AIRBNB AND TOURISM GENTRIFICATION: IMPLICATIONS IN THE MILANESE CONTEXT

In the last decade, a new accommodation provider entered the hospitality sector. Peer-to-peer accommodation platforms, such as Airbnb, have taken cities all around the world by storm. The main appeal lies in the fact that Airbnb is internet-mediated and promises the 'live like a local-experience'. Conversely, the proliferation of Airbnb in the main tourist cities has sparked opposition among locals. Residents report noise, rising rents, overcrowding and a general loss of 'sense of place' as the main issues. Over time, issues like these have the potential to displace the local population, much like gentrification processes. The main problem is that until recently, the debate has been in the hands of the public and media, which denies the creation of effective policy supported by empirical evidence. This dissertation aims to explore the extent to which gentrification and Airbnb intersect, the disparity in this process between active and non-active Airbnb's and possible policy recommendations. A multiple linear regression showed a small correlation between Airbnb presence and gentrification. This implies that a higher Airbnb presence is more likely in gentrifying neighbourhoods, potentially aggravating gentrifying processes further with the addition of tourism gentrification. It is concluded that Airbnb follows after gentrification, which forces policies to focus on an intersectoral approach to gentrification.

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ACKNOWLEDGEMENTS

I would like to use this opportunity to express my gratitude towards several people that have helped me greatly over the course of these last six months. Firstly, I would like to thank my friend Mart Lootsma, whose expertise in the field of programming proved invaluable in the process of data collection and manipulation. Secondly, I would like to thank my supervisor, Arie Stoffelen, for his constant guidance and feedback. Lastly, I would like to thank Illaria Mariotti and Fabio Manfredini from Politecnico di Milano for their guidance and advice on all things Italian.

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1. INTRODUCTION

In the years following 2008, the world of tourism accommodation saw an important change with the arrival of the peer-to-peer accommodation sector. Airbnb – at that time still called ‘Airbed and Breakfast’ – was founded by Brian Chesky and Joe Gebbia in San Francisco. Noticing hotels in the area had been sold out due to a design conference, they hosted guests to earn some cash for rent (*Airbnb*, 2018). This anecdote captures the very essence of peer-to-peer platforms, where individuals let other individuals use their unused spaces, vehicles or other possessions in exchange for currency (Guttentag, 2015). The main benefits lie in the nature of the platform: internet-mediation (Guttentag & Smith, 2017; Ioannides, Röslmaier, & van der Zee, 2018). Because transactions between tourists and hosts are internet-mediated, a host has the ability to reach a global clientele. At the same time, companies like Airbnb, Homeaway and Couchsurfing provide a more diverse supply of accommodation to the market (Guttentag & Smith, 2017). In addition, Airbnb argues that their service complements the existing supply and does therefore not directly compete with the traditional accommodation sector (Oskam & Boswijk, 2016). Moreover, Airbnb argues that their guests are more likely to stay longer, spend more money and thus provide a new source of income for neighbourhoods that do not usually get much tourist attention (Oskam & Boswijk, 2016). In 2019, with over six million listings worldwide and more than two million stays per night on average, Airbnb has quickly grown into one of tourism’s biggest companies (*Airbnb*, 2018). This enormous growth has not gone without resistance.

Despite the advantages for tourists, there is a wide variety of negative externalities that have been linked to Airbnb. ‘Rattling suitcases’ has become an increasingly popular way of describing the main problem with Airbnb and its clients. Indeed, the term is an effective summary of the biggest complain concerning the company: noise caused by the tourists it hosts (Cócola-Gant, 2018). Due to its tremendous success, recent studies argue that Airbnb has the capability to affect the urban fabric in several ways. In addition to noise, locals report problems with an excess in waste, overcrowding and a loss of access to services (Gurran & Phibbs, 2017). The issues surpass the plain of practical issues like safety, sanity and nuisance though.

From an economic point of view, the impact of peer-to-peer accommodation platforms is far from agreed upon. For example, Airbnb is accused of having an unfair advantage to the traditional hotel industry through tax evasion (Guttentag, 2015). Moreover, it is argued frequently that the presence of Airbnb has an impact on residential property values and hotel revenues (Cesarani & Nechita, 2017; Gurran & Phibbs, 2017; Gutiérrez, García-Palomares, Romanillos, & Salas-Olmedo, 2017; Guttentag, 2015; Lambea Llop, 2017; Tussyadiah & Pesonen, 2016). Further, several authors explored the impact of Airbnb on the housing market. The main argument here is local residents are denied access to a pool of housing that was once within their reach through the proliferation of Airbnb (Füller & Michel, 2014; Lee, 2016; Novy & Colomb, 2013).

In a broader sense, it is argued that Airbnb and platforms like it have the potential to cause multiple forms of displacement, much like gentrifying processes do (Cócola-Gant, 2015; Lopes, Rodrigues, & Vera-Cruz, 2019). In other words, Airbnb can be interpreted as a gentrifying force. The link between gentrification and peer-to-peer accommodation platforms has been noted in several studies before (Cócola-Gant, 2016; Ioannides et al., 2018; Lopes et al., 2019; Wachsmuth & Weisler, 2018; Yrigoy, 2016).

What is striking then is the fact that only recently, in academic terms at least, has the phenomenon of peer-to-peer accommodation appeared on the scientific radar (Guttentag, 2015; Proserpio & Byers, 2016). Because of this, the debate on frontrunners of this platform such as Airbnb has largely been in the hands of the media and politics (Gravari-Barbas & Guinland, 2017). The previous shows that the problems associated with peer-to-peer accommodation platforms are more serious and far more complex than rattling suitcases alone. The nature of the platform and the problems surrounding its businesses has proven to be an enormous challenge for local authorities to regulate. Thus, the main problem posited here is that much more critical insight is needed regarding the intersection between Airbnb and gentrification which can eventually be used to formulate an empirically sound regulatory framework for cities that deal with high tourist pressures.

Taking the works of Ioaniddes et al. (2018) and Wachsmuth & Weisler (2018) as a starting point, this dissertation aims to find a link between gentrification and Airbnb presence. To this end, the main questions that are to be answered in this dissertation are 1) to what extent do gentrification and Airbnb presence intersect and 2) how can this intersection be regulated? To answer these questions, the spatial distribution of more than 18.000 Airbnb listings will be tested against gentrification characteristics in a case study of Milan (Italy) using a multiple linear regression. The results of this analysis will then be used to formulate a policy recommendation.

This dissertation is structured as follows. Firstly, the relevant literature surrounding the issue of (tourism) gentrification and Airbnb will be explored. Next, the methodology of this dissertation will be explained, after which the results of the analysis will be provided. Finally, a discussion of the results is provided with the addition of a policy framework, aimed towards the mitigation of negative externalities caused by Airbnb.

2. THEORETICAL FRAMEWORK

In this chapter, the theoretical basis upon which this dissertation is built is provided. The first section explores the phenomenon called gentrification and serves to supply a theoretical basis for the creation of a gentrification index, explained in the methodological chapter. Next, a section on tourism gentrification seeks to more specifically explore the role of tourism in gentrifying processes. Subsequently, a section on Airbnb is provided where the role of the peer-to-peer accommodation sector in (tourism) gentrification is explored. The main focus here is on regulation and is aimed to explore the various tools used by governments to mitigate negative externalities of the peer-to-peer accommodation sector. Finally, a synthesis of the concepts and relationships used in this dissertation is outlined.

2.1 Grasping gentrification

2.1.1 DEFINING GENTRIFICATION

As stated in the introduction, the goal of this dissertation is to propose a policy framework that can help spatial interventions in a meaningful way. This is by definition what planning entails (Allmendinger, 2017). To properly formulate ways of dealing with externalities of gentrification, it is important to understand what drives this phenomenon.

Gentrification is by no means a new concept. In fact, the birth of the term can be traced all the way back to 1964, when Ruth Glass, a British sociologist, coined the term for the first time (Lees, Slater, & Wyly, 2008). This term was meant to describe what we now know as 'classical gentrification': the displacement of the lower classes by the 'gentry' in central neighbourhoods. Glass stressed that gentrification is best viewed as a complex urban process that entails the reappraisal of the existing housing stock, the shift from renting to owning, the rise in property values and most importantly the subsequent displacement of the existing population by the gentry (Lees et al., 2008). It is important to note here that three key elements lie at the basis of Glass' notion of classic gentrification: forced social transformation, urban renewal and centrality.

Over time, the definition of the concept evolved along with the concept itself. For example, Neil Smith defines gentrification in the 2000 *Dictionary of Human Geography* as (Smith, 2000):

> **gentrification** The reinvestment of CAPITAL at the urban centre, which is designed to produce space for a more affluent class of people than currently occupies that space. The term, coined by Ruth Glass in 1964, has mostly been used to describe the residential aspects of this process but this is changing, as gentrification itself evolves. (N. Smith: p. 294; emphasis in original)

This definition points to the fact that the way gentrification is understood should be broader. For example, as cities sought to reinvent themselves, capital was invested to develop retail and restaurant districts on the one hand and to redevelop urban areas that were left to degrade as they deindustrialized on the other. This understanding of the concept originated in the late 1970s (Lees et al., 2008). By the early 1980s, the conceptualization of gentrification became even more broad when it was linked to social, economic and spatial rehabilitation which was actively encouraged by governments. As such, Smith (2002) described gentrification as a 'global urban strategy', in which cities actively enable gentrification processes. Through this 'neoliberal urban policy', Smith (2002) argues, cities capitalize on the opportunity of redevelopment without having to pay for it while simultaneously increasing property tax returns. In this sense, changes in the economic and social spheres combined with physical alterations in the urban fabric that result from such rehabilitation are understood as gentrification (Lees et al., 2008). Lees et al. (2008), therefore, promote the use of a more recent definition of gentrification that is both fluid and specific (Clark, 2005). Clark (2005) defined gentrification as:

> a process involving a change in the population of land-users such that the new users are of a higher socio-economic status than the previous users, together with an associated change in the built environment through a reinvestment in fixed capital (Clark, 2005: p. 258).

To end, it was again Neil Smith (1987) who provided perhaps one of the most effective descriptions of gentrification at the time:

> The crucial point about gentrification is that it involves not only a social change but also, at the neighbourhood scale, a physical change in the housing stock and an economic change in the land and housing markets. It is this combination of social, physical, and economic change that distinguishes gentrification as an identifiable process or set of processes (N. Smith: p. 463)

Despite the fact that gentrification has been on the academic radar for five decades now, its relevance today is rarely disputed. In fact, the topic has seen a renaissance since the 1990s (Zuk, Bierbaum, Chapple, Gorska, & Loukaitou-Sideris, 2018). Since then, the topic has assimilated into other areas of urban research: globalization, social exclusion, segregation and polarization, public space and privatization, geography of consumption and urban policy in general (Lees et al., 2008). In other words, gentrification evolved into a helpful research topic through which a wide array of urban phenomena can be approached (Lees, 2000; Lees et al., 2008; Zuk et al., 2018). Hamnett (1991) argued that there are five reasons for the prolonged interest on the subject. First, gentrification has supplied the academic community with a new and seemingly elusive subject. Second, gentrification challenged the common notions of residential location theories. Third, gentrification is a highly political subject. Especially the interaction between regeneration and displacement is the subject of debates in policy and politics. Fourth, gentrification was the next big concept in urban restructuring, like suburbanization before it. In the process of slowing down inner-city decline, gentrification represents a departure from previous trends as it entails the re-urbanization of inner-city neighbourhoods through the attraction of a new middle-class. Fifth, gentrification is highly significant in both an ideological and theoretical sense for urban geography. Hamnett describes it as being an 'intellectual battleground between competing and radically opposed theoretical perspectives' (p.175). These perspectives include: 1) the explanation of gentrification as a product of either demand- or supply side driven processes and 2) the framing of gentrification as a good or bad process which should either be supported and even encouraged by governments or discouraged as social justice is fragile in gentrification processes. Considering this line of argument, it is clear that gentrification maintains a high relevance in academia (Hamnett, 1991).

In addition to this, Lees et al. (2008) argue that gentrification is still very much alive, unlike the notions put forward by scholars like Berry (1980) and Bourne (1993), who argued that gentrification would be short-lived because it was the product of a temporary imbalance in housing stock or demographic transitions caused by the baby-boomer generation in combination with economic recession (Berry, 1980; Bourne, 1993). Instead, Lees et al. (2008) provide three additions to Hamnett's list. First, gentrification represents the vanguard of neoliberal urbanism. As the world's population grows to be more urbanized with every year, the regeneration of urban space is as apparent as ever. Second, gentrification developed into a global phenomenon and is argued to be interconnected with globalization processes. Third, in line with the previous two arguments, gentrification is no longer limited to the absolute inner cities and First World urban areas. With these additions, Lees et al. (2008) hint at an important notion in the literature on gentrification drivers. This notion is elaborated upon in section 2.1.4.

Although debates on the various drivers of gentrification are seemingly inexhaustible, a generalization of the inner workings of the main processes can be agreed upon (Hochstenbach & van Gent, 2015; Lees et al., 2008; Zuk et al., 2018). When approached as a simplified dichotomy, gentrification has historically been regarded as a process driven by with two sides: supply and demand (Giorgetta, 2016; Lees et al., 2008). In this sense, the supply perspective entails the production of gentrification. This process mainly concerns changes in the quantity and quality of the built environment brought about by either investment or disinvestment (Lees et al., 2008). Conversely, the demand perspective describes gentrification as a consequence of the transformation of cities in terms of industrial and occupational compositions and the societal change that comes with it (Lees et al., 2008). It is important to note that the concept of gentrification as a whole should not be dissected into this dichotomy, as larger forces like globalization, corporate capital and especially neoliberal urban policy are argued to encompass the supply-demand drivers of gentrification (Gotham, 2005; Lees et al., 2008). Therefore, any explanation of gentrification from either side alone is at risk of being inconsiderate of any number of factors (Lees et al., 2008). However, in an effort to create a comprehensible overview of the drivers involved, this division between supply and demand is used throughout the following sections with a sole organizational purpose. Encompassing drivers such as globalization and neoliberal policy will be discussed separately in section 2.1.4.

2.1.2 PRODUCING GENTRIFICATION

With a definition of gentrification established, a detailed account of the various drivers of gentrification can be provided. The main reason for this is to identify particular processes that drive gentrification, which provide the input and the validation necessary for the creation of a gentrification index. A more detailed description of this index can be found in chapter 3 (Methodology).

