The Effect of Location Quality on Airbnb Prices: Evidence from Stockholm

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Abstract

The rise of peer-2-peer platforms in the market for short-term rental accommodations is notorious. Platforms, such as Airbnb, have become proven instigators of consumer demand in the short-term rental market. The externalities of Airbnb generally alter the socio-economic and geographic traits of urban areas, such as Stockholm. This study aims to add to the existing literature on Airbnb by endeavouring on multiple hedonic price models including location quality, accommodation characteristics, customer opinions, and host traits. The emphasis of this study lies on the effect of location quality on Airbnb listing prices. Importantly, the neighbourhood, distance to the nearest touristic amenity, and distance to the city centre have been appointed as the proxies for location quality. Similar to previous studies, this study indicates that Airbnb accommodations located in the vicinity of the city centre, or a touristic amenity, have higher listing prices. Furthermore, the results show that Airbnb hosts with low-cost Airbnb accommodations capitalize more on location quality than hosts with high-cost Airbnb accommodations and that hosts with a superhost badge solely capitalize more on location quality when their listing is located in a 0.25-kilometre radius from the city centre. Lastly, this study indicates that the superhost badge is capitalized on differently across Stockholm's neighbourhoods.

Keywords: Stockholm; Airbnb; Price; Location Quality; Superhost

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1. Introduction

1.1 Motivation

In the past decade, urban tourism has become increasingly popular (Henley, 2020; Travel2Latam, 2019). Precisely, within the paradigm of the tourism industry, the market share of urban tourism has grown from 22% in 2014 to 45% in 2018 (ITB, 2020; Travel2Latam, 2019). On a global scale, short-term rental platforms are perceived to be an instigator of urban tourism (Barker, 2020; Murphy & McCaffrey, 2020). This development can be characterized by Airbnb, which is recognized to positively affect both the decision and span of a trip for over 30% of its customers (Bernardi, 2018).

Research on the causes and consequences of urban tourism is particularly relevant for Europe, as the European Union (EU) is the world's main tourist destination (Eurostat, 2016). In 2018, urban tourism in the EU claimed a market share of 67.4%. Urban tourism tends to have a period of up to three days and mainly revolves around shopping, sightseeing, and entertainment (Bock, 2015; Smith et al., 2012). Popular amongst urban tourists is reaching activities by foot, making walkability to touristic attractions a popular prerequisite for short-term lodging (Speck, 2018; World Tourism Organization, 2019). Unsurprisingly, urban tourists tend to opt for accommodations in the city centre, where popular sights are prone to be situated (Benítez-Aurioles, 2018).

Positively, the tourist induced demand for short-stay accommodations in urban areas provides cities with economic growth (Eurostat, 2016). However, downsides such as nuisance and gentrification are infamous (Álvarez-Herranz & Macedo-Ruíz, 2021). "Gentrification", "Disneyfication", and "The Airbnb Effect", have become common notions for those living in touristic urban areas (Bernardi, 2018). As a consequence of the increased demand for short-stay accommodations, such as Airbnb, residential rents and, indirectly, housing prices increase (Barker, 2020). This is particularly challenging for cities with a housing shortage, such as Stockholm, where, in 2016, rent-controlled dwellings had 20-year long waiting lists (Savage, 2016). In such cities, residents are prone to be outpriced and forced to the peripheries (Barker, 2020). These negative trends have been grouped under the label "The Airbnb effect" (Zee, 2016). Besides nuisance and gentrification, the Airbnb effect connotes externalities in the real estate market as it shrinks both the long-term rental housing market and available housing stock (Barker, 2020).

In short, Airbnb pricing dynamics endorse the capacity to disrupt the status quo in real estate markets through gentrification, long-term housing shortages, and nuisance. A study of the effect of location quality on Airbnb prices can aid society by forming a broader understanding on Airbnb pricing dynamics, providing a tool to increase the resilience of the studied real estate market against the negative externalities of Airbnb.

1.2 Literature Review

Previous literature on the impact of location quality on Airbnb prices has shown mostly unilateral results. Chica-Olmo et al. (2020) conclude that Airbnb accommodations in Malaga have higher prices when located closer to urban amenities. Similarly, Perez-Sanchez et al. (2018) who have studied the regions of Valencia, Alicante, Castellon de la Plana, and Elche, conclude that listings located nearby or within a sightseeing area have a 15% increase in listing price and that listings located close to or within a shopping or restaurant area have listing price premium of 5%. The essence of this conclusion is supported by Zhang et al. (2017) whose research on Metro Nashville shows that a one unit increase in the Euclidian distance to the urban amenity of interest, the convention centre, decreases Airbnb listing prices by 152.4%. Cai et al. (2019) present evidence from Hong Kong and conclude that the Airbnb listing price increases by 3.05% as it gets one kilometre closer to the tourist attraction, thereby implying a smaller effect compared to the results from Zhang et al. (2017). Furthermore, according to Cai et al. (2019), proximity to the city centre and shopping area are not significant in explaining Airbnb prices. Unlike Cai et al. (2019), Wang & Nicolau (2017), who conducted a study on 33 cities, state that Airbnb listing prices decrease by 0.59% as they are located one kilometre further away from the city centre.

1.3 Research Problem Statement

From the recent literature discussed above, it can be concluded that the effect of location quality on Airbnb listing prices has not been studied for the region of Scandinavia. The importance of this conclusion is endeavoured upon later in this section. Overall, research on the drivers of Airbnb listing prices is still young which leaves out opportunities for further research (Cai et al., 2019). This study aims to measure the effect of location quality on Airbnb prices. Therefore, one research question and four sub-questions are formulated. The research question that this master's thesis intends to answer is: *What is the effect of location quality on Airbnb prices?* To answer the stated research question, four sub-questions are formulated: (1) What does the theory conclude on the effect of location quality on Airbnb prices? (2) What is the effect of location quality on Airbnb prices in Stockholm? (3) What is the effect of trustworthiness on the capitalization of location quality in Airbnb listings in Stockholm? (4) What is the effect of location quality on low-cost Airbnb listings relatively to high-cost Airbnb listings?

The first sub-question provides a theoretical grip and will be answered from the perspective of several theories. Several authors have endeavoured on the effect of location quality on Airbnb pricing, which provides opportunities to harvest theoretical insights. Furthermore, both the second, third, and fourth sub-question contribute to the academic relevance and will be answered by using the acknowledged hedonic regression model, as it allows to study location-specific qualities (Bull, 1994; Perez-Sanchez et al., 2018; Wang & Nicolau, 2017).

The contribution of this study to the existing literature can be formulated as follows. Firstly, this study presents an empirical analysis of how location quality impacts Airbnb listing prices in Stockholm. This addition can be considered relevant as the North-European real estate market differs significantly from the more researched South-European real estate market (Azevedo, 2016). Moreover, Sweden has an unpegged currency, the Swedish Krona. Considering that exchange rates can indirectly affect yields through foreign investments, Sweden's yields may be differently affected by exchange rates compared to the Eurozone (Liu & Zhang, 2013). For example, the Swedish Krona may depreciate, thereby raising the relative wealth of investors and tourists in foreign countries (Goldberg, n.d.). This increase in relative wealth may initiate both an increase in foreign investment and tourism into Sweden (Čavlek & Wanhill, 2015). Considering such developments, it is plausible that a depreciation of the Swedish Krona leads to increased investment in real estate assets for buy-to-let purposes. Therefore, Sweden offers a distinctive research opportunity within the European Union.

Secondly, this study contributes to the still limited body of literature on Airbnb pricing and responds to the call of Cai et al. (2019) for academic endeavour on Airbnb pricing (Cai et al.,2019: Perez-Sanchez et al.,2018). Thirdly, to the best of my knowledge, this study contributes to the current literature as it examines the effect of trust as a moderator in the relationship between location quality and Airbnb listing prices.

The conceptual model, depicted in Figure 1, is constructed with dependent, independent, and control variables. The dependent variable, Airbnb Price, is proxied by the Airbnb listing prices retrieved from Inside Airbnb. Inside Airbnb is a non-commercial third-party which, by scraping data from Airbnb, provides monthly data on Airbnb listings on a geographically granular scale (Inside Airbnb, n.d.). The data provided by Inside Airbnb is publicly available with the aim to complement debates on Airbnb (Inside Airbnb, n.d.) Furthermore, Inside Airbnb can be considered a trustworthy source as numerous researchers have successfully made use of their data (Arenaza, Hierro, & Patiño, 2019; Cai et al.,2019; Perez-Sanchez et al., 2018; Wang & Nicolau, 2017). The independent variable of interest, Location Quality, is constructed by two distance variables, namely 'distance to the nearest touristic attraction', 'distance to the city centre', and a neighbourhood dummy variable. Following Wang & Nicolau (2017) and Gyódi & Nawaro (2021), the distance to the nearest touristic attraction proxies the Euclidian distance of an Airbnb listing to a touristic attraction. Furthermore, following Chica-Olmo et al. (2020), the variable 'distance to the city centre' proxies the Euclidian distance of an Airbnb listing to the city centre. The construction of the Location Quality variables is viable given that Inside Airbnb provides both latitude and longitude coordinates. Following Gibbs et al. (2018) and Gyódi & Nawaro (2021) relevant touristic attractions are retrieved from Tripadvisor. The coordinates of the chosen attractions are obtained from Latitute.to. Similar to Chica-Olmo et al. (2019), the city centre has been appointed as a specific location. The coordinates of the city centre of Stockholm are retrieved from Flatlong.com. In line with the Miriam-Webster (n.d.) definition of the city centre, the coordinates provided by

Flatlong.com indicates a central location where tall buildings, stores, and offices are located. Both websites Latitute.to and Flatlong.com are publicly available.

Lastly, following the model of Chica-Olmo et al. (2020), the control variables room type, reviews per month, review score, bedrooms, bathrooms, superhost, host count, and neighbourhood are retrieved from Inside Airbnb and included in the model. Furthermore, following Hong & Yoo (2020), the variable 'listing density' is included, as their research points out the plausible influence of competitors on Airbnb listing prices. Lastly, following the model presented by Gyódi and Nawaro (2021), the variable 'accommodates' is included as their research points out the significance of the guest capacity on Airbnb listing prices. To consider the differences in prices asked by professional and private hosts, the variable 'host listing count' is included (Kwok & Xie, 2018).

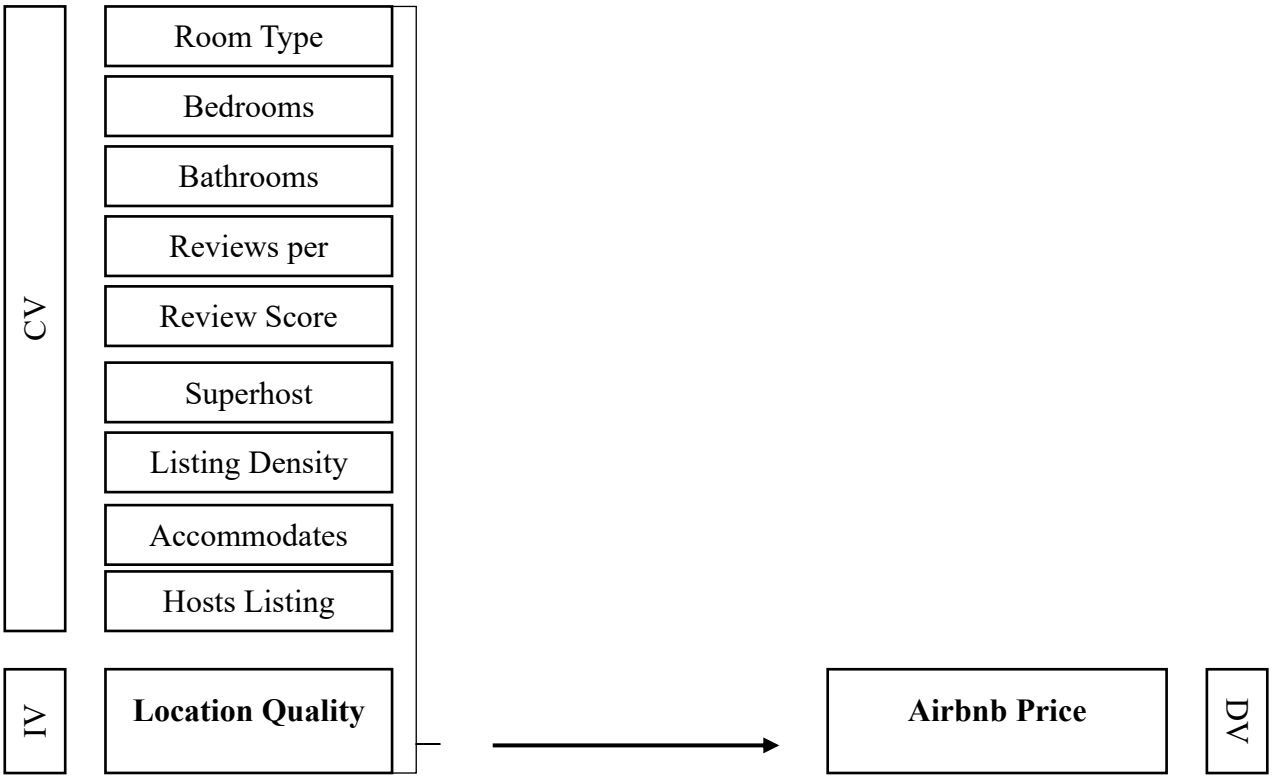

Figure 1. Conceptual model explaining the relationship between Location Quality and Airbnb Price. CV stands for control variable. IV stands for independent variable. DV stands for dependent variable.

The remainder of this paper is organized as follows. Section 2 describes the conceptual model and section 3 the empirical approach. Section 4 describes the data and the exploratory analysis, presents the results, and provides a discussion on the results presented in this master's thesis. Lastly, chapter 5 provides the conclusion.

2. A Theoretical Perspective on Location Quality

"Location is everything", is a common notion often heard by those connected to the real estate market (Weintraub, 2020; Grusin, 2000). Generally, a listing characterised by high accessibility to local amenities will be more valuable than a listing with low accessibility (Jordaan, Drost, & Makgata, 2004). Therefore, regarding Airbnb listing prices, it would be viable to assume that Airbnb listings located in the vicinity of touristic amenities have relatively higher listing prices. Unsurprisingly, there have been multiple researchers providing theoretical insights for this rule of thumb (Alonso, 1960; Blair, 1995; Evans, 1985; Isard, 1957; Von Thünen, 1826). Notably, the vitality of accessibility tends to rely upon both financial aspects, such as commuting costs, and non-financial factors, such as nuisance and community (Jordaan, Drost, & Makgata, 2004). Underlying such reasoning is one of the cornerstones of the location theory, namely the theorem that distance, or the lack of accessibility, is an instigator of costs and time consumption (Isard, 1957; Williams, 1971; Blair, 1995). In the aim to provide a theoretical conclusion on the effect of location quality on Airbnb prices, an elaboration of this theoretical introduction on location quality is presented in the following sections.

2.1 Alonso and Von Thünen

On the matter of location quality, both Von Thünen (1826) and Alonso (1960) have forwarded theoretical insights concluding that an increase in the distance to the Central Business District (CBD) would decrease the value of land. According to Von Thünen (1826), this relation is due to transportation costs. Precisely, Von Thünen (1826) argues that properties in the vicinity of the CBD experience more demand due to lower transportation costs. In line with Von Thünen (1826), Alonso (1960) presents the urban location theory, which is founded on the tenet that as distance to the CBD increases, revenue shrinks, operating costs rise, and rents moderate. Even though both the Von Thünen model and the urban location theory have been criticised for having implausible assumptions, such as a singular CBD, the overall bid-rent association can be used to provide a theoretical answer to location quality as a driver of Airbnb pricing.

