THE IMPACT OF AIRBNB ON A NON-TOURISTIC CITY. A CASE STUDY OF SHORT-TERM RENTALS IN SANTA CRUZ DE TENERIFE (SPAIN)

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THE IMPACT OF AIRBNB ON A NON-TOURISTIC CITY. A CASE STUDY OF SHORT-TERM RENTALS IN SANTA CRUZ DE TENERIFE (SPAIN)

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Summary: Short-term rentals such as Airbnb have become a persistent element of today's urbanism around the globe. The impacts are manifold and differ depending on the context. In cities with a traditionally smaller accommodation market, the impacts might be particularly strong, as Airbnb contributes to ongoing touristification processes. Despite that, small and medium-sized cities have not been in the centre of research so far. This paper focuses on Santa Cruz de Tenerife as a medium-sized Spanish city. Although embedded in the touristic region of the Canary Islands, Santa Cruz is not a tourist city per se but still relies on touristification strategies. This paper aims to expand the knowledge of Airbnb's spatial patterns in this type of city. The use of data collected from web scraping and geographic information systems (GIS) demonstrates that Airbnb has opened up new tourism markets outside of the centrally established tourist accommodations. It also shows that the price gap between Airbnb and the housing rental market is broadest in neighbourhoods that had not experienced tourism before Airbnb entered the market. In the centre the highest prices and the smallest units are identified, but two peripheral quarters stand out. Anaga Mountains, a natural and rural space, has the highest numbers of Airbnb listings per capita. Suroeste, a suburban quarter, shows the highest growth rates on the rental market, which implies a linkage between Airbnb and suburbanization processes.

Zusammenfassung: Plattformen für touristische Kurzzeitvermietungen wie Airbnb sind weltweit zu einem elementaren Bestandteil des städtischen Alltags geworden. Die Auswirkungen sind vielfältig und kontextspezifisch. In Städten mit einem traditionell kleineren Übernachtungsmarkt wird erwartet, dass die Auswirkungen besonders stark sind, da Airbnb zur Touristifizierung beiträgt. Die Studie legt den Untersuchungsfokus auf Santa Cruz de Tenerife, eine mittelgroße spanische Stadt. Santa Cruz ist nicht per se eine Touristenstadt, obwohl sie die Hauptstadt der Kanarischen Inseln und damit in einer von Tourismus geprägten Region gelegen ist. Gleichzeitig sind jedoch umfangreiche Maßnahmen beobachtbar, die zur Touristifizierung Santa Cruz' beitragen. Ziel dieser Arbeit ist es, die räumlichen Verteilungsmuster von Airbnb in Santa Cruz zu analysieren. Hierfür werden Daten, die mittels Web-Scraping ermittelt werden, mithilfe geographischer Informationssysteme (GIS) ausgewertet. Das Material zeigt, dass durch Airbnb neue touristische Märkte abseits vom touristisch geprägten Zentrum in umliegenden Quartieren erschlossen werden. Der Preisunterschied zwischen Airbnb und dem Mietmarkt ist in den Vierteln am größten, die vor der Entstehung Airbnbs wenig bis gar nicht touristisch genutzt wurden. Abgesehen vom Altstadtkern, in dem die höchsten Preise und die Airbnb-Einheiten mit der geringsten Kapazität identifiziert werden, fallen zwei periphere Viertel auf. Das Anaga-Gebirge, eine ländlich geprägte Region, weist die höchste Anzahl an Airbnbs pro Kopf auf. In Suroeste, einem suburbanen Viertel, können die höchsten Wachstumsraten auf dem Mietmarkt festgestellt werden, was auf eine Verbindung zwischen Airbnb und Suburbanisierungsprozessen schließen lässt.

Keywords: urban development, short-term rentals, Airbnb, tourism, housing, Canary Islands, Spain

1 Introduction

In the last decade, the sharing economy has seen a tremendous rise in popularity. The most prominent example is possibly the home-sharing website Airbnb. The company's influence on tourism is seen as disruptive (Guttentag 2015). Airbnb facilitates a relatively barrier-low entry for renting accommodations to tourists. The company has not only intensified competition on the accommodation market but has also contributed to rising rental and housing prices, commodification of housing, touristification, gentrification, and other community conflicts. These aspects have been topic of several articles predominantly dealing with the cities that are highly frequented by tourists, e.g. Berlin (Schäfer and Braun 2016), New York (Wachsmuth and Weisler 2018), Seoul

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(Ki and Lee 2019), Cape Town (Visser et al. 2017) as well as Barcelona (Gutiérrez et al. 2017) and Palma (Yrigoy 2019) in Spain. In this perspective, a research gap is identified: The impact of short-term rentals in non-touristic small and medium-sized cities is researched to a lesser extent (Morales Pérez et al. 2020).

The following study of Santa Cruz de Tenerife as a medium-sized city will contribute to filling this gap. Based on the conversion of a considerable part of its city functions to tourism in recent years (García Herrera et al. 2007, 280; Fainstein and Judd 1999, 266), this paper will look at the spatial patterns of Airbnb in Santa Cruz. This is of particular interest because Santa Cruz showed the highest growth rate in rental prices in Spain in 2018 (13.2 %; Ministerio de Fomento 2019, 16). As such, Santa Cruz's housing market has been considered as a "black swan" (Marrero 2019). Contrary to the prevailing positive correlation between demographic growth and increasing prices on the rental market in other Spanish cities (López Rodríguez and Llanos Matea 2019, 14), population in Santa Cruz has declined by almost 7 % between 2009 and 2019 (ISTAC 2020). Hence, there must be other factors, such as short-term rentals, that explain these dynamics on the housing market.

The aim of this study is to reveal the spatial patterns of the Airbnb supply in the city, taking aspects such as price, capacity, and professionalism of hosts in the different neighbourhoods into account. Based on ongoing discussions about possible rent gap generation and commodification of housing, descriptive statistical methods and geostatistical analysis are used in this study. The results contribute to understand the relationship between short-term rentals and the housing market in a non-touristic medium-sized city on an intra-urban level, which also takes suburban and rural parts of the city into account. Our hypothesis is that Santa Cruz' centre is the district with the highest density of Airbnb listings and the highest degree of professionalism in the city. This reflects in categories such as price, multi-hosts and entire homes and has significant impacts on the housing market. Our assumption is based on the experiences other cities made with Airbnb (see for example Boros et al. (2018) and Garcia-Ayllon (2018), section 2), on the one hand. On the other hand, Santa Cruz' centre is the place where (1) the hotel industry concentrates, (2) the cruise tourism is located and (3) where the strongest touristification in urbanism is observed.