On the supply side of gentrification, capital investment is central. In his early work, Smith explicitly emphasizes the predominant role of capital in gentrification, rather than people (Smith, 1979). In this 'gentrification by capital' interpretation, gentrification is explained as a product of (dis)investments on a neighbourhood scale with the deliberate intent to attract and expand capital (Lees et al., 2008; Smith, 2002). Moreover, Smith (2002) argues that gentrification developed into a 'global urban strategy' for capital accumulation (p.437). Central to this gentrification by capital is the rent gap theory. Devised by Smith in 1979, rent gap theory seeks to explain capital investment as part of gentrifying processes (Smith, 1979). The rent gap is best defined as:

> the disparity between the potential ground rent level and the actual ground rent capitalized under the present land use (p.545).

It is important to note here that Smith underlined two crucial aspects in this definition of the rent gap. First, a distinction must be made between land rent and house value as they are conceptually detached. Whereas house value generally incorporates land rents, it must not be equated with it. The rent gap isolates the value of land from any structure of improvement built on it. Second, the rent gap can be regarded as both an economic gap and a historical gap. The historical gap can be seen as the outcome of a historic string of investment (or rather disinvestment) in the urban fabric. It is argued that eventually, when the gap is wide enough, gentrification occurs, filling the rent gap (Smith, 1979). The main reason for the widening of the rent gap is depreciation. Smith (1979) identifies multitude of causes of depreciation. They include, among others, use cycles, blockbusting and abandonment (Smith, 1979). For example, with each use cycle, a building deteriorates to a certain extent. Without proper maintenance, a building that sees multiple use cycles depreciates. Further, blockbusting entails the use of racial tensions to scare people of certain ethnicities into selling their homes in fear of the arrival of another ethnic group in the neighbourhood (Smith, 1979). To summarize, rent gap theory suggests that the incentive for investment of rational economic agents is largest where the rent gap is sufficiently wide, thus opening the area up for gentrification to fill said gap. In short, the rent gap describes gentrification as (at least partly) the result of investment and disinvestment in metropolitan land markets (Lees et al., 2008).

Several authors offered their critique on rent gap theory (Badcock, 1990; Bourassa, 1993; Ley, 1987). These critiques generally revolve around the relation between house value and land rent. Both Ley (1987) and Bourassa (1993) for example parallel land rent with house value. This, as both Smith (1987) and Clark (1995) argue, fails to effectively identify a rent gap. Further, substantial doubt is cast over the significance of rent gap theory outside of redevelopment and the use of rent gap theory other than an equation intended to find profitability in redevelopment (Bourassa, 1993). This doubt was swiftly challenged two years later by Clark (1995). He argues, in line with Smith's original formulation of the theory, that rent gap theory is not intended to be a simple equation used by real estate agents in search of profitability. Instead, it encompasses political economic theories of uneven development on the urban scale and can therefore not be separated from the societal aspects and power relations associated with the creation of value in the urban fabric (Clark, 1995).

Smith (1979) ended on the notion that he observed a back-to-the-city movement of capital, rather than people. The main reasoning behind this is that little evidence was found to indicate that people – the gentry, that is - followed the capital into the city centre. Smith does however state that a continued financial interest in the city centre could eventually kickstart a back to the city movement of capital ánd people (Smith, 1979). This conclusion has proven to be valid. Much attention has since been given to residential mobility, social mobility and demographic change (Chapple & Zuk, 2016; Hochstenbach & van Gent, 2015; Smith, 2005; Zuk et al., 2018). The question that is evident then is, how do these processes relate to gentrification?

2.1.3 CONSUMING GENTRIFICATION

On the demand side of gentrification, major changes in industrial and occupational structures in metropolises are central to the explanation of gentrification (Lees et al., 2008). In their post-industrial and professionalization theses, scholars like Ley (1996) and Hamnett (1996) view gentrification as a process driven by the expansion of the middle-class (Lees et al., 2008). From a post-industrial perspective, Ley (1996) argued that gentrification characterized a movement away from suburbanization. Specifically, it embodied a movement that was brought about by the growing importance of consumption features and a certain taste for aesthetics that was popular with the new middle class (Lees et al., 2008; Ley, 1996). More importantly, these developments could not be explained by the dominant literature at the time, which favored more operational approaches to explore the production of space and housing markets (Lees et al., 2008). This idea was expanded upon by Hamnett (1996), who argued in a similar manner that gentrification is the outcome of the transformation of cities from a place of production and industry to a place of consumption and creative business, which resulted in the expansion of the middle class through substantial occupational change (Hamnett, 1996; Lees et al., 2008). In this literature, gentrifiers are typically described as 'yuppies' (the 'Young Urban Professional'). They are typified as part of a countercultural movement, which entails an affinity with a more liberal political outlook and a specific interest in issues like ethnicity, feminism and sexuality (Lees et al., 2008; Ley, 1996). No description of the identity of the new cultural middle class is complete without mentioning the highly influential work of Richard Florida. In his book *The Rise of the Creative Class* (2003), Florida describes a group very similar to Ley's (1996) new cultural middle class. The creative class is comprised of creative individuals spanning from scientist and students to bohemians, (young) entrepreneurs, artists and gays (Florida, 2003). This class is central to Florida's premise, which is that urban development and innovation can be realized through the attraction of the creative class. This notion hints at the importance of urban policy, which is elaborated upon later. In relation to gentrification, it is the creative class that desires a certain 'edginess' found in historic architectural aesthetics, diversity and tolerance, all of which are evident in previously depreciated urban areas (Florida, 2003; Lees et al., 2008).

From a more practical perspective, three drivers of gentrification processes in relation to demand are generally recognized: residential mobility, social mobility and demographic change (Hochstenbach & van Gent, 2015). Firstly, residential mobility describes the process of in-migration by wealthier populations, leading to the subsequent out-migration of a lower-income income population through a process called displacement (Hochstenbach & van Gent, 2015). For a thorough discussion on displacement, please refer to paragraph 2.1.5. Different phases of in-migration are referred to as gentrification waves (Diappi & Bolchi, 2006; Hackworth & Smith, 2001; Hochstenbach & van Gent, 2015). With each wave, the amount of capital needed to move into an area generally increases (Hackworth & Smith, 2001; Hochstenbach & van Gent, 2015). Secondly, the process of social mobility refers to the socio-economic advancement of the population within a neighbourhood, resulting in a different socio-economic composition of the area. This upward momentum subsequently allows for the advancement of the neigbourhood in the physical and economic spheres as well (Hochstenbach & van Gent, 2015). It is here that hints of Florida's creative class can be observed as for example graduates who, after moving into an affordable neighbourhood, become gentrifiers as they get more established over time. Thirdly, demographic change (on a larger scale as compared to the neighbourhood scale, that is) is argued to alter neighbourhood composition. This process entails the previously discussed notions posed by Ley (1996) and Hamnett (1996), among others, whereby a growing middle- and upper class replaces the working-class residents (Hochstenbach & van Gent, 2015). Crucially, Hochstenbach & van Gent (2015) stress that gentrification cannot be explained in a definitive model of each driver individually. Instead, they found that each driver contributes to gentrification to various extents. Thus, they argue, multiple forms of gentrification can be observed at one time, which consequently calls for the efficient incorporation of multiple models (Hochstenbach & van Gent, 2015).

2.1.4 EXPANDING GENTRIFICATION

Importantly, gentrification as a concept in more recent years is argued to have rescaled from a local neighbourhood scale to citywide, national and even global scales (Lees et al., 2008). The role of forces like globalization and neo-liberal urban policy as drivers of gentrification is argued to be critical to the understanding of the concept (Atkinson & Bridge, 2005; Lees et al., 2008; Smith, 2002). In what is called 'contemporary gentrification', processes on a global scale offer a more generalized characterization of gentrification processes (Lees et al., 2008). As mentioned earlier, several authors argue that gentrification should not be perceived as driven by either supply- or demand-side processes. Rather, the supply-demand dichotomy is encompassed by larger processes that enable gentrification and provide the regulatory framework in which supply and demand processes operate (Gotham, 2005; Lees et al., 2008). For example, Smith (2002) argued that gentrification could be seen as a 'global urban strategy' (Smith, 2002). As such, gentrification and globalization are linked through processes of neoliberal urban policy, the ever increasing mobility of capital and people and the proliferation of the cosmopolitan class (Atkinson & Bridge, 2005; Smith, 2002). Crucially, it is argued that these processes set the stage for gentrification and therefore define how gentrification is driven (Atkinson & Bridge, 2005; Gotham, 2005; Lees et al., 2008; Smith, 2002). For example, neo-liberal urban policy is central to the re-urbanization of inner-cities. This type of policy is aimed towards the attraction of financial capital and new national and international real estate investors, which should encourage urban renewal (Lees et al., 2008). Evidently, this has several benefits for both developers and local government. For example, the encouragement of gentrification creates the opportunity for investors and developers to capitalize on rent gaps, while simultaneously solving the problem of urban decay for local governments. Critically, this process allows for urban renewal without substantial government investment, which is why it is argued to be so attractive (Atkinson & Bridge, 2005; Lees et al., 2008; Smith, 2002). Moreover, the encouragement of gentrification through neo-liberal urban policy can be used as a way of increasing property tax returns (Smith, 2002). This process entails the increasing of property values through encouraged gentrification and the subsequent increase in property tax returns. Additionally, the attraction of Florida's (2003) creative class is argued to be central for urban renewal and innovation, which further underlines the importance of urban policy and regulation as drivers of gentrification on a larger scale than the supply-demand dichotomy.

In addition to the global rescaling of gentrification described above, gentrification is rescaled further by Lees (2006), who identified a 'cascading effect' in Portland (Maine). Although being considerably smaller than cities higher in the urban hierarchy, Portland (Maine) also experienced considerable gentrification (Lees, 2006). In this sense, the process of gentrification is no longer limited to urban areas high on the urban hierarchy. Instead, the process is observed to be expanding down the urban hierarchy (Lees, 2006). Interestingly, this process is explained by Lees (2006) and Lees et al. (2008) as an attempt to find rent gaps that have not yet been exploited. Evidently, cities further down the urban hierarchy are more likely to still be untouched by large-scale gentrification processes (Lees, 2006). To end, Lees et al. (2008) argue that contemporary gentrification has rescaled both outwards (to a global scale) and downwards (down the urban hierarchy). In other words, Lees et al. (2008) argue for the expansion of the concept of gentrification. The explanation of gentrification as a process driven by forces larger than local demand and supply factors alone is crucial to the understanding of the concept. Specifically, the roles of urban policy and global forces in gentrification are of great importance to this dissertation.

2.1.5 FRAMING GENTRIFICATION

It goes without saying that the various processes described above have numerous consequences, both in a socio-economic and physical respect. In this paragraph, a comprehensive overview of the various positive and negative effects of gentrification as identified by a substantial amount of research is illustrated. In other words, the way in which gentrification can be framed as either good, bad or neither is elucidated here. In line with the conceptualization of gentrification processes, its effects too can be perceived in a dichotomy. Relating closely to the conceptualization of gentrification as a demand-driven process, the 'emancipatory city thesis', proposed by Lees in 2000, seeks to portray gentrification as a largely positive process (Lees, 2000). Conversely, the 'revanchist city thesis', which evidently relates to supply-driven conceptualizations of gentrification, paints a more ominous picture where gentrification is perceived as a predominantly negative process (Smith, 2002). A large part of the focus in the negative effects of gentrification has historically been on the process of displacement (Lees et al., 2008). The process of displacement is discussed in detail later. This paragraph concludes with a discussion of a temporal component to the effects of gentrification, as proposed by Lees (2008).

In conceptualizations from the 80's and 90's that Lees (2000) collected under the term 'the emancipatory city thesis', gentrification is framed as a positive process. From this perspective, gentrification is perceived as a liberating experience and an emancipatory power, the main premise being that gentrification leads to increased social mixing, diversity and tolerance and thus creates ‘safe havens’ or enclaves for the oppressed (Lees, 2000; Lees et al., 2008). The idea of increased social mixing brought forth images of old-city areas where a more cultured class resided, not conforming to societies’ standards. For example, the more densely populated inner-cities were argued to offer a higher level of anonymity, which provided a more secure environment for people belonging to minorities. This image, where individuals with radically different backgrounds live side by side without resentment or conflict, is contested by several authors listed by Lees (2000). For example, discourses between strangers in gentrifying areas is argued to be disinterested and infrequent, which challenges notions of the positive effects of social mixing (Slater, 2004). Furthermore, Lees (2000) emphasizes that the actual encounter of social difference is likely less positive than portrayed in the image of an emancipatory city. The main reasoning behind this is compelling: the proliferation of freedom and social diversity in the gentrifying inner-cities is bound to favor similar world views, while simultaneously opposite opinions are rejected (Lees, 2000). Nevertheless, compelling evidence is found for the positive outcomes of gentrification in economic and physical respects. For example, gentrification is argued to counteract neighbourhood decline as capital is invested in both private and public property. In addition, with the arrival of new capital, local revenues are found to be higher. Further, the intensification of the urban fabric through the conversion of older and industrial buildings is found to reduce the sprawling tendencies of cities (Lees, 2000; Lees et al., 2008).

More recently, the framing of gentrification has made a turn towards the negative effects. In what Smith (2005) describes as ‘the revanchist city thesis’, gentrification is framed as a much more insidious process, characterized by a revanchist agenda that seeks to recapture the inner-city from those who have occupied it. The premise of this revanchist city thesis is that following the transformation of the general positivity of the 1980’s, recession in the 1990’s spurred an aggressive anger among the white middle class which was subsequently directed at the population of the inner-cities, now occupied by lower-classes and minorities after the white flight to the suburbs (Smith, 2005). Smith goes on to argue that the effects of the gentrification that ensued were of a very negative nature and indeed, were intended to be. In this sense, the effects of gentrification are much more characterized by arson, abandonment and purification and less so by social mixing and diversity (Lees et al., 2008). The list of negative externalities linked to gentrification goes from various types of displacement to social conflict and civil unrest (Atkinson & Bridge, 2005). For example, as the housing market goes up, it is argued that the demand of housing becomes greater in gentrifying neighbourhoods. Subsequently, affordable housing becomes either less affordable or disappears entirely (Atkinson & Bridge, 2005). In a similar way, as more people are displaced to surrounding areas, members of the lower-class are argued to be trapped between their own gentrifying neighbourhood and the surrounding areas that see a surge in demand. This process forces them to stay put in an area where rents are going up and the services that cater them generally move away through the process of commercial displacement (Atkinson & Bridge, 2005). Displacement is one of the most recognized negative effects of gentrification (Atkinson & Bridge, 2005; Lees et al., 2008; Smith, 2005). Slater (2009) even states that displacement is crucial to the process of gentrification and should therefore be the starting point of any attempt to grasp it (Lees et al., 2008; Slater, 2009).

