

DELab

DIGITAL RESEARCH STUDIES

WORKING PAPER # 1/2022

REGULATIONS AND THE CHARACTERISTICS OF AIRBNB ACROSS EUROPE: AN EXPLORATIVE STUDY

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Praca finansowana ze środków Narodowego Centrum Nauki, Polska, nr umowy: 2017/27/N/HS4/00951.

Citation

K. Gyódi, Regulations and the characteristics of Airbnb across Europe: An explorative study, DELab Digital Working Studies 1/2022, 2022



ABSTRACT

Short-term accommodation rentals provided via Airbnb had a major impact on urban tourism across Europe. Cities reacted to the challenges related to Airbnb in various ways, pursuing a wide range of regulatory strategies between *laissez-faire* and almost full ban policies. The aim of this paper is to examine the attributes related to the professionalization of Airbnb in 12 major EU cities, and evaluate the role of local regulations. The results suggest that cities with a liberal approach are characterized by relatively larger and more professionalized Airbnb supply compared to locations with a tighter regulatory strategy.

INTRODUCTION

The advent of online platforms has brought significant change to tourism and hospitality services. With the online platform as the intermediary, organizing a stay in a private home became much easier than in the pre-smartphone times. At first, with platforms like Couchsurfing, home-sharing was rather a community-based social activity, with hosts spending time with guests (Molz, 2012). Airbnb arrived to this rather niche sector in 2008, switching the focus towards earning an income from unused space by enabling hosts to charge tourists. Initially, Airbnb made use of the mainstream emergence of “sharing economy”, an umbrella term for platform-mediated services based on unused assets, such as a free room in one’s home (Frenken & Schor, 2017). The emergence of low-cost flights and the increasing popularity of urban destinations, coupled with monetization led to a gradual professionalization of home-sharing in the 2010s. Airbnb formed a dual nature: while its sharing economy roots remained, investors and businesses began to acquire housing property to meet tourist demand. The “professional host” emerged, running multiple listings on the platform and making a living by offering accommodation for tourists. Therefore, local residents faced crucial processes in touristic cities: under the auspices of sharing economy, the available housing declined, while tourist pressure increased in popular neighbourhoods (Benítez-Aurioles & Tussyadiah, 2020; Gutiérrez et al., 2017). Airbnb has become a significant actor of urban change, attracting policy and regulatory attention.

A wide debate began on regulating platform mediated services, including short-term rentals (STR). While an EU-wide rulebook has been in the works¹, cities adopted different approaches ranging from a liberal, *laissez-faire* and a restrictive, full ban approach (Nieuwland & van Melik, 2020). Therefore, Airbnb has been functioning in highly heterogeneous conditions across Europe. This wide variety of local environments offer an opportunity to explore the differences in the development of Airbnb and evaluate the role of regulations.

¹ <https://www.politico.eu/article/pressure-mount-brussels-deliver-airbnb-rule/>

The aim of this paper is to examine and evaluate the differences in the structure and characteristics of Airbnb supply in 12 major EU cities². In this analysis I focus on the pre-pandemic period of 2018-2019. The research questions I am seeking to answer are the following:

RQ1: *What are the differences in the size of Airbnb supply relative to the hospitality sector in the analysed cities?*

RQ2: *What are the differences in the level of professionalization across major European cities?*

RQ3: *How do the characteristics of Airbnb in cities with a liberal approach compare to the more regulated locations of Europe?*

I. REGULATIONS IN THE ANALYSED CITIES

Among the cities pursuing a no-intervention policy are Warsaw, Prague and Rome, where no major restrictions have been implemented on providing STR in private homes. Next, cities may offer exceptions and easier rules for occasional hosting with day caps, such as the 90 day limit on entire homes in London³. A tighter approach also differentiates between primary and secondary residences, requiring the host to be living permanently in the rented property, such as in Amsterdam⁴. A further popular method is restricting supply with licenses: this has been the case in Barcelona⁵. Finally, cities often combine different rules with territorial restrictions, requiring permits or banning Airbnb in certain districts, e.g. in Vienna and Barcelona⁶. Cities can also request hosts to follow detailed safety and community rules, as in Brussels⁷. Besides rules designed for home-sharing and Airbnb, the general regulatory environment for housing is highly relevant as well. This is especially the case in Stockholm, where tight tenancy and housing regulations are in place curb-

² Amsterdam, Barcelona, Berlin, Brussels, Lisbon, London, Paris, Prague, Rome, Stockholm, Vienna and Warsaw

³ <https://www.airbnb.co.uk/help/article/1340/i-rent-out-my-home-in-london-what-shortterm-rental-laws-apply>

⁴ <https://www.airbnb.com/help/article/860/amsterdam#section-heading-3-0>

⁵ <https://www.nytimes.com/2021/09/22/travel/barcelona-airbnb.html>

⁶ <https://www.bloomberg.com/news/articles/2018-06-06/how-barcelona-is-limiting-airbnb-rentals>

⁷ <https://www.airbnb.com/help/article/1393/responsible-hosting-in-belgium#section-heading-3-0>

⁸ <https://economy-employment.brussels/tourist-accommodation-registration>

ing the expansion of Airbnb (Einefors, 2018). Table 1. provides an overview of rules in the examined cities. In most cities, regulations differentiate between services provided occasionally and in the primary residence of host (non-professional); and services provided regularly or in second homes (professional). As an example, in Amsterdam occasional hosting is tied to an annual cap of 30 days (in case of entire homes), requires registration and the host needs to be the main resident of the home. In any other case a license is necessary to host guests.