Our study is structured as follows: Section 2 reviews related literature. Section 3 presents the case study of Santa Cruz. Then, section 4 describes the methods that we apply. Section 5 explores the spatial distribution and the impact of Airbnb. Finally, section 6 contains the concluding remarks.

2 Literature review on Airbnb

Globally, Airbnb has seen a rise of listings from about 2.3 million in 2016 (Ke 2017) to 5.7 million in 2019 (Adamiak 2019). In recent years there has also been a growing number of academic publications and research about Airbnb and its effects on different regions. The spatial distribution of Airbnb listings often follows similar patterns: They primarily are concentrated in the inner city or the historical core (Boros et al. 2018; Garcia-Ayllon 2018; Roelofsen 2018) as well as near points of interest and tourist hotspots (Dudás et al. 2017; Roelofsen 2018). Other often-cited factors related to Airbnb are the presence of a young population (Dudás et al. 2017) or the creative class (Quattrone et al. 2018) in neo-bohemian and possibly gentrified areas (Schäfer and Braun 2016; Wachsmuth and Weisler 2018) or heritage areas and "residential neighbourhoods of traditional character" (Garcia-Ayllon 2018, 16).

It is particularly the existence of "entire homes", which are rented out through Airbnb most of the year, that have an impact on local housing markets. These units are credited to significantly increase rents by taking these rental units off the market (Wachsmuth and Weisler 2018). Lee (2016, 237) indicates that for Los Angeles "each 1 % decrease in supply would lead to a 0.2 % rent increase". In the United States in general, "a 1 % increase in Airbnb listings leads to a 0.018 % increase in rents" (Barron et al. 2018, 1). These effects are primarily detected in inner-city neighbourhoods. There, the highest shares of rental units are taken off the market, as the examples of Salzburg (8 %) (Smigiel et al. 2020), Rome (3.7 %) and Florence (18 %; Picascia et al. 2017) show.

One reason for the withdrawal from the long-term rental market is the higher and more flexible revenue gained through short-term rentals, which can lead to increasing pressure on the rental market by the conversion of long-term rentals to short-term rentals (Yrigoy 2019). This revenue

can be – Reykjavík is a very illustrative example – up to four times higher than long-term rents in downtown neighbourhoods (Mermet 2017). Based on Smith (1979), this describes a new form of rent gap generation with the potential rents through Airbnb exceeding rents on the traditional rental market. Through the embeddedness in profit maximisation this is part of the global financialization and commodification of housing (Aalbers 2016; Madden and Marcuse 2016).

These processes further contribute to (tourism) gentrification and the indirect and direct displacement of residents which Cocola Gant and Gago (2019) show in the case of Lisbon. Tourism gentrification refers to the "transformation of a middle-class neighbourhood into a relatively affluent and exclusive enclave marked by a proliferation of corporate entertainment and tourism venues" (Gotham 2005, 1102). The arrival of short-term rentals intensifies this process. This is firstly because short-term rentals have spread among different neighbourhoods within urban spaces (Romero Padilla et al. 2019, 27). Secondly, they affect a larger number of cities (Koens 2018, 9). Short-term rentals have thus contributed to the emergence of overtourism as a new umbrella concept for investigating spaces, where "locals or visitors feel that […] the quality of life in the area or the quality of the experience has deteriorated unacceptably" (Goodwin 2017, 1).

Right now, Covid-19 imposes new challenges to tourism in general and to short-term rentals in particular (Gössling et al. 2020). Dolnicar and Zare (2020) expect that professional hosts will offer their accommodations on the traditional long-term rental market instead of Airbnb due to the global decline in tourist numbers.

Within the pre-Covid-19 research on tourism and short-term rentals, a strong focus on large cities with high tourist numbers is observed (Morales Pérez et al. 2020). In contrast, research on medium-sized and non-touristic cities is sparse (Adamiak et al. 2019: 2). Palma (Yrigoy 2019), Reykjavík (Mermet 2017) or Salzburg (Smigiel et al. 2020) may have a more or less similar population size compared to Santa Cruz de Tenerife but are probably more affected by tourism. In their study on Airbnb in Switzerland, Domènech et al. (2019) show that Airbnb in (rural) touristic regions is seen as an opportunity for professional hosts and owners of second homes to increase their income. Cors-Iglesias et al. (2020) come to the conclusion, that the rise of peer-to-peer accommodations expand tourism in the Catalonian hinterland.

Only a couple of studies have investigated the spatial distribution of Airbnb listings on the Canary Islands. According to Eugenio-Martin et al. (2019, 1236), the "Airbnb supply outperforms hotel supply for city tourism and nature-based tourism", but hotels on the Canary Islands better cover beach tourism. Other Spanish studies even excluded the Canary Islands, emphasizing that this region "would have required a more specific study" (Gutiérrez and Domènech 2020, 14). This opens up the opportunity to now shift the focus to our case study, as the spatial distribution of Airbnb in Santa Cruz de Tenerife has not been researched in detail so far.

3 Santa Cruz: towards a converted touristic city

Santa Cruz de Tenerife has approximately 200,000 inhabitants (ISTAC 2020). It is located in the north-eastern part of Tenerife and is both the island's capital and the Canary Islands' co-capital. As one of Spain's Autonomous Communities, the archipelago received more than 13 million tourists in 2019 and is thus Spain's third most attractive tourist destination (INE 2020). Compared to the other tourist regions on Tenerife, Santa Cruz has lost its importance on the island's tourist market over the last 40 years. The share of incoming tourists on Tenerife dropped from 11.8 % in 1978 to only 3.9 % in 2018 (see Fig. 1). Despite that, the number of tourists in the city is growing, although slower than in other areas on the island and not equally in each sector. The most substantial growth can be observed in cruise tourism: Tourist numbers have multiplied tenfold since 1998.

