105,574 in 2019.

The use of the web-scraped data on Airbnb listings has some limitations that result from both technical flaws of the data acquisition method and the features of Airbnb database. First, the scraper saves only information on the listings that are available in the near future after the scraping. As a result, the script may have omitted some of the listings, hence the actual number of listings can be, in fact, some 20% higher (Slee, 2018). The number of available offers changes over time following the seasonal pattern of tourism demand, so early fall was chosen to perform the scraping as the period after the tourism peak season. Data for several Nordic cities from AirDNA (commercial service providing Airbnb supply data on continuous basis) show that the numbers of offers in summer season are on average 15–20% higher than in autumn. Second, some Airbnb offers are actually not used, e.g. created by accident or rented only once long time ago. Therefore, the dataset for 2019 was limited to contain only 69,751 (66.1% of the initial number) active offers, defined as those who earned at least one review during the last year or were created and reviewed at last once during the last year.

Airbnb is not only a platform for renting places in individual flats, but also an online travel agency distributing bed-places in hotels, guesthouses and similar catered accommodation establishments. In 2019 Airbnb created a separate category of hotel rooms in its listings database, but earlier these offers were listed as private rooms or shared rooms. To eliminate hotel rooms from the database, 8,382 listings (12.0% of all active listings) categorised as hotel rooms, private or shared rooms and hosted by hosts with more than one offer were filtered out and described separately in results tables.

Apart from the numbers of offers several additional characteristics of Airbnb supply were measured for territorial units. Yearly growth of the number of listings was calculated based on the number of active listings in 2019 and the number in 2018, assuming that the proportion of listings with last review written more than 1 year before was the same in 2018 as in 2019. Share of entire homes is the proportion of homes and apartments offered for rent, while the remaining part are private and shared rooms within homes or apartments. Listings offered by multihosts are those whose owners host more than one listing. Note that rooms offered by multihosts were excluded from the study population. Average number of reviews per listing per year was calculated based on the results of two web-scraping rounds, only for listings that appeared in both datasets.

Web scraping procedure resulted in 61,369 active non-hotel listings in the Nordic countries, which means the actual number of offers is probably close to 75 thousand. Denmark has the highest number of listings of all Nordic countries, followed by Sweden and Norway (Table 3). Numbers of listings per capita for countries are diverse: highest in Iceland and relatively low in Finland and Sweden. The structure of listings is dominated by entire homes or apartments. Private and shared rooms are slightly more common in Denmark than in other countries. Multi-hosted properties account for one-fourth of the total supply, much less than in other parts of the world (Adamiak, 2019).

The average number of reviews per year informs how many tourists actually use the offers. In Iceland, Airbnb listings are much more intensively used than in other Nordic countries. It means that the role of Airbnb for tourism in Iceland is even higher than the

Table 3. Active Airbnb listings in Nordic countries and territories.

Country/ territory	Excluding hotel rooms and rooms offered by multihosts						Hotel rooms and rooms offered by multihosts
	Number of listings	Listings per 1000 inhabitants	Share of entire homes	Share of listings offered by multihosts	Average yearly number of reviews per listing	Growth 2018–2019	
Denmark	19,417	3.4	86.3%	16.6%	6.1	10.7%	2,153
Finland	6,999	1.3	90.6%	36.6%	10.1	21.9%	788
Iceland	4,018	11.5	93.0%	43.8%	19.5	2.1%	1,684
Norway	14,775	2.8	87.8%	24.4%	8.8	13.9%	1,873
Sweden	15,474	1.5	88.4%	21.6%	6.7	20.3%	1,732
Åland Islands	101	3.4	90.1%	29.7%	6.4	41.2%	10
Faroe Islands	495	9.8	90.5%	29.3%	11.1	20.5%	122
Greenland	76	1.4	78.9%	14.5%	5.1	23.0%	19
Svalbard	14	5.0	78.6%	35.7%	10.4	0.0%	1
Total	61,369	2.3	88.1%	23.9%	8.3	14.7%	8,382

numbers of listings would suggest. The supply of Airbnb listings grew by almost 15% during the last year in the entire Nordic region. The growth was relatively low in countries with already high numbers of offers per capita (Iceland, Denmark) and high in Finland and Sweden, with not so many listings yet. Airbnb supply increased also on the archipelagos.