Table 1. Rules for occasional and non-professional STR (NP) and professional (P) STR via Airbnb in 2019

	Registration	License	Day Cap	Primary residence	Location	Safety / community rules
Amsterdam	NP	P	NP	NP		
Barcelona	NP	P			P	
Berlin	NP	P	P	NP		
Brussels	NP					NP
Lisbon	NP	NP				
London		P	NP			
Paris	P		NP	NP		
Prague						
Rome						
Stockholm						NP
Vienna					P	NP

Warsaw

Source: Own elaboration

II. LITERATURE REVIEW

The literature analysing the structure and characteristics of Airbnb supply in major cities has been quickly growing. In my prior work (Gyódi, 2019) I analysed Airbnb in Barcelona, Berlin, Paris and Warsaw, categorizing listings based on type and host characteristics to sharing economy and business offers. The results showed that sharing economy listings constitute a minority in all cities, with the highest level of professionalization in Warsaw (high level of multi-listings and entire homes). Gil & Sequera (2020) examined the evolution and professionalization of Airbnb in Madrid, focusing on key attributes: type of listing; the number of days the listing is provided in a year; listing accumulation by hosts and whether the listing is located in the central district. The authors found that Airbnb is heavily concentrated in the city centre, where the vast majority of listings are offered throughout the year. Crommelin et al. (2018) examined Airbnb in 5 cities (Hong Kong, London, New York, Paris, Sydney) based on 2016 data and differentiated between peer-to-peer house sharing and commercial activity based on listing type and the number of days offered. According to the authors, the share of commercial offers is similar in Hong Kong, London, Sydney and New York (24 - 28%) and higher in Paris (49%). Wegmann & Jiao (2017) examined 5 cities in the US and has identified a high share of entire homes and heavy concentration in areas attractive for tourists. Serrano et al. (2020) examined a wide sample of European cities along such attributes as the share of entire homes; share of offers with high availability; share of hosts with multiple listings and the share of listings that belong to top Airbnb hosts.

The authors identified two main categories of cities: the “production centre of Europe” (including Amsterdam, Berlin, Brussel, London, Paris and Vienna), and “Europe’s playground” (e.g. Barcelona, Lisbon, Prague and Rome). The first cluster is characterized by lower professionalization: lower shares of listings with high-availability, entire homes and multi-listings. Demir & Emekli (2021) examined 10 major EU cities and presented the shares of listing types and different market concentration variables based on the number of listings that belong to hosts. The results suggest a high share of single-listings in Paris, Berlin, Amsterdam (above 75%); and low shares in Rome,

Lisbon and Barcelona (below 40%). An important conclusion of the authors is that the share of multi-hosts is not a perfect proxy for measuring the level of professionalization.

Relevant to this study are also papers focusing on regulating Airbnb. Nieuwland & van Melik (2020) summarised the regulatory approaches in US and EU cities, highlighting the goals and types of regulations (qualitative, quantitative and locational). Chen et al. (2021) examined the impact of regulations on Airbnb supply in US cities and found a short-term negative impact on the number of listings that diminished over time. Similarly, van Holm (2020) reported only a short-term decline of Airbnb listings in New Orleans. Finally, Uzunca & Borlenghi (2019) found a positive relationship between regulation strictness and the supply of home-sharing, arguing that clear legal guidance facilitates these activities.

To conclude, the literature shows significant differences in the characteristics of Airbnb in major cities across the world. However, the links between the development of STR and local characteristics, such as the regulatory environment, remained largely unexplored.

III. DATASETS

3.1. Airbnb supply

Web-scraped data on Airbnb listings has been sourced from two providers: Inside Airbnb and AirDNA. Inside Airbnb “is a mission driven project that provides data and advocacy about Airbnb’s impact on residential communities”⁹. The project regularly publishes complete datasets on Airbnb listings in a wide range of cities. Inside Airbnb data is used for all cities with the exception of Warsaw, for which AirDNA is the data provider. As both sources use web-scraping techniques to collect data from the Airbnb website, data on Warsaw can be harmonized with the Inside Airbnb datasets.