Major contributions in the field of displacement have been made by Peter Marcuse. He defines gentrification-induced displacement as follows:

> Displacement from gentrification occurs when any household is not permitted to move into a dwelling, by a change in conditions that affects the dwelling or its immediate surroundings, and that: 1) is beyond the household's reasonable ability to control or prevent; 2) occurs despite the household's being able to meet all previously imposed conditions of occupancy; 3) differs significantly and in a spatially concentrated fashion from changes in the housing market as a whole; and 4) makes occupancy by that household impossible, hazardous, or unaffordable. (Marcuse, 1985: p. 207)

In a detailed account of the various types of gentrification-induced displacement, he identified two main forms of displacement: involuntary displacement and voluntary displacement. The distinction between the two, as will later be discussed, can be considered fuzzy. Involuntary displacement is comprised of several sub-forms: 1) direct displacement (which is divided into two forms: physical displacement and economic displacement); 2) exclusionary displacement and 3) pressure of displacement (Marcuse, 1985).

Physical displacement occurs when physical limitations as a result of either purposeful or natural abandonment force households from their dwellings. Examples of physical limitations are broken windows, a lack of running water, electricity or heating and other forms of decay. Alternatively, economic displacement occurs when a household can no longer afford to live in a dwelling due to rising costs of living. These processes combined are considered direct displacement. Furthermore, exclusionary displacement entails the inability to move to a gentrifying area as previously available housing stock is subjected to gentrification. Finally, the concept pressure of displacement describes displacement beyond those that have already been displaced. As an area gentrifies, households see their families move and their services disappear. As a result, their needs are no longer catered for and the pressure to move increases (Marcuse, 1985). It is here that the fuzziness of the distinction between voluntary and involuntary displacement becomes apparent. As the pressure of displacement increases, it is argued that households are not forced to move, they are forced to adapt.

To end, Lees et al. (2008) identified a temporal component pertaining the effects of gentrification. In general, they argue, gentrification-induced effects are experienced more positively in the earlier waves of gentrification, as 'pioneer gentrifiers', who actively sought social mixing, settle in. However, later waves of gentrification are associated with more individualistic attitudes. Consequently, the effects of those waves are associated with more negative ramifications (Lees et al., 2008).

To summarize, this chapter provided an overview of the complex process of gentrification, its various drivers and its effects. The numerous effects of gentrification on either side of the emancipatory-revanchist city dichotomy have been aptly laid out in a book by Atkinson & Bridge (2005). Table 1 serves as a synopsis of the various effects of gentrification and combines the reflections from Atkinson and Bridge (2005) with other relevant readings.

Table 1: *An overview of the externalities of gentrification* (after: Atkinson & Bridge, 2005; Hochstenbach & van Gent, 2015; Marcuse, 1985)

Positive	**Negative**
Counteraction of neighbourhood decline	Conflict and resentment
Increased property values (positive displacement)	Loss of affordable housing
Reduced vacancy	Increased homeless population
Increased local revenue and tax basis	Increased take of local spending
Reinvigorated development	Commercial displacement
Intensification of the urban fabric (i.e. reduced urban sprawl)	Increased demand of housing in surrounding areas
Increased social mix	Loss of social diversity
Rehabilitation of existing property	Population loss to gentrified areas
Rehabilitation of public space	Displacement through rent/price increase (Residential displacement)
	Pressures of displacement

2.2 Tourism Gentrification

This sub-chapter starts by exploring the process of tourism gentrification and its relation to the larger tourism debate. It then goes on to discuss the various effects of tourism gentrification, where both old and new forms of displacement are of great importance. Several forms of gentrification have been identified in line with the aforementioned rescaling of the concept. They include, among others, commercial gentrification (Cócola-Gant, 2015), tourism gentrification (Cócola-Gant, 2016, 2018; Füller & Michel, 2014; González-Pérez, 2019; Gotham, 2005; Ioannides et al., 2018; Mermet, 2017; Wachsmuth & Weisler, 2018), super-gentrification (Lees, 2003), environmental gentrification (Eckerd, 2011; Pearsall, 2012) and rural gentrification (Phillips, 2010). For example, super-gentrification entails the gentrification of an already gentrified neighbourhood, brought about by the influx of an even higher quantity of capital than previously required to gentrify (Lees, 2003; Lees et al., 2008). Special attention is given to the concept of tourism gentrification in this sub-chapter. The field of tourism gentrification has added a new realm of processes to investigate. For example, the rise of the peer-to-peer accommodation sector has led researchers to question the role of tourism as a gentrifying force. Although this development is just a small part of the discourse on tourism gentrification, the topic as a whole continues to add to gentrification literature (Guttentag, 2015; Zuk et al., 2018). In this sub-chapter, a more detailed look into the process of tourism gentrification is presented. Having considered the many intricacies of gentrification as a whole, this form of gentrification is elaborated upon as it is of substantial significance in this dissertation.

2.2.1 GENTRIFICATION BY TOURISM

In a famous case study of the Vieux Carré, a neighbourhood in New Orleans (Louisiana), Gotham created a new term in gentrification literature: tourism gentrification (Gotham, 2005). Tourism gentrification is defined as the transformation of a neighbourhood into a relatively prosperous and elite area in which entertainment and tourism venues dominate the urban fabric (Gotham, 2005). The main mechanism behind this is quite similar to the processes described in the previous sub-chapter. It is argued that the increased flow of (global) capital combined with the growth of tourism as a whole has enhanced the importance of consumption-oriented uses of residential space. As a result, lower-income residents are priced out of their neighbourhood (Gotham, 2005). These findings seem to be in accordance with the narrative of contemporary tourism as described by Williams & Lew (2014), who argue that tourism is an increasingly global phenomenon through a multitude of processes such as globalization, technical innovation in both transportation and communication industries, economic and political stability and the ever-growing popularity and ease of travel for an increasingly large number of the world's population (Williams & Lew, 2014). The growth of tourism can be characterized by an increasing amount of niche forms of tourism that each seek to cater a relatively small demand. This demand is characterized by the increased popularity and fashionability of so-called 'off-the-beaten-track' and 'authentic' experiences (Williams & Lew, 2014). Moreover, stays tend to be shorter and more frequent rather than longer and infrequent (Guttentag, 2015; Williams & Lew, 2014). These tendencies result in an increased tourist pressure in popular tourist destinations (Gutiérrez et al., 2017). It is worth noting here that Gotham (2005) rejects the notion that gentrification can be explained through the supply-demand dichotomy. Rather, he argues, the gentrification that is caused by tourism is both commercial and residential and is reflected by new connections between local institutions, the real estate industry and the global economy (Gotham, 2005; Lees et al., 2008). Gotham (2005) summarizes this argument best here:

> Gentrification is not an outcome of group preferences nor a reflection of market laws of supply and demand. One particular myth is the claim that consumer desires are forces to which capital merely reacts. Consumer taste for gentrified spaces is, instead created and marketed, and depends on the alternatives offered by powerful capitalists who are primarily interested in producing the built environment from which they can extract the highest profit (p. 1114).

The creation of a built environment intended to maximize profits is perhaps most evident in the inner cities of popular tourist destinations. It is argued that urban tourism, like many other forms of tourism, tend to locate visitors in an 'environmental bubble' (Cohen, 1972). This bubble, otherwise known as the 'tourism bubble', is described in a rather critical fashion by Williams & Lew (2014) to be:

> a protective cocoon of Western-style hotels, international cuisine, satellite television, guidebooks and helpful, multilingual couriers. These might be considered 'surrogate parents' that cushion and, as necessary, protect the tourist from harsher realities and unnecessary contacts. In such a situation, the tourist gaze is akin to gazing into a mirror. We construct tourism places to reflect ourselves, rather than the place we are visiting (p. 161).

In the context of cities, this tourism bubble generally manifests itself in historic inner-cities or, increasingly, in adjacent neighbourhoods that possess characteristics like historic architecture, high presence of minorities and cultural capital (Gotham, 2005; Huning & Novy, 2006; Lees et al., 2008; Williams & Lew, 2014). Interestingly, several authors have researched the expansion of the tourism bubble (Huning & Novy, 2006; Ioannides et al., 2018; Kagermeier & Stors, 2013). In a case study of the tourism bubble in Copenhagen, the borders of this bubble were found to be fading (Kagermeier & Stors, 2013). In a similar respect, Ioannides et al. (2018) explore the role of the sharing economy, more specifically the peer-to-peer accommodation sector, in the expansion of the tourism bubble. In their analysis of Airbnb listings in two neighbourhoods in the Dutch city of Utrecht, they observe that the supply of Airbnb listings is larger in neighbourhoods that possess neo-bohemian characteristics. Their findings suggest that in such areas, Airbnb can be seen as an instigator of tourism bubble expansion (Ioannides et al., 2018). A closer look into the consequences of this process is provided by Huning & Novy (2006), who argue that the effects of an increased influx of tourist into 'edgy' neo-bohemian neighbourhoods as they venture off the beaten track should be considered as neither good nor bad. Rather, the effects of this process are affected by: 1) the type and extent of tourism that enters a neighbourhood; 2) the institutional and regulatory context; 3) tourism planning and 4) the host communities themselves (Huning & Novy, 2006). Interestingly, Huning & Novy (2006) emphasize the potential for neighbourhood development that tourism provides. First, they argue, tourism is one of the world's biggest economies and is one of the few economic sectors that has the ability to reach declining neighbourhoods. Second, tourism development can in some cases supersede economic and physical improvement, as it has the potential to contribute to long term and sustainable regeneration (Huning & Novy, 2006).

In contrast to the positivity in the work of Huning & Novy (2006), much of the academic focus has been on the negative externalities of tourism gentrification. A frontrunner in this debate is Agustín Cócola-Gant, who extensively emphasizes the processes of displacement associated with tourism gentrification. In his work, he explores the extent to which tourism can be interpreted as a gentrifying process (Cócola-Gant, 2018). In doing so, he identified several forms of displacement that closely relate to the types of displacement described earlier (2.1.5). These various forms of displacement can be summarized by what Cócola-Gant (2016) describes as 'collective displacement', where residential life is substituted by tourism. This process, he argues, is driven by the growth of tourism and the subsequent conversion of housing and commercial establishments into amenities that solely cater visitors. He argues that this substitution causes the area to increasingly resemble the tourism bubble, not the neighbourhood the inhabitants feel connected to (Cócola-Gant, 2018). Moreover, several authors stress the fact that the seriousness of the effects caused by tourism gentrification differs from context to context (Cócola-Gant, 2018; Lees et al., 2008; Lopes et al., 2019; Phillips, 1993). The main argument here is that smaller host communities in for example rural or coastal spatial contexts are more vulnerable to relatively small increases in tourism activity (Cócola-Gant, 2018; Phillips, 1993).

To end, Cócola-Gant (2018), along with many others (Gotham, 2005; Lees et al., 2008; Powell & Spencer, 2002; Smith, 2005), rejects the notion that gentrification – or indeed tourism gentrification – is the result of a 'natural' process. Instead, it is argued that the state fuels gentrification passively through persistent inaction and, more importantly, actively by promoting gentrification as a 'positive public policy tool' (Lees et al., 2008; Powell & Spencer, 2002). Further, as described in the beginning of this sub-section, Gotham (2005) concludes that (tourism) gentrification is not the result of developments in the free market or a change in consumer behavior. Instead, he argues, in a way that closely relates to the arguments of Smith (2005), that global capital, enabled by neo-liberal urban policy, actively produces gentrified spaces for profit (Gotham, 2005). Interestingly, Cócola-Gant (2016) identifies a new actor that closely resembles the process described above: the peer-to-peer accommodation sector. In what he describes as 'the new gentrification battlefront', holiday rentals are key to tourism gentrification processes as global capital invests in residential space (Cócola-Gant, 2016). A detailed look into the role of the peer-to-peer accommodation sector as a gentrifying actor is provided in the next sub-chapter (2.3.2).

2.3 Gentrification through the sharing economy

Effectively, this theoretical framework has zoomed in from the complex issue of gentrification down to tourism gentrification and finally to gentrification through the sharing economy. In this sub-chapter, the role of the peer-to-peer accommodation sector in gentrification processes is explored. Specific attention is given to one of the most popular companies in this regard: Airbnb. First, the origin of the company is described. This eventually sheds light on a larger economic development called the 'sharing economy'. Second, the concept of gentrification through the sharing economy is clarified. Third, the growing literature on Airbnb's gentrifying properties is reviewed. Finally, a review of the literature pertaining the regulation of the peer-to-peer accommodation sector is provided, which completes the review of the theories from which this research departs.

2.3.1 AIRBNB: THE COMPANY

In 2008, Airbnb was founded by Brian Chesky and Joe Gebbia in San Francisco. They had noticed that hotels in the area were complete full due to a design conference being held in the city. Figuring they could use some extra funds to cover their rent, they hosted a website called Airbed and Breakfast, offering their home as a makeshift hotel room, with breakfast as an added bonus (Airbnb, 2019). Their idea grew into what is now one of the biggest companies in the sector: Airbnb. As stated on the website, Airbnb now brokers over two million stays per night on average, with six million listings currently spread across the globe (Airbnb, 2019). The main idea behind the company is simple: Airbnb is the middleman between individuals who have unused space and individuals who seek accommodation. The type of accommodation offered on the platform varies greatly and usually is somewhere along the line between a couch and an entire multi-room apartment (Guttentag, 2015).The benefits are widespread: the fact that the platform is internet-mediated means individuals on both sides of the transaction have access to a tremendously large group of other individuals (Guttentag, 2015). Furthermore, its informal nature promises the guest a so-called 'live like a local-experience'. In other words, the fact that one does not go to an impersonal hotel room but an actual person's home is among the main appeals of this platform (Guttentag, Smith, Potwarka, & Havitz, 2018; Lambea Llop, 2017). More importantly, Airbnb is generally cheaper than similar spaces in traditional accommodation (Guttentag et al., 2018). The company has some competitors offering the very same service, but it is by far the most prominent in the peer-to-peer accommodation sector. The growth of the peer-to-peer accommodation sector is part of a larger movement: the sharing economy. The sharing economy is a concept built on the internet-mediated exchange of goods and services between peers (Wachsmuth & Weisler, 2018). It is the peer-to-peer component that sets the sharing economy apart from more traditional industries. As such, Guttentag (2015) called for the critical consideration of the various impacts brought about by Airbnb.