Originally, Santa Cruz de Tenerife was rather described as a port city than a tourist city since the major share of its coast was historically dedicated to the port industry. Only a couple of hotels emerged in the 19th and 20th centuries, but they did not change Santa Cruz' function in the regional context (Martín Galán 2008, 59). However, a shift towards tourist development emerged over the last decades including the commodification and privatization of the waterfront (Armas Díaz and Sabaté Bel 2020, 10). It impacted the port (Díaz Rodríguez et al. 2008), the city's central square Plaza de España (Armas Díaz 2016), and Cabo-Llanos, the new business district (Hübscher 2020). Even planned development such as Santa Cruz Verde 2030, a megaproject that aims to transform the inner-city oil refinery into an urban neighbourhood, will contribute to the ongoing touristification of the city's water-

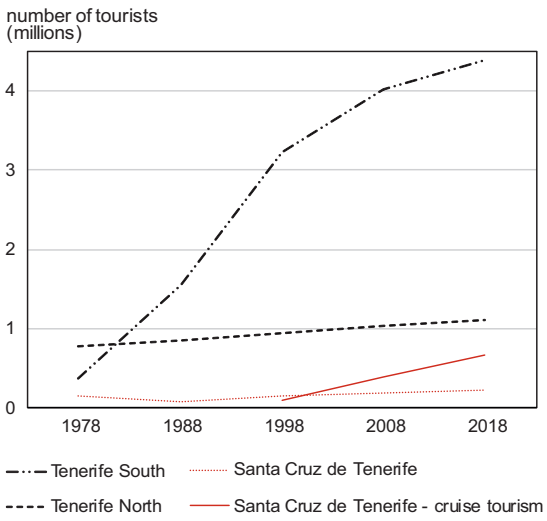

Fig. 1: Cruise tourism in Santa Cruz and time series of incoming tourist numbers in different destinations on Tenerife. Own elaboration based on Turismo de Tenerife (2019).

front (Hübscher 2019). Because of these dynamics, Santa Cruz is considered as a converted city (García Herrera et al. 2007, 280) in which "places with few obvious or easily advertised attractions [are remade] into tourist cities" (Fainstein and Judd 1999, 266). Research literature shows very little interest in short-term rentals in converted cities so far (see section 2). It makes, thus, Santa Cruz a compelling case study, also because currently there is little regulation of short-term rentals in the city and on the Canary Islands (Diario de Avisos 2020; Ortuño and Jiménez 2019, 87). This is the result of court decisions annulling the existing law, which would have been one of the strictest within Spain (Consejo General del Poder Judicial 2019). However, this leaves short-term rentals in Santa Cruz rather unregulated which has been described as a laissez-faire approach in the existing literature (Nieuwland and Van Melik 2020, 812).

Compared to other cities, the case of Santa Cruz also gains complexity due to the variety of urban, suburban and rural spaces that are represented by five districts (see Tab. 1). About 80 % of the municipality is a protected natural space (Anaga Mountains), with some settlements being more than one hour away from the city centre by car (ASCT 2020).

4 Data sources and methods

This paper uses different data sources and variables (see Tab. 2). The data set of web scraped Airbnb listings from DataHippo in the municipality of Santa Cruz de Tenerife was first collected in August 2017 and revised up to September 2018. It contains information about the approximate location (longitude and latitude), host id (and therefore the number of listings per host), room type, capacity and price per night. During the analysis of the data, information

Tab. 1: The five districts in Santa Cruz and their characteristics

	Area [km²]	Inhabitants 2019	Share of the total urban population 2019 [%]	Population growth 2015-2019 [%]	Average per capita income 2017 [€]	Average age 2017	Share of residents without formal education 2019 [%]	Spatial characteristics
Centro-Ifara	4.4	47519	22.8	0.8	15830	44.9	3.0	historic city centre
Salud-La Salle	4.1	60209	28.8	1.0	11611	44.9	5.6	inner-city district
Ofra-Costa Sur	7.5	38833	18.6	-2.3	6594[1)]	45.2	9.5	first periphery of the city
Suroeste	14.6	50225	24.1	3.7	8694	37.6	6.7	second periphery of the city
Anaga	119.3	11969	5.7	-0.9	9059	45.4	12.1	rural area, protected natural park (Anaga Mountains)
total	**149.9**	**208755**	**100**	**0.8**	**11337**	**43.2**	**6.4**	

Source: Own elaboration based on INE (2019) and ASCT (2019a)
[1)] 41% of the quarters within the district contained missing values, which reduces data quality significantly

about the associated quarter and district was added. In total, 1,027 Airbnb offers were aggregated. We also used the databases of Inside Airbnb to compare Santa Cruz to other cities. We thus rely on the comparability of different web scraping tools which is given at least concerning the most relevant aspects of the data (Smigiel et al. 2020, 158).

The study also uses data on the hotel market in Santa Cruz. Data originates from internet research, browsing booking.com, hotel websites and municipal statistics. In addition, data collected from Idealista, as one of the largest real estate marketplaces in Spain, helps to analyse the local housing market. However, the data is limited because it only reflects rental prices. Last, the study gathered further sociodemographic data according to the sources indicated (Tab. 2).

Our study is based on four different methodological approaches. We first describe the spatial distribution of Airbnb. Then the owner structures based on Anselin's (1995) local indicators of spatial association (LISA), the local Moran's I, is analysed in order to identify local hotspots. We also investigate the distribution of different room types to identify professionalisation of the market. We further implement a descriptive price analysis. Finally, we search for relationships between social indicators, housing market indicators and Airbnb to calculate a proxy rent gap on a district level.

An early data analysis shows three levels of inconsistencies. First, the discontinuity of data retrieval provided by DataHippo makes the gathering of usable information about the seasonality of Airbnb listings difficult. Then, no data about the occupancy rate of listings or the number of bookings was included. Last, our analysis is limited by the municipal administrative divisions as data is not available for certain districts and quarters for some years.