Considering that popular sights are prone to be situated in the city centre and that sightseeing is one of the pillars of urban tourism, the operating costs of urban tourists are lower when having an accommodation in the city centre (Benítez-Aurioles, 2018; Bock, 2015; Smith et al., 2012). Therefore, following location theory and considering urban tourists' preference to walk to their destinations, urban tourist's demand for Airbnb accommodations in the city centre can be assumed to be higher, as less monetary and time resources are needed for sightseeing (Speck, 2018; Blair, 1995; Isard, 1957; Williams, 1971; World Tourism Organization, 2019). By definition, higher demand in a ceteris paribus

market leads to increased prices. Hence, higher Airbnb prices in the city centre, or the vicinity of touristic amenities, can be assumed from both the research of Alonso (1960) and Von Thünen (1826).

Interestingly, Zhang et al. (2011) show that accommodation rates across different tourism segments are prone to be affected by location to different extents. From their results, Zhang et al. (2011) conclude that, in New York, solely mid-and high-end segment tourists are willing to pay a premium for accommodations with high location quality. However, research performed by Yang et al. (2016), concerning the Caribbean, shows that as hotels move up in class, the capitalization of location in the room rates is lower. Therefore, the capitalization of location across different tourist segments is ambiguous. Following Zhang et al. (2011) and Yang et al. (2016), Airbnb hosts with high-end listings can be expected to capitalize on location quality differently than hosts with low-end listings,

2.2 Muth and Wilkinson

The conclusions drawn from the research of Alonso (1960) and Von Thünen (1826) find further credibility in the studies of Wilkinson (1973) and Muth (1969). Wilkinson (1973) presents a theory "of house price differentials", in which Wilkinson (1973) states that external traits of real estate, such as location, are capitalized into real estate prices. In detail, the capitalization of location quality in Airbnb prices can be determined by city-bound environmental factors like infrastructure and nuisance (John, 1998; So et al., 1997; Truong & Shimizu, 2016). A city's infrastructure quality is a determinant for both real estate prices and a tourist's preferred accommodation area. In the case that governmental disinvestment occurs in the city centre, leading to the decay of its infrastructure, location quality is reflected to a lesser extent into housing prices (Cró & Martins, 2017; Simons et al., 1998). Furthermore, in the case that peripheral areas offer higher infrastructural qualities, tourists will be more likely to find accommodation in the periphery. Consequently, modern amenities will flourish in such areas, which will increase periphery attractiveness, thereby increasing demand for real estate and by definition increase prices in the periphery while lowering prices in the city centre due to less demand (Brueckner et al., 1999; Cró & Martins, 2017; Simons et al., 1998).

The trade-off model presented by Muth (1969), argues that if travel costs are reduced by the location quality of a dwelling, rational actors will be willing to incur higher accommodation costs. The trade-off model proposed by Muth (1969) can be applied to international tourism. For example, Santos & Cincera (2018) show that low-cost carriers have an impact on tourist demand. Specifically, their research shows that a 10% increase in low-cost carrier revenue share increases tourist demand for accommodation by 1.3-1.7% (Santos & Cincera, 2018). Furthermore, Eugenio-Martin & Inchausti-Sintes (2016) show that tourists that fly with low-cost carriers tend to increase their spending at destination relative to scheduled-flight tourists.

Following Wilkingson (1973), hosts with Airbnb accommodations located in areas with good infrastructure can be anticipated to capitalize more on location quality than hosts with accommodations in areas where infrastructure is in decay. For example, Airbnb accommodations located in areas with exceptional transport infrastructure can reduce tourists' transportation and transaction costs and thereby increase the demand for Airbnb accommodations in such areas (Wilkingson, 1973; Muth, 1969). Furthermore, Airbnb hosts with accommodations located in cities reachable with low-cost carriers can be assumed to capitalize more on location quality than hosts with Airbnb accommodations that are solely reachable with full-service airlines (McDonald & Bessis, 2018; Santos & Cincera, 2018).

2.3 Brueckner and Segal

Specific to myriad cities, including Stockholm, is the central geographic location of historical amenities (Segal, 1979; Eurostat, 2016). Brueckner et al. (1999) state that modern amenities, such as restaurants and shopping areas, are often linked to historical amenities' location. Therefore, the three main pillars of urban tourism, sightseeing, shopping, and entertainment, tend to be in the city centre (Brueckner et al., 1999; Segal, 1979).

The amenity-based theory, proposed by Brueckner et al. (1999), provides further theoretical insight into how location quality is capitalized in real estate prices. Similar to multiple of the location attractiveness pillars of Segal (1979), Brueckner et al. (1999) state that accommodations located in the vicinity of historical, modern, and natural amenities will be populated by financially prosperous citizens. The cause for such allocation is that high-income citizens are inclined to provide a higher marginal value to such amenities and poses a higher disposable income. This finding is supported by Segal (1979), whose research suggests that the wealthy are willing to pay more to live in high amenity areas, and thereby form the largest group of real estate consumers in the CBD. Unsurprisingly, research points out that houses in the vicinity of historical amenities sell at a premium. Franco & Macdonald (2018) show that in Lisbon, houses located in conservation areas sell at an average premium of 4.1%. Furthermore, Lazrak et al. (2014) concluded that in the conservation area of the Zaanstad region in the Netherlands, houses are sold at premiums of 26.9%.

Hence, similar to house prices, Airbnb prices are likely to be influenced by the Airbnb accommodation's distance to both historical and modern sights (Chica-Olmo et al., 2020; Perez-Sanchez et al., 2018). Precisely, Airbnb prices can be expected to be higher when Airbnb accommodations are located in the vicinity of historical and modern sights as properties in such neighbourhoods are priced at a premium (Brueckner et al., 1999)

2.4 The General Walkability Theory & The Alonso-Muth-Mills Model

One of the cornerstones of the general walkability theory is usefulness (Speck, 2018). By usefulness, Speck (2018) entails that day-to-day endeavours are in the vicinity of an individual's dwelling and easily reached by foot. Walkability may positively affect Airbnb listings as current health trends and sustainability endeavours see demand for accommodations that feature walkability soar (Quercia et al., 2015). Besides walkability, urban tourists are known to appreciate a widespread public transport service (Franco & Macdonald, 2018; OECD, 2016). Interestingly, the main forecast of the Alonso-Muth-Mills model involves the negative effect of transportation costs on real estate prices (Glaeser, 2008).

Long et al. (2016) show that an extra minute of commuting decreases house prices by 1.9 US Dollars. Following the Alonso-Muth-Mills model, a well-organized public transport service should lower transportation costs. Consequently, tourists can be expected to opt for lower-priced peripheral accommodations, considering that time resources will not be depleted at large due to transportation (Glaeser, 2008; Franco & Macdonald, 2018). In this case, Airbnb accommodations in the city centre are likely to be listed at lower premiums.

However, expensive public transport is prone to diminish the effect of well-organized public transport on peripheral Airbnb accommodation demand (Long et al., 2016). Following the residual theory of land value, transportation costs can be concluded to influence the highest and best use residual, which ultimately is capitalized into Airbnb listing prices (Long et al., 2016). Hence, following the general walkability theory and the Alonso-Muth-Mills Model, it can be assumed that as transportation costs rise, Airbnb listings in the inner city, or in the vicinity of touristic amenities, will see higher rents.

2.5 Theory of Nuisance Law vs The Airbnb Effect

According to the "Economic Theory of Nuisance Law" proposed by Hylton (2008), homeowners can suffer considerable monetary setbacks from nuisance. However, the contrary is true for the Airbnb effect, as an increased concentration of Airbnb tourists in residential areas tends to increase housing prices even though nuisance is exacerbated (Barron, Kung, & Proserpio, 2017). Furthermore, nuisance caused by over-tourism is a known cause for residents to move from the city centre to the periphery (Zemła, 2020). Consequently, residents increase the demand for housing in the peripheral area and thereby tend to increase house prices and fuel the development of modern amenities (Zemla, 2020). However, due to the combination of nuisance in the inner city, increased local activity and modern amenities in the periphery, tourists' demand for accommodations in the periphery may rise, thereby decreasing the capitalization of vicinity to the city centre in Airbnb prices (Pizam & Mansfield, 1996; Cró & Martins, 2017).

2.6 Transaction Cost Theory

The extent to which Airbnb hosts can capitalize on location quality can be moderated by reputation indicators. Following transaction cost theory and previous research indicating that trustworthiness lowers transaction costs, it can be assumed that hosts with higher trustworthiness can capitalize more on location quality than hosts who are not labelled as such (Dyer & Chu, 2003; Williamson, 1979). This theoretical assumption finds further credibility in the research presented by Wang and Nicolau (2017), as their results show that Airbnb listing prices saw superhost induced premiums of 8.73%. The superhost label is awarded to hosts that have a minimum of 10 guests per year, have a response rate equal to or exceeding 90%, have a cancellation frequency of lower or equal to 1%, and have a 4.8 review score (Airbnb, 2021).

2.7 Theoretical Framework

The theories discussed in the previous paragraphs have been conceptualized in Figure 2, depicting the theoretical framework of this thesis. Precisely, Figure 2 includes the theories that have been examined in relation to Airbnb, the conclusion of the reviewed theories regarding how location quality may be capitalized on in Airbnb listing prices, and lastly what can be understood under the term 'location quality' accordingly.

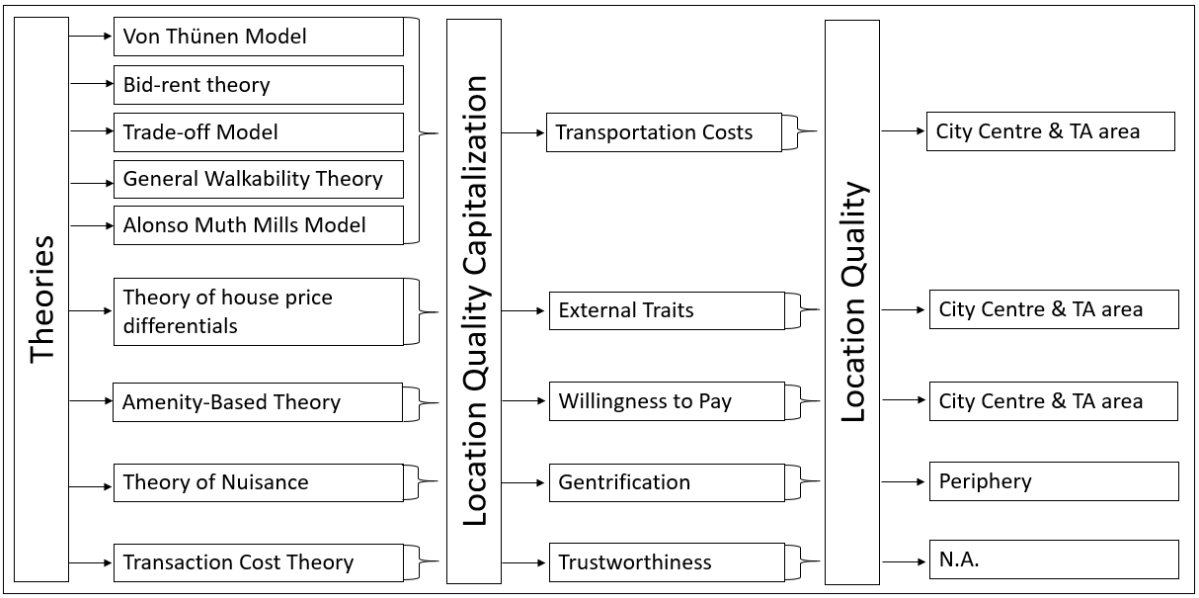

Figure 2. Theoretical Framework

Note: TA stands for Touristic Amenity. N.A. stands for not applicable.

2.8 Hypotheses

Following from the theoretical perspectives on how location quality can be capitalized on in Airbnb prices, six hypotheses are formulated.

Hypothesis *1*:

Vicinity to the city centre is positively capitalized in Airbnb listing prices.

The first hypothesis is founded on the assumption that walking is urban tourists' preferred mode of transportation. Consequently, walkability to modern and historic amenities is likely to be a determinant for Airbnb listing prices in Stockholm (Speck, 2018; World Tourism Organization, 2019). Hence, Airbnb prices are likely to be positively influenced by the Airbnb accommodation's distance to both historical and modern sights (Chica-Olmo et al., 2020; Perez-Sanchez et al., 2018).

Hypothesis *2:*

Vicinity to touristic amenities is positively capitalized in Airbnb listing prices.

The second hypothesis is constructed on the notion that, like most European cities, modern and historic amenities are situated in the city centre of Stockholm (Eurostat, 2016). Therefore, considering location theory, urban tourist's demand for accommodations in the city centre is expected to be higher as less monetary and time resources are needed for sightseeing (speck, 2018; Blair, 1995; Isard, 1957; Williams, 1971; World Tourism Organization, 2019).

Hypothesis *3:*

The positive capitalization of vicinity to touristic amenities is higher for relatively more trustworthy Airbnb hosts.

Hypothesis *4:*

The positive capitalization of vicinity to the city centre is higher for relatively more trustworthy Airbnb hosts.

The third and fourth hypotheses are based on the idea that trustworthiness lowers transaction costs. Therefore, an Airbnb host labelled as trustworthy is likely to capitalize more on location quality than an Airbnb host in a similar location without such a label.

Hypothesis *5:*

The positive capitalization of vicinity to touristic amenities is higher for relatively more expensive Airbnb listings.

Hypothesis *6:*

The positive capitalization of vicinity to the city centre is higher for relatively more expensive Airbnb listings.

Lastly, previous research provides ambiguous conclusions on the effect of different class segments on hotel room rates (Yang et al., 2016; Zhang et al., 2011). However, spatially, Stockholm resembles New York more than the Caribbean. Therefore, the fifth and sixth hypothesis are based on the results presented by Yang et al. (2016), who indicate that high-cost Airbnb listings capitalize more on location quality than low-cost Airbnb listings.

3. Methods and Data

3.1 Stockholm & Tourism

In Scandinavia, Stockholm is a front-runner in terms of tourism, accounting for 15.3 million overnight stays in 2019 (Statista Research Department, 2020). Stockholm is making considerable efforts to achieve top-notch walkability and sustainability. In 2010, Stockholm's city council approved "The walkable city", a plan which focuses on making walking safe and enjoyable, with the scope of reaching sustainability (The City Planning Administration, 2010). Furthermore, future tourism is likely to be attracted by Stockholm as Sweden plans to be a fossil-free country by 2045, thereby likely becoming the first country to reach this goal (OECD, 2021). Further incentive for tourists to visit Stockholm is derived from the city's low crime rate (Mataković & Mataković, 2019; OSAC, 2020).

The city's roots lie in the 13th century and Stockholm is known for its large and well-preserved medieval centre comprising the Stads Island, Helgeands Island, and Riddar Island neighbourhoods (Encyclopaedia Britannica, n.d.). Furthermore, Stockholm is geographically characterised by its

islands. Precisely, Stockholm is built on 14 islands and is known as the "Venice of the Nord" (Encyclopaedia Britannica, n.d.). Stockholm's urban tourism visits have more than doubled between the period 2003-2019 and on average consists of a stay of 2.7 nights in which tourists spend approximately 3.161 SEK (312 EURO) for their accommodation (Stockholm the Capital of Scandinavia, 2019). In 2019, the main attractions in Stockholm comprised the Gröna Lund, the Vasa Museum, and the Royal Palace, which together attracted over 4.5 million visitors and are all located around the city centre (Stockholm the Capital of Scandinavia, 2019). Part of the tourist growth in Stockholm is allocated to Airbnb. Even though Airbnb accounted for solely 4% of the overnight stays, Airbnb growth comprised 20% during the period 2016-2017, which relative to hotel growth is an excess of 15 percentage points (Stockholm the Capital of Scandinavia, 2018).

From a demographic perspective Stockholm is noteworthy, as the city accounted for an approximated population of 935,000, making it both the most populous city of Sweden and Scandinavia (PopulationStat, 2020). Estimations point out that 15% of Stockholm's population is foreign-born, the highest percentage of any Scandinavian city (World Population review, n.d.). Such diversity is prone to have a positive effect on tourism, as a multicultural society is prone to offer diversity to tourists (Bacsi, 2017). Furthermore, Stockholm has a population density 4,800 people per square kilometre, which in density terms places it close to Amsterdam which has a density of 4,439 people per square kilometre (Book, 2020; University College London, n.d.).