2.3.2 SHARING MEANS GENTRIFYING

Considering the previously discussed notion of the peer-to-peer accommodation sector as 'the new gentrification battlefront' as proposed by Cócola-Gant (2016), it is evident that the issue is highly relevant. As such, Airbnb has recently been researched in an urban context from a variety of perspectives. They include: the spatial manifestation of Airbnb (Gutiérrez et al., 2017), the regulation of Airbnb (Gurran & Phibbs, 2017; Lambea Llop, 2017; Nieuwland & van Melik, 2018; Wegmann & Jiao, 2017), Airbnb in relation to gentrification (Cócola-Gant, 2016; Freytag & Bauder, 2018; González-Pérez, 2019; Horn & Merante, 2017; Ioannides et al., 2018; Martin, 2016; Mermet, 2017; Stors & Kagermeier, 2017; Wachsmuth & Weisler, 2018), societal, economic and physical impact of Airbnb (Blal, Singal, & Templin, 2018; Ferreri & Sanyal, 2018; Guttentag & Smith, 2017; Lee, 2016; Zuk et al., 2018), displacement (Cócola-Gant, 2015, 2016, 2018) and many more.

As previously mentioned in the discussion on tourism gentrification, short-term rentals – more specifically Airbnb – can be considered as a gentrifying force. In a similar respect, Mermet (2017) regards short-term rentals in Reykjavík from a housing market perspective. In a case study of the city, two arguments concerning the emergence of Airbnb and the local housing market are proposed. First, Airbnb is argued to create a new segment of the housing market that is specifically geared towards short-term rentals (Mermet, 2017). The crucial point here is that this new market is different from the traditional real estate market as it is focused solely on tourists, rather than locals. It is not part of the residential market, nor is it part of the second-home market (Mermet, 2017). Second, it is argued that this new short-term rental segment created by Airbnb drives a more direct form of tourism gentrification, in addition to other indirect forms like residential gentrification or commercial gentrification caused by tourism as a whole (Mermet, 2017). In other words, the market for short-term rentals created by Airbnb directly denies locals the chance to live in what was otherwise an available listing (Cócola-Gant, 2016; Mermet, 2017). The main idea behind this is simple: every property listed on Airbnb is removed from the pool of properties listed on the local real-estate market. The removal of a listing from the long-term rental market into the short-term market is explained by the existence of a rent gap. In an exploratory analysis of the city, Mermet (2017) identifies a substantial difference between potential profits in the long-term rental market and the short-term rental market (Mermet, 2017). Thus, she concludes, in the post-crisis context of Iceland, the conversion of housing into short-term rentals can be partially explained by the fact that the opportunity for profit is far greater in short-term rental markets (Mermet, 2017).

A closer look into such market dynamics is provided by Wachsmuth & Weisler (2018). By applying the rent gap theory posed by Smith (1979), they sought to explain gentrification through the sharing economy. Quite similar to the arguments of Mermet (2017), it is argued here that Airbnb has introduced a new mechanism for profit maximization in housing markets. Crucially, they denote that this new mechanism is systematic and geographically uneven, which creates a rent gap in neighbourhoods with a neo-bohemian characteristic (Wachsmuth & Weisler, 2018). Interestingly, they posit that this rent gap, created by the proliferation of the sharing economy, has two unusual traits. Firstly, very little investment is needed to enter the short-term rental market (Wachsmuth &

Weisler, 2018). In other words, very little capital is required to exploit a rent gap, which means the rent gap is profitable earlier than traditionally. This is illustrated in situation B of Figure 1. Secondly, the rent gap can, in close resemblance of the peer-to-peer accommodation sector as a whole, emerge very quickly. Subsequently, the rent gap can be profitable prior to neighbourhood decline (Wachsmuth & Weisler, 2018). This notion is illustrated in situation C of Figure 1. Indeed, this notion

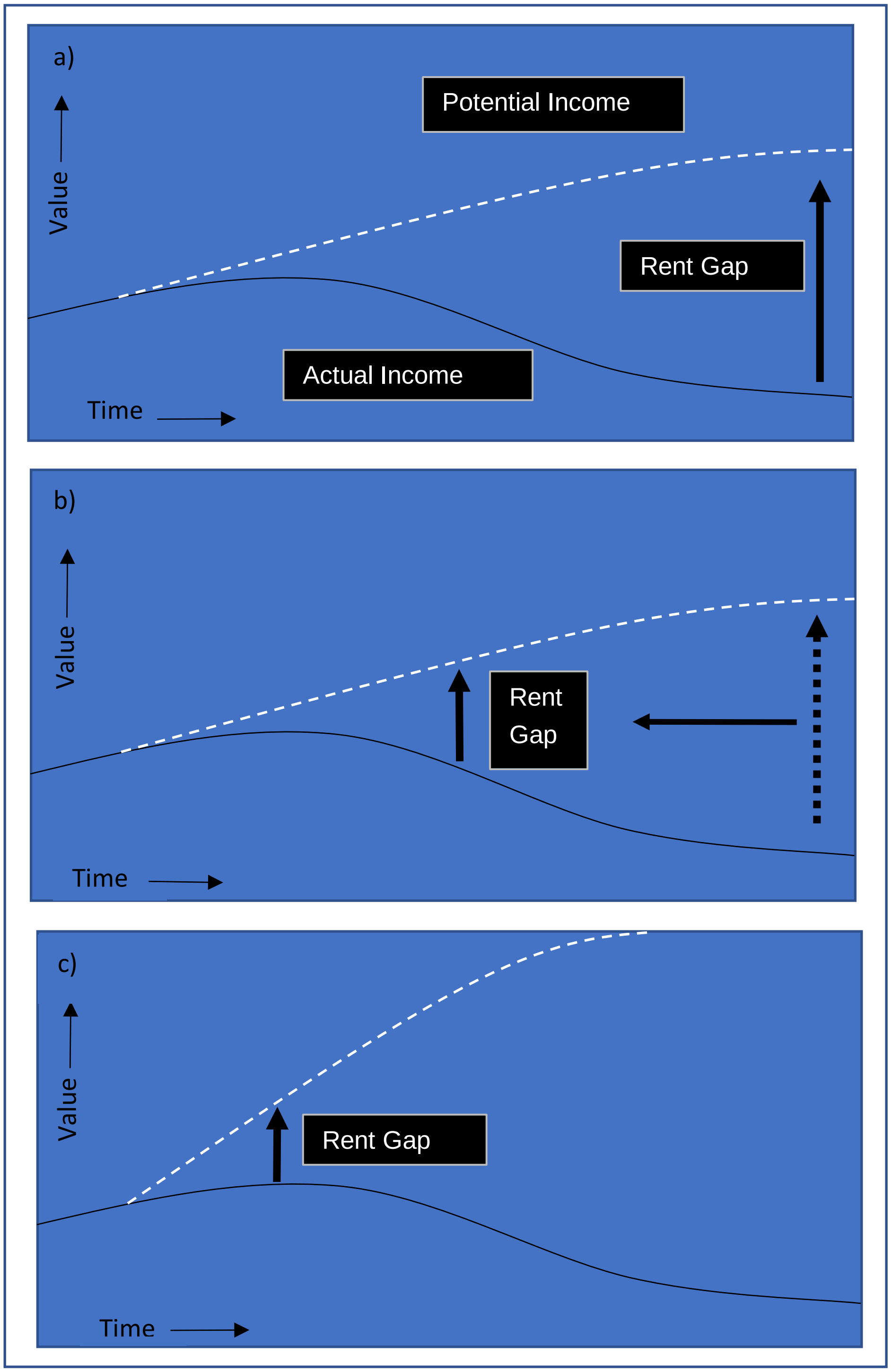

Figure 1: *Authors own processing of rent gap variations in relation to Airbnb* (after: Wachsmuth & Weisler, 2018, p. 1154)

deviates from the traditional rent gap theory as posed by Smith (1979), where the rent gap generally becomes profitable following substantial neighbourhood decline. This situation is illustrated in situation A of Figure 1. Thus, Wachsmuth & Weisler (2018) argue, the rent gap becomes profitable earlier than traditionally through the high accessibility of the short-term rental market. An overview of these variations of the rent gap is illustrated in Figure 1 above.

Notably, Wachsmuth & Weisler (2018) argue that Airbnb-induced gentrification is an example of what Hammell (1999) called 'transnational gentrification'. This process is characterized by rent gaps that are globally scaled, rather than locally (Hammel, 1999; Wachsmuth & Weisler, 2018). Subsequently, this results in locals being forced to pay prices set by a global demand (Hammel, 1999; Wachsmuth & Weisler, 2018).

Crucially, Wachsmuth & Weisler (2018) denote that Airbnb-induced gentrification is connected to certain neighbourhoods. Specifically, they argue that global demand favours the characteristics of either gentrifying or recently gentrified areas (Wachsmuth & Weisler, 2018). They describe two types of neighbourhoods: 1) areas near the city centre that are already established tourism spaces and 2) residential neighbourhoods with cultural capital, good connectivity to the inner-city and a strong presence of leisure services (Wachsmuth & Weisler, 2018). What this means is that Airbnb-induced gentrification potentially exacerbates housing pressures in gentrifying or recently gentrified areas. This has led Wachsmuth & Weisler (2018) to end with a call for further research and, more importantly, regulation.

To end, it is important to note that the role of the peer-to-peer accommodation sector in relation to gentrification as a whole is relatively small. Peer-to-peer accommodations, specifically Airbnb, are only a part of the tourist accommodation sector as a whole in urban contexts. Moreover, as outlined in the discussions above, tourism gentrification in general is only a small part of gentrification processes as a whole. Therefore, Airbnb-induced gentrification is but a small cog in a much larger machine. However, as shown in this chapter, Airbnb can be linked to many processes that closely resemble gentrification processes. As such, the critical evaluation of Airbnb in relation to gentrification is of great importance.

2.3.3 REGULATING AIRBNB

The vast majority of authors stress the importance of regulation (Ferreri & Sanyal, 2018; Gurran & Phibbs, 2017; Guttentag, 2015; Lambea Llop, 2017; Lee, 2016; Mermet, 2017; Nieuwland & van Melik, 2018; Prayag & Ozanne, 2018; Wachsmuth & Weisler, 2018; Wegmann & Jiao, 2017). Guttentag (2015) argues that Airbnb can be described as a 'disruptive innovation'. Such innovations are argued to break with the traditional way of business in a certain industry, as it challenges the notions that rule it. In fact, one of the key characteristics of a disruptive innovation (like Airbnb) is that it operates in a completely novel way (Guttentag, 2015). It is precisely this novelty factor which contributes heavily to the difficulty of regulating Airbnb (Guttentag, 2015; Nieuwland & van Melik, 2018). This is mainly caused by the fact that most attempts to regulate Airbnb are based on regulatory approaches focused on business to business or business to consumer models. Since

Airbnb operates on a peer-to-peer model, these approaches are less suitable (Guttentag, 2015; Nieuwland & van Melik, 2018). Nieuwland & van Melik (2018) identify several other difficulties. For example, regulatory frameworks targeting the 'producers' have an impact on Airbnb hosts, not the company directly. Moreover, hosts are notoriously hard to locate and control as peer-to-peer accommodation platforms maintain strict privacy laws. Finally, existing regulations are not designed for the mitigation of negative externalities caused by peer-to-peer accommodation (Nieuwland & van Melik, 2018).

In a review of short-term rental related regulations in several cities around the globe, Nieuwland & van Melik (2018) explored the various methods used by governments to control the short-term rental market. They make several distinctions between the various regulatory frameworks.

First, a distinction can be made regarding the general approach of short-term rentals. There are three main approaches: full prohibition, limitation and laissez-faire (Nieuwland & van Melik, 2018). Evidently, full prohibition entails the complete banning of short-term rentals and can therefore be considered the most aggressive approach. On the other side of the spectrum is laissez-faire. Although this approach does not entail actual regulation, some forms of policy can be identified as mostly laissez-faire, as they do not employ any restrictions. A good example of this is Milan, where the municipality (Comune di Milano) has struck a deal with Airbnb concerning the collection of taxes and the requirement of a permit. Surprisingly, this development came in 2018, three full years after the growth of Airbnb became really apparent (Airbnb, 2019). Finally, limitation is found in the middle of the spectrum (Nieuwland & van Melik, 2018).

Off all forms considered in their distinction, Nieuwland & van Melik (2018) found that limitation was the most popular approach. This approach too, can be divided into several forms of restriction. First, quantitative restrictions entail the limitation of the number of short-term rentals, the amount of tourists and the amount of time an Airbnb is allowed to be rented out per year (Nieuwland & van Melik, 2018). Second, locational restrictions aim to detain short-term rentals to a certain area (Nieuwland & van Melik, 2018). Closely relating to this is the third restriction. These are density restrictions, which aim to set a threshold on the number of short-term rentals per area (Nieuwland & van Melik, 2018). Fourth, qualitative restrictions aim to restrict certain variants of short-term rentals. For example, Airbnb offers entire apartments, but also shared accommodation. Moreover, this type of restriction is particularly effective in restricting commercialized short-term rentals (Nieuwland & van Melik, 2018).

To end, Nieuwland & van Melik (2018) found that most cities have a distinct focus on two negative effects of short-term rentals. They state that in general, cities aim to maximize the potential for capital accumulation while mitigating the negative effects of neighbourhood change and a loss in affordable housing (Nieuwland & van Melik, 2018). In line with the conclusions of Lee (2016), several authors stress that the main concern for cities should be on commercialized Airbnb's (Nieuwland & van Melik, 2018; Wegmann & Jiao, 2017). These Airbnb's are seen as investments and as such mostly surpass the off-the-beaten-track narrative that is still marketed by Airbnb (Nieuwland & van Melik, 2018). It is important to note that the development of commercialized Airbnb blocks hints at a self-destructive tendency as the live-like-a-local aspect keeps getting smaller and financial motivations proliferate

(Nieuwland & van Melik, 2018). Crucially, Wegmann & Jiao (2017) emphasize the importance of enforcement in meaningful regulation. Given the fact that Airbnb, and others like it, maintain strict privacy laws, the enforcement of newly imposed regulation can be problematic. To counteract this, it is argued that increased tourism tax returns can be used to strengthen the enforcement of new regulation (Wegmann & Jiao, 2017). Interestingly, the approaches described here only focus on the limitation of Airbnb, rather than gentrification processes as a whole.

2.4 Synthesis

In this section, the main theories and concepts outlined in this theoretical framework are summarized. This synthesis serves to create a conceptual model of the theories and concepts involved. This model is than used as a tool to guide the analysis of the intersection between Airbnb and gentrification throughout this dissertation. The conceptual model proposed here follows the same line of argument as the theoretical framework: it begins with a more general consideration of gentrification and ends with Airbnb as a gentrifying force specifically.