There is an evident spatial concentration of Airbnb listings in major cities, coastal areas and island tourist destinations (Figure 2(A)). The city of Copenhagen comprises 12.0% of all active listings in Nordic region, Stockholms län – 6.9%, Västra Götaland (Gothenburg), Oslo, Helsinki-Uusima and Höfuðborgarsvæði (Reykjavík) – 3.6%–4.5% each. The highest numbers of active Airbnb listings per inhabitant are characteristic for islands, as well as capital cities, some regions of the Norwegian coast and Finnish Lapland (Figure 2(B)). Low values, in turn, appear in densely populated areas of central Sweden, as well as southern and central Finland.

Listings located in islands and archipelagos, most of Norwegian coastal regions, Helsinki and other parts of Finland are relatively frequently used. Low numbers of reviews per listing characterise the majority of Danish and Swedish regions (Figure 2(C)). The highest rates of increase in the number of active listing in recent year are noted in Finnish and Swedish regions, where, to date, the numbers of listings per capita were below the average. At the same time, capital regions of Norway and Iceland experienced a decrease in the number of active listings (Figure 2(D)).

Airbnb and other forms of tourism accommodation in different stages of destination life cycle

Regions classified in the first involvement stage of destination life cycle are most numerous, have the largest area (thanks to Greenland) and population. The group of regions in the second development stage comprises many urban units, hence despite small joint area, its total population is the second largest. Regions in the third consolidation stage are second in total area and third in population, and units assigned to the forth stagnation stage have the lowest population of all (Table 4). The distribution of hotel rooms is more or less even across regions in various stages of life cycle. But, the differences in the new hotel