3.2 Data & Variables

The variables included in this study have been commonly used by previous researchers (Chica-Olmo et al., 2020; Gibbs et al., 2018; Teubner et al., 2017). Similar to previous research, the independent and dependent variables used to study Airbnb accommodations in Stockholm have been extracted from Inside Airbnb (Chica-Olmo et al., 2020; Wang & Nicolau, 2017). The dataset that has been extracted from Inside Airbnb contains 106 variables and a total of 8,012 observations for Stockholm on the 28th of June 2019. A limitation to the dataset used in this study is that individual accommodation rules have not been studied (e.g., no smoking, no pets). Furthermore, several accommodation amenities are not provided by Inside Airbnb and therefore have not been examined (e.g., elevator, sauna, hot tub) (Chica-Olmo et al., 2020; Gibbs et al., 2018; Wang & Nicolau, 2017). Nonetheless, this dataset does provide the coordinates for each listing, which enables the focus of this study, being the measurement of the effect of both the distance to the city centre and touristic amenity on Airbnb listing prices.

For example, in Figure 3, the relationship between Airbnb listing prices and the respective distance to the city centre and nearest touristic amenity is depicted. In Figure 3, the blue listings show the relationship between Airbnb listing prices and distance to the city centre whereas the green listings show the relationship between Airbnb listing prices and the distance to the nearest touristic amenity.

Furthermore, the purple and orange lines depict the relationships between price and distance to the city centre (CC) and touristic amenity (TA), respectively. What can be concluded from Figure 3 is that both the distance to the city centre and the distance to the nearest touristic amenity are negatively associated with Airbnb listing prices. Hence, as the distance to the city centre, or touristic amenity, increases the Airbnb listing prices decline. This implies that location quality, defined as the city centre or touristic amenity area, has a positive effect on Airbnb listing prices.

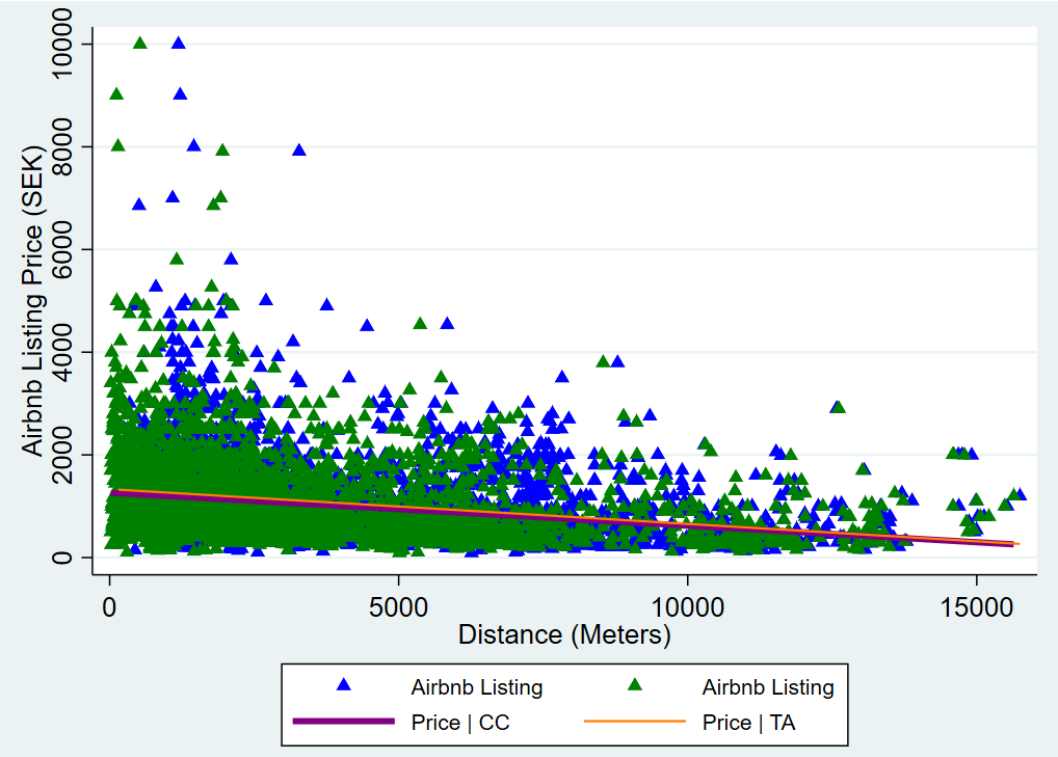

Figure 3. Airbnb Listing Prices Relative to the Airbnb's Distance to the City Centre (blue) or Distance to the Nearest Touristic Amenity (green)

Source: Inside Airbnb (n.d) & ArcGIS PRO

Note: (1) Price | CC stands for the association between Airbnb listing prices and the distance to the city centre. **(2)** Price | TA stands for the association between Airbnb listing prices and the distance to the nearest touristic amenity.

To construct the variable 'distance to the nearest touristic amenity' as a proxy of location quality, a set of touristic amenities have been appointed to study the effect of the distance to the nearest touristic amenity on Airbnb listing prices. Similar to previous researchers, the appointment of the touristic amenities is not based on theory. For example, Chica-Olmo et al. (2020) have seemingly arbitrarily appointed several amenities for their cultural and entertaining values. Furthermore, Perez-Sanchez et al. (2018) resorted to using Instasights heat maps to establish popular touristic amenities. Differently, Gyódi and Nawaro (2021) extracted popular amenities from Tripadvisor. Following Gyódi and Nawaro (2021), this study extracted information from Tripadvisor to determine popular sights. The choice for Tripadvisor follows from the fact that several previous researchers accredited credibility to

Tripadvisor's reviews and Tripadvisor's ability to determine popular sights (Chua & Banerjee, 2013; Díaz & Espino-Rodríguez, 2018). Therefore, the main touristic attractions in Stockholm have been extracted from TripAdvisor (2021). Precisely, the 10 most popular sights have been selected as such sights are most likely to be visited and thereby perceived as a location quality indicator by urban tourists. These attractions consist of the Vasa Museum, Stockholm Old Town, Stockholm City Hall, ABBA The Museum, Kungliga Djurgården, Fotografiska Stockholm, Skansen, Royal Palace, Monteliusvagen, and National Museum.

Furthermore, several control variables have been appointed, see Table 1. Various variables may need further explanation. As Airbnb is a peer-to-peer platform that largely relies on trust between tenants and landlords, trust-related variables are prone to affect listing prices (Wang & Nicolau, 2017). Therefore, the variables 'review score rating' and 'superhost' are considered. Additionally, due to spatial spillover effects, the prices of neighbouring listings may affect an Airbnb listing price (Chica-Olmo et al., 2020). Therefore, the variable 'neighbourhood' is constructed to control for spatial fixed effects. Lastly, Hong & Yoo (2020) point out that density can positively affect listing prices. To consider this relationship, the dummy variable 'listing density' has been constructed, which studies zip codes that embody over 10% of the total supply, namely Kungsholmen, Norrmalm, and Södermalm.

Table 1. Descriptive Statistics (N = 3804) | **Source**: Inside Airbnb (n.d.) & STATA

Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Price per night (SEK)	1072.844	742.880	93	9996
Location				
Listing density	.317	.465	0	1
Neighbourhood:				
Bromma	.046	.210	0	1
Enskede-Ärsta-Vantör	.077	.266	0	1
Farsta	.023	.150	0	1
Hägersten-Liljeholmen	.094	.291	0	1
Hässelby-Vällingby	.020	.139	0	1
Kungsholmen	.105	.306	0	1
Norrmalm	.127	.333	0	1
Rinkeby-Tensta	.015	.120	0	1
Skarpnäck	.044	.206	0	1
Skärholmens	.009	.097	0	1
Spanga-Tensta	.011	.102	0	1

Sodermalm	.320	.467	0	1
Älvsjö	.019	.138	0	1
Östermalm	.090	.287	0	1
Distance CC	3838.012	2837.437	146	15747
Distance nearest TA	2967.680	2793.256	19	15640
Accommodation Characteristics				
Bedrooms	1.409	1.041	0	10
Beds	2.138	1.703	0	25
Bathrooms	1.153	.380	0	5
Accommodates	3.244	1.801	1	16
Room type:	1.778	.442	0	2
Shared room	.012	.107	0	1
Private room	.198	.399	0	1
Entire home or apartment	.790	.407	0	1
Customer Opinion				
Review score rating	95.944	5.924	20	100
Host Traits				
Host listing count	2.183	5.004	1	110
Superhost	.204	.403	0	1

Note: CC stands for City Centre and TA stands for Touristic Attraction. The distance variables are listed in meters. Furthermore, the dummy variable Room Type, consists of the reference category (Shared room), 1 = Private Room, and 2 = Entire Home or Apartment.

3.3 ArcGIS & Descriptive Statistics

Common in Airbnb research is the use of spatial mapping software to depict the studied listings (Dudás et al., 2017; Garcia-Ayllon, 2018; Deboosere et al., 2019). Following Deboosere et al. (2019), Geographic Information System (GIS) methods have been utilized to provide spatial depictions of the studied Airbnb listings. In particular, the software ArcGIS PRO has been used which allows researchers to input x & y coordinates and consequently generate spatial maps of those coordinates. In Figure 4, the Airbnb listings that will be studied, the ten touristic attractions, and the city centre are depicted. From eyeballing the listings, it can be concluded that myriad listings can be found surrounding the city centre and the touristic amenities. Following Keynesian Economics, which asserts that demand shapes supply, the importance of walkability for tourists can be confirmed as the majority of the supplied accommodations are located in the vicinity of the touristic amenities (Speck, 2018). Furthermore, the spatial depiction of the location of the touristic amenities and the city centre falls in line with the work

of Benítez-Aurioles (2018), Brueckner et al. (1999) and Segal (1979), who suggest that touristic amenities tend to be located in the vicinity of the city centre.

From Table 1, which offers an overview of the descriptive statistics, it can be concluded that the average Airbnb listing price in Stockholm comprised 1073 SEK, with prices ranging from 93 SEK to 9996 SEK. Furthermore, the studied Airbnb accommodations in Stockholm tend to have 1.4 bedrooms, 2.1 beds, and 1.2 bathrooms. Importantly, an average of 3.2 persons can be accommodated per listing. The dataset differentiates between 3 types of Airbnb accommodations. Notably, 79% of the accommodations are entire homes or apartments, whereas solely 20% and 11% are private rooms and shared rooms, respectively. Regarding the opinion category, it can be concluded that on average the accommodations in Stockholm are granted a review score of 96% and that 20% of the hosts are superhosts.

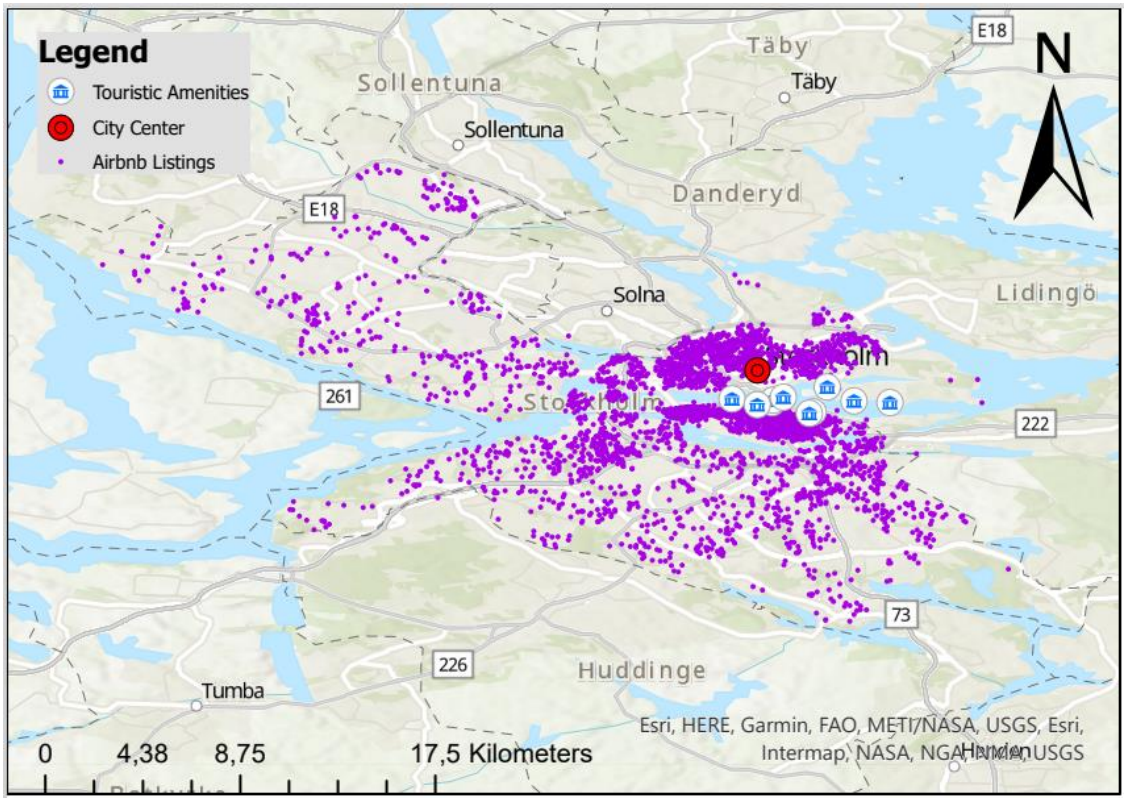

Figure 4. Airbnb Listings in Stockholm

Source: Inside Airbnb (n.d) & ArcGIS PRO

Note: In total, 3,804[1] listings are depicted in the ArcGIS map which were scraped by Inside Airbnb on June 28th, 2019.

[1] The original dataset by Inside Airbnb provided 8,012 observations. However, this dataset has been deemed unfit for empirical analysis. Therefore, several adjustments have been made. Precisely, observations with missing data regarding zip codes have been removed (477 observations deleted). Furthermore, observations missing reviews and having no recent reviews, meaning that the listing has not had one review over the period 28/06/2018 – 28/06/2019, have been removed as this study aims at considering active listings (3635 observations deleted). Moreover, 8 additional observations have been

Furthermore, the average listing count per host is 2.2 listings. From the variable 'listing density', it can be concluded that 31.7% of the listings are located in zip codes (Tract=3) that contain over 10% of the Airbnb listing supply. Moreover, 12.7% of the listings are in a popular touristic neighbourhood. The average distance of an accommodation to the city centre and the nearest touristic amenity comprises 3838 meters and 2968 meters, respectively. The minimum and maximum distance of a listing to the city centre equals 146 and 15748 meters, respectively. Additionally, the minimum and maximum distance of a listing to a touristic amenity comprises 19 and 15640 meters, correspondingly. From table 1, it can be noted that, for the sake of clarity, four categories have been added to the descriptive statistics table. Following Hong and Yoo (2020) the variables have been noted under one of four categories, being: characteristics, opinion, host traits, or location.

3.4 Methods

Following Chica-Olmo et al. (2020), this study uses hedonic price models to research the influence of location quality on Airbnb listing prices. The most extensively used method in comparable studies is the ordinary least squares method (OLS) (Chica-Olmo et al., 2020). Therefore, this study elaborates on the proposed model by employing the OLS method. Expansion on the OLS assumptions can be found in Appendix B. The researched dependent variable in this study is the Airbnb listing price. Importantly, the distance variables included in this research have been categorized in several intervals. Following Yu et al. (2017), the distance intervals have been categorized as 0 KM – 0.25 KM, 0.25KM – 0.5 KM, 0.5KM – 0.75KM, 0.75KM – 1KM. Following those intervals, the intervals 1KM – 2KM, 2KM – 3KM, 3KM – 4KM, and 4KM – 5KM are depicted.