To begin, gentrification as a whole can be interpreted as a process that is driven by globalization and neo-liberal policies, which in turn determine 'the rules of the game' in which supply- and demand side drivers operate. Such policies are seen by Smith (2002) as part of a 'global urban strategy'. As such, the regulatory framework in a certain urban area dictates the various shapes and forms that gentrification takes. In turn, this determines what drivers of gentrification are most important. For example, neo-liberal urban policies are geared towards the encouragement of rent gap capitalization as the resulting gentrification is favorable for both developers and the local government (Lees et al., 2008). This process is fueled by residential mobility, social mobility and demographic change as these drivers are the product of a back-to-the-city movement (Hochstenbach & van Gent, 2015; Smith, 2002). The re-urbanization that follows results in the gentrification of an area. The framing of this process as either good, bad or neither can be characterized by a distinction between the emancipatory city thesis and the revanchist city thesis (Lees et al., 2008).

As a specific part of gentrification as a whole, the way tourism gentrification is shaped is therefore also mandated by neo-liberal policies and the interest of global capital. In this sense, tourism gentrification can also be seen as part of a global urban strategy (Lees et al., 2008; Smith, 2002). These frameworks bring forth the drivers of tourism gentrification, which in the case of Airbnb can be interpreted as rent gap capitalization and a growing global demand for certain urban areas that offer off-the-beaten-track experiences (Mermet, 2017; Wachsmuth & Weisler, 2018). These main two drivers create a new short-term rental market that is shaped by mediators like Airbnb (Mermet, 2017). As such, Airbnb can be interpreted as a gentrifying force, directly displacing residents through the creation of a new real estate market (Mermet, 2017; Wachsmuth & Weisler, 2018), and indirectly displacing residents through residential and commercial gentrification (Cócola-Gant, 2016;

Wachsmuth & Weisler, 2018). Thus, Airbnb-induced gentrification can be interpreted as a form of tourism gentrification, which in turn is a driver of gentrification as a whole.

As such, Airbnb-induced gentrification can be interpreted as a result of rent gap capitalization and a global demand for gentrified areas, which are in turn encouraged by neo-liberal urban policies and global investment as these larger forces have a substantial interest in the creation of spaces for profit making (Gotham, 2005; Lees et al., 2008). It is important to note here again that, as shown in this conceptualization of Airbnb-induced gentrification, the role of this form of gentrification in relation to gentrification as a whole is relatively small. Therefore, any attempt to regulate gentrification certainly needs to take Airbnb into consideration, but must also consider (tourism) gentrification processes as a whole (Gurran & Phibbs, 2017; Nieuwland & van Melik, 2018).

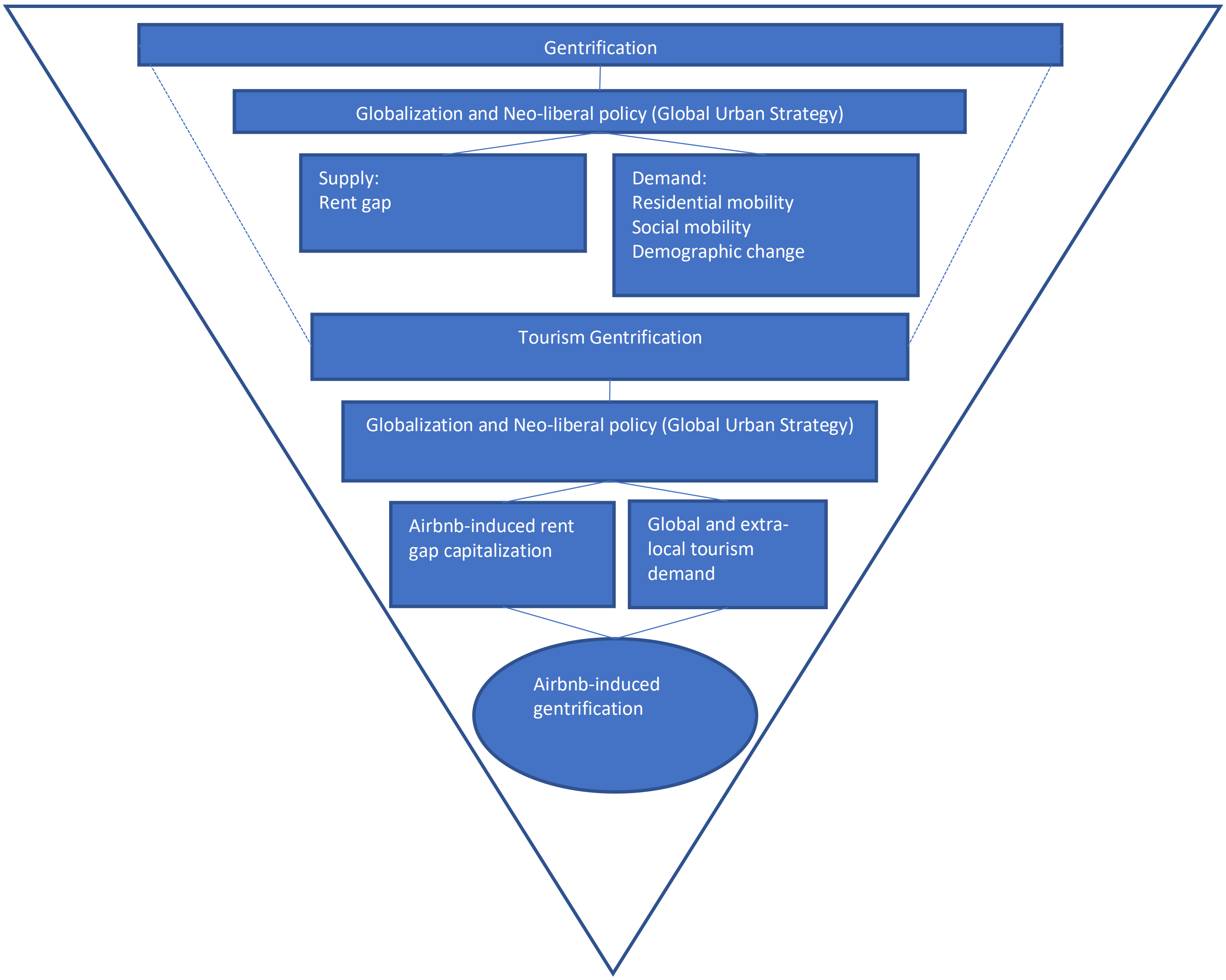

Figure 2: *A conceptualization of Airbnb's relation to gentrification processes* (source: authors own interpretation)

3. METHODOLOGY

3.1 Research approach

In this dissertation, quantitative methods are used to test whether the notion posed by Wachsmuth & Weisler (2018) applies to the city of Milan as well. To quickly recap, Wachsmuth & Weisler (2018) argued that Airbnb-induced gentrification can be characterized as 'transnational gentrification'. Crucially, they further stated that Airbnb activity is likely to be connected to gentrifying or recently gentrified neighbourhoods (Wachsmuth & Weisler, 2018). To test this notion, the intersection between gentrification in Milanese neighbourhoods and Airbnb is explored using quantitative methods.

Considering the main question, both in terms of the scale of analysis and the nature of the question, quantitative methodology offers the most reliable approach. More specifically, the aim of this dissertation is to test to what extent Airbnb and gentrification intersect in Milan. As such, a quantitative methodology is argued to be the most appropriate, as this methodology allows for the statistical and spatial consideration of the intersection between gentrification and relative Airbnb presence. Further, a quantitative methodology provides statistical evidence which can be used to critically evaluate the role of the peer-to-peer accommodation sector in gentrification. Thus, this methodology offers a solid empirical approach to the formulation of regulations on the issue of (tourism) gentrification and Airbnb. However, this methodology does come with several drawbacks. For example, a causal relationship between Airbnb and gentrification cannot be identified as the type of analysis used in this dissertation explores the existence of a linear relationship between Airbnb and gentrification, rather than a causal relationship. Further, unfortunate limitations in the datasets gathered do not allow for the measurement of displacement. These limitations are mainly of a temporal nature. In other words, to accurately measure displacement, one needs data from at least two points in recent history to compare the growth the short-term rental market as opposed to the development of the real estate market. Sadly, this data was not available for the case study of Milan. In addition, Wachsmuth & Weisler (2018) correctly argue that the direct measurement of displacement is best done through extensive qualitative research. Nevertheless, some conclusions in this respect can be carefully drawn from previous studies into the same subject. Moreover, the use of quantitative methods denies the opportunity to consider various relevant underlying processes in the context of (tourism) gentrification. They include, among others: power relations, institutional connections, sense of place and global demand.

To test the extent to which active Airbnb listings and gentrification in the Milanese context intersect, a multiple linear regression was conducted. To this end, various datasets have been acquired and combined to form a multi criteria evaluation method of assessing gentrification processes (Diappi, Bolchi, & Gaeta, 2013). More specifically, to approach relative Airbnb presence, data on Airbnb listings on a neighbourhood level were gathered. Further, to approach gentrification in Milan, data on several topics were gathered, including: demographic change, social mobility, residential mobility, real estate price development and building characteristics. These topics are then combined to form a 'gentrification index'. The methodology on approaching gentrification in Milan through a gentrification index is in accordance with previous studies of gentrification processes in the city (Diappi et al., 2013; Giorgetta, 2016). Additionally, three independent variables used in a study by Ioannides et al. (2018) have been added to the regression models. They include; the presence of young children (<15 years old), the presence of Non-Western minorities (as a percentage of the population) and the relative presence of restaurants per neighbourhood. These variables were added for two main reasons. First, because the nature of the question answered by Ioannides et al. (2018) through their regression is similar to the question posed here, the addition of the same variables can provide interesting insight into the differences between different urban contexts. Second, the addition of these variables allows for the control of the gentrification index variable. Since the gentrification index is intended to provide a way of approaching gentrification in neighbourhoods, its robustness is can be interpreted when controlled against established variables.

In addition, an important distinction with regard to the regulation of gentrification and Airbnb can be made between active and non-active Airbnb's. Several studies suggest active and professional Airbnb's hold a greater potential for social and physical disruption as compared to non-active Airbnb's (Cócola-Gant, 2015, 2016; Gurran & Phibbs, 2017; Guttentag, 2015; Nieuwland & van Melik, 2018; Wachsmuth & Weisler, 2018). To expand on the extent of this disparity, a second multiple linear regression with regard to the relationship between non-active Airbnb's and gentrification has been performed.

3.1.1 CASE STUDY SELECTION

This dissertation aims to explore the spatial spread of Airbnb in urban contexts. More specifically, the intersection between Airbnb presence and gentrification is explored. To test the extent to which Airbnb and gentrification intersect, Milan was chosen as a case study because of its unique characteristics. Firstly, the city of Milan is a good example of a large metropolitan area in Europe. Milan has a surface of 182 km2 and a population between 1.3 and 4 million, depending on one's definition of Milan's boundaries (Comune di Milano, 2019a). Also, it is arguably the city with the most 'cosmopolitan' atmosphere in Italy. Partly because of this, parts of the city are well known to have experienced gentrification (Diappi & Bolchi, 2006; Giorgetta, 2016). Moreover, Milan is one of the most attractive historic cities in Europa. It hosts many historical landmarks like the Duomo, Castello Sforzesco, Santa Maria della Grazie – which hosts Leonardo da Vinci's famous work 'the Last Supper' – and many more. In addition, the city hosts multiple fashion weeks per year. All things considered; Milan is a popular destination for tourists. Unsurprisingly, Airbnb has quite the presence in the city. With approximately 18.000 listings inside the metropolitan area, Airbnb's can be found throughout the city (InsideAirbnb, 2019b). Furthermore, the Milanese municipality has only recently begun to take notice of peer-to-peer accommodation platforms. Especially in the case of Airbnb, little to no regulation was in place until the end of 2018 (Airbnb, 2019), leaving plenty of room for policy recommendations. Finally, the selection of Milan as a case study was deliberately done as little to no attention has yet been given to the intersection between Airbnb and gentrification in Milan, whereas gentrification has been the subject of several studies (Bernardi & Diamantini, 2018; Caselli & Ferreri, 2013; Diappi & Bolchi, 2006; Diappi et al., 2013; Giorgetta, 2016). In this sense, this dissertation can be regarded as a pioneering attempt. The absence of studies in this regard is not surprising, as the data density in Italy is somewhat low (Bernardi & Diamantini, 2018; Diappi et al., 2013). Furthermore, similar datasets can be found in multiple sources that occasionally do not match completely (Bernardi & Diamantini, 2018; Diappi et al., 2013). Nevertheless, although these limitations can lead to concessions in terms of the generalization of results, more difficult case studies should not be avoided (Clifford, Cope, Gillespie, & French, 2016).

3.2 Data sources and collection

3.2.1 DATA ON AIRBNB LISTINGS

To obtain data on Airbnb listings, an open source database called InsideAirbnb was consulted. Multiple parties provide data on Airbnb online. Previous studies by Gutiérrez et al. (2016) and Ioannides et al. (2018) for example have used data from either InsideAirbnb (www.insideairbnb.com) or AirDNA (www.airdna.com). Both data sources were proven fit for academic use in several other studies (Gurran & Phibbs, 2017; Salas-Olmedo, Moya-Gómez, García-Palomares, & Gutiérrez, 2018; Wachsmuth & Weisler, 2018). These databases are available online and use a scraping method to acquire the data. Scraping is the process of extracting data from a websites source code to create a database (Boeing & Waddell, 2017). This method will be elaborated upon later. There are several relevant differences between these two data sources. AirDNA for example adds several algorithms which filter the data for inconsistencies to their service. This also provides extra parameters which can be used for the estimation of annual turnovers (AirDNA, 2019). Conversely, the dataset provided by InsideAirbnb does not offer this type of data to the same extent. Still, InsideAirbnb is a free service and does provide certain estimates on the availability and popularity of listings. Interestingly, both of the services seem to have their own narrative**.** InsideAirbnb is very vocal about the 'downsides' of Airbnb activity in cities. The website is clearly intended to make the discussion on Airbnb more informed through the addition of data on the phenomenon. This is readily apparent in their motto: 'adding data to the debate' (InsideAirbnb, 2019a). Conversely, AirDNA can be seen as a promoter of Airbnb activity, focusing on the other side of the debate. AirDNA provides datasets to individuals or companies looking to invest in real estate. The product they deliver therefore is more geared towards informed investment. Furthermore, several differences are evident between these two services in terms of data quality. Using previous studies as a guideline, it is concluded that data provided by AirDNA seems to be completer and more thorough (Gutiérrez et al., 2017; Ioannides et al., 2018). Specifically, AirDNA datasets offer a substantial temporal component, whereas InsideAirbnb datasets do not. Additionally, AirDNA datasets are filtered more thoroughly for errors and outliers. As a result, the data provided by AirDNA tends to be more robust. Both datasets have the downside of a slight spatial inaccuracy. Airbnb never shows exact locations of listings until a booking to safeguard its hosts privacy (Airbnb, 2016).