5 The geographies of Airbnb listings in Santa Cruz

This study analyses the spatial differences of the Airbnb supply in Santa Cruz' neighbourhoods. The objective is to understand the role of short-term rentals in non-touristic medium-sized cities such as Santa Cruz, where Airbnb apparently plays an increasingly relevant role and is expected to have an influence on the city's housing market. We will therefore firstly concentrate on the spatial aspects. Secondly, we will analyse the relationship of Airbnb and the housing market.

Tab. 2: Data sources and variables

Data class	Source	Variables
Spatial data	AYUNTAMIENTO DE SANTA CRUZ DE TENERIFE (2019a)	GIS data base; spatial information about the districts and quarters
	GRAFCAN (2020)	spatial information on the built environment
	OPEN STREET MAP and GEOFABRIK GMBH (2020)	GIS data base; spatial information about Tenerife
Tourism	DATAHIPPO (2020)	airbnb listings (location, price, capacity, entire homes, professionalism of hosts)
	INSIDE AIRBNB (2020)	airbnb listing (share of multi-hosts and entire homes)
	AYUNTAMIENTO DE SANTA CRUZ DE TENERIFE (2019b)	hotel location
	BOOKING.COM (2020)	hotel prices
	TURISMO DE TENERIFE (2019)	tourist numbers on Tenerife
Housing market	IDEALISTA (2020)	asking rental prices, growth in asking rental prices
	INE INSTITUTO NACIONAL DE ESTADÍSTICA (2018)	housing stock, average flat size
Population	INE INSTITUTO NACIONAL DE ESTADÍSTICA (2019)	income, education, average age
	AYUNTAMIENTO DE SANTA CRUZ DE TENERIFE (2019a)	population numbers, population growth

5.1 Spatial distribution of Airbnb listings

Looking at the total number of Airbnb listings, the spatial distribution of Airbnb listings in Santa Cruz draws a similar picture as in other cities (see section 2). The largest number of Airbnb listings, 457 in total, can be found in the city centre Centro-Ifara. The number of offers decreases towards the northern and southern peripheries. This distribution follows a similar pattern compared to the hotel industry, which also concentrates most of its objects in Centro-Ifara with 17 hotels and 1,436 rooms (see Fig. 2).

The figure also shows disparities between the spatial distribution of listings in total and per capita. Although there are less than half as many Airbnb listings in Anaga (169) compared to the city centre, Anaga shows the highest proportion of listings per inhabitant (up to 4.9 per 100 residents; see Fig. 2). Therefore, Anaga is the district with the highest pressure. This is comparable to what Cors-Iglesias et al. (2020, 5) found out for Catalonia: "the ratio between their capacity (measured in the total number of tourist beds) and the resident population, is higher in the rural municipalities than in the other non-coastal urban municipalities". However, comparing these numbers to other municipalities reveals a much higher Airbnb density in cities such as Barcelona (almost 40 offers per 100 residents in the centre; Gutiérrez et al. 2017, 14).

In order to measure the professionalism on the market, we use the number of offers per host. It is assumed that hosts with two or more offers on Airbnb in the same city have a strong economic interest in renting their units permanently, as they cannot live in several flats simultaneously. Professionalism is highest in Centro-Ifara and Anaga (58 %; see Fig. 3). In the other districts, the proportion of professional owners lies only between 37 % and 54 %. Hence, the districts Centro-Ifara and Anaga but also Santa Cruz in total (54 %) reach similar levels of professionalism on the market compared to cities such as Salzburg (55 %; Smiegiel et al. 2020) and Valencia (56 %; Inside Airbnb 2020). However, the share is significantly

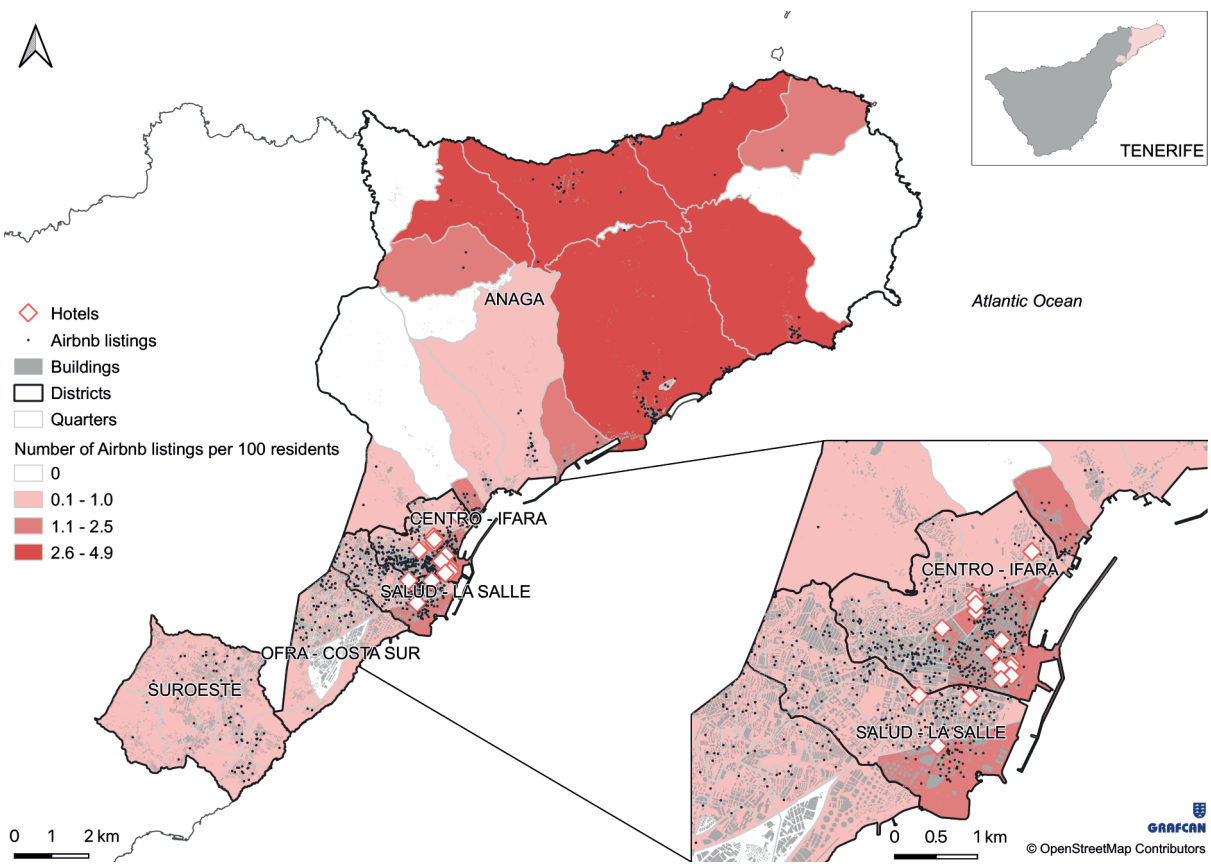

Fig. 2: Number of Airbnb listings in Santa Cruz de Tenerife per 100 residents. Own elaboration based on ASCT (2019a; 2019b), DataHippo (2020), Grafcan (2020), Open Street Map and Geofabrik GMBH (2020).