These intervals deviate from the interval magnitude that has been used for the first four intervals to retain a sufficiently large observation base, see Appendix G. Following Hong and Yoo (2020) and Yu et al. (2017), the independent variables have been categorized as: location quality (L), accommodation characteristics (A), customer opinion (C), and Host trait (H). Consequently, several hedonic equations have been derived.

$$P = f(L, A, C, H) \quad \textbf{[1]}$$

removed due to missing data regarding accommodation traits and 88 observations have been deleted due to missing review data.

Following Yu et al. (2017), this equation will be studied empirically with several models. The baseline model is specified as:

$$\ln P_{ij} = \alpha 0 + \beta 1 Bedrooms_i + \beta 2 Beds_i + \beta 3 Bathrooms_i + \beta 4 Accommodates_i + \beta 5 Roomtype_i + \beta 6 Review\ Score\ Rating_i + \beta 7 Superhost_i + \beta 8 Host\ Listing\ Count_i + \beta 9 Airbnb\ Listing\ Density_i + \gamma_1 Neighbourhood_j + \varepsilon_{ij}$$

[2]

With

$\ln P_{ij}$	the natural logarithm of the Airbnb listing price of accommodation i in neighbourhood j;
$\alpha 0$	the constant;
$\beta 1 Bedrooms_i$	the number of bedrooms of property i;
$\beta 2 Beds_i$	the number of beds of property i;
$\beta 3 Bathrooms_i$	the number of bathrooms of property i;
$\beta 4 Accommodates_i$	the number of guests that can be accommodated at property i;
$\beta 5 Roomtype_i$	the type of accommodation (e.g., shared room (2), private room (1), entire house or apartment (0)) offered at property i;
$\beta 6 Review\ Score\ Rating_i$	the review rating of property i;
$\beta 7 Superhost_i$	indicates whether the host of property i is a superhost (1) or not (0);
$\beta 8 Host\ Listing\ Count_i$	indicates the quantity of listing managed by the host of property i;
$\beta 9 Airbnb\ Listing\ Density_i$	proxies the effect of competing listings on property i;
$\gamma_1 Neighbourhood_j$	neighbourhood fixed effects;
ε_{ij}	the error term.

The ‘Airbnb listing price’ is converted to a natural logarithm as the variable is skewed right, see Appendix A (Siegel, 2017). The baseline model, which includes neighbourhood dummies as a proxy of location quality, provides a first indication of how location quality affects Airbnb listing prices. However, the baseline model fails explain why location quality is high for a certain neighbourhood (Heyman & Sommervoll, 2019).

According to Heyman and Sommervoll (2019), in the best-case scenario, neighbourhood dummies portray the level of services in the respective neighbourhood. However, the effect that is captured may be distorted as it is prone to be propelled by a neighbourhood’s distance to certain amenities. Therefore, two distance variables have been constructed in the aim to explain the differences in location quality between neighbourhoods (Heyman & Sommervoll, 2019).

Firstly, the variable ‘Near Distance CC’ is included to study the relationship between Airbnb listing price and the distance to the city centre. Secondly, the variable ‘Near Distance CC’ is replaced by ‘Near Distance TA’, which allows for a study on the relationship between Airbnb listing price and the distance to the nearest touristic amenity. The distance variables are not run in a single model to prevent multicollinearity from distorting the effects of the explanatory variables on the explained variable (Siegel, 2017).

$$\ln P_{ij} = \alpha 0 + \beta 1 Bedrooms_i + \beta 2 Beds_i + \beta 3 Bathrooms_i + \beta 4 Accommodates_i + \beta 5 Roomtype_i + \beta 6 Review\ Score\ Rating_i + \beta 7 Superhost_i + \beta 8 Host\ Listing\ Count_i + \beta 9 Airbnb\ Listing\ Density_i + \gamma_1 Neighbourhood_j + \gamma_2 Near\ Distance\ CC_i + \varepsilon_{ij} \quad \textbf{[3]}$$

With

$\gamma_2 Near\ Distance\ CC_i$ the distance of property i to the city centre.

To study the effect that trust has on the relationship between location quality and Airbnb listing prices. Three further models have been tested. First, the interaction variable ‘Near Distance CC*Superhost’ and ‘Near Distance TA*Superhost’ have been constructed. In the model below, the equation is specified for the city centre distance measure. To study the model for the nearest touristic amenity distance measure, the city centre distance variable and the ‘Near Distance CC*Superhost’ interaction variable

are changed by the nearest touristic amenity distance variable and the 'Near Distance TA*Superhost' interaction variable.

$$\ln P_{ij} = \alpha 0 + \beta 1 Bedrooms_i + \beta 2 Beds_i + \beta 3 Bathrooms_i + \beta 4 Accommodates_i + \beta 5 Roomtype_i + \beta 6 Review\ Score\ Rating_i + \beta 7 Superhost_i + \beta 8 Host\ Listing\ Count_i + \beta 9 Airbnb\ Listing\ Density_i + \gamma_1 Neighbourhood_j + \gamma_2 Near\ Distance\ CC_i + \gamma_3\ Near\ Distance\ CC * Superhost_i + \varepsilon_{ij}$$

[4]

With

$\gamma_3\ Near\ Distance\ CC * Superhost_i$	the effect of being a superhost versus not being a superhost on the effect of the nearest distance for property i.

Lastly, the interaction variable Neighbourhood*superhost is generated, as previous research illustrates that the neighbourhood in which a property is located can serve as a proxy for location quality and added to the baseline model (Chica-Olmo, 2020; Can, 1992; Gallin, 2008).

$$\ln P_{ij} = \alpha 0 + \beta 1 Bedrooms_i + \beta 2 Beds_i + \beta 3 Bathrooms_i + \beta 4 Accommodates_i + \beta 5 Roomtype_i + \beta 6 Review\ Score\ Rating_i + \beta 7 Superhost_i + \beta 8 Host\ Listing\ Count_i + \beta 9 Airbnb\ Listing\ Density_i + \gamma_1 Neighbourhood_j + \gamma_2 Neighbourhood_j * Superhost_i + \varepsilon_{ij}$$

[5]

With

$\gamma_2 Neighbourhood_j * Superhost_i$	the effect of being a superhost versus not being a superhost on the effect of neighbourhood for property i.

4. Results & Discussion

4.1 Core Models & ArcGIS Heatmap

The results of the models formulated in the previous chapter are presented in Table 2. The baseline model (1) depicts the effect of accommodation characteristics (A), customer opinion (C), Host trait (H), and location quality (L) proxied by 'neighbourhood' on Airbnb listing price. Notably, the R-squared of the baseline model indicates that 63.7% of the variation in Airbnb listing prices can be explained by the model. This result is similar to the R-squared of model (6) which comprises 63.9% and solely adds the interaction variable 'neighbourhood*superhost' to the baseline model. The R-squared of the models including the effect of location quality (L) proxied by a distance variable is higher than that of the baseline model (1) and model (6), indicating that the models including the distance variables explain a higher percentage of the variance in Airbnb listing price. The variance in Airbnb listing price is best explained by model (3) and (5), which consider location quality as a proxy of distance to the nearest touristic amenity and explain 66.5% of the variance in the dependent variable.

In all the models, neighbourhood fixed effects are considered, the effects of Stockholm's boroughs are spatially depicted in Figure 5. From the coefficients presented in Figure 5, it can be concluded that location quality is high for the neighbourhoods located nearby the city centre and touristic amenities.

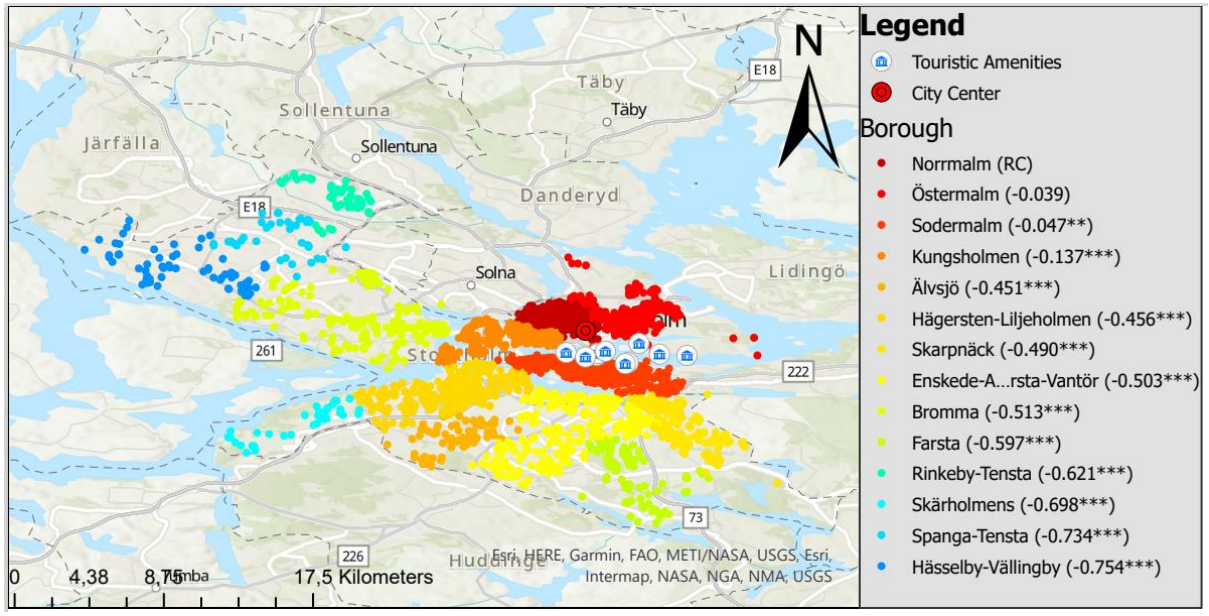

Figure 5. Heatmap Depicting the Effect of Stockholm's boroughs on Airbnb Listing Prices.

Source: Inside Airbnb (n.d.) & ArcGIS PRO

Note: Figure 5, presents a heatmap giving a spatial depiction of the effect of neighbourhood on Airbnb listing price. Compared to the reference category (RC) Norrmalm (dark red) listings in Hässelby-Vällingby (dark blue) rent at the highest discount. The heatmap is based on the regression results of model (1). The coefficients listed in the legend stem from Appendix B.

In more detail, relative to accommodations in Hässelby-Vällingby, accommodations in Norrmalm rent at premiums of 53%, whereas compared to accommodations in Sodermalm, accommodations in Norrmalm rent at premiums of 4.6%[2]. The positive effect of location quality, when proxied by neighbourhood, on Airbnb listing prices is in line with the theories indicating that high location quality is represented by areas near the city centre and touristic amenities, see Figure 2.

Considering the general observations of Von Thünen (1826), Alonso (1960), and Speck (2018), accommodations in Norrmalm may rent at premiums relative to Hässelby-Vällingby due to lower transportation costs. As urban tourism typically revolves around visiting sights located near the city centre, accommodations in this area will lower tourists' transportation costs (Speck, 2018; Blair, 1995; Isard, 1957; Williams, 1971; World Tourism Organization, 2019). Therefore, such accommodations see high demand, leading to higher prices (Von Thünen, 1826). The results of Brueckner et al. (1999) further support the conclusion drawn from Figure 5. Following the amenity-based theory, higher prices in the vicinity of the city centre can be expected if the central area is home to historical amenities, as wealthier citizens allocate a higher marginal value to such amenities.

Model (2) and (4) incorporate the impact of distance to the city centre on Airbnb listing price. Contrary to the findings of Cai et al. (2019), both models illustrate that the distance dummies are significant at the 99% confidence level. For both model (2) and (4), the effect of being between 0.5-and 0.75-kilometres away from the city centre affects the Airbnb listing price most. Airbnb accommodations located 0.5-to 0.75-kilometres away from the city centre have 85% (2) and 82.2% (4) higher listing prices than Airbnb locations located more than 5-kilometres away from the city centre, respectively. Contrary to model (2) and (4), in model (3) and (5), the highest effect of distance to nearest touristic amenity on Airbnb listings is found for accommodations located between 0-and 0.25-kilometres away from the amenity. Concluding from model (3) and (5), respectively, Airbnb accommodations located between 0-to 0.25-kilometres away from the nearest amenity have 113.4% and 117.5% higher listing prices than Airbnb locations located more than 5 kilometres away from the nearest amenity.

As expected, both the distance variables have a positive sign, implying a negative effect, as the reference category represents distances greater than 5-kilometres away from the location proxy (Bull, 1994; Chica-Olmo et al., 2020; Gibbs et al. 2017; Wang & Nicolau, 2017). This indicates that compared to an Airbnb accommodation that is located more than 5-kilometres away from the location quality proxy, an Airbnb accommodation located within a 5-kilometre range from the location quality proxy increases the Airbnb listing price. Interestingly, the effect of the distance to the nearest touristic amenity is larger than the effect of the distance to the city centre within the 1-kilometre distance intervals. However, regarding the distance intervals 1-2, 2-3, 3-4, and 4-5 kilometres, the effect of the distance to the city centre becomes greater. Furthermore, similar to the results of Gibbs et al. (2017), the coefficients of

[2] Based on the coefficients of model 1. Calculated as (exp(b)-1)*100).

distance to the city centre are significant at the 99% confidence level. Notably, the distance to touristic amenity loses significance at the 4-to 5-kilometre interval.

Transportation costs can provide an explanation for the greater effect that distance to the nearest touristic amenity has within the 1-kilometre distance intervals and for the greater effect that distance to the city centre has for the intervals lying between 1-and 5-kilometres. On the one hand, being within a 1-kilometre radius from the nearest touristic amenity contributes to the sightseeing walkability of a listing (Speck, 2018). On the other hand, considering the trade-off model presented by Muth (1969), once the 1-kilometre radius is crossed, the distance to the city centre may have a larger effect on Airbnb prices than distance to the nearest touristic amenity due to the proximity to public transport hubs such as the central station which, based on ArcGIS PRO measurements, is solely 500 meters away from Stockholm's city centre.

Considering the second sub-question*, "what is the effect of location quality on Airbnb prices in Stockholm?",* it can be concluded that the effect of location quality increases Airbnb listing prices in Stockholm. Therefore, both the first and second hypothesis, *vicinity to the city centre is positively capitalized in Airbnb listing price* and v*icinity to touristic amenities is positively capitalized in Airbnb listing prices,* can be accepted.

Regarding the interaction variables included in model (4) and (5), the sole significant result from the two interaction variables was found at a radius of 250 meters from the city centre. The coefficient is significant at the 99% confidence level and has a positive sign. Therefore, in the case of model (4), it can be concluded that the location quality capitalization of Airbnb hosts is positively affected by being a superhost for accommodations located in a 250-meter radius from the city centre. The interaction variable included in model (6), neighbourhood*superhost, is significant at various levels and carries divergent signs depending on the neighbourhood. Interestingly, the interaction variable is significant at the 90% confidence level for Hässelby-Vällingby and Kungsholmen with both coefficients carrying negative signs, implying that the effect of location quality, when it is proxied by neighbourhood, on Airbnb prices is negatively affected by superhosts. Regarding the neighbourhoods Skärholmen and Älvsjö, the coefficient of the interaction variable is significant at the 95% confidence level. For Älvsjö, it can be concluded that superhosts negatively capitalize on location quality when compared to non-superhosts. The contrary is true for superhosts in Skärholmen, as the coefficient is positive, thereby implying that the relation between location quality and Airbnb listing price is positively affected by the superhost label.

The counterintuitive results obtained for Älvsjö, Hässelby-Vällingby, and Kungsholmen can be explained by customer expectations. Specifically, lower-priced listings may obtain better customer feedback due to lower initial expectations (Ofir & Simonson, 2007). Consequently, such hosts with lower-priced listing may yield excellent feedbacks which is part of earning a superhosts badge.

By including the interaction variable measuring the effect of the superhost badge on location quality capitalization in Airbnb listing prices, an attempt is made at answering the third research question, "*what is the effect of location quality capitalization on Airbnb listings with differing trust indicators in Stockholm?"*. From the results, it can be concluded that superhosts ambiguously capitalize on location quality. In short, the third hypothesis cannot be accepted whereas the fourth hypothesis can be solely accepted within the 0-to 0.25-kilometre radius.