⁹ <http://insideairbnb.com/about/>

The main difference between the datasets concerns the issue of identifying active listings. When viewing individual offers available on Airbnb, the user is provided with a calendar that presents the days the listing is available or blocked for rental. However, it is unknown whether the listing is blocked due to a reservation or because the host does not provide services in the specific time period. Therefore, web-scraped data reveals only the number of days a listing is blocked at the time of the scraping, but does not inform about the number of bookings. AirDNA, however, claims to accurately identify bookings and differentiate them from inactive days. In this analysis I focus only on active listings (listings that are available for rental). In the case of AirDNA, listings that were available or booked at least for 1 day in the analysed month are included. In the case of Inside Airbnb, without an approximation on the number of bookings, the number of available days is used: active listings need to have available days in the next 60 days at the time of the data collection.

3.2. Demand for STR

While the listing level datasets provide a good overview of Airbnb supply, limited information can be gained on the actual number of bookings. On the other hand, Eurostat reached a data-sharing agreement in 2021 with four short-term accommodation platforms: Airbnb, Booking.com, Tripadvisor and Expedia Group¹⁰. In cooperation with these major players, Eurostat prepared city-level aggregate datasets on such metrics as the number of nights listings were occupied. Therefore, Eurostat datasets will be used to put the Airbnb supply characteristics in the context of tourist demand.

3.3. Hotels

To examine the size of the Airbnb market in relation to the overall size of the hospitality sector, data provided by Smith Travel Research (STR LLC) on the hotel industry will be used. We will focus on two metrics: the number of hotel rooms; and demand for hotel rooms (the number of hotel rooms sold in a month).

¹⁰ <https://ec.europa.eu/eurostat/web/experimental-statistics/collaborative-economy-platforms>

3.4. Limitations of data

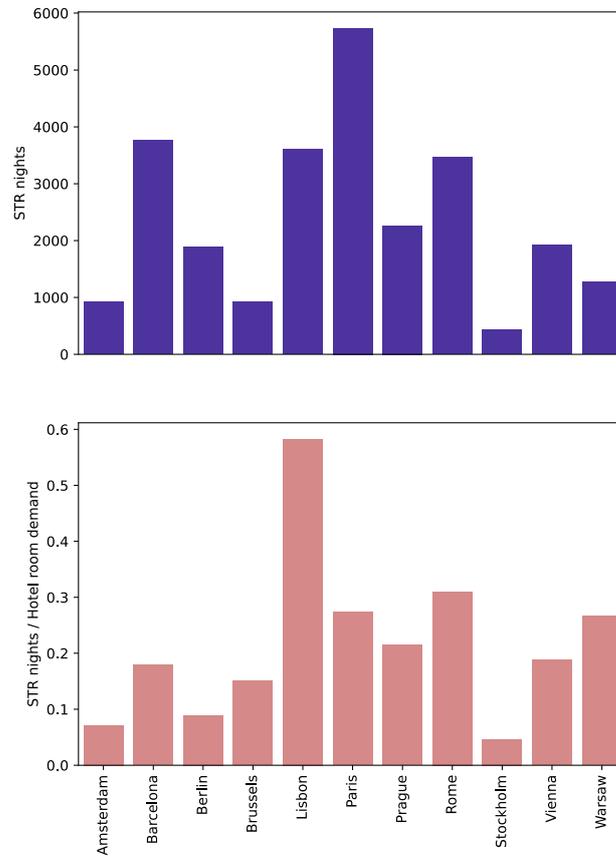
A difficulty of harmonising the listing-level Airbnb datasets with aggregate Eurostat and STR LLC datasets is related to the covered geographical areas. In the case of Eurostat, the city-level datasets present data not only for the city itself, but for the surrounding suburbs as well (the so-called “greater city”) for Amsterdam, Brussels, Barcelona, Lisbon, Paris and Stockholm. In the case of STR LLC, the greater city concept has been used only in Stockholm. On the other hand, Inside Airbnb data for some cities includes the surrounding suburban areas (e.g. in Lisbon), but not in all instances (e.g. Paris). To keep the comparison of Airbnb supplies accurate between cities, Airbnb listings outside the administrative boundaries were excluded. However, this creates a mismatch in comparing the datasets between the three sources: Eurostat data covers larger city areas, while STR LLC and Airbnb listing data represent only core city areas.

IV. Results

4.1. Demand for STR

The upper half of Figure 1. shows the number of nights spent in short-term rentals (the number of nights a listing was occupied) in 2019 based on Eurostat. The cities with the highest demand include Paris (5.7 mln), Rome (3.5 mln), Lisbon and Barcelona, while cities with the lowest include Stockholm (0.4 mln) and Amsterdam (0.9 mln). The lower figure puts STR in the context of the hotel room demand: the number of STR nights divided by hotel room demand (the number of nights hotel rooms were sold) in 2019. When interpreting the results, it is important to note that while the STR numbers relate to “greater” city areas in Amsterdam, Brussels, Barcelona, Lisbon and Paris, the hotel rooms are restricted to the core cities. Therefore, the relative importance of STR may be lower in these cities. Lisbon and Warsaw are the cities with the greatest shares of STR - reaching more than 10% of hotel room demand. Unfortunately, data for London is missing from the Eurostat datasets.