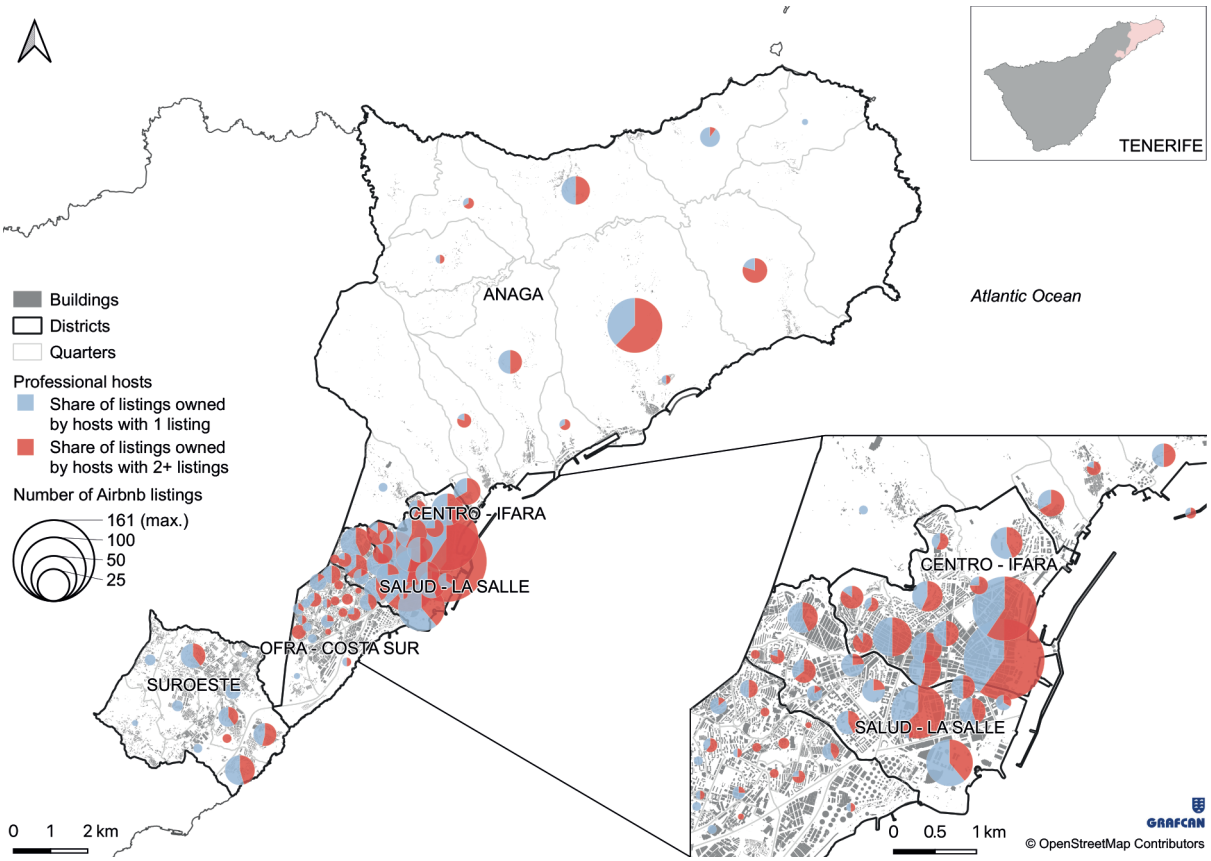

Fig. 3: Share of professional hosts in each quarter. Own elaboration based on ASCT (2019a; 2019b), DataHippo (2020), Grafcan (2020), Open Street Map and Geofabrik GMBH (2020).

lower compared to Seoul (75 % Ki and Lee 2019) or Spanish touristic cities such as Barcelona (65 %) and Palma de Mallorca (77 %; Inside Airbnb 2020).

Looking at the professionalism on a neighbourhood level, only a few clusters of professional hosts can be detected. The hotspots of the univariate analysis are neither in Anaga nor in Centro-Ifara, but in Ofra-Costa Sur (see Fig. 4, left). However, these hotspots are not very telling due to the small sample size in Costa Sur, as shown in Fig. 3. Adding the density of Airbnb listings as a second variable, the bivariate local Moran's I pictures a significantly high amount of professional hosts and density of Airbnb listings in surrounding quarters in the district of Anaga. The coldspot in Suroeste exists in both the univariate and the bivariate analysis showing a possible rent gap not yet filled by professional hosts (see Fig. 4, right) with a current tendency towards a less professional sharing economy.

A second approach to assess the market's professionalism is the share of entire homes (Fig. 5). More than 92 % of all Airbnb offers in Anaga are entire homes. This share is much higher than in Centro-Ifara (68 %) or the southern peripheries (55 - 58 %). While such results are to be expected in the centre due to the high tourist use, the high professionalism of offers in Anaga seems to be surprising at first. However, it is consistent with the results of DiNatale et al (2018, 413) because "in regions with higher populations, […] STRs are operated as private rooms slightly more often than as entire homes". It can be assumed that the Airbnb listings in Anaga do not just serve as an occasional additional income for private owners. Instead they use the platform as an opportunity to constantly rent out entire homes to increase their gains. From which, in turn, another central insight can be deduced that a new accommodation market has emerged in Anaga beyond the traditional hospitality industry. With regards to the whole city, Santa Cruz (71 %) has shares of entire homes comparable to Valencia (70 %) and Palma de Mallorca (69 %), but the numbers are significantly higher than in Barcelona (49 %; Inside Airbnb 2020).