Owing to capacity constrains associated with a dissertation combined with only slight disadvantages in terms of data quality of using InsideAirbnb compared to AirDNA, the decision was made to use the data supplied by InsideAirbnb (InsideAirbnb, 2019b). This service offers multiple datasets (i.e. different dates of data collection) per city. The data collection by InsideAirbnb generally takes place every other month. The data used here was collected by InsideAirbnb on the 11th of April, 2019 and downloaded on the 15th of April, 2019. This fact has certain consequences. As the dataset used here is derived from a single moment in time in which InsideAirbnb scraped Airbnb, this dataset does not have a temporal component. Therefore, the volatility of the data cannot be accounted for. In other words, sudden spikes or dips in Airbnb activity before or after the moment of acquisition are not accounted for. As a result, a generalized illustration of yearly Airbnb activity cannot be made with this dataset. Nevertheless, several interesting studies have used datasets obtained from InsideAirbnb (González-Pérez, 2019; Gutiérrez et al., 2017; Mermet, 2017; Oskam & Boswijk, 2016; Yrigoy, 2016). Following these examples, this dataset is used in this dissertation as well.

The raw dataset used contains 18.359 listings. The dataset is comprised of detailed listing information (room type, availability, review information, etcetera). This data was transformed into a relative indicator of Airbnb presence per neighbourhood. This was done through the exclusion of cases outside of the Milan proper area (i.e. outside of the Comune di Milano jurisdiction). Subsequently, a filter was applied to isolate 'active' Airbnb's. Several studies suggest active Airbnb's hold a greater potential for social and physical disruption (Cócola-Gant, 2015, 2016; Gurran & Phibbs, 2017; Guttentag, 2015; Nieuwland & van Melik, 2018; Wachsmuth & Weisler, 2018). Therefore, the distinction between active and non-active Airbnb's in relation to gentrification is important in terms of regulation (Lee, 2016).

To distinguish between active and non-active Airbnb's, a filtration methodology based on the implementation of the San Francisco Model provided on the InsideAirbnb website was used (InsideAirbnb, 2019a). This model can be used to calculate certain estimates based on basic listing information. A full description of the calculations is available on the website (see InsideAirbnb, 2019a). In line with the San Francisco Model, active Airbnb's are listings that are:

1) an entire home/apartment
2) booked frequently (estimated nights per year is higher than 60),
3) booked recently (booked within the last six months),
4) highly available (available more than 60 nights per year).

After the filter was applied, 5052 active Airbnb's were aggregated to the neighbourhood level (NIL-scale) using a spatial join operation. The final variable entails the number of Active Airbnb's per 100 households per neighbourhood. Evidently, the same methodology was applied to extract non-active Airbnb listings from the dataset. The total number of non-active Airbnb's considered in this analysis is 13.307. All spatial operations have been performed with ArcGIS 10.5.

3.2.3 NEIGHBOURHOOD CHARACTERISTICS

To explore the relationship between relative Airbnb presence and gentrification processes, the variable described above is linked to data on gentrification processes on the neighbourhood level. To this end, census data is the most appropriate. Data on neighbourhood characteristics were collected from multiple online sources (see Table 2). Census data was downloaded from two open data portals hosted by the Milanese municipality: Comune di Milano Portale Open Data (Comune di Milano, 2019a) and SISI, otherwise known as Sistema Statistico Integrato (SISI, 2019). These datasets are comprised of the most recent census data in Milan. This census was conducted in 2011. Implications concerning these relatively outdated datasets are elaborated upon in section 3.2.6. The 2011 census divided Milan into 88 census blocks, or NILs (Nuclei d'Identita Locale). These sections closely resemble Milanese neighbourhoods. Neighbourhoods with a population density lower than three thousand inhabitants per square kilometer have been omitted. The reasoning behind this is that although gentrification is technically possible in neighbourhoods with low population densities, most (if not all) clear cases of gentrification are manifested closer to the city center where population densities are generally higher (Diappi & Bolchi, 2006; Giorgetta, 2016; Lee, 2016; Wachsmuth & Weisler, 2018). Furthermore, neighbourhoods that are situated closer to the city centre are more relevant in the exploration of the intersection between gentrification and Airbnb because the tourism bubble in tourist historic cities are argued to be strongly connected to a centrality measure (Ioannides et al., 2018). In addition, this way of discerning omits census blocks that (largely) include parks, marshalling yards and urban wastelands. Therefore, neighbourhoods with a low population density have not been considered. This choice has downsides, as for example interesting outliers could be omitted.

Table 2: *an overview of the collection and transformation of data on neighbourhood characteristics*

Source	Mode of acquisition	Data type	Data transformation	Final variable
Census 2011 (Comune di Milano open data)	Download	Polygon	Neighbourhoods with a population density lower than 3000 inhabitants per square kilometer were omitted	Neighbourhood polygons
Census 2011 (Comune di Milano open data)	Download	Numerical	N.A.	Percentage of inhabitants that are children under the age of 14 per neighbourhood
Census 2011 (Comune di Milano open data)	Download	Numerical	N.A.	Percentage of inhabitants that are non-Western foreigners per neighbourhood
Tripadvisor	Scraping	Point	Points were aggregated to the neighbourhood level (spatial join operation)	Number of restaurants per 100 households

Additionally, three independent variables used in a study by Ioannides et al. (2018) have been added to the consideration. They include; the presence of young children (<14 years old), the presence of Non-Western minorities (as a percentage of the population) and the relative presence of restaurants per neighbourhood. These variables were added for several reasons. First, because the nature of the question answered by Ioannides et al. (2018) through their regression is similar to the question posed in this dissertation, the addition of the same variables can provide interesting insight into the differences between different urban contexts. Second, the addition of these variables allows for the control of the gentrification index variable. Since the gentrification index is intended to provide a way of approaching gentrification in neighbourhoods, its robustness is can be interpreted when controlled against established variables. Third, Ioannides et al. (2018) argue that these variables are valuable additions to the explanation of the distribution of Airbnb throughout the urban landscape. As these variables are not covered by the gentrification index as formulated by Diappi, Bolchi and Gaeta (2013), their addition to the consideration could result in valuable insights.

The method of data collection concerning the number of restaurants is outlined hereUsing a method called scraping, a variable on the relative presence of restaurants was created. A web scraper is a program designed to find relevant data on a web page, after which it extracts said data and saves it in a specified way (Boeing & Waddell, 2017). The dataset used in this dissertation was scraped from Tripadvisor on the 6th of January 2019 (Tripadvisor, 2019). Tripadvisor is one of the most extensive sources on restaurants. For this reason, it has been used in a similar methodology to produce interesting notions by previous studies (Salas-Olmedo et al., 2018; van der Zee, Bertocchi, & Janusz, 2016). Therefore, Tripadvisor was identified as a reliable source for data on restaurant locations. This method is especially useful in cases where the desired dataset does not exist or is incomplete, redundant or otherwise unhelpful. It is important to note that discussions on legality and fairness regarding the use of scraping in academics are still ongoing. However, following the examples of previous publications, the use of scraping in this instance is justified by the following considerations. First, the fact that the acquired dataset is not obtained for commercial redistribution. Second, the acquired dataset does not contain personal information such as names, photographic material or otherwise private content. Third, the original data from the source (Tripadvisor) is known as 'User Generated Content'. This means that the can be considered part of the public domain and is not copyrighted (Boeing & Waddell, 2017; van der Zee et al., 2016). For more detailed information on the use of scraping in spatial sciences, see Boeing and Waddell (2017).

3.2.4 GENTRIFICATION INDEX

It is important to state that the idea to create a gentrification index in the Milanese context is not new. Several publications have used this method to approach gentrification processes in Milanese neighbourhoods (Diappi & Bolchi, 2006; Diappi et al., 2013; Giorgetta, 2016). Importantly, the use of a similar methodology serves an additional purpose. The index was recently recalculated on a different administrative scale by Giorgetta (2016). This dissertation serves as an update of these works while simultaneously adding to it with the link to tourism gentrification and Airbnb. For these reasons, a similar methodology is applied here.

Table 3: *An overview of the variables used to calculate the gentrification index* (after: Diappi, Bolchi and Gaeta, 2013; Giorgetta, 2016)

Characteristic	Calculation
Demographic turnover	$\frac{\sum_{2004}^{2011} Entries - \sum_{2004}^{2011} Removals}{Total\ Residents\ (2004)}$
Graduates development	$\frac{Graduates\ (2011) - Graduates\ (2001)}{Graduates\ (2001)}$
Property value development	$\frac{Combined\ property\ values\ (2011) - Combined\ property\ values\ (2001)}{Combined\ property\ values\ (2001)}$
Tenures	Percentage of rented housing per neighbourhood in 2011
Distance to city centre (Duomo cathedral)	Distance to the city centre from the centroid of the neighbourhood in meters
Buildings <1919	Percentage of buildings older than 1919 per neighbourhood in 2011

The gentrification index is calculated through the ranking of neighbourhood characteristics associated with gentrification processes. For a detailed overview of the calculations and characteristics, see Table 3. An explanation of the creation of a gentrification index using the methodology as proposed by Diappi, Bolchi and Gaeta (2013) is provided here.

The gentrification index is an index composed of several indicators used to approach gentrification characteristics in Milanese neighbourhoods. Specifically, Diappi, Bolchi and Gaeta (2013) argue for the use of the following variables: 1) demographic turnover, 2) professional turnover, 3) distance from the city centre (defined as the Duomo cathedral), 4) presence of old residential buildings, 5) trend of residential property value and 6) tenure change from rental to ownership. These indicators relate closely to the ideas outlined in the theoretical framework of this dissertation. For example, Smith (1987) argued for the use of residential property value trends in the absence of more precise data to approach emergent rent gaps (Smith, 1987). Also, tenure change from rental to ownership is used by many researchers as an indicator of gentrification processes in neighbourhoods (Cócola-Gant, 2016; Mermet, 2017; Wachsmuth & Weisler, 2018). Moreover, demand-side drivers of gentrification like residential mobility, social mobility and demographic change can be identified through the indicators demographic turnover and professional turnover (Hochstenbach & van Gent, 2015). Finally, centrality and the presence of old residential buildings are used as exclusionary indicators of gentrification, as gentrification is generally associated with a distance decay effect and the re-development of older buildings. In other words, without the presence of older buildings with close adjacency to the city centre, gentrification is argued to be less likely (Diappi et al., 2013).

It is important to note here that several variables used to create a gentrification index in this dissertation differ from the description above. Specifically, data on professional turnover was not renewed in the latest census. Therefore, this variable could not be included in this update of the gentrification index. In a similar way, data on the transformation of tenures from rentals to ownership was also not included in the latest census. Nevertheless, the percentage of tenures in a neighbourhood does say something about the composition of housing (Mermet, 2017; Smith, 1987; Wachsmuth & Weisler, 2018). Table 3 provides an overview of the indicators used in the creation of a gentrification index in this dissertation. These were chosen for they have the closest resemblance to the original formulation of the gentrification index by Diappi, Bolchi and Gaeta (2013).

The census of Milan used in this study consists of 88 neighbourhoods. As described earlier, neighbourhoods with a low population density have been omitted. After this filtration, 64 neighbourhoods remained. The gentrification index is calculated as follows. Each indicator can be regarded as a proxy with regard to the state of gentrification. As such, areas are sorted by their value per indicator. Subsequently, their ordinal positions are converted into ranks. For example, a neighbourhood that scored highest on residential property value increase received the rank of 64. Finally, all the ranks are summed to arrive at a gentrification index per neighbourhood.(Diappi et al., 2013; Giorgetta, 2016)

The data used in the creation of this gentrification index were sourced from SISI, the census of both 2001 and 2011 (Comune di Milano) and the OSMI dataset built by the Borsa di Immobilari. The dataset on property values (OSMI) in Milan was provided by Fabio Manfredini of Politecnico di Milano. He, among others, devised a way of overcoming the differences in measurement scale between the census data, which is measured on the NIL scale, and the property value data, which is measured on the OSMI scale by the Borsa Immobilari. The calculation of the distance from neighbourhood centroids to the city centre was performed with ArcGIS 10.5.

3.3 Data analysis

To test the intersection between gentrification and the relative presence of active and non-active Airbnb's on the neighbourhood level, two multiple linear regressions were performed. This method is especially useful to test the linear connection between multiple independent variables and one dependent variable (Clifford et al., 2016). The regression model is built as follows. The gentrification index, the presence of young children (<14 years old), the presence of Non-Western minorities and the presence of restaurants are the independent variables that are expected to relate to the dependent variable, which is the relative presence of active Airbnb's per neighbourhood. Evidently, the same model applies for the testing of non-active Airbnb's per neighbourhood against indicators. The regression models were performed after testing for all assumptions (Clifford et al., 2016). Most importantly, no multicollinearity was identified in the review of the correlation matrix. All spatial operations in this dissertation were performed through GIS software (ArcGIS Desktop 10.5) created by ESRI. Statistical analysis was performed with SPSS.

3.4 Reflection on data quality

Several points concerning data quality have to be made. First, as mentioned before, Airbnb listing data is not completely accurate. Spatial inconsistencies in the dataset as a result of Airbnb's privacy policy generally lie between ten and fifty meters. Airbnb data was supplied as data points, which could therefore be considered accurate up to fifty meters. Considering the substantially larger scale of analysis (the larger neighbourhood NIL-scale), these discrepancies should not result in significant issues. Second, the most recent census data in Milan dates from 2011. The fact that this data is linked to much more recent Airbnb data needs to be considered carefully in the interpretation of the results. While unfortunate, this situation was unavoidable considering data availability. This issue however is not detrimental to the analysis, as gentrification is a process that manifests itself on a long temporal scale. Therefore, the argument can be made that there is sufficient overlap between the indicators of gentrification used here and the relative presence of Airbnb. Third, although scraping is considered a fairly thorough method, the possibility exists that some cases did not make it into the dataset. Nevertheless, the scraped data can be considered as representative at the very least.