Figure 1. Number of nights spent in STA (thousands) and relative to hotel room demand in 2019

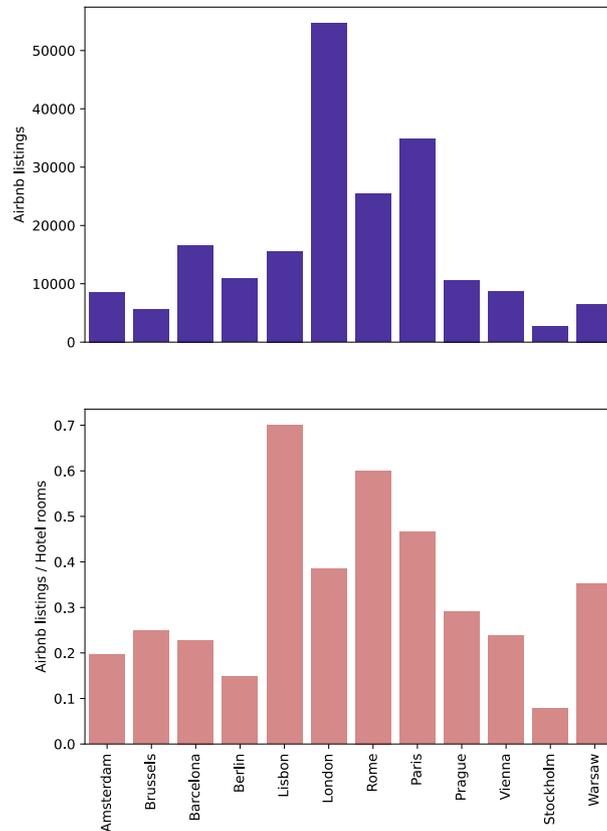


Source: Own elaboration based on data from Inside Airbnb and Eurostat

4.2. Airbnb Supply

The next figure (Figure 2.) provides the number of active Airbnb listings in August 2019. This month has been chosen as the peak period for STR supply. The greatest Airbnb market is London (55 thousand including Greater London) and Paris (35 thousand), while the smallest markets include Stockholm and Brussels. Relative to the number of hotel rooms, the size is notably high in Lisbon, Rome, Prague and Warsaw – cities that had a liberal approach towards regulating platform mediated services, or that began to tackle Airbnb a limited time before the analysed time period (Lisbon). On the other hand, the relative size of Airbnb is significantly lower in cities with a stricter regulatory approach: Amsterdam, Berlin, Brussels, Barcelona and Stockholm.

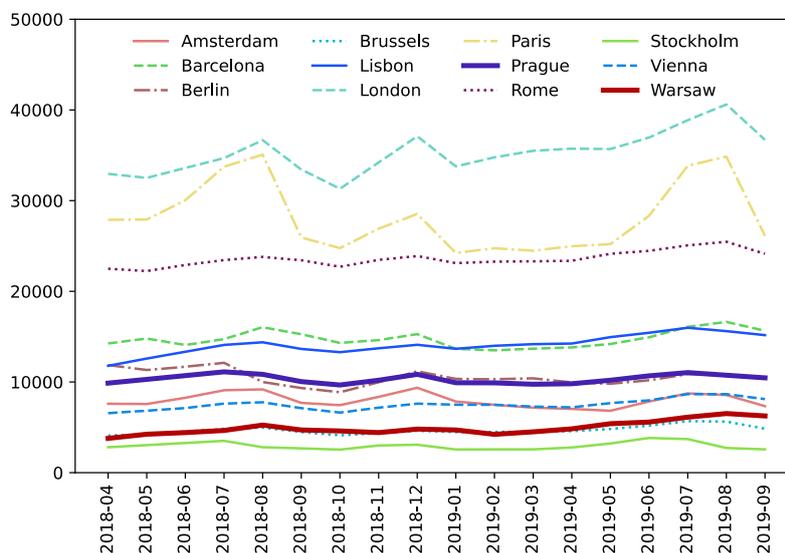
Figure 2. Number of active Airbnb listings and relative to number of hotel rooms in August 2019



Source: Own elaboration based on data from Inside Airbnb and STR LLC

Next, the changes in the number of active listings is evaluated. A seasonality of offers can be observed in most cities (Figure 3.), with uptakes of listings during the summer months and in December, and falls in fall and spring. Table 2. provides a comparison of trends in the active listing numbers: the greatest increase occurred in Warsaw (more than 60%), Vienna and Lisbon, while numbers were declining in Stockholm, Amsterdam, Berlin and Paris. Therefore, the data suggests varying growth patterns: cities with liberal policies witnessed a robust expansion, while many locations limiting Airbnb seemed to be able to keep listing numbers at a more stable growth path. On the other hand, clamping down Airbnb has not everywhere prevented further growth, as shown by the numbers in Lisbon.