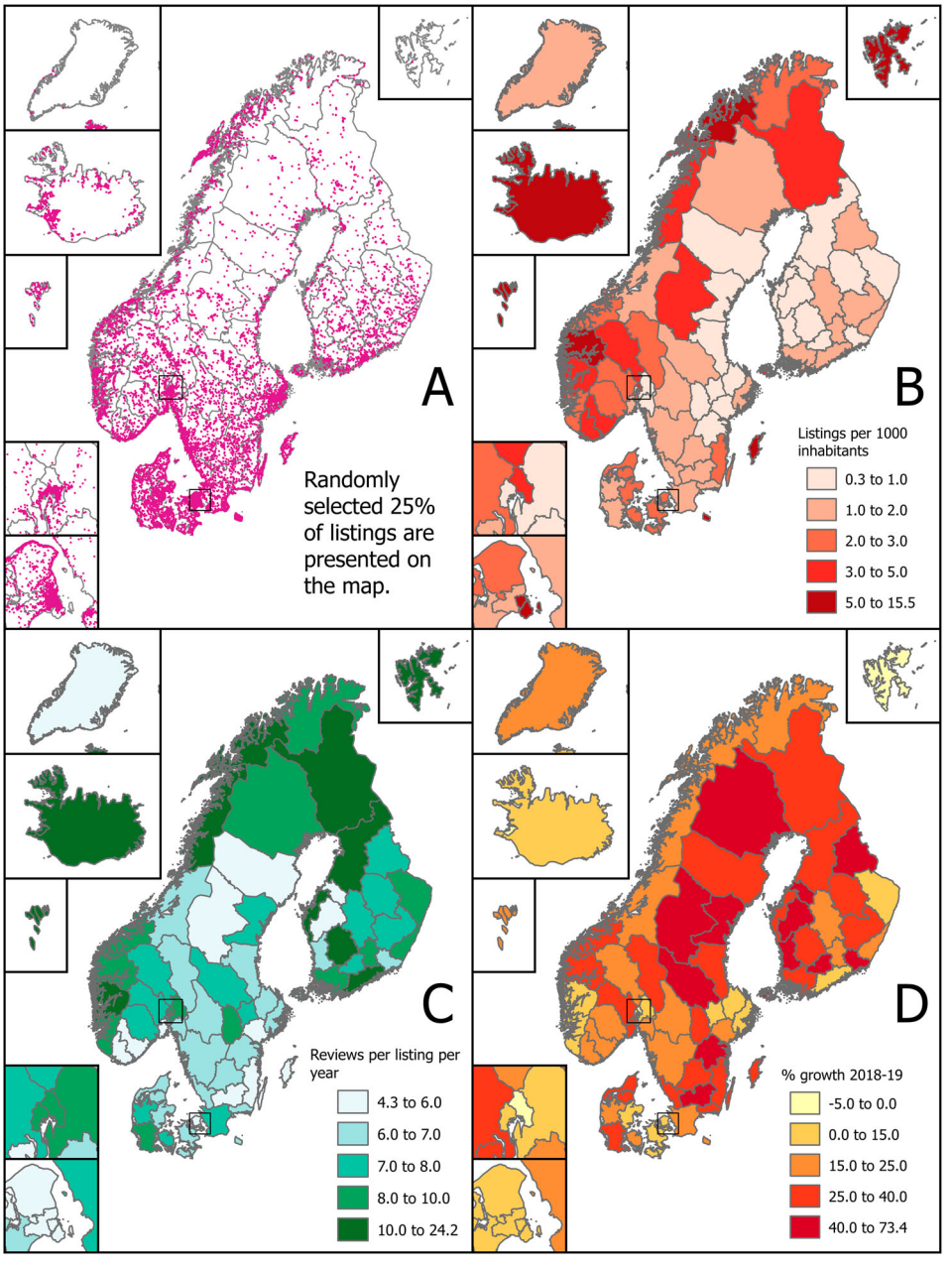

Figure 2. Airbnb offer in NUTS-3 regions of Nordic countries.

capacity across regions validate the tourism area life cycle assumptions. Most of new hotel rooms have appeared in the regions in the consolidation stage, while in the regions assigned to the stagnation stage their number has decreased (Figure 3). The distribution of hotel rooms offered on Airbnb platform (multihosted rooms) is similar to that of new hotel capacity, which may mean that primarily new hotels use this distribution channel.

Table 4. Characteristics of tourism accommodation in regions in different stages of destination life cycle.

	Stage 1: Involvement	Stage 2: Development	Stage 3: Consolidation	Stage 4: Stagnation
Number of regions	32 (43.2% of total)	9 (12.2% of total)	14 (18.9% of total)	19 (25.7% of total)
Total area	2,486,249 km^2 (71.4% of total)	93,392 km^2 (2.7% of total)	541,257 km^2 (15.5% of total)	361,314 km^2 (10.4% of total)
Total population	9,693,083 (35.5% of total)	7,944,116 (29.1% of total)	6,178,241 (22.7% of total)	3,457,381 (12.7% of total)
Hotel rooms in 2018	86,777 (26.6% of total)	80,062 (24.5% of total)	110,217 (33.8% of total)	49,220 (15.1% of total)
Increase in hotel rooms 2008–2018	8,038 (15.6% of total, increase by 10.2%)	15,662 (30,3% of total, increase by 24.3%)	29,188 (56.5% of total, increase by 36.0%)	−1,214 (−2.3% of total, decrease by 2.4%)
Second homes in 2018	681,199 (38.3% of total)	273,928 (15.4% of total)	303,628 (17.1% of total)	519,491 (29.2% of total)
Increase in second homes 2008–2018	21,682 (20.2% of total, increase by 3.3%)	9,934 (9.3% of total, increase by 3.8%)	35,417 (33.1% of total, increase by 13.2%)	40,114 (37.4% of total, increase by 8.4%)
Active Airbnb listings in 2019	12,806 (20.9% of total)	14,863 (24.2% of total)	25,064 (40.8% of total)	8,636 (14.1% of total)
Increase in Airbnb listings 2018–2019	2,980 (32.9% of total increase by 30.3%)	2,341 (25.9% of total, increase by 18.7%)	1,768 (19.5% of total, increase by 7.6%)	1,956 (21.6% of total, increase by 29.3%)
Airbnb listings in 2019: entire homes	11,263 (20.8% of total, 88.0% of listings)	12,843 (23.7% of total, 86.4% of listings)	22,070 (40.8% of total, 88.1% of listings)	7,917 (14.6% of total, 91.7% of listings)
Airbnb listings in 2019 offered by multihosts	3,168 (21.6% of total, 24.7% of listings)	3,594 (24.5% of total, 24.2% of listings)	5,530 (37.7% of total, 22.1% of listings)	2,380 (16.2% of total, 27.6% of listings)
Reviews per year per listing	7.5	8.7	8.9	6.7
Hotel rooms and rooms offered by multihosts (excluded in other rows)	1,615 (19.3% of total)	1,944 (23.2% of total)	4,032 (48.1% of total)	791 (9.4% of total)