The OLS results concerning the accommodation characteristics (A) and the customer opinion variable (C) generally have the expected significance and signs (Chica-Olmo et al., 2020; Hong & Yoo, 2020; Perez-Sanchez et al., 2018; Wang & Nicolau, 2017). An anomaly is found in the variable 'beds', as the variable has a negative sign. For example, regarding model (1), a one-unit increase in the number of beds decreases the Airbnb listing price by -2.96%[3]. Both Chica-Olmo et al. (2020) and Wang and Nicolou (2017) presented significant positive results. A foundation for this anomaly can be found in Sweden's demography and the majority of Stockholm's tourists being domestic. In 2017, 51.4% of Sweden's households consisted of single-person households, the highest percentage of all European countries (CBI, 2018). Considering Stockholm's demographics and the fact that domestic tourists contribute to roughly 60% of Stockholm's demand for short stay lodging, high demand can be expected for Airbnb listings with a small number of beds (Stockholm the Capital of Scandinavia, 2019). Following this perspective, an increase of beds meets lower demand and thereby lower prices.

Like Chica-Olmo et al. (2020), the effect of the host trait (H) variable 'listing count' is positive and significant at the 99% confidence level, see Appendix H for further discussion. However, the insignificant effect of 'superhost' is surprising. Previous research has largely obtained positive results (Chica-Olmo et al., 2020; Gibbs et al., 2017; Hong and Yoo, 2020). The result presented in this study are similar to the result presented by Teubner et al. (2017) and Benítez-Aurioles (2018). Following transaction cost theory, and previous research indicating that trustworthiness lowers transaction costs, the insignificant effect of being a superhost can be explained by the distribution of the variable review score rating (Dyer & Chu, 2003; Williamson, 1979). Specifically, 73.6% of the Airbnb hosts in Stockholm have a rating of 95% or higher, indicating that most of the Airbnb listings in Stockholm have a perceived trustworthy host, see Appendix F. Therefore, Airbnb customers might not be willing to pay extra for staying at a superhost accommodation as most accommodations offer perceived trustworthiness.

Lastly, considering the paper by Hong and Yoo (2020), the variable measuring the effect of listing density on Airbnb listing prices has the expected significance and sign, see Appendix H for further discussion.

[3] As all models specified in Table 2 are log-linear, the calculation of the independent variable's effect on the dependent variable is calculated as (exp(b)-1)*100).

Table 2. OLS Results

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Variable	**lnListing_price**	**lnListing_price**	**lnListing_price**	**lnListing_price**	**lnListing_price**	**lnListing_price**
Bedrooms	0.172***	0.175***	0.176***	0.176***	0.176***	0.172***
	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)
Beds	-0.030***	-0.031***	-0.032***	-0.032***	-0.032***	-0.030***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Bathrooms	0.139***	0.147***	0.149***	0.146***	0.149***	0.137***
	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)
Accommodates	0.093***	0.091***	0.090***	0.091***	0.090***	0.093***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Shared room	-1.316***	-1.324***	-1.343***	-1.322***	-1.347***	-1.318***
	(0.088)	(0.086)	(0.086)	(0.086)	(0.086)	(0.088)
Private room	-0.480***	-0.479***	-0.475***	-0.478***	-0.474***	-0.480***
	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
Entire home or apartment	-	-	-	-	-	-
Review score rating	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Superhost	-0.000	-0.014	-0.017	-0.012	0.008	0.002
	(0.015)	(0.014)	(0.014)	(0.027)	(0.034)	(0.042)
Host listing count	0.011***	0.010***	0.009***	0.010***	0.009***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Listing density	-0.015	-0.035*	-0.004	-0.035*	-0.004	-0.015
	(0.018)	(0.019)	(0.018)	(0.020)	(0.018)	(0.018)
Near distance CC | 0-0.25 KM		0.554***		0.420***		
		(0.152)		(0.123)		
Near distance CC | 0.25-0.5 KM		0.538***		0.497***		
		(0.071)		(0.076)		
Near distance CC | 0.5-0.75 KM		0.615***		0.600***		
		(0.061)		(0.070)		
Near distance CC | 0.75-1 KM		0.506***		0.507***		
		(0.057)		(0.059)		
Near distance CC | 1-2 KM		0.499***		0.502***		
		(0.041)		(0.042)		
Near distance CC | 2-3 KM		0.308***		0.307***		
		(0.039)		(0.040)		
Near distance CC | 3-4 KM		0.227***		0.230***		
		(0.036)		(0.039)		
Near distance CC | 4-5 KM		0.151***		0.154***		
		(0.025)		(0.028)		
Near distance TA | 0-0.25 KM			0.758***		0.777***	
			(0.051)		(0.057)	
Near distance TA | 0.25-0.5 KM			0.645***		0.632***	
			(0.048)		(0.054)	
Near distance TA | 0.5-0.75 KM			0.592***		0.611***	
			(0.044)		(0.047)	
Near distance TA | 0.75-1 KM			0.516***		0.516***	
			(0.044)		(0.046)	
Near distance TA | 1-2 KM			0.405***		0.412***	
			(0.037)		(0.039)	
Near distance TA | 2-3 KM			0.264***		0.277***	
			(0.032)		(0.034)	
Near distance TA | 3-4 KM			0.180***		0.178***	
			(0.031)		(0.034)	
Near distance TA | 4-5 KM			0.055*		0.071**	
			(0.032)		(0.035)	
CC##Superhost | 0-0.25 KM				0.539***		
				(0.120)		
CC##Superhost | 0.25-0.5 KM				0.166		
				(0.135)		
CC##Superhost | 0.5-0.75 KM				0.060		
				(0.089)		

CC##Superhost | 0.75-1 KM				-0.005		
				(0.113)		
CC##Superhost | 1-2 KM				-0.013		
				(0.039)		
CC##Superhost | 2-3 KM				0.001		
				(0.038)		
CC##Superhos | 3-4 KM				-0.017		
				(0.052)		
CC##Superhost | 4-5 KM				-0.014		
				(0.047)		
TA##Superhost | 0-0.25 KM					-0.059	
					(0.076)	
TA##Superhost | 0.25-0.5 KM					0.053	
					(0.064)	
TA##Superhost | 0.5-0.75 KM					-0.075	
					(0.062)	
TA##Superhost | 0.75-1 KM					0.017	
					(0.066)	
TA##Superhost | 1-2 KM					-0.022	
					(0.044)	
TA##Superhost | 2-3 KM					-0.060	
					(0.045)	
TA##Superhost | 3-4 KM					0.010	
					(0.051)	
TA##Superhost | 4-5 KM					-0.101	
					(0.075)	
Bromma##Superhost						-0.031
						(0.096)
Enskede-Ärsta-Vantör##Superhost						0.017
						(0.060)
Farsta##Superhost						-0.109
						(0.091)
Hägersten-Liljeholmen##Superhost						-0.050
						(0.058)
Hässelby-Vällingby##Superhost						-0.168*
						(0.098)
Kungsholmen##Superhost						-0.105*
						(0.061)
Rinkeby-Tensta##Superhost						-0.075
						(0.137)
Skarpnäck##Superhost						0.049
						(0.068)
Skärholmen##Superhost						0.243**
						(0.102)
Spanga-Tensta##Superhost						0.206
						(0.153)
Sodermalm##Superhost						0.024
						(0.049)
Älvsjö##Superhost						-0.234**
						(0.100)
Östermalm##Superhost						0.090
						(0.063)
Neighbourhood	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.791***	5.269***	5.447***	5.269***	5.437***	5.800***
	(0.115)	(0.121)	(0.117)	(0.121)	(0.118)	(0.115)
Observations	3,804	3,804	3,804	3,804	3,804	3,804
R-squared	0.637	0.657	0.665	0.658	0.665	0.639

Note: Dependent variable is the natural logarithm of listing price. Robust standard errors are noted in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

4.2 Sensitivity Analyses

Firstly, a chow test is conducted in this study to examine whether the effect of the constructed distance variables is different for low-priced Airbnb listings compared to high-priced Airbnb listings (Fruhen & Flin, 2015; Lee, 2008). Two subgroups have been created for both model (2) and (3) studying the effect of the distance to the city centre and the effect of the distance to the nearest touristic amenity on Airbnb listing prices, respectively. The subgroups have been divided into a low-cost group and a high-cost group, with the separation lying on the mean of the natural log of Airbnb listing prices. Consequently, two null hypotheses have been studied, namely:

1. H0 Model(2): $\beta DLC = \beta DHC$

2. H0 Model(3): $\beta DLC = \beta DLC$

In both hypotheses, *DLC* stands for drivers of Airbnb listing prices for the low-cost model and *DHC* stands for drivers of Airbnb listing prices for the high-cost model. The results obtained from the chow test regarding the first null hypothesis, F(13, 3779) = 403.83 & Prob > F = 0.0000[4], indicate that the null hypothesis can be rejected. Therefore, the chow test rejects the stability of parameters between low-cost and high-cost listings for the model including the city centre distance variable.

The chow test has given a similar result regarding the model including the distance to nearest tourist amenity as a proxy for location quality. Precisely, the chow test results, F(13, 3779) = 395.01 & Prob > F = 0.0000, point out that the null hypothesis can be rejected. Hence, the chow test rejects the stability of parameters between the low-cost and high-cost listings for the model including the distance to the nearest touristic amenity variable. Considering that the coefficients have been shown to differ when the pooled models are split into a low-cost and high-cost model, several inferences can be made.

Precisely, regarding the city centre location quality proxy, it can be concluded that for the intervals 0-to 0.25-kilometers, 0.75-to 1-kilometre, and 1-to 2-kilometres, hosts with expensive listings capitalize more on location quality than hosts with low-cost Airbnb accommodations. Furthermore, the opposite can be concluded for the intervals 0.25-to 0.5-kilometres, 0.5-to 0.75-kilometres, 2-to 3-kilometres, 3-to 4-kilometres, and 4-to 5-kilometres. Hence, overall, hosts with low-cost Airbnb accommodations capitalize more on location quality when it is proxied by the distance to the city centre, see Table 3.

When considering the effect of the distance to the nearest touristic amenity as a proxy of location quality, a similar conclusion can be made. Specifically, hosts with expensive Airbnb accommodations solely capitalize more on the distance to the nearest amenity for the interval 0-to 0.25-kilometres.

[4] The results of the chow test have been calculated by STATA. STATA calculates the chow test as $F(k, N_1 + N_2 - (2k)) = \frac{\left(RSS_p - (RSS_1 + RSS_2)\right)/k}{(RSS_1 + RSS_2)/(N_1 + N_2 - 2k)}$.

Table 3. Chow Test Distance Measure Effects on Airbnb Listing Price

Distance in kilometres	CC | Low-cost	CC | High-cost	TA | Low-cost	TA | High-cost
0 – 0.25	41.1	48.9	59.5	68.0
0.25 – 0.5	52.0	31.8	50.7	49.6
0.5 – 0.75	46.1	44.1	49.2	40.9
0.75 - 1	34.3	36.1	43.3	35.7
1 - 2	37.0	42.8	40.2	26.0
2 - 3	26.0	24.0	29.0	20.1
3 - 4	22.4	17.6	23.1	6.7*
4 -5	15.5	11.7	6.1	0.1*
5 >	-	-	-	-

Note: CC stands for city centre. TA stands for touristic amenity. The numbers allocated beneath the distance measures are representations of the independent variable's effects on the dependent variable, calculated as (exp(b)-1)*100). The coefficients used for the calculation stem from the results of the chow test which can be found in Appendix C. * indicates percentages that are not significant at the 90% confidence level. As the chow test rejects the stability of parameters, there is significant evidence that the coefficients are different for the split models. [5>] represents the reference category.

In detail, hosts with expensive Airbnb listings up to 250 meters away from the city centre ask 68% higher prices than hosts with expensive listings located more than 5-kilometres away from the city centre. Consequently, it can be concluded that generally, hosts with low-cost Airbnb accommodations capitalize more on location quality when it is proxied by the distance to the nearest touristic amenity, see Table 3.

An insight as to why hosts with higher-priced Airbnb listing capitalize less on location quality can be drawn from the spatial interaction theory (Yang et al., 2016). The spatial interaction theory indicates that visitors make a trade-off between the quality of an accommodation and the travel costs that will have to be incurred. Assuming that higher-priced listings offer higher quality accommodation, travel costs can be traded off for quality. In other words, higher-priced Airbnb accommodations are less affected by location quality indicating that Airbnb quality explains more of the variation in Airbnb listing prices than travel costs (Yang et al., 2016).

Interestingly, both the fifth and the sixth hypothesis cannot be accepted. Based on Stockholm's higher spatial resemblance to New York than to the Caribbean, the result of Zhang et al. (2011) was used in the formulation of both the fifth and sixth hypothesis. However, the results of the chow-test indicate resemblance to the results of Yang et al. (2016), who concluded that in the Caribbean an increase in class is accompanied by a lower capitalization of location quality.

In short, with regard to the fourth sub-question, *what is the effect of location quality on low-cost Airbnb listings relatively to high-cost Airbnb listings?,* it can be determined that, generally, hosts with low-cost

Airbnb listings capitalize more on location quality than hosts with high-cost Airbnb listings, for both location quality proxies.

Lastly, to examine the robustness of model (2) and (3), both models have been split into three subgroups. Precisely, subgroup 1 solely considers shared rooms, subgroup 2 solely takes into account private rooms, and subgroup 3 solely takes into account entire homes or apartments. The signs and magnitude of the independent variables all have similar signs, significance, and magnitude which suggests robustness, see Appendix E.

5. Conclusion

5.1 Summary

In this master's thesis, an empirical analysis on the effect of location quality on Airbnb listing prices is provided. In the section forwarding the theoretical perspectives on the effect of location quality on Airbnb listing prices, an answer to the first research question of this thesis is offered. Commonly, theories indicate that transportation costs explain the capitalization of location quality by Airbnb hosts. However, several other explanations can be provided. In the sections following the theoretical perspective, the main contribution of this thesis is found. Specifically, in the results and discussion section, the second, third, and fourth research question are answered. Importantly, it can be concluded that location quality positively affects Airbnb listing prices. Furthermore, an insight is provided in the effect of Airbnb host trustworthiness as a moderator between the effect of location quality on Airbnb listing prices. From the results, it is concluded that trustworthiness significantly affects the relationship between vicinity to the city centre and Airbnb listing prices when the accommodation of the host is located in a radius of 250 meters from the city centre. Moreover, trustworthiness is found to be a significant moderator for a number of neighbourhoods. Regarding the price segment analysis on the effect of location quality on Airbnb listing prices, it can be concluded that generally hosts with low-cost Airbnb accommodations capitalize more on location quality than hosts with high-cost Airbnb accommodations.

5.2 Managerial Recommendations

Considering that this thesis provides a first insight into the effect of location quality on Airbnb listing prices in Stockholm, the research conducted in this thesis can prove useful to both Stockholm's governmental institutions and managers working in the hospitality sector. Precisely, governmental institutions located in Stockholm that are looking into regulating the Airbnb market due to negative externalities, such as nuisance and gentrification, may be challenged by a lack of data on Airbnb pricing.

Consequently, this thesis could provide governmental institutions with the means to make research-based decisions, which are at the base of professional and sensible policies (Baba & Hakemzadeh, 2012)

Furthermore, managers in the hospitality industry, such as professional Airbnb hosts, may be served by additional research regarding Airbnb pricing to refine their pricing strategy. Concretely, Airbnb hosts in Stockholm may be served by inspecting the empirical results of this thesis as a multitude of independent variables have been studied in relation to Airbnb listing prices. For example, Airbnb hosts should be encouraged to add listings to their portfolio as this study shows that the number of listings managed by a host positively affects the host's accommodation listing prices. Additionally, Airbnb hosts are advised to add listings to their portfolio that are either in the vicinity of the city centre or a touristic amenity as that contributes to increased listing prices as well.