Figure 3. Number of active Airbnb listings



Source: Own elaboration based on data from Inside Airbnb

Table 2. Number of active Airbnb listings and change between 04.2018 and 09.2019

	2018-04	2019-09	% change
Amsterdam	7597	7337	-3.42
Barcelona	14257	15648	9.76
Berlin	11863	10401	-12.32
Brussels	4094	4851	18.49
Lisbon	11789	15162	28.61
London	32950	36701	11.38
Paris	27880	26109	-6.35
Prague	9876	10636	7.70

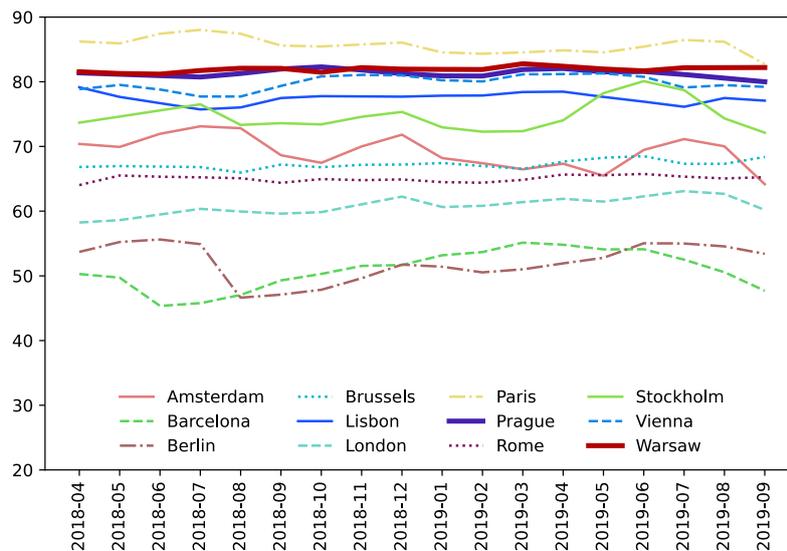
Rome	22493	24140	7.32
Stockholm	2800	2565	-8.39
Vienna	6568	8111	23.49
Warsaw	3793	6257	64.96

Source: Own elaboration

4.3. The characteristics of Airbnb

In the next sections I focus on characteristics that shed light on the professionalization of Airbnb. The first important metric is the share of entire homes: a high share suggests that hosts rent secondary homes instead of rooms in their primary residence. The differences between cities are very significant: while in Paris almost 90% of listings are entire home offers, in Barcelona and Berlin they constitute only around half of the sample. Warsaw and Prague are also characterized by high shares of entire homes, along with Vienna, Lisbon and Stockholm (Figure 4.).

Figure 4. The share of entire homes



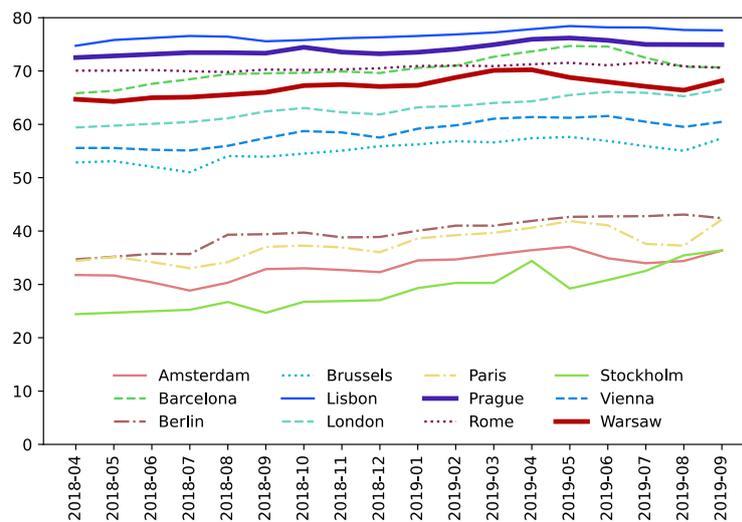
Source: Own elaboration based on data from Inside Airbnb

These significant differences suggest that local regulations have a major role in shaping Airbnb. First, cities with minor interventions seem to have greater shares of entire homes. Second, regulatory changes may cause shifts – even if only temporary - in the structure of Airbnb. This is well visible in the case of Berlin, where a temporary decline occurred during the summer of 2018, when the city introduced the requirement to publish a registration number for all listings (Duso et al., 2020). Similarly, the low level measured in Barcelona may be related to the requirement to obtain a license in order to rent entire homes.

Next, I focus on the share of listings that belong to hosts with multiple offers (multi-listings). There are two major groups visible on Figure 5., with cities above 50% (Brussels, Vienna, Barcelona, Warsaw, Barcelona, Rome, Prague and Lisbon), and cities below 40% (Berlin, Paris, Amsterdam and Stockholm). Again, cities at the top of the list either have been pursuing a laissez-faire approach or have been at an early stage in the regulatory process (Lisbon).