4. RESULTS

In this chapter, the results of the analysis described in the previous chapter on Methodology are outlined. This chapter is a factual account of the findings. A detailed discussion of these findings can be found in the next chapter (Discussion, 5). First, the spatial spread of Airbnb across the city of Milan are elaborated upon. Second, the outcome of the creation of a gentrification index are mentioned. Third, the results of two multiple linear regressions are outlined.

To begin, the spatial spread of Airbnb throughout the city of Milan is characterized by high levels of active Airbnb's presence in the center of the city. A visualization of the relative presence of active Airbnb's is presented on the left in figure 3 below. Moreover, a distinct distance-decay effect can be observed, as the presence of active Airbnb's gradually dissipates towards the outskirts of Milan. In addition, a concentric pattern can be observed. Airbnb presence becomes gradually lower as one moves away from the center. Interestingly, the boundaries between the various decreasing densities are mostly circular and seem to follow the concentric roads around the centre of the city. Most interestingly, this pattern is only broken by the fact that high levels of Airbnb presence per neighbourhood seems to be following a north-east to south-west diagonal axis.

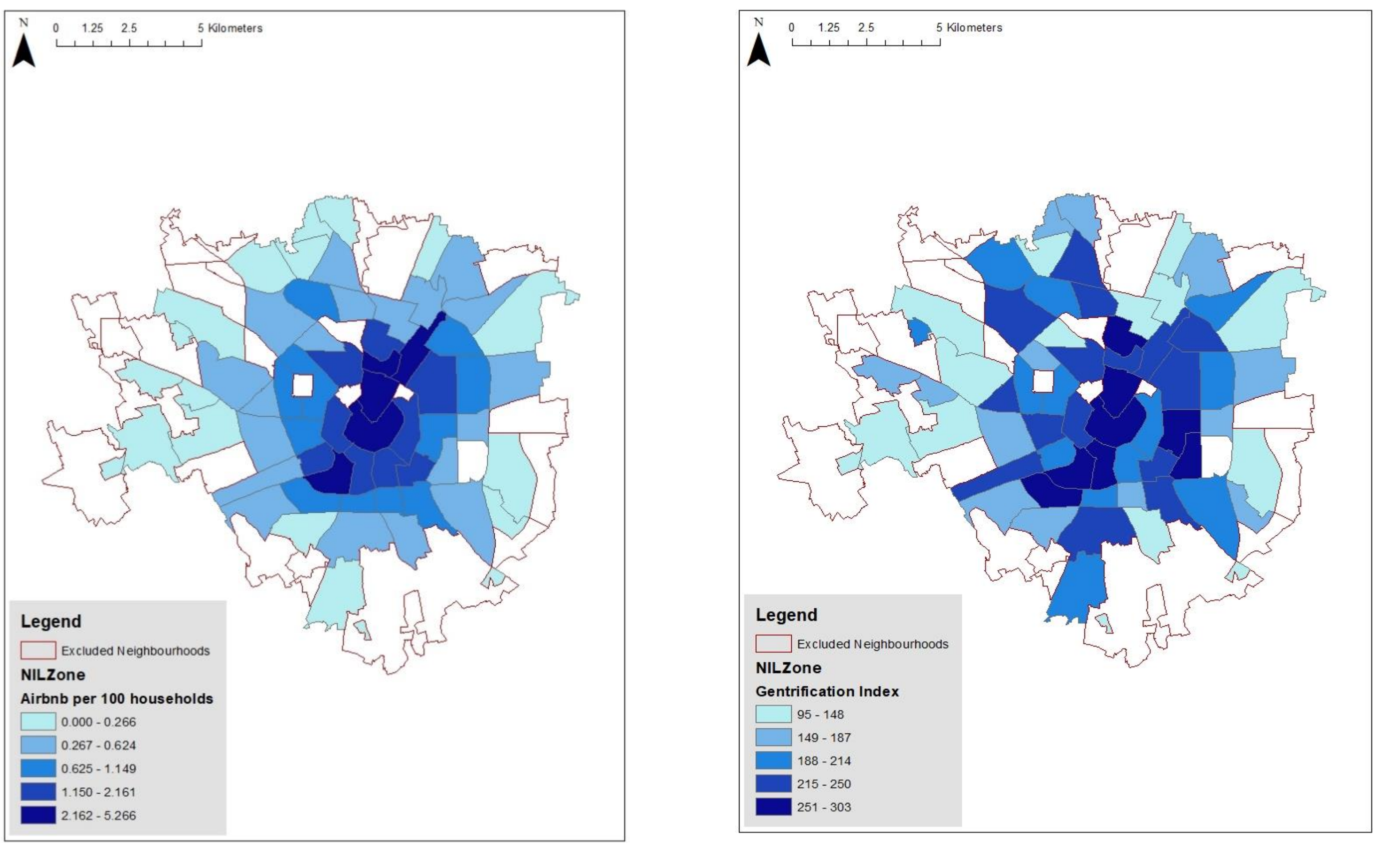

Figure 3: *A visualization of the relative presence of active Airbnb's and the gentrification index per neighbourhood*

In relation to the gentrification index, which is presented visually on the right-hand side of Figure 3, there seems to be an overlap between the spatial manifestation of neighbourhoods with a high gentrification index score and a relatively high presence of Airbnb. This is particularly true for the most central neighbourhoods. Importantly though, several differences can also be identified. For instance, there seems to be less of a distance decay effect with regard to gentrification, as several neighbourhoods score relatively high even though their location is quite far away from the city centre. This is true for some neighbourhoods in the north as well as the south of Milan. Moreover, the decline of the gentrification index score towards the outskirts of the city appears to be much less smooth as compared to the obvious distance decay effect that is observed in the relative presence of Airbnb. In other words, the gentrification index score does not gradually decline as the distance to the city centre increases. Rather, some neighbourhoods are substantially farther from the city center as compared to other present higher gentrification index scores.

A deeper look into the distribution of the gentrification index shows, unsurprisingly, high scores in the city centre. More importantly however, neighbourhoods surrounding the city centre, bordered by the former Spanish wall, also display relatively high gentrification index scores. In other words, high gentrification index scores have been found around the city center, following the corridor of what is now known as the 'Cerchia dei Bastioni' (the Bastion Ring). Some examples of these neighbourhoods are Navigli, Isola, Ticinese, Brera, Umbria -Molise, San Cristoforo sul Naviglio, Giambellino and Porta Romana.

Table 4: *An overview of the top fifteen highest scoring neighbourhoods*

Neighbourhood name	Gentrification Index
1. NAVIGLI	303
2. ISOLA	294
3. TICINESE	272
4. BRERA	268
5. UMBRIA - MOLISE	268
6. DUOMO	265
7. S. CRISTOFORO	263
8. XXII MARZO	261
9. LORETO	250
10. PORTA ROMANA	244
11. STADERA	244
12. MAGENTA - S. VITTORE	241
13. VILLAPIZZONE	237
14. GIAMBELLINO	235
15. SCALO ROMANA	233

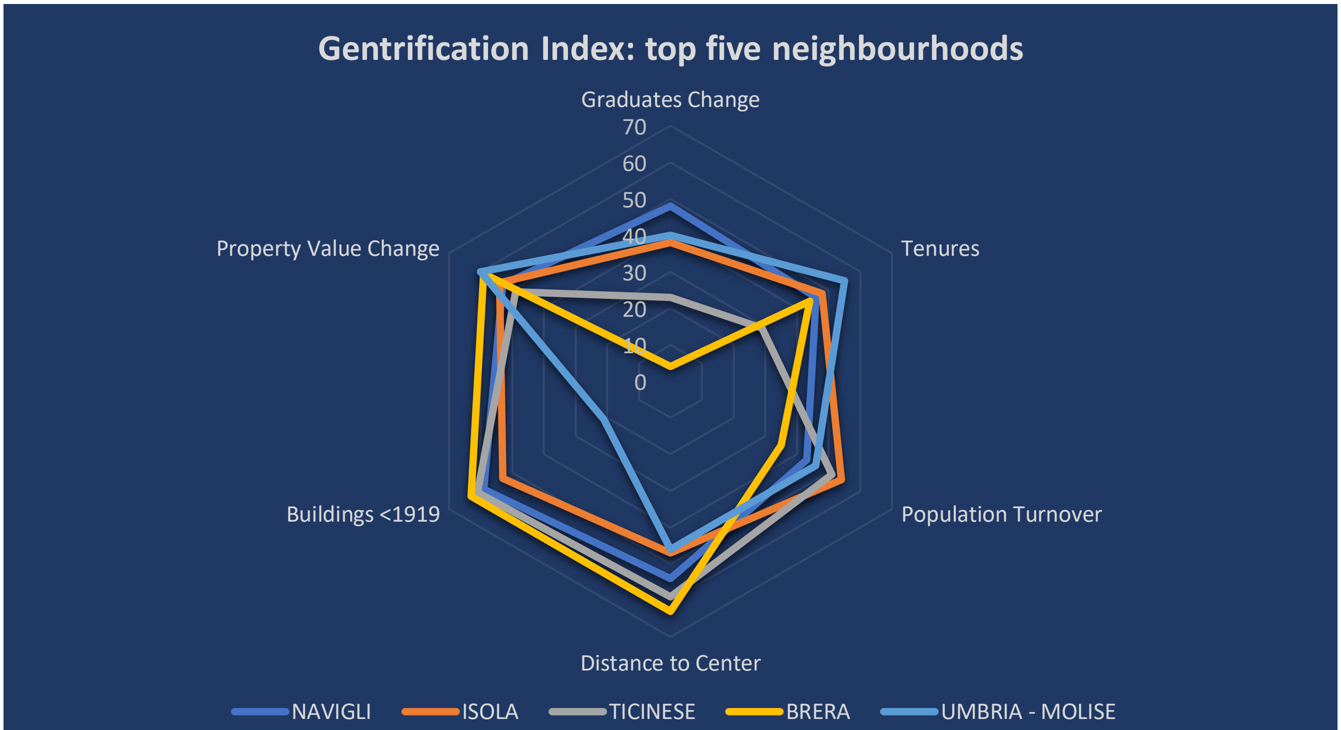

Figure 4: *A radar chart depicting the composition of the top five highest scoring neighbourhoods*

The gentrification index provided a way of approaching the uneven development of Milanese neighbourhoods. Figure 4 above shows some examples of this. In this radar chart, the composition of the gentrification index is depicted per neighbourhood. In other words, each colored line shows the score of each variable that was attributed to each neighbourhood. Each variable has a maximum score of 64, as 64 neighbourhoods have been considered in this analysis. Figure 4 displays the top five neighbourhoods with the highest total gentrification index scores. The ranking has a right to left orientation, meaning that the highest scoring neighbourhood is Navigli, while the 5th highest score is given to Umbria-Molise. For additional scores please refer to table 4. Some interesting observations can be made here. First, this representation of the gentrification index shows that high scores can be given to neighbourhoods with quite different characteristics. For example, Brera scores quite low on variables like the change in graduates, population turnover and the amount of tenures. On the other hand, Brera ranks very high on variables like distance to center, the presence of old buildings and property value trends. As such, this gentrification index points to more advanced processes of gentrification. An example of this is super-gentrification. Conversely, Umbria-Molise scores relatively low on variables like the distance to the city centre and the presence of old buildings. At the same time, this neighbourhood scores high on property value trends, graduates change and population turnover. This indicates that gentrification in Umbria-Molise has quite different underlying processes as compared to Brera.

Table 5: *An overview of a multiple linear regression on the relative presence of active Airbnb's per neighbourhood*

Independent variables	**Dependent variable:** **Relative presence of Airbnb (Number of active Airbnb's per 100 households)** **B (Beta)**
Gentrification Index	0.005 (0.247)***
Relative presence of restaurants (number of restaurants per 100 households)	0.334 (0.789)***
Presence of young children (percentage of inhabitants below 14 years old)	-0.006 (-0.014)
Presence of non-Western foreigners (percentage of inhabitants with a non-Western background)	-0.002 (-0.019)
*P<0.10, **P<0.05, ***P<0.01	Adjusted R^2 = 0.85 F(4, 57) = 88.187 N = 64

Sources: Comune di Milano (2019), SISI (2019), Borsa Immobilari (2019) and InsideAirbnb (2019).

To explore the extent of the relationship between gentrification and relative Airbnb presence, a multiple regression was run to predict the relative presence of active Airbnb's from the Gentrification Index, the relative presence of restaurants, the presence of young children and the presence of non-Western foreigners. The multiple regression model statistically significantly predicted the relative presence of Airbnb's. Not all variables statistically significantly added to the prediction (P<0.05). As shown in Table 5, the regression has an adjusted R^2 of 85%. This model indicates that linear relationships exist between the gentrification index and the relative presence of restaurants on the one hand and the relative presence of active Airbnb's on the other. Such a relationship is not identified between the presence of young children and non-Western foreigners on the one hand and the relative presence of active Airbnb's on the other.

To explore the difference between the relationship of active and non-active Airbnb presence and gentrification, a second multiple regression was conducted. Specifically, a multiple regression was run to predict the relative presence of non-active Airbnb's from the Gentrification Index, the relative presence of restaurants, the presence of young children and the presence of non-Western foreigners. The multiple regression model statistically significantly predicted the relative presence of Airbnb's. Not all variables statistically significantly added to the prediction (P<0.05). As showed in Table 6, the regression has an adjusted R^2 of 79%. This model indicates that linear relationships exist between the gentrification index and the relative presence of restaurants on the one hand and the relative presence of non-active Airbnb's on the other. Such a relationship is again not identified between the presence of young children and non-Western foreigners on the one hand and the relative presence of active Airbnb's on the other.

Table 6: *An overview of a multiple linear regression on the relative presence of non-active Airbnb's per neighbourhood*

Independent variables	**Dependent variable:** **Relative presence of Airbnb (Number of non-active Airbnb's per 100 households)** **B (Beta)**
Gentrification Index	0.014 (0.317)***
Relative presence of restaurants (number of restaurants per 100 households)	0.658 (0.707)***
Presence of young children (percentage of inhabitants below 14 years old)	-0.053 (-0.053)
Presence of non-Western foreigners (percentage of inhabitants with a non-Western background)	0.004 (0.020)
*P<0.10, **P<0.05, ***P<0.01	Adjusted R^2 = 0.79 F(4, 59) = 61,014 N = 64

Sources: Comune di Milano (2019), SISI (2019), Borsa Immobilari (2019) and InsideAirbnb (2019).

5. DISCUSSION

In this chapter, the findings outlined in the previous chapter are critically discussed. The analysis brought forth several interesting and important insights.