Lastly, previous research shows that Airbnb is infamous for disrupting the hotel industry (Dogru et al., 2020). The study of Airbnb pricing may aid managers in the hospitality industry to grasp Airbnb's underlying structures and to construct robust strategies (Aznar et al., 2018)

5.3 Limitations and Directions

Important to consider, both when studying this master's thesis and when commencing a similar study, are the limitations of the empirical study conducted in this thesis. First, the results of the empirical study are challenged by several design limitations. In detail, due to data scarcity, both the effects of individual accommodation rules and accommodation amenities such as hot tubs and elevators have not been studied (Chica-Olmo et al., 2020; Gibbs et al., 2018; Wang & Nicolau, 2017). Therefore, this study may be subjected to omitted variable bias (Brooks & Tsolacos, 2010).

Furthermore, in the face of time scarcity, solely two proxies for location quality have been studied. Consequently, the generalizability of the conclusions on location quality can be deemed meagre. An intricate caveat of the two vicinity proxies used in this study is that even if run in separate models, the results may depict the effect of both the city centre and touristic amenities as, in the case of Stockholm, Airbnb accommodations nearby the city centre are prone to be in the vicinity of touristic amenities. Therefore, future researchers aspiring to study the effect of location quality on Airbnb prices are encouraged to study the effect of location quality more thoroughly by examining a multitude of proxies for location quality. Furthermore, as this study solely examines the effect of location quality on Airbnb listing prices in Stockholm, the conclusions drawn on location quality cannot be generalized.

Similarly, future researchers studying the moderating effect of trustworthiness on the effect of location quality on Airbnb listing prices are encouraged to draw conclusions from multiple proxies. Due to time limitations, this thesis solely considers the superhost badge as a proxy for trustworthiness. Although, the frequency of reviews and the review scores could have served as proxies for trustworthiness as well.

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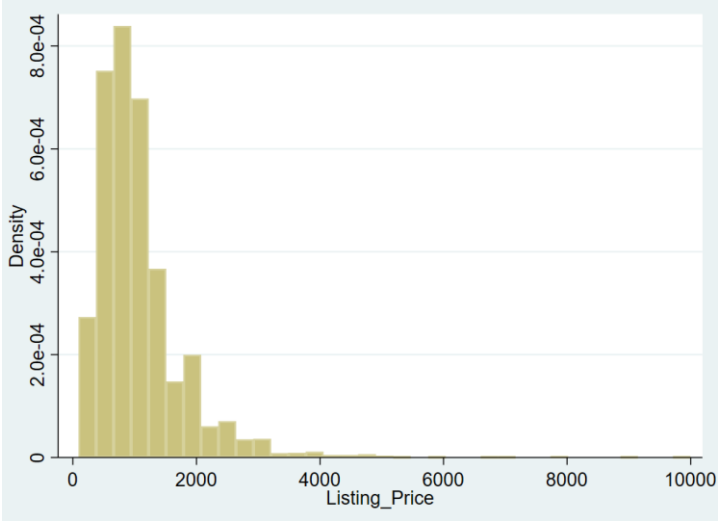
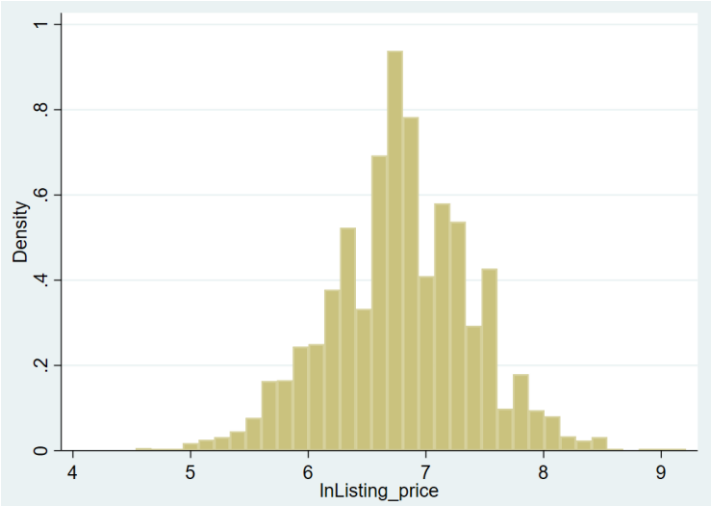
Appendix A: Transformation of the Dependent Variable





Appendix B: OLS assumptions

To examine the models forwarded in paragraph 3.4, OLS is used. Therefore, the OLS assumptions underlying the OLS method must be met (Brooks & Tsolacos, 2010). The OLS assumptions are formulated as follows:

1. **E(ut) = 0**

   This assumption points out the necessity for the average value of the errors to be zero (Brooks & Tsolacos, 2010). Considering that STATA is used as the testing software, this assumption is satisfied, as STATA includes an error term at all times.

2. **var(ut) = σ2 <** ∞

   This assumption points out the necessity for the errors to be homoscedastic. To control if the residuals are heteroscedastic, the command 'regcheck' is performed. The results from the regcheck command point out that the residuals are heteroscedastic: **Breusch-Pagan Test,** Chi2(1): 9.306, p-value: 0.002. Precisely, the null hypothesis of the Breusch-Pagan test, which comprises that the variance of the residuals is constant, is rejected as the p-value is smaller than .05. Therefore, the command 'r' will be used when performing OLS to ensure robust standard errors.

3. **cov(ui, uj) = 0 for I≠j**

   This assumption points out the necessity for no autocorrelation. Hence, to use OLS the residuals must not be correlated. A Durbin-Watson test has been conducted to test for correlation in the residuals. The outcome of the Durbin-Watson test is as follows: **Durbin-Watson d-statistic** (12, 3804) = 1.959482. Considering that the residuals are not autocorrelated when the Durbin-Watson test equals 2, it can be assumed that the assumption is met.

4. **cov(ut, xt) = 0**

   This assumption points out the necessity for the regressors not to be stochastic. This assumption can be tested with the variance inflation factor (VIF). Precisely, a VIF value

below 10 suggest that the regressor is not stochastic (Glen, n.d.). As expected, the interaction variables have a high VIF due to the interaction with another independent variable. However, STATA indicates that for all of the models no multicollinearity problems are founds. This finding is in line with Allison (2012), who indicates that a high VIF for interaction terms may be ignored.

Model (1)

Variables	VIF
Accomomodates	4.06
D_listing_density	3.84
beds	2.85
bedrooms	1.54
bathrooms	1.23
D_room_type	1.1
review_scores_rating	1.06
host_listings_count	1.06
D_host_is_superhost	1.03
neighborhood_cleansed_N	1.02

Model (2)

accommodates	4.06
host_listings_count	3.84
D_host_is_superhost	2.85
beds	1.66
bedrooms	1.56
near_dist_cc	1.3
bathrooms	1.29
D_listing_density	1.25
neighborhood_cleansed_N	1.1
D_room_type	1.07
review_scores_rating	1.06

Model (3)

accommodates	4.06
host_listings_count	3.84
D_host_is_superhost	2.85
beds	1.56
bedrooms	1.54
bathrooms	1.35
near_dist_ta	1.25
neighborhood_cleansed_N	1.15
D_room_type	1.1
D_listing_density	1.06
review_scores_rating	1.06

Model (4)

bedrooms	2.88
D_listing_density :	3.86
neighborhood_cleansed_N :	1.58
1.D_near_distance_cc :	1.11
2.D_near_distance_cc :	1.28
3.D_near_distance_cc :	1.15
4.D_near_distance_cc :	4.18
5.D_near_distance_cc :	1.09
6.D_near_distance_cc :	1.65
7.D_near_distance_cc :	1.98
beds	3.86
1.D_near_distance_cc#1.D_host_is_superhost	2.59
2.D_near_distance_cc#1.D_host_is_superhost	9.89

3.D_near_distance_cc#1.D_host_is_superhost	13.48
4.D_near_distance_cc#1.D_host_is_superhost	11.03
5.D_near_distance_cc#1.D_host_is_superhost	55.26
6.D_near_distance_cc#1.D_host_is_superhost	31.67
7.D_near_distance_cc#1.D_host_is_superhost	6.51
8.D_near_distance_cc#1.D_host_is_superhost	1.34
bathrooms :	1.39
accommodates :	1.45
shared_room :	1.42
private_room :	2.71
review_scores_rating :	2.37
D_host_is_superhost :	1.66
host_listings_count :	1.65

Model (5)

bedrooms	2.88
D_listing_density :	3.87
neighborhood_cleansed_N :	1.58
D_near_distance_ta :	4.16
1.D_near_distance_ta :	1.12
2.D_near_distance_ta :	1.29
3.D_near_distance_ta :	1.15
4.D_near_distance_ta :	6.14
5.D_near_distance_ta :	1.08
6.D_near_distance_ta :	1.3
7.D_near_distance_ta :	1.91
beds	3.87
1.D_near_distance_ta#1.D_host_is_superhost	73.95
2.D_near_distance_ta#1.D_host_is_superhost	69.38

3.D_near_distance_ta#1.D_host_is_superhost	68.31
4.D_near_distance_ta#1.D_host_is_superhost	44.27
5.D_near_distance_ta#1.D_host_is_superhost	81.54
6.D_near_distance_ta#1.D_host_is_superhost	39.52
7.D_near_distance_ta#1.D_host_is_superhost	9.61
8.D_near_distance_ta#1.D_host_is_superhost	2.12
bathrooms :	1.85
accommodates :	1.95
shared_room :	1.67
private_room :	2.98
review_scores_rating :	2.46
D_host_is_superhost :	2
host_listings_count :	1.45

Model (6)

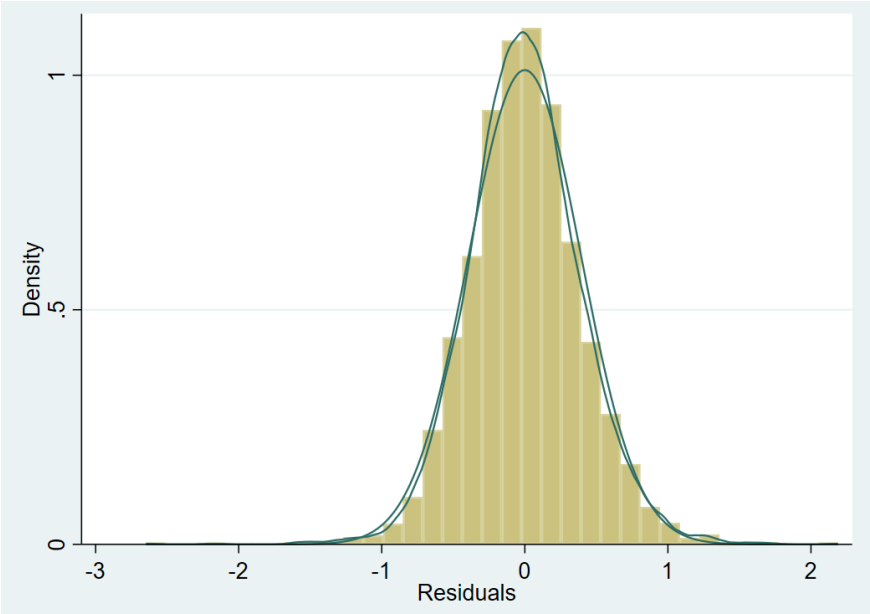
D_listing_density :	3.87
1.neighborhood_cleansed_N :	1.58
2.neighborhood_cleansed_N :	4.15
3.neighborhood_cleansed_N :	1.12
4.neighborhood_cleansed_N :	1.31
5.neighborhood_cleansed_N :	1.16
6.neighborhood_cleansed_N :	8.9
8.neighborhood_cleansed_N :	1.1
9.neighborhood_cleansed_N :	2.32
10.neighborhood_cleansed_N :	1.9
beds :	2.38
11.neighborhood_cleansed_N :	1.62
12.neighborhood_cleansed_N :	2.53
13.neighborhood_cleansed_N :	1.52

14.neighborhood_cleansed_N :	2.09
1.neighborhood_cleansed_N#1.D_host_is_superhost :	1.46
2.neighborhood_cleansed_N#1.D_host_is_superhost :	1.95
3.neighborhood_cleansed_N#1.D_host_is_superhost :	1.31
4.neighborhood_cleansed_N#1.D_host_is_superhost :	1.27
5.neighborhood_cleansed_N#1.D_host_is_superhost :	3.45
6.neighborhood_cleansed_N#1.D_host_is_superhost :	1.46
bathrooms :	2.55
8.neighborhood_cleansed_N#1.D_host_is_superhost :	1.61
9.neighborhood_cleansed_N#1.D_host_is_superhost :	2.12
10.neighborhood_cleansed_N#1.D_host_is_superhost :	1.51
11.neighborhood_cleansed_N#1.D_host_is_superhost :	2.12
12.neighborhood_cleansed_N#1.D_host_is_superhost :	1.39
13.neighborhood_cleansed_N#1.D_host_is_superhost :	2.45
14.neighborhood_cleansed_N#1.D_host_is_superhost :	1.33
accommodates :	1.8
shared_room :	1.23
private_room :	1.12
review_scores_rating :	4.84
D_host_is_superhost :	1.27
host_listings_count :	2.45

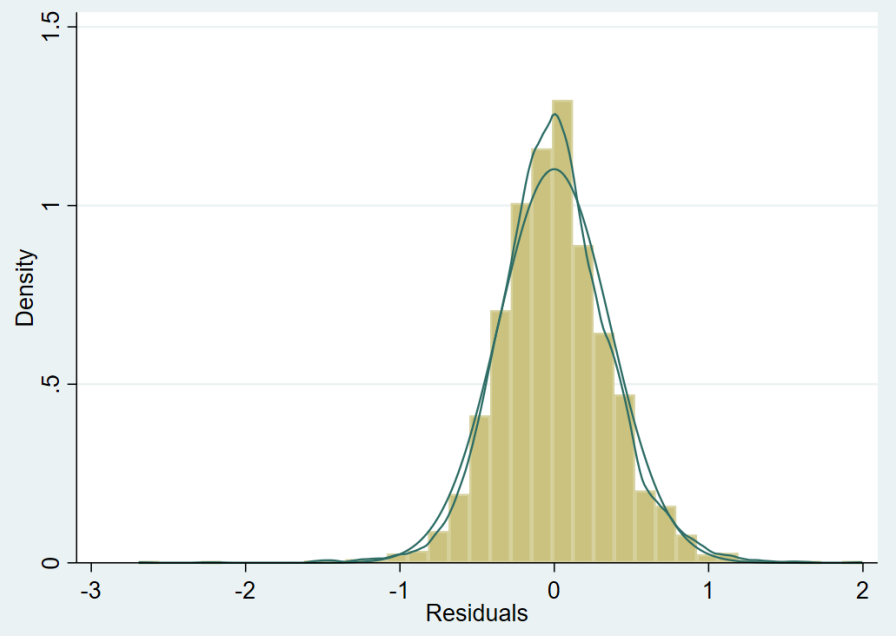
5. **(ut ~ N(0, σ2))**

This assumption points out the necessity for the residuals to be normally distributed. The normality of the residuals is verified by plotting a histogram of the residuals. What can be concluded from the histogram, is that the residuals are normally distributed.