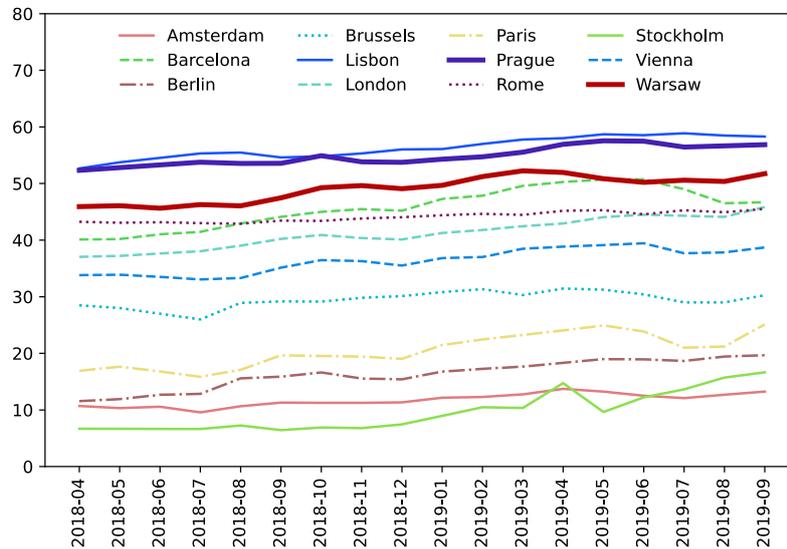
Reducing the analysis to listings that belong to hosts with more than 3 offers, Lisbon and Prague maintain the highest shares, followed by Warsaw (Figure 6). Overall, an upward trend can be observed in the samples.