Contrary to that, with regard to the price analysis, Santa Cruz shows lower levels. This becomes clear comparing the city's median Airbnb price

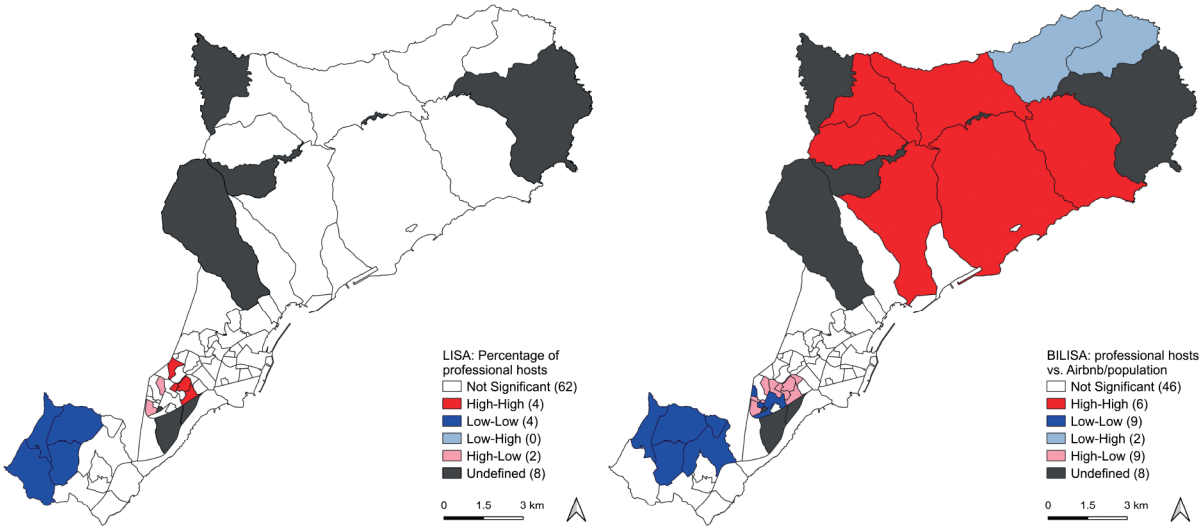

Fig. 4: Univariate local Moran's I of the percentage of professional hosts (left) and bivariate local Moran's I of the percentage of professional hosts and the density of Airbnb listings (right) based on a queen contiguity. Own elaboration based on ASCT (2019a; 2019b) and DataHippo (2020). Note: "Undefined" neighbourhoods do not have any Airbnb listings; therefore, the percentage of professional hosts is not 0, but non-existent.

per night (46 €) with other more touristic Spanish cities such as Las Palmas de Gran Canaria (51 €), Valencia (60 €) or Barcelona (72 €; own calculation based on DataHippo 2020). Within Santa Cruz, the prices fluctuate strongly and vary in the median between 30 and 49 € (see box plot below, Fig. 6). The number of outlier values is particularly high in Centro-Ifara. There, a high diversity in the standard of the accommodations is assumed, which again leads to the wide price range. The median price for an Airbnb in the city centre is 48 €, which is significantly below the median price of 72 € for a hotel room (Booking.com 2020)[1]. The highest median price is found in Anaga with 49 €. The capacity of the accommodations is also high in Anaga with an average of 3.7 persons per unit which partly explains why the prices here are the highest in all of Santa Cruz de Tenerife. Also, a link between the urban structure and the capacity can be seen. In the central districts and the adjacent first periphery, where high densities and multi-storey buildings can be found, the capacity of Airbnb apartments is lower with a median between 2 (Centro-Ifara) and 3 (Ofra-Costa Sur and Salud-La Salle). The second periphery (Suroeste) with a mix between multi-storey buildings, row houses and single houses and the rural area Anaga show a higher capacity of 4 (Median) which is linked to the lower housing density.

5.2 Airbnb and the local housing market

Comparing the local housing markets and Airbnb listings demonstrates that the rental prices have increased in each district during the last five years. Growth has been strongest in Suroeste (60.9 %; Tab. 3). This might be linked to the highest municipal population growth in the same period, which indicates an ongoing suburbanization process. However, Ofra-Costa Sur has even shrunk in population numbers, but still shows a high growth rate in the rental prices (55.3 %). Hence, the current price dynamics in Santa Cruz, which were the highest all-over Spain in 2018 (Ministerio de Fomento 2019, 16), cannot be explained by demographic processes only. Further aspects such as a growing demand due to a shift towards renting in the Spanish housing policy in the last decade should be taken into account (López Rodríguez and Llanos Matea 2019, 2). Apart from that, short-term rentals are expected to take flats off the market. It is thus of no surprise, that rents have increased mostly in districts where the tenancy market is smallest (Tab. 3). In the suburban district Suroeste, only 12.3 % of all apartments are rental flats which is why the observed price increase is the result of a high demand and a small supply.

[1] The hotel prices refer to an overnight stay in a double room without breakfast. For better comparability the hotel prices were all queried directly on the hotel websites for one night during the week in September 2020. The prices were queried before the outbreak of COVID-19.