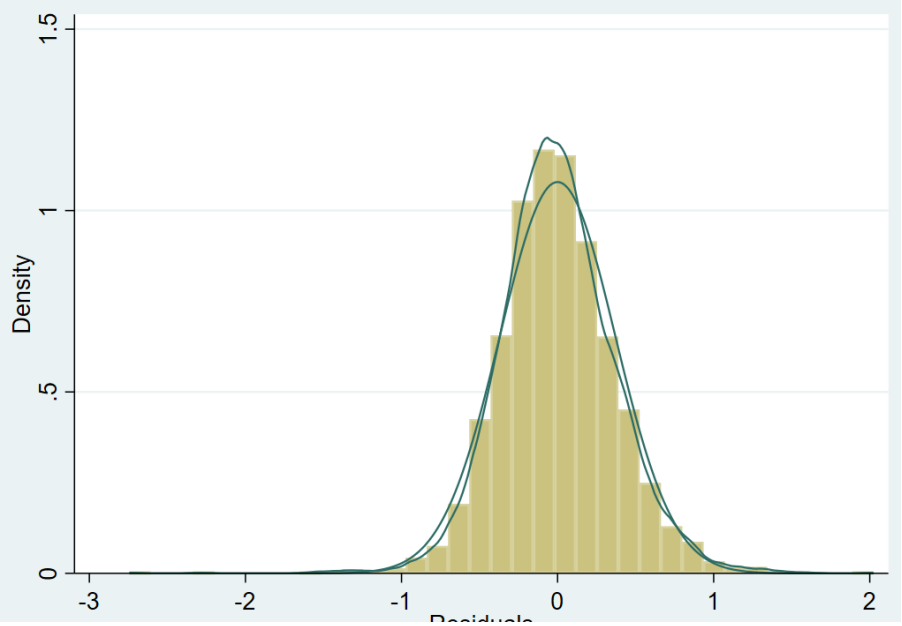
Model(1)



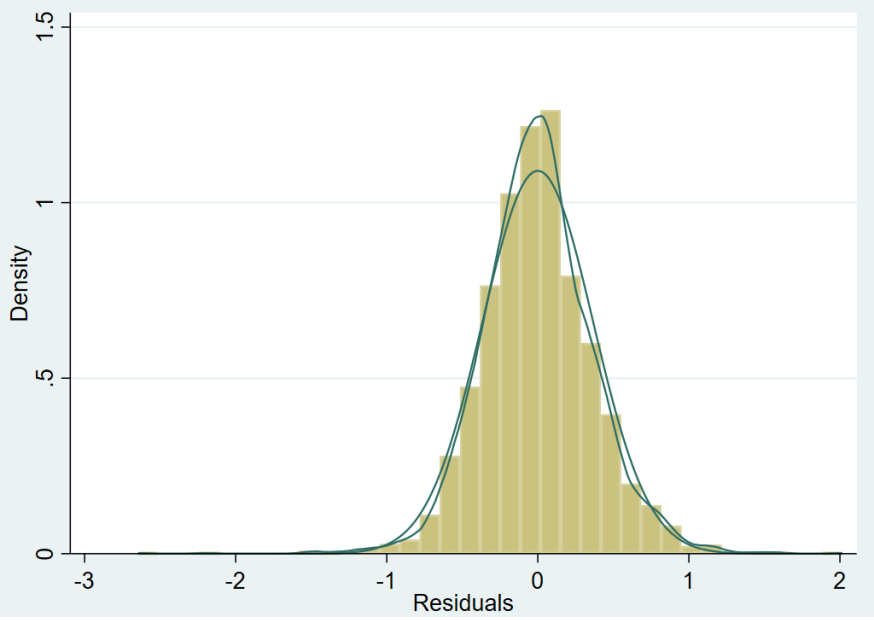
Model (2)



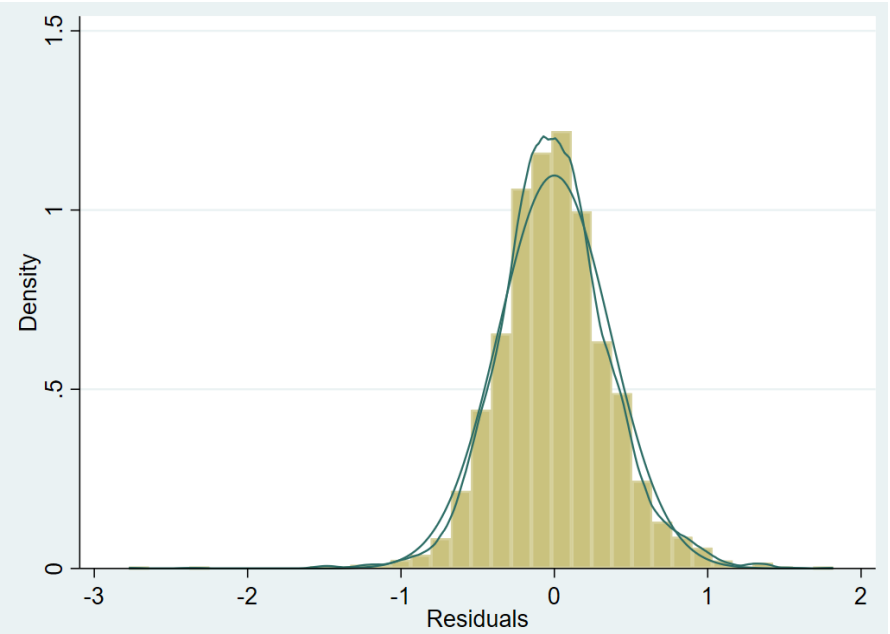
Model (3)



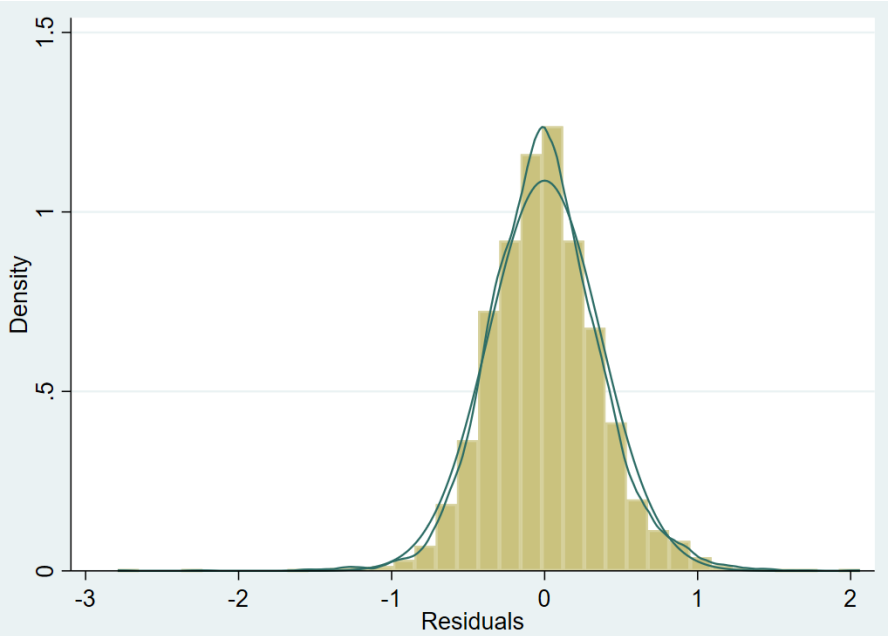
Model (4)



Model (5)



Model (6)



Appendix C: OLS Results Full Overview

Table 2. OLS Results Full overview

VARIABLES	(1) lnListing_price	(2) lnListing_price	(3) lnListing_price	(4) lnListing_price	(5) lnListing_price	(6) lnListing_price
bedrooms	0.172***	0.175***	0.176***	0.176***	0.176***	0.172***
	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)
beds	-0.030***	-0.031***	-0.032***	-0.032***	-0.032***	-0.030***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
bathrooms	0.139***	0.147***	0.149***	0.146***	0.149***	0.137***
	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)
accommodates	0.093***	0.091***	0.090***	0.091***	0.090***	0.093***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
shared_room	-1.316***	-1.324***	-1.343***	-1.322***	-1.347***	-1.318***
	(0.088)	(0.086)	(0.086)	(0.086)	(0.086)	(0.088)
private_room	-0.480***	-0.479***	-0.475***	-0.478***	-0.474***	-0.480***
	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
o.entire_home_apt	-	-	-	-	-	-
review_scores_rating	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
D_host_is_superhost	-0.000	-0.014	-0.017	-0.012	0.008	0.002
	(0.015)	(0.014)	(0.014)	(0.027)	(0.034)	(0.042)
host_listings_count	0.011***	0.010***	0.009***	0.010***	0.009***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
D_listing_density	-0.015	-0.035*	-0.004	-0.035*	-0.004	-0.015
	(0.018)	(0.019)	(0.018)	(0.020)	(0.018)	(0.018)
1.D_near_distance_cc <0.25		0.554***		0.420***		
		(0.152)		(0.123)		
2.D_near_distance_cc <0.5		0.538***		0.497***		
		(0.071)		(0.076)		
3.D_near_distance_cc < 0.75		0.615***		0.600***		
		(0.061)		(0.070)		
4.D_near_distance_cc < 1		0.506***		0.507***		
		(0.057)		(0.059)		
5.D_near_distance_cc < 2		0.499***		0.502***		
		(0.041)		(0.042)		
6.D_near_distance_cc < 3		0.308***		0.307***		
		(0.039)		(0.040)		
7.D_near_distance_cc < 4		0.227***		0.230***		
		(0.036)		(0.039)		
8.D_near_distance_cc < 5		0.151***		0.154***		
		(0.025)		(0.028)		
1.D_near_distance_ta < 0.25			0.758***		0.777***	
			(0.051)		(0.057)	

2.D_near_distance_ta < 0.5			0.645***		0.632***	
			(0.048)		(0.054)	
3.D_near_distance_ta < 0.75			0.592***		0.611***	
			(0.044)		(0.047)	
4.D_near_distance_ta < 1			0.516***		0.516***	
			(0.044)		(0.046)	
5.D_near_distance_ta < 2			0.405***		0.412***	
			(0.037)		(0.039)	
6.D_near_distance_ta < 3			0.264***		0.277***	
			(0.032)		(0.034)	
7.D_near_distance_ta < 4			0.180***		0.178***	
			(0.031)		(0.034)	
8.D_near_distance_ta < 5			0.055*		0.071**	
			(0.032)		(0.035)	
CC##Superhost <0.25				0.539***		
				(0.120)		
CC##Superhost<0.5				0.166		
				(0.135)		
CC##Superhost<0.75				0.060		
				(0.089)		
CC##Superhost<1				-0.005		
				(0.113)		
CC##Superhost<2				-0.013		
				(0.039)		
CC##Superhost<3				0.001		
				(0.038)		
CC##Superhost<4				-0.017		
				(0.052)		
CC##Superhost<5				-0.014		
				(0.047)		
TA##Superhost<0.25					-0.059	
					(0.076)	
TA##Superhost<0.5					0.053	
					(0.064)	
TA##Superhost<0.75					-0.075	
					(0.062)	
TA##Superhost<1					0.017	
					(0.066)	
TA##Superhost<2					-0.022	
					(0.044)	
TA##Superhost<3					-0.060	
					(0.045)	
TA##Superhost<4					0.010	
					(0.051)	
TA##Superhost<5					-0.101	
					(0.075)	
(D) Neighborhood						
1.Bromma	-0.513***	-0.044	-0.204***	-0.044	-0.203***	-0.508***
	(0.036)	(0.052)	(0.045)	(0.052)	(0.046)	(0.038)

2.Enskede-Ärsta-Vantör	-0.503***	-0.066	-0.314***	-0.065	-0.314***	-0.506***
	(0.030)	(0.045)	(0.033)	(0.045)	(0.033)	(0.033)
3.Farsta	-0.597***	-0.107*	-0.288***	-0.107*	-0.286***	-0.575***
	(0.045)	(0.059)	(0.053)	(0.059)	(0.053)	(0.051)
4.Hägersten-Liljeholmen	-0.456***	-0.055	-0.277***	-0.054	-0.276***	-0.447***
	(0.029)	(0.043)	(0.033)	(0.043)	(0.033)	(0.033)
5.Hässelby-Vällingby	-0.754***	-0.265***	-0.434***	-0.264***	-0.432***	-0.725***
	(0.047)	(0.061)	(0.056)	(0.061)	(0.057)	(0.052)
6.Kungsholmen	-0.137***	0.013	-0.154***	0.014	-0.154***	-0.114***
	(0.025)	(0.028)	(0.026)	(0.028)	(0.026)	(0.028)
8.Rinkeby-Tensta	-0.621***	-0.124*	-0.293***	-0.124*	-0.291***	-0.609***
	(0.055)	(0.068)	(0.063)	(0.068)	(0.063)	(0.060)
9.Skarpnäck	-0.490***	-0.040	-0.316***	-0.039	-0.315***	-0.500***
	(0.033)	(0.048)	(0.035)	(0.049)	(0.035)	(0.037)
10.Skärholmens	-0.698***	-0.209***	-0.380***	-0.208***	-0.377***	-0.732***
	(0.060)	(0.072)	(0.068)	(0.072)	(0.068)	(0.066)
11.Spanga-Tensta	-0.734***	-0.247***	-0.419***	-0.246***	-0.414***	-0.749***
	(0.068)	(0.079)	(0.075)	(0.079)	(0.075)	(0.072)
12.Sodermalm	-0.047**	0.115***	-0.268***	0.116***	-0.269***	-0.053**
	(0.020)	(0.025)	(0.026)	(0.025)	(0.026)	(0.022)
13.Älvsjö	-0.451***	0.038	-0.142**	0.039	-0.139**	-0.422***
	(0.052)	(0.065)	(0.060)	(0.065)	(0.060)	(0.057)
14.Östermalm	-0.039	0.023	-0.079***	0.023	-0.080***	-0.061*
	(0.030)	(0.032)	(0.030)	(0.032)	(0.030)	(0.034)
1.Bromma##Superhost						-0.031
						(0.096)
2.Enskede-Ärsta-Vantör##Superhost						0.017
						(0.060)
3.Farsta##Superhost						-0.109
						(0.091)
4.Hägersten-Liljeholmen##Superhost						-0.050
						(0.058)
5.Hässelby-Vällingby##Superhost						-0.168*
						(0.098)
6.Kungsholmen##Superhost						-0.105*
						(0.061)
8.Rinkeby-Tensta##Superhost						-0.075
						(0.137)
9.Skarpnäck##Superhost						0.049
						(0.068)
10.Skärholmens##Superhost						0.243**
						(0.102)
11.Spanga-Tensta##Superhost						0.206
						(0.153)
12.Sodermalm##Superhost						0.024
						(0.049)

13.Älvsjö##Superhost						-0.234**
						(0.100)
14.Östermalm##Superhost						0.090
						(0.063)
Constant	5.791***	5.269***	5.447***	5.269***	5.437***	5.800***
	(0.115)	(0.121)	(0.117)	(0.121)	(0.118)	(0.115)
Observations	3,804	3,804	3,804	3,804	3,804	3,804
R-squared	0.637	0.657	0.665	0.658	0.665	0.639

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The reference group for the variable neighbourhood dummy is Norrmalm.