Figure 5. The share of listings that belong to hosts with more than one offer



Source: Own elaboration based on data from Inside Airbnb

Figure 6. The share of listings that belong to hosts with more than three offers

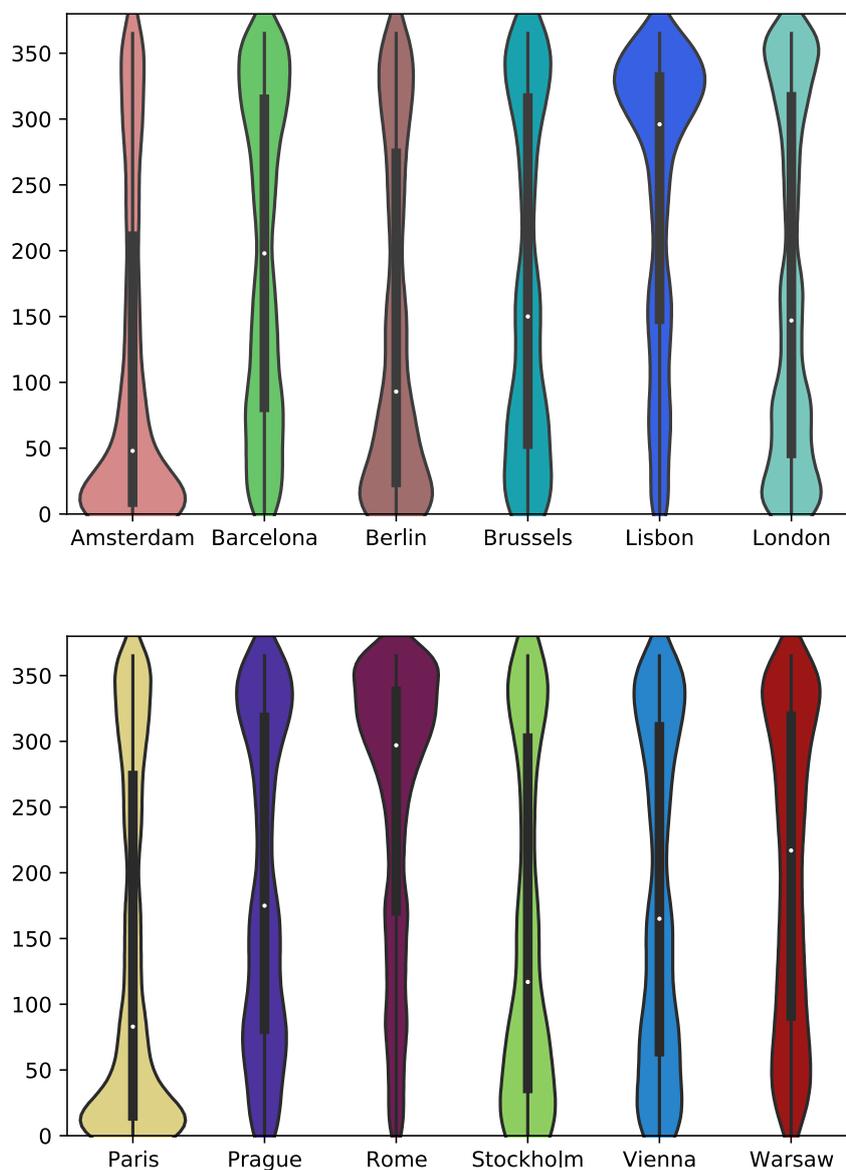


Source: Own elaboration based on data from Inside Airbnb

Besides the overall quantities of listings, another major metric is the frequency and duration hosts provide their accommodation for rental. To examine this attribute across cities, the distribution of the number of available days is examined for August 2019. In the case of Warsaw, the availability of a listing was calculated from AirDNA data by summing the number of days the listing was available and booked in the 12 months prior to August 2019. In the remaining cities, availability was determined by the number of days listings were marked as available in the 12 months ahead from August 2019. Therefore, the presented metrics serve as a broad approximation to assess whether listings are offered occasionally or on a constant basis. High values suggest that Airbnb decreases the housing supply available for local citizens, negatively affecting flat-renting tenants.

Figure 7. reveals great differences in the distributions of available days: the data suggest that cities introducing day caps are characterized by lower availability of listings (Amsterdam, Berlin and Paris). In these cities, the median days of availability are below 100 days a year. In the case of London, however, the 90-day limit seems to be not enforced, as the median value is close to 150. Similarly, the majority of listings in non-interventionist cities (Warsaw, Rome, and also Lisbon) are offered throughout the whole year. In the remaining cities, the distributions are split close to the median, with two sections of greater concentration. This suggests a strong presence of listings offered occasionally, as well as professional rentals.

Figure 7. Distribution of number of days the listing is available

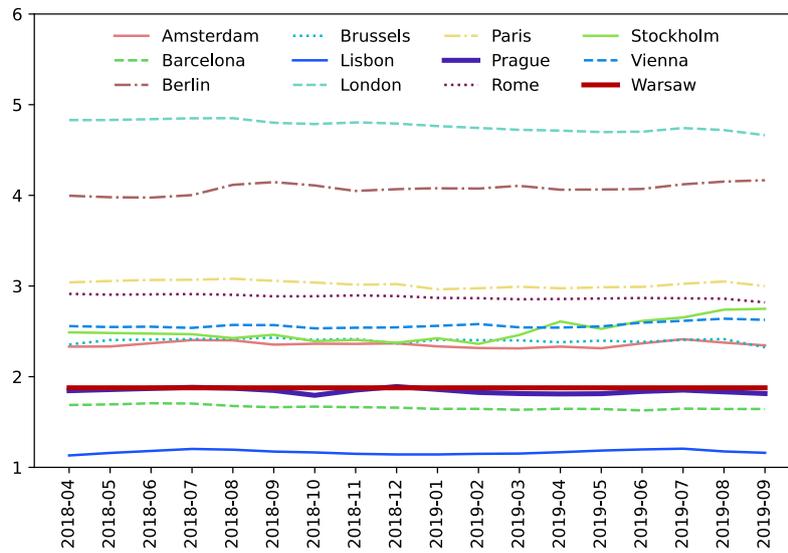


Source: Own elaboration based on data from Inside Airbnb

Finally, a major spatial characteristic of Airbnb listings is examined: the distance from the city centre. First, we focus on changes in the median distance to assess whether Airbnb supply has become more or less concentrated spatially over time. Two conclusions can be explored from Figure 8. The results suggest that Airbnb homes are very dense in Lisbon, Barcelona, Warsaw and Prague

(half of the listings within 2km from central point), while they are more dispersed in Berlin and London. Second, there are only minor changes over time, with the exception of Stockholm, where a gradual expansion of Airbnb can be observed further from the centre in 2019.

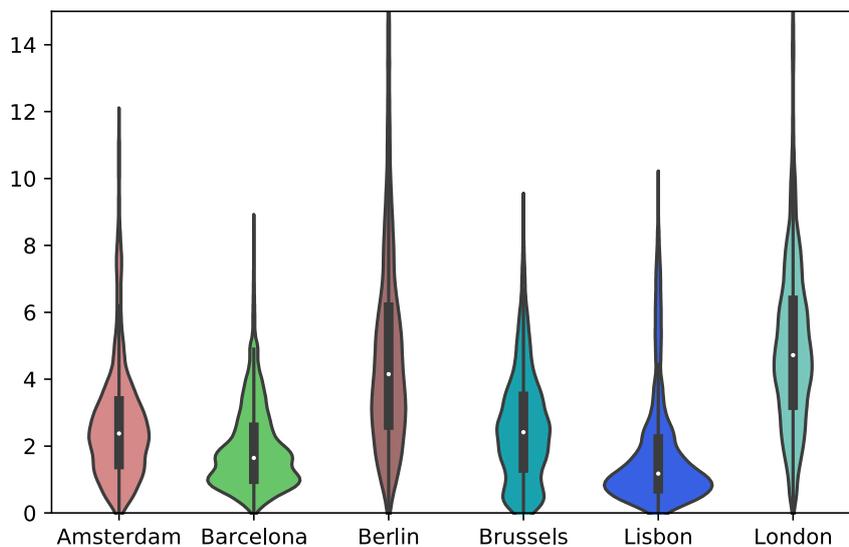
Figure 8. Median distances from the city centre (in km)