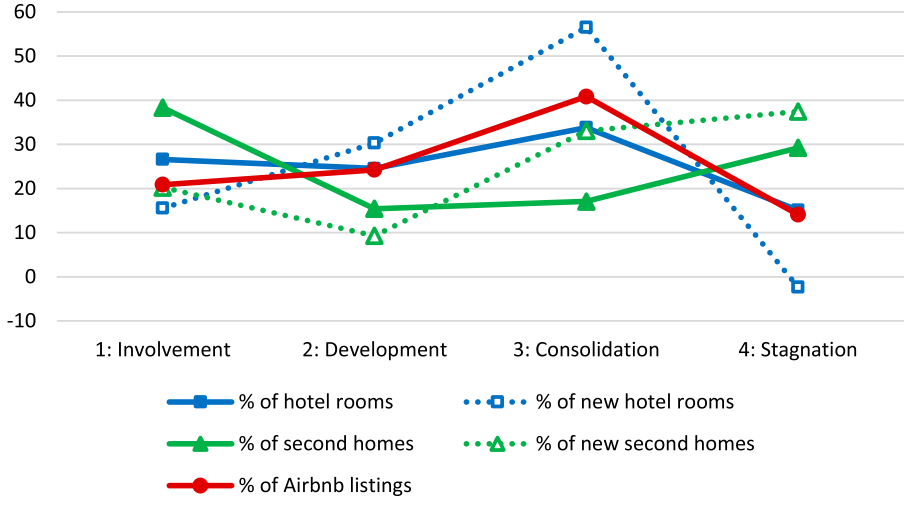

Figure 3. Distribution of new tourism accommodation capacity across regions in different stages of destination life cycle.

The distribution of second homes is different: many second homes are located in regions in the involvement stage and in the stagnation stage, so in regions of low dynamics of tourism arrivals. The former concentration is related to the rural areas within commuting distance to big cities (Back & Marjavaara, 2017; Nouza et al., 2013; Rye & Berg, 2011). The growing concentration of second homes in the stagnation stage results from the shift from hotels towards second homes and rental apartments e.g. in ski resorts (Flognfeldt & Tjørve, 2013; Komppula et al., 2008).

The proportions of Airbnb listings in groups of regions in different stages of development are correlated to those for new hotel rooms, but have lower variance. Two out of five offers are located in regions in the consolidation stage, one fourth in regions in the development stage, one fifth in regions in the involvement stage and the remaining part in regions in the stagnation stage. It means that the distribution of Airbnb offers on the regional level does not dramatically differ from the distribution of other forms of commercial tourism accommodation. Consequently, it contrasts with the distribution of second homes, though judging from the newest Airbnb offer which appeared on the platform in the last year this disparity will be reduced. Comparing the numbers of reviews per year shows that in regions in the growth stages of life cycle Airbnb offers were used slightly more intensively than in other areas. There are no major differences in the share of entire homes and the proportion of multihosted listing in Airbnb supply in regions in different life cycle stages.

Discussion

The study has shown that Airbnb has created at least 61 thousand new commercial tourism accommodation sites in the Nordic countries in the past 11 years, after excluding 8 thousand hotel and guesthouse rooms distributed through this platform. This new offer supplements the stock of 326 thousand hotel rooms and other commercial accommodation establishments. At least partially, it consists of some of 1.8 million private second homes that exist in the region. The distribution of peer-to-peer rental offers and the intensity of the use of properties is correlated with the distribution of tourism arrivals and with the dynamics of existing commercial accommodation supply and use.