In relation to the spatial manifestation of Airbnb in the city of Milan, high levels of active Airbnb presence have been observed in both the inner-city and directly around it. Moreover, a distinct distance-decay effect has been observed, as the presence of active Airbnb's gradually dissipates towards the outskirts of Milan. These findings are not surprising, as they are in direct accordance with the conclusions of several authors (Diappi et al., 2013; Ioannides et al., 2018; Wachsmuth & Weisler, 2018). Furthermore, a concentric pattern has been observed as the relative presence of Airbnb declines in unison with centrality. In other words, Airbnb presence becomes gradually lower as one moves away from the centre. Interestingly, the boundaries between various levels of distance-decay seems to follow the concentric roads around the city centre. When compared with the findings of similar studies, this fact is somewhat unique (Gutiérrez et al., 2017; Ioannides et al., 2018; Mermet, 2017; Wachsmuth & Weisler, 2018). In this case, geography matters. Milan is situated on a plain, whereas cities like Barcelona, Paris and London are all dominated by geographic features that impede this pattern. More interestingly, this concentric pattern is broken by the fact that high levels of Airbnb presence per neighbourhood seem to be following a north-east to south-west diagonal axis. This can be explained by the fact that the north-east to south-west diagonal axis is one of the most efficient ways to intersect the most tourism hotspots (Comune di Milano, 2019b). Finally, the spatial manifestation of Airbnb in Milan is in close accordance with the patterns of Airbnb in other European tourist historic cities (Freytag & Bauder, 2018; Gutiérrez et al., 2017; Ioannides et al., 2018).

The creation of a gentrification index allowed for the careful consideration of various indicators of gentrification and provided a way of approaching the uneven development of Milanese neighbourhoods. The final result of this index can be seen as a confirmation of the methodology employed here, as proposed by Diappi, Bolchi & Gaeta (2013). Specifically, neighbourhoods surrounding the city centre, bordered by the former Spanish wall, were observed to display relatively high gentrification index scores. In other words, high gentrification index scores have been found not only in, but also around the city center, following the corridor of what is now known as the 'Cerchia dei Bastioni' (the Bastion Ring). The fact that the gentrification index devised here points out such patterns serves as an indication that this methodology is still capable of identifying gentrification processes, several years after it is was first used in the Milanese context (Diappi et al., 2013). Further support for the use of a gentrification index to approach gentrification processes is given by the fact that many off the well-known gentrifying areas of Milan, such as Isola, Ticinese, Navigli, Brera or Porta Romana, scored high on the gentrification index (Bernardi & Diamantini, 2018; Caselli & Ferreri, 2013; Diappi et al., 2013). Additionally, the findings suggest that the gentrification index can be used to approach different forms or stages of gentrification, as each area has a unique buildup of gentrifying characteristics (see Figure 4). However, several important factors, as illustrated in the conceptual model proposed in the theoretical framework (see Chapter 2.4), have not been taken into account in the formulation of the gentrification index and the statistical analysis of its relation to Airbnb. Specifically, encompassing forces like neo-liberal urban policy as part of a global urban strategy are not included in the gentrification index. Therefore, it is important to stress the fact that the processes measured by the index are argued to be a result of encompassing forces (Lees et al., 2008; Smith, 2002). In other words, the gentrification index is not equipped to provide a complete picture of gentrification processes, nor is it intended to (Diappi et al., 2013). Instead, it can be used, like it is in this dissertation, as a way to estimate gentrification in neighbourhoods.

To explore the extent of the relationship between gentrified areas and relative Airbnb presence as proposed by Wachsmuth & Weisler (2018), a multiple regression was run to predict the relative presence of active Airbnb's from the gentrification index, the relative presence of restaurants, the presence of young children and the presence of non-Western foreigners. The multiple regression model statistically significantly predicted the relative presence of Airbnb's. However, not all variables statistically significantly added to the prediction ($P<0.05$). As shown in Table 5, the regression has an adjusted R^2 of 85%. This is a relatively high figure in the context of spatial sciences. The same is true for the second regression of relative non-active Airbnb presence. However, a very similar methodology was used by Ioannides et al. (2018), which also resulted in a relatively high R^2: 66.2% (Ioannides et al., 2018). Thus, such numbers are not unheard of in this context.

More importantly, the relationship found between the gentrification index and relative Airbnb presence in this regression is very weak. This is especially true when compared to the much larger correlation found between the presence of restaurants and Airbnb presence. This finding further confirms the notion that the relative presence of restaurants is a very good predictor of Airbnb presence (Ioannides et al., 2018). Two reasons have been identified for the weak correlation between Airbnb presence and the gentrification index. First, the quality of the data used here was not ideal. For example, several important indicators of gentrification proposed by Diappi, Bolchi & Gaeta (2013) could not be used as the data was unavailable. Consequently, the gentrification index posited here is less reliable. Second, the extent to which Airbnb and gentrification intersect in Milan is simply not that large. The weak correlation between Airbnb presence and gentrification indicates that in Milan, Airbnb does not correlate strongly with gentrification. However, a very small linear relationship does exist. Therefore, the findings of this dissertation do suggest there is some truth to the contention of Wachsmuth & Weisler (2018) and Ioaniddes et al. (2018) that Airbnb tends to proliferate in neighbourhoods that have already gentrified or are currently gentrifying. For example, the findings posited in the previous chapter indicate a linear relationship between Airbnb presence and the gentrification index. This is true for both active and non-active Airbnb presence. This means that, according to the model, an increase in the gentrification index score leads to an increase in Airbnb presence. As such, these findings confirm the line of argument that Airbnb follows after gentrification (Ioannides et al., 2018; Wachsmuth & Weisler, 2018). Interestingly, the two variables on youth and minorities did not significantly add to the model. This points to a difference between the findings presented here and the findings of Ioannides et al. (2018), who found these same two variables to reliably predict the relative presence of Airbnb in Utrecht, among others. These differences can be partially explained by the distinct difference in geography and urban context between Milan and Utrecht. Additionally, the addition of the variables used by Ioannides et al. (2018) did provide interesting control variables.

It is important to note that in terms of regulation, the confirmation of a small connection between Airbnb and gentrification in Milan means that the small part that Airbnb plays in tourism gentrification needs to be controlled or at least closely watched. This is especially true as it is argued by several authors that Airbnb can act as an exacerbator of gentrifying pressures (Ioannides et al., 2018; Mermet, 2017; Wachsmuth & Weisler, 2018). In other words, the intersection of Airbnb and gentrification means that Airbnb-induced gentrification that can follow after gentrification could become evident in neighbourhoods that are already gentrifying or have recently been gentrified. Further, very little differences have been found between the connections of active and non-active Airbnb's to gentrification in Milan. This implies that the active Airbnb's do not correlate with gentrification to a larger extent than non-active Airbnb's. This is a direct challenge to the notions put forth by various authors that active Airbnb's should have a greater interest in profit-making (Cócola-Gant, 2016; Gutiérrez et al., 2017; Ioannides et al., 2018; Mermet, 2017; Wachsmuth & Weisler, 2018). It is important to note here that this dissertation did not consider the relationship between professional Airbnb's and gentrification. Based on the conclusions of other similar contributions in this regard, it is likely that a stronger relationship is found between professional Airbnb's and gentrification (Cócola-Gant, 2015; Ioannides et al., 2018; Mermet, 2017; Wachsmuth & Weisler, 2018). Therefore, the call for the regulation of professional Airbnb's should not be diminished on the basis of the findings presented in this dissertation. Furthermore, regulation needs to account for both Airbnb and gentrification as a whole, should it wish to combat the social injustices associated with gentrification (Lees et al., 2008). The consideration of social justice is of particular importance, as Lees et al. (2008) argue that gentrification studies should depart from a social justice agenda.

6. POLICY RECOMMENDATION

In this chapter, a policy recommendation is provided. In order to propose helpful recommendations, the situation in Milan needs to be assessed first. Historically, the process of gentrification in Milan was seen as a 'necessary evil' (Catalano, 2012). Further, gentrification was welcomed for its positive effects. As such, the impact of gentrification on Milan is historically under-valued (Catalano, 2012). As argued previously in the theoretical framework of this dissertation, gentrification can be seen as a global urban strategy. To a large extent, this is how the situation in Milan can be characterized (Catalano, 2012). More recently, the sharing economy has shed new light on gentrification in Milan. Interestingly, it is argued by Aguilera et al. (2019) that the sharing economy was framed in a very positive way in Milan. This positive framing has led the regulation of short-term rentals in the city to be very lenient (Aguilera, Artioli, & Colomb, 2019). The current regulatory framework consists of the encouragement of the sharing economy as a whole. As a result, commercial (or professional) short-term rentals are allowed, provided they have a permit and commercial taxes are paid (Aguilera et al., 2019). Evidently, lighter forms of short-term rentals that are either less active or smaller in scale are allowed as well, provided they have a permit and pay commercial taxes (Aguilera et al., 2019).

The general aim of the policy recommendation proposed here is to provide a framework in which not only the negative effects of short-term rentals but gentrification as a whole are taken into consideration. In doing so, this recommendation operates from a social justice agenda (Lees et al., 2008). The stakeholders in this regulatory framework are 1) the Comune di Milano, as the main regulatory power in the area, 2) Airbnb as a whole and its hosts and 3) local investors. Next, how does this regulatory framework work?

In line with findings by Lee (2016), Nieuwland & van Melik (2018) and Wegmann & Jiao (2018), a policy recommendation is proposed here that is focused on the elimination of commercialized Airbnb's, the effective enforcement of regulation and the preservation of residential neighbourhoods. The fact that Airbnb follows gentrification means that a truly effective policy that is aimed at the mitigation of negative effects of gentrification needs to take both Airbnb and gentrification as a whole into account. To this end, it is argued here that the Milanese government should maintain Airbnb for what it was intended to do: the temporary letting of accommodations to earn some extra cash while offering tourists an off the beaten track experience. This can be done by limiting Airbnb, imposing restrictions that counteract professional Airbnb's in mainly residential neighbourhoods. Airbnb should not be regarded as an investment opportunity (Cócola-Gant, 2016). Therefore, a hard cap on the number of listings per person/business is advised. The extent to which this measure needs to be implemented varies per neighbourhood. Regulations in this regard can use either locational or density restrictions if needed. Crucially, the restriction of short-term rentals needs to be part of a larger, intersectoral approach to gentrification externality mitigation. Specifically, this means that policy on both tourism and urban development need to be closely intertwined. The main reason for this, as outlined in the theoretical framework of this dissertation, is that neo-liberal urban policies and globalization are the main determinants of the rule of the game in which the various other drivers of gentrification operate. Short-term rentals and tourism gentrification are just two small examples of such smaller drivers and are thus directly dictated by larger urban policy. As mentioned above, the current policy framework towards gentrification as a whole as well as short-term rentals is fairly positive towards gentrification and short-term rentals. It is argued here that the restrictions outlined above combined with a broader anti-gentrification approach can be used when either the attitude or the political climate changes. Therefore, a regulatory framework needs to be broad (i.e. on a city-wide level) to cope with the various effects of gentrification as a whole and specific (i.e. on a neighbourhood level) to limit short term rentals. Thus, the main institution responsible for the creation and implementation of this framework is the Comune di Milano.

As stated by several authors, the importance of enforcement in regard to Airbnb regulation is undeniable (Gurran & Phibbs, 2017; Lambea Llop, 2017; Leshinsky & Schatz, 2018). The more specific measures aimed towards the limitation of Airbnb will likely be successful if innovative forms of enforcement are implemented. Enforcement using technology is among such innovations. As technology helped Airbnb, so can it help enforcement. For example, there is a host of publicly available data on Airbnb listings. When combined with other public data, specially developed software can pinpoint where regulations are not honored.

7. CONCLUSION

The rise of the peer-to-peer accommodation sector has led to the need of a careful consideration of the role of Airbnb in gentrification processes. In the theoretical framework, it is argued that gentrification as a whole can be interpreted as a process that is driven by globalization and neo-liberal policies, which in turn determine 'the rules of the game' in which supply- and demand side drivers operate. Such policies are seen by Smith (2002) as part of a 'global urban strategy'. As such, the regulatory framework in a certain urban area dictates the various shapes and forms that gentrification takes. More specifically, as a specific part of gentrification as a whole, the way tourism gentrification is shaped is therefore also mandated by neo-liberal policies and the interest of global capital. These frameworks bring forth the drivers of tourism gentrification, which in the case of Airbnb can be interpreted as rent gap capitalization and a growing global demand for certain urban areas that offer off-the-beaten-track experiences (Mermet, 2017; Wachsmuth & Weisler, 2018). These main two drivers create a new short-term rental market that is shaped by mediators like Airbnb (Mermet, 2017). As such, Airbnb can be interpreted as a gentrifying force, directly displacing residents through the creation of a new real estate market (Mermet, 2017; Wachsmuth & Weisler, 2018), and indirectly displacing residents through residential and commercial gentrification (Cócola-Gant, 2016; Wachsmuth & Weisler, 2018). Thus, Airbnb-induced gentrification can be interpreted as a form of tourism gentrification, which in turn is a driver of gentrification as a whole.

Subsequently, in the methodology, the argument was made that this dissertation seeks to explore the extent of the relationship between gentrification and Airbnb. Additionally, it seeks to explore the extent of the disparity between active and non-active gentrification, and seeks to recommend regulation. Because of this, a quantitative methodology was identified to be the most appropriate. Specifically, a multiple regression was run to predict the relative presence of active Airbnb's and non-active Airbnb's from a gentrification index, the relative presence of restaurants, the presence of young children and the presence of non-Western foreigners. The multiple regression model statistically significantly predicted the relative presence of Airbnb's. Not all variables statistically significantly added to the prediction ($P<0.05$). Consequently, it is concluded that gentrification and Airbnb presence intersect to a small extent. This means that, according to the findings of this study, an increase in the gentrification index score leads to an increase in Airbnb presence. As such, these findings confirm the line of argument that Airbnb follows after gentrification (Ioannides et al., 2018; Wachsmuth & Weisler, 2018). Very little differences have been found between the relations of gentrification and active and non-active gentrification. This implies that the active Airbnb's do not correlate with gentrification to a larger extent than non-active Airbnb's. However, it is important to note that the correlation between gentrification and Airbnb presence is very weak. Derived from these conclusions, a policy recommendation was proposed with specific focus on the intersectoral approach of anti-gentrification policies. In this sense, policies in terms of tourism and urban redevelopment are meant to create a regulatory framework that is broad and specific at the same time.

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