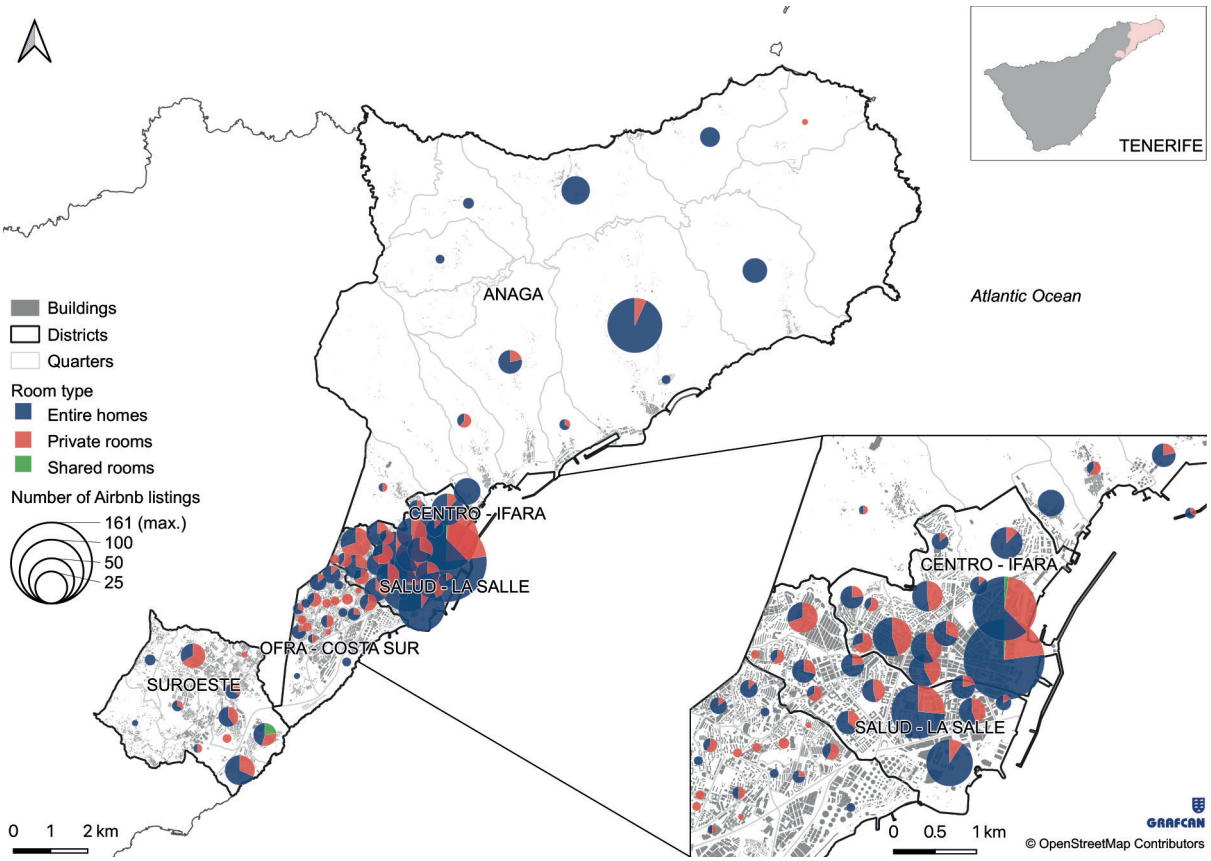

Fig. 5: Share of different room types in each quarter. Own elaboration based on ASCT (2019a; 2019b), DataHippo (2020), Grafcan (2020), Open Street Map and Geofabrik GMBH (2020).

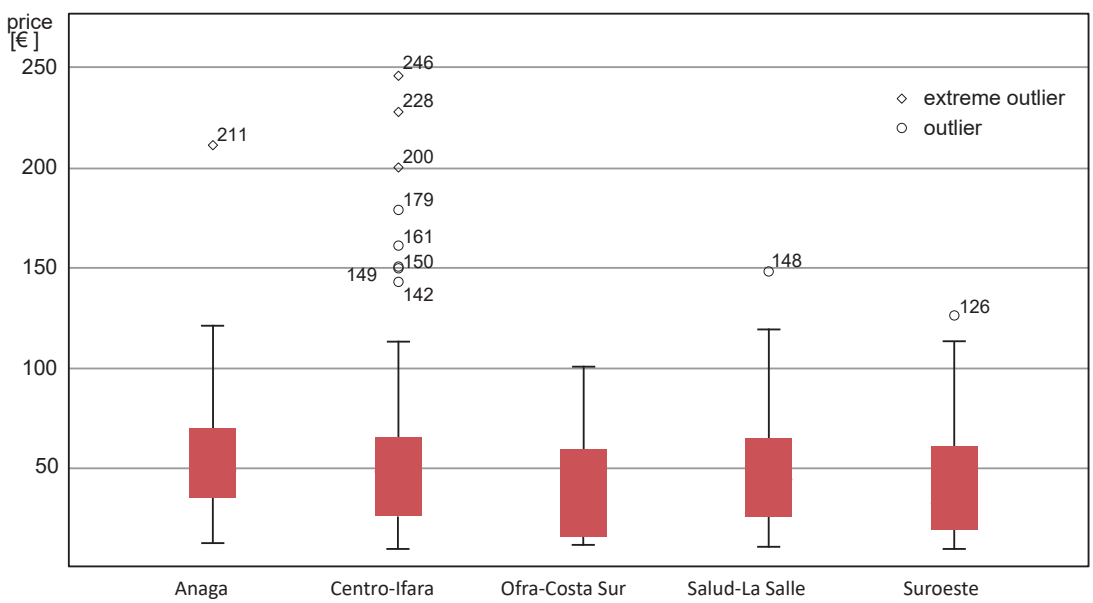

Fig. 6: Price range of Airbnb listings in Santa Cruz de Tenerife. Own elaboration based on DataHippo (2020).

Tab. 3: Housing market and Airbnb key data

	Housing Market			Airbnb			
	Asking rental prices Oct 2019 [€/sqm]	Growth in asking rental prices 2014-2019 [%][1)]	Share of rental apartments on the housing market [%][2)]	Average price of Airbnb offers [€/night]	Share of entire Airbnb homes on total housing market [%][3)]	Share of entire Airbnb homes compared to rental apartments [%][3)]	Rent gap [%][4)]
Centro-Ifara	9.0	50.0	25.2	54.0	2.5	6.8	101
La Salud-La Salle	9.1	58.3	17.4	46.8	1.8	4.2	73
Ofra-Costa Sur	6.9	55.3	12.6	38.9	0.3	2.2	89
Suroeste	6.4	60.9	12.3	46.1	0.5	2.0	142
Anaga	-	-	9.5	56.8	3.4	33.0	-

Source: Own elaboration based on ASCT (2020); DataHippo (2020), Idealista (2020) and INE (2018).
1) Different months have been chosen in these years according to the respective minimum (2014) and maximum (2019) values for each district. With this, a more realistic comparison of the effective growth rate is provided.
2) The share of rental apartments is based on the latest census data from 2011 (INE 2018).
3) The number of entire Airbnb homes is compared to the number of rental apartments and the total housing market respectively. Data of housing stock is based on the latest census data from 2011 (INE 2018).
4) The rent gap is the ratio between the monthly price for an Airbnb flat and the average rental price of an apartment on the housing market. For the average rental price we multiplied the price per square meter (Idealista 2020) with the average flat size in Santa Cruz (INE 2018). Additional costs (electricity, water, etc.) were neglected.