The results do not provide support for the first and third hypotheses that Airbnb plays an important role in destinations in the stages of exploration and stagnation of their life cycles. It is possible that if inactive listings were taken into account, the proportion of those located in the destinations on the involvement stage would be higher. The findings confirm the second hypothesis which states that Airbnb is relatively concentrated in destinations in the development and consolidation stages of their life cycles. In such areas not only are the listings most numerous but they are also most frequently used. It means that, on the one hand, Airbnb helps to accommodate tourism growth; on the other hand, it contributes to the increasing concentration of tourism arrivals in growing destinations. Overall, the distribution of listings across destinations on different stages of their life cycles is similar to the distribution of new hotel rooms.

There are diverse possible impacts of Airbnb activity and different managerial responses needed in destinations depending on the stages of their life cycles (Avdimiotis & Poulaki, 2019). The current study was not aimed at the investigation of these impacts. Instead, it showed that there are no large differences in the relative presence of Airbnb

in regions across stages of their destination life cycles. Therefore, neither the optimistic vision of Airbnb spreading tourism away from existing hotpots, nor the pessimistic view of the platform as a direct threat of the decline of traditional tourism businesses is fully justified. Most peer-to-peer accommodation activity focus in developing tourism destinations, both urban and nature-based. In such places, the impact on traditional hotel industry is, to some degree, compensated by the overall increase in tourism demand. Also, the socio-environmental problems related to overtourism cannot be accounted to Airbnb only, but arise from the general growth of tourism. However, even though current growth in tourism means that peer-to-peer accommodation services supplement rather than substitute commercial accommodation services, harsher competition may emerge at the time of the slowdown of the number of arrivals when currently growing destinations enter the stagnation stage.

The study raises some theoretical and methodological issues regarding the application of TALC model to describe the temporal changes in tourist areas. The division of administrative units into four stages of tourism area life cycle may be controversial, besides data quality and comparability between countries and the choice of spatial units as tourism areas, because of different possible operationalisations of the level of tourism development (Butler, 2006; Haywood, 1986). Conventionally employed number of tourist arrivals is often measured only for the commercial accommodation and sometimes (as in this case) also second homes. Due to the unregulated nature of Airbnb rentals, their users are usually not included in tourism statistics. Considering the distribution of Airbnb listings, it should not alter the typology of regions in the case of the current study. Yet, the use of economic metrics to measure the development of destination, such as revenues, profitability or employment in tourism sector, faces more important problems due to different organisational structure of Airbnb services in comparison to incumbent businesses. In platform economy the global platform and individual part-time "micro-entrepreneurs" take the role of local businesses and their employees (Sundararajan, 2016). Even apparent decay in tourism economic activity in a mature destination with growing Airbnb rental stock would signify a qualitative change similar to the replacement of commercial accommodation with second homes and residential housing (Strapp, 1988).

The generalizability of the results of the current study has several constraints. It describes countries similar to each other in many aspects of tourism economics. Airbnb supply in the Nordic countries is dominated by actual peer-to-peer accommodation providers, while in many other counties professional suppliers play a more important role. The results could differ if other region was taken into consideration. The statistical data used in the analysis are not perfectly comparable between countries due to the different methodologies of statistical offices. The level of geographic generalisation resulting from data availability hinders concluding about local properties of accommodation patterns and trends. Future studies should address these issues. Widening the geographic scope of analysis beyond the Nordic countries could identify types of tourism destinations most affected by the development of peer-to-peer rental platforms. More localised studies, in turn, using longitudinal data or qualitative methods, would be helpful to understand the role that home-sharing platforms play in the evolution of specific destinations. Considering the high number of research studies in primary urban tourism areas situated in the advanced stages of tourism development, it would be particularly interesting to focus on

the impacts of peer-to-peer accommodation on the destinations at early stages of their life cycles.

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