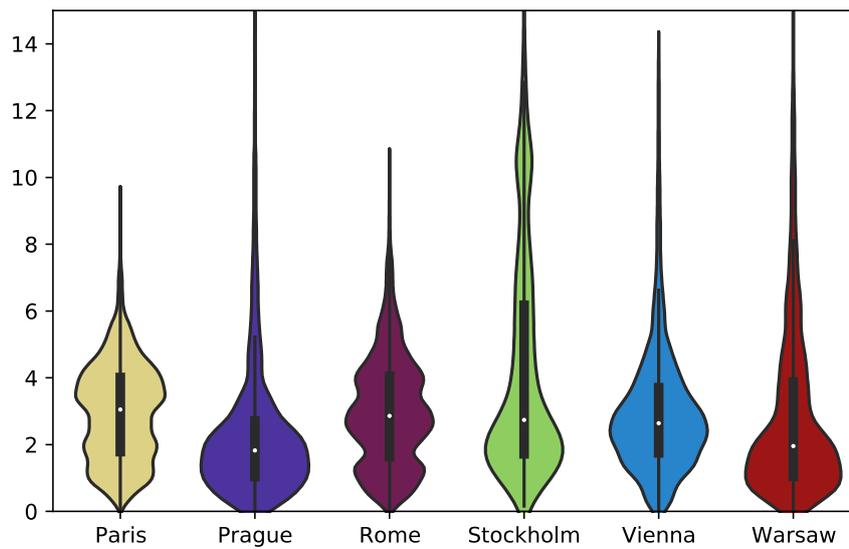


Source: Own elaboration based on data from Inside Airbnb

The analysis of distributions provides more details on the spatial concentration of Airbnb in August 2019 (Figure 9). Overall, in most cities the locations are strongly concentrated in the city centre, with highly uneven distributions, especially in Prague, Warsaw, Lisbon and Barcelona. Cities with a more evenly distributed spatial concentration include Berlin and London. Overall, the data support that Airbnb supply is highly uneven with focal points in city centres.

Figure 9. Distribution of distances from the city centre (in km)





Source: Own elaboration based on data from Inside Airbnb

CONCLUSIONS

This explorative study presented significant differences in the structure and characteristics of Airbnb in major cities in the period 2018-2019. Table 3. summarizes the results, focusing on the regulatory strategy of cities and on the attributes related to professionalization. The results suggest that local regulations play an important role in the development of Airbnb.

Cities with a liberal approach – Warsaw, Prague and Rome - are characterized by relatively large Airbnb supply (compared to the hotel industry) and high levels of professionalization, signaled by the high shares of entire home listings, multi-listings and offers available throughout the year. On the other hand, cities pursuing more active regulatory strategies seem to have an impact on the structure and characteristics of Airbnb supplies, especially Amsterdam, Berlin and Stockholm. The data suggests that Barcelona and Paris also achieved some success in keeping the professionalization of Airbnb at bay, despite the large demand for such services. Finally, while Lisbon had one of the most professionalized Airbnb market, the time since the introduction of regulations (end of 2018¹¹) may have been too short to capture their impact.

Therefore, the results provide important insights for cities and policy-makers. Airbnb is relatively larger and more professionalized in cities without an STR strategy than in locations actively regulating. As the literature shows (Chen et al., 2021), the effectiveness of specific measures (e.g. licenses, day caps etc) differs; however, cities can influence the direction of Airbnb’s development. A straightforward strategy is to provide limits for professional accommodation provision while enabling occasional hosting, and setting separate requirements and controls for different types of Airbnb hosts. Such approach, as shown by the examples of Amsterdam and Berlin, can limit the share of listings permanently offered for tourists.

Table 3. Summary of regulations and characteristics of Airbnb

Regulatory	Relative	Entire homes	Multi-listings	Availability
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¹¹ <https://blogs.lse.ac.uk/businessreview/2021/05/05/a-lisbon-story-short-term-rental-platforms-and-the-housing-market/>

	approach	size			
Amsterdam	Strict	Low	Moderate	Low	Low
Barcelona	Strict	Moderate	Low	High	High
Berlin	Strict	Low	Low	Low	Low
Brussels	Strict	Moderate	Moderate	Moderate	Moderate
Lisbon	Strict	High	High	High	High
London	Moderate	Moderate	Moderate	High	Moderate
Paris	Strict	High	High	Low	Low
Prague	Laisses-faire	Moderate	High	High	Moderate
Rome	Laisses-faire	High	Moderate	High	High
Stockholm	Strict	Low	High	Low	Low
Vienna	Moderate	Moderate	High	Moderate	Moderate
Warsaw	Laisses-faire	High	High	High	High

Source: Own elaboration

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