

Back to mom and dad? The influence of Airbnb on chances for first time buyers

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Abstract

Over the course of the past few years, it seems like buying a house for first time buyers has become more difficult. The timing of this coincides with another phenomenon: Airbnb. The amount of dwellings on Airbnb has been on the rise, and this includes houses that are bought for the sole purpose of being rent on Airbnb, a practice which is part of the buy to let trend. In this research, the spatial patterns of first time buyers, Airbnb and buy-to-let have been mapped in ArcGIS