This is also reflected in our rent gap calculation, measuring the difference between rental and Airbnb prices.

It is a complex calculation (Yrigoy 2019, 2714) and restricted with regard to comparability. Airbnb prices include additional costs for water, heating and internet among others and are given per accommodation and night. Contrary to that, rental prices are provided per square meter and month, excluding additional costs. Calculating this rent gap provides some interesting insights, however, because the abovementioned distortion is supposed to be systematic in each quarter. Applied to Santa Cruz' districts, the calculation proves that Suroeste (second periphery) has the highest gap between Airbnb and the housing market (142 %, see Tab. 3). This is not surprising, as the new "possibilities of short-term rentals systematically raises potential ground rents" even in places that have not been target of revaluation or displacement processes in before (Wachsmuth and Weisler 2018, 152). This seems to be a general trend, as also in other cities such as Berlin a notable touristification through short-term rentals in suburban neighbourhoods is observed (Gyódi 2017, 542). In Salzburg, the highest rent gap can be found in a suburban quarter, too (Smigiel et al. 2020, 165). Gutiérrez and Domènech (2020) found out that deprived areas in Spain are possibly more vulnerable to these developments because of the higher rent gap between traditional and short-term rentals. This also applies to Santa Cruz' Suroeste, where a much lower income per capita is identified (Tab. 1).

On Santa Cruz' housing market, 1.3 % of all housing units are rented as entire homes on Airbnb. This value is lower compared to other cities such as Venice (8.9 %) or Verona (4.1 %) in Italy (Picascia et al. 2017, 6) but is still higher than Berlin in Germany (0.3 %; Schäfer and Braun 2016, 297). Contrary to other cases such as Salzburg (Smigiel et al. 2020, 164), the highest share of entire homes on the rental market is not found in the city centre but rather in the rural periphery (see Tab. 3 and Fig. 5). This value is highest in Anaga, where the share of entire homes equals one-third of the available rented apartments. Hence, a severe reduction of housing units due to Airbnb is observed.

6 Conclusion

Research on short term rentals focus mainly on large urban spaces and cities affected massively by tourism. Our aim is to contribute to overcome this gap by analysing the spatial dimension of short-term rentals in Santa Cruz de Tenerife, a medium-sized city that is not a tourist city per se. Our analy-

sis shows that Santa Cruz reaches lower prices and shares of Airbnb listings per inhabitant compared to larger and more touristic cities. However, its high share of entire homes stands out from other case studies, indicating a high degree of professionalism on the market. The case study also shows how short-term rentals such as Airbnb have uncoupled the existing relationship between real estate market and demographic trends (López Rodríguez and Llanos Matea 2019, 14).

However, Airbnb does not affect each part of the city equally. Our initial hypothesis is only partly supported by the data because the city centre is not necessarily the place where the Airbnb supply is most developed and professionalized. Instead, a considerable spatial roll-out took place leading to a diversification on the tourist accommodation market.

- The centre, traditionally concentrating both sights and tourist accommodations, has the highest spatial accumulation of short-term rentals, but not the highest number of Airbnb listings per capita.
- Anaga, a rural district of the municipality, shows the highest number of Airbnb listings per capita and the highest prices (in absolute terms) in the whole case study. We trace this back to the types of tourism found there (hiking and nature based tourism). In both Anaga and the centre the largest degree of professionalism on the market is identified, displayed for example by the share of multi-hosts. About one third of the rental apartments are taken off the market due to Airbnb in Anaga.
- Salud-La Salle (inner-city district) and Ofra-Costa Sur (first periphery) mostly show the lowest values in the observed categories (spatial densities of Airbnb listings, capacities, professionalism of hosts). There, the cheapest offers can be found, which we relate to structural deficits in the area, such as the low average physical condition of the buildings (Hübscher 2020, 76).
- Suroeste is the so-called second periphery of the city. This suburban district has the highest Airbnb capacities. We identify the largest rent gap there, which explains why this district faces the highest increase in rental prices in the whole city. We thus expect a further dispersion of short-term rentals in Santa Cruz into the hinterland of the city, where Airbnb goes hand in hand with suburbanisation processes. More research has to be done, as there is currently little scientific discussion on short-term rentals in suburban neighbourhoods.

The results of this study show that both in Santa Cruz as a converted city and other tourist cites a strong concentration of Airbnb listing in the centres can be found. However, in Santa Cruz, this dominance of the city centre on the Airbnb market might decrease. Short-term rentals become more attractive even in peripheral districts where rents increase and flats are taken off the traditional rental market. This will lead to new conflicts in the city because these peripheral districts are more vulnerable from a socio-economic point of view. In this respect, the current Covid-19 pandemic is seen as a test case. Different opinions exist about how this crisis will affect Airbnb (Dolnicar and Zare 2020; Cocola-Gant 2020). However, it seems undoubtful that the pandemic will leave local neighbourhoods more vulnerable due to the economic crisis that it has entailed. This, again, will reinforce the displacement of residents, leaving space for more profitable uses of housing units, as it is already observed in Santa Cruz (García Hernández et al. 2020).

It is particularly this perspective showing that urban policies urgently need to address the topic of short-term rentals and find effective ways to guarantee a balance between tourism and the social function of housing. This case study shows that "one-size-fits-all" solutions for cities will not meet the multiple needs of the different districts. As each district shows different characteristics in the Airbnb supply (with regard to prices, professionalism, rent gap etc.), tailored approaches are necessary. Analysing the spatial geographies of short-term rentals at a neighbourhood level, even in smaller cities, should be carried forward because the Airbnb phenomenon is getting increasingly multifaceted from a spatial point of view.

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