Appendix D: Chow Test Results

VARIABLES	(1) lnListing_price	(2) lnListing_price
bedrooms_cheap	0.082***	0.082***
	(0.011)	(0.011)
bedrooms_expensive	0.096***	0.095***
	(0.011)	(0.011)
beds_cheap	-0.028***	-0.029***
	(0.008)	(0.008)
beds_expensive	-0.022***	-0.019***
	(0.007)	(0.007)
bathrooms_cheap	0.051**	0.055**
	(0.023)	(0.023)
bathrooms_expensive	0.100***	0.091***
	(0.022)	(0.022)
accommodates_cheap	0.055***	0.056***
	(0.008)	(0.008)
accommodated_expensive	0.064***	0.064***
	(0.007)	(0.007)
shared_room_cheap	-1.117***	-1.109***
	(0.047)	(0.047)
shared_room_expensive	N.A.	N.A.
private_room_cheap	-0.373***	-0.377***
	(0.015)	(0.015)
private_room_expensive	0.008	0.032
	(0.056)	(0.057)
review_scores_rating_cheap	0.004***	0.004***
	(0.001)	(0.001)
review_scores_rating_expensive	0.005***	0.005***
	(0.002)	(0.002)
D_host_is_superhost_cheap	-0.003	-0.005
	(0.014)	(0.014)
D_host_is_superhost_expensive	-0.003	0.006
	(0.021)	(0.021)
host_listings_count_cheap	0.001	0.002
	(0.002)	(0.002)
host_listings_count_expensive	0.002*	0.002*
	(0.001)	(0.001)
D_listing_density_cheap	0.030	0.019
	(0.021)	(0.022)
D_listing_density_expensive	-0.027	-0.061**
	(0.022)	(0.024)
1.Bromma_cheap	-0.034	-0.011
	(0.044)	(0.051)
2.Enskede-Ärsta-Vantör_cheap	-0.184***	-0.070
	(0.035)	(0.046)
3.Farsta_cheap	-0.158***	-0.117**
	(0.050)	(0.057)
4.Hägersten-Liljeholmen_cheap	-0.141***	-0.037
	(0.034)	(0.044)

5.Hässelby-Vällingby_cheap	-0.236***	-0.205***
	(0.051)	(0.057)
6.Kungsholmen_cheap	-0.112***	-0.032
	(0.025)	(0.029)
8.Rinkeby-Tensta_cheap	-0.151***	-0.117*
	(0.054)	(0.060)
9.Skarpnäck_cheap	-0.147***	0.001
	(0.038)	(0.050)
10.Skärholmens_cheap	-0.168***	-0.136**
	(0.061)	(0.066)
11.Spanga-Tensta_cheap	-0.280***	-0.247***
	(0.063)	(0.069)
12.Sodermalm_cheap	-0.110***	0.061**
	(0.029)	(0.029)
13.Älvsjö_cheap	0.032	0.078
	(0.054)	(0.061)
14.Östermalm_cheap	-0.053	-0.008
	(0.032)	(0.035)
1.Bromma_ex	-0.082	0.011
	(0.068)	(0.074)
2.Enskede-Ärsta-Vantör_ex	-0.146***	-0.003
	(0.054)	(0.070)
3.Farsta_ex	-0.124	-0.013
	(0.088)	(0.095)
4.Hägersten-Liljeholmen_ex	-0.113**	-0.003
	(0.051)	(0.061)
5.Hässelby-Vällingby_ex	-0.267**	-0.156
	(0.107)	(0.112)
6.Kungsholmen_ex	0.006	0.076**
	(0.033)	(0.034)
8.Rinkeby-Tensta_ex	-0.028	0.057
	(0.192)	(0.196)
9.Skarpnäck_ex	-0.207***	-0.062
	(0.060)	(0.075)
10.Skärholmens_ex	-0.146	-0.031
	(0.208)	(0.211)
11.Spanga-Tensta_ex	-0.325***	-0.216*
	(0.111)	(0.116)
12.Sodermalm_ex	-0.190***	0.025
	(0.032)	(0.031)
13.Älvsjö_ex	-0.140*	-0.030
	(0.082)	(0.087)
14.Östermalm_ex	0.008	0.038
	(0.035)	(0.038)
1.D_near_distance_ta < 0.25_cheap	0.467***	
	(0.052)	
2.D_near_distance_ta < 0.5_cheap	0.410***	
	(0.047)	
3.D_near_distance_ta < 0.75_cheap	0.400***	
	(0.043)	
4.D_near_distance_ta < 1_cheap	0.360***	
	(0.042)	
5.D_near_distance_ta < 2_cheap	0.338***	

	(0.033)	
6.D_near_distance_ta < 3_cheap	0.255***	
	(0.028)	
7.D_near_distance_ta < 4_cheap	0.208***	
	(0.028)	
8.D_near_distance_ta < 5_cheap	0.059**	
	(0.029)	
1.D_near_distance_ta < 0.25_ex	0.519***	
	(0.067)	
2.D_near_distance_ta < 0.5_ex	0.403***	
	(0.066)	
3.D_near_distance_ta < 0.75_ex	0.343***	
	(0.064)	
4.D_near_distance_ta < 1_ex	0.305***	
	(0.064)	
5.D_near_distance_ta < 2_ex	0.231***	
	(0.058)	
6.D_near_distance_ta < 3_ex	0.183***	
	(0.056)	
7.D_near_distance_ta < 4_ex	0.065	
	(0.050)	
8.D_near_distance_ta < 5_ex	0.001	
	(0.049)	
1.D_near_distance_cc <0.25_cheap		0.344*
		(0.205)
2.D_near_distance_cc <0.5_cheap		0.419***
		(0.086)
3.D_near_distance_cc < 0.75_cheap		0.379***
		(0.066)
4.D_near_distance_cc < 1_cheap		0.295***
		(0.060)
5.D_near_distance_cc < 2_cheap		0.315***
		(0.039)
6.D_near_distance_cc < 3_cheap		0.231***
		(0.037)
7.D_near_distance_cc < 4_cheap		0.202***
		(0.033)
8.D_near_distance_cc < 5_cheap		0.144***
		(0.023)
1.D_near_distance_cc <0.25_ex		0.398*
		(0.211)
2.D_near_distance_cc <0.5_ex		0.276***
		(0.090)
3.D_near_distance_cc < 0.75_ex		0.365***
		(0.078)
4.D_near_distance_cc < 1_ex		0.308***
		(0.074)
5.D_near_distance_cc < 2_ex		0.356***
		(0.061)
6.D_near_distance_cc < 3_ex		0.215***
		(0.061)
7.D_near_distance_cc < 4_ex		0.162***
		(0.058)

8.D_near_distance_cc < 5_ex		0.111**
		(0.045)
Observations	3,804	3,804
R-squared	0.998	0.998

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. N.A. stands for not applicable, as there are no shared rooms which can be placed under the expensive category. Ex stands for expensive.

Appendix E: Sensitivity Analysis

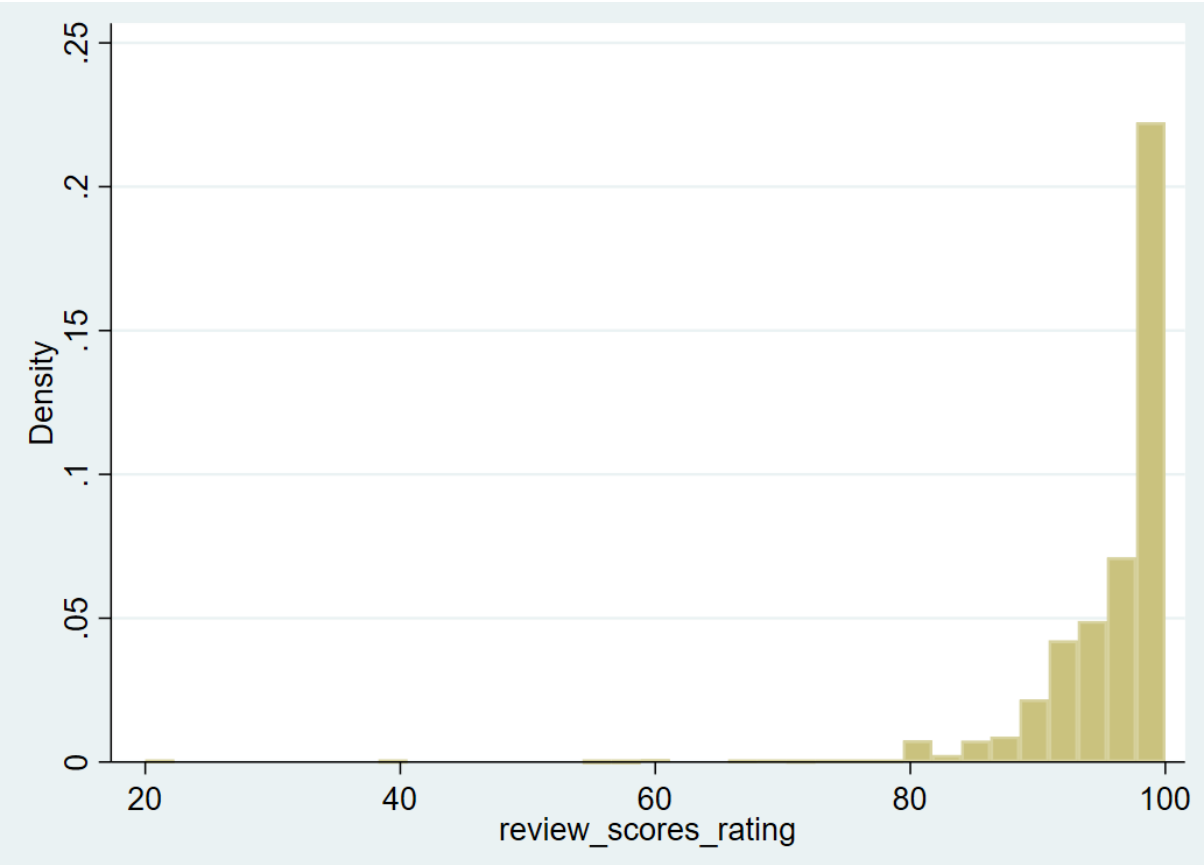
VARIABLES	(2)NEW lnListing_price	(2) lnListing_price	(3)NEW lnListing_price	(3) lnListing_price
bedrooms	0.177***	0.175***	0.176***	0.176***
	(0.012)	(0.012)	(0.012)	(0.012)
Beds	-0.032***	-0.031***	-0.032***	-0.032***
	(0.010)	(0.010)	(0.010)	(0.010)
bathrooms	0.145***	0.147***	0.150***	0.149***
	(0.022)	(0.022)	(0.022)	(0.022)
accommodates	0.089***	0.091***	0.090***	0.090***
	(0.008)	(0.008)	(0.008)	(0.008)
shared_room	-1.357***	-1.324***	-1.337***	-1.343***
	(0.091)	(0.086)	(0.086)	(0.086)
private_room	-0.485***	-0.479***	-0.472***	-0.475***
	(0.017)	(0.017)	(0.017)	(0.017)
o.entire_home_apt	-	-	-	-
review_scores_rating	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
D_host_is_superhost	-0.012	-0.014	-0.016	-0.017
	(0.014)	(0.014)	(0.014)	(0.014)
host_listings_count	0.009***	0.010***	0.009***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)
D_listing_density	-0.025	-0.035*	-0.021	-0.004
	(0.020)	(0.019)	(0.018)	(0.018)
1.Bromma	-0.003	-0.044	-0.237***	-0.204***
	(0.056)	(0.052)	(0.044)	(0.045)
2.Enskede-Ärsta-Vantör	-0.019	-0.066	-0.341***	-0.314***
	(0.050)	(0.045)	(0.032)	(0.033)
3.Farsta	-0.080	-0.107*	-0.312***	-0.288***
	(0.063)	(0.059)	(0.052)	(0.053)
4.Hägersten-Liljeholmen	0.015	-0.055	-0.295***	-0.277***
	(0.050)	(0.043)	(0.032)	(0.033)
5.Hässelby-Vällingby	-0.237***	-0.265***	-0.465***	-0.434***
	(0.065)	(0.061)	(0.054)	(0.056)
6.Kungsholmen	0.026	0.013	-0.148***	-0.154***
	(0.028)	(0.028)	(0.024)	(0.026)
8.Rinkeby-Tensta	-0.095	-0.124*	-0.325***	-0.293***
	(0.071)	(0.068)	(0.062)	(0.063)
9.Skarpnäck	0.013	-0.040	-0.333***	-0.316***
	(0.054)	(0.048)	(0.034)	(0.035)
10.Skärholmens	-0.182**	-0.209***	-0.410***	-0.380***
	(0.075)	(0.072)	(0.066)	(0.068)
11.Spanga-Tensta	-0.218***	-0.247***	-0.450***	-0.419***
	(0.082)	(0.079)	(0.074)	(0.075)
12.Sodermalm	0.117***	0.115***	-0.294***	-0.268***
	(0.025)	(0.025)	(0.026)	(0.026)
13.Älvsjö	0.066	0.038	-0.166***	-0.142**
	(0.068)	(0.065)	(0.059)	(0.060)
14.Östermalm	0.033	0.023	-0.105***	-0.079***

	(0.032)	(0.032)	(0.030)	(0.030)
1.D_near_distance_cc <0.25		0.554***		
		(0.152)		
2.D_near_distance_cc <0.5		0.538***		
		(0.071)		
3.D_near_distance_cc < 0.75		0.615***		
		(0.061)		
4.D_near_distance_cc < 1		0.506***		
		(0.057)		
5.D_near_distance_cc < 2		0.499***		
		(0.041)		
6.D_near_distance_cc < 3		0.308***		
		(0.039)		
7.D_near_distance_cc < 4		0.227***		
		(0.036)		
8.D_near_distance_cc < 5		0.151***		
		(0.025)		
2.D_NEW_near_distance_cc <0.35	0.498***			
	(0.105)			
3.D_NEW_near_distance_cc<0.6	0.628***			
	(0.082)			
4.D_NEW_near_distance_cc<0.85	0.590***			
	(0.058)			
5.D_NEW_near_distance_cc<1.5	0.561***			
	(0.047)			
6.D_NEW_near_distance_cc<2.5	0.423***			
	(0.044)			
7.D_NEW_near_distance_cc<3.5	0.280***			
	(0.044)			
8.D_NEW_near_distance_cc<4.5	0.139***			
	(0.027)			
1.D_NEW_near_distance_ta<0.1			0.840***	
			(0.065)	
2.D_NEW_near_distance_ta<0.35			0.689***	
			(0.047)	
3.D_NEW_near_distance_ta<0.6			0.656***	
			(0.043)	
4.D_NEW_near_distance_ta<0.85			0.543***	
			(0.040)	
5.D_NEW_near_distance_ta<1.5			0.452***	
			(0.035)	
6.D_NEW_near_distance_ta<2.5			0.320***	
			(0.031)	
7.D_NEW_near_distance_ta<3.5			0.187***	
			(0.029)	
8.D_NEW_near_distance_ta<4.5			0.131***	
			(0.028)	
1.D_near_distance_ta < 0.25				0.758***
				(0.051)
2.D_near_distance_ta < 0.5				0.645***
				(0.048)
3.D_near_distance_ta < 0.75				0.592***
				(0.044)

4.D_near_distance_ta < 1				0.516***
				(0.044)
5.D_near_distance_ta < 2				0.405***
				(0.037)
6.D_near_distance_ta < 3				0.264***
				(0.032)
7.D_near_distance_ta < 4				0.180***
				(0.031)
8.D_near_distance_ta < 5				0.055*
				(0.032)
Constant	5.258***	5.269***	5.493***	5.447***
	(0.122)	(0.121)	(0.115)	(0.117)
Observations	3,804	3,804	3,804	3,804
R-squared	0.659	0.657	0.666	0.665

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The variable D_NEW_near_distance_cc <0.1 is not listed as no listings are available within a 100-meter radius from the city centre.

Appendix F: Review Score Rating Distribution



Appendix G: Listing Distribution per Interval

D_near_distance_cc		
	Freq.	Percent
0-0.25 KM	4	0.11
0.25-0.5 KM	36	0.95
0.5-0.75 KM	71	1.87
0.75-1 KM	83	2.18
1-2 KM	952	25.03
2-3 KM	980	25.76
3-4 KM	335	8.81
4-5 KM	320	8.41
5 > KM	1,023	26.89
Total	3,804	100

D_near_distance_ta		
	Freq.	Percent
0-0.25 KM	157	4.13
0.25-0.5 KM	196	5.15
0.5-0.75 KM	270	7.1
0.75-1 KM	251	6.6
1-2 KM	921	24.21
2-3 KM	768	20.19
3-4 KM	359	9.44
4-5 KM	196	5.15
5 > KM	686	18.03
Total	3,804	100

Appendix H: Control Variable Discussion

Kwok & Xie (2018) provide an in-depth overview of the positive effect of listing count on Airbnb prices. They argue that hosts with multiple listings are prone to put more effort into their Airbnb business, leading to higher service levels and higher revenue. Moreover, hosts with multiple listings are likely to have more experience due to an increased number of transactions which can boost profit performance (Kwok & Xie, 2018).

Interestingly, for model (3) and (5) which include the distance to the city centre as a location quality proxy, listing density is significant at the 90% confidence level. The negative sign of the variable 'listing density' can be explained by competition. Precisely, high-density areas are characterized by relatively high supply levels of Airbnb listings. Following the conventional interpretation of competition and price in economics, high-density levels can be expected to decrease prices. In the case of model (3) and (5), it can be concluded that Airbnb listing prices decrease by 3.4% due to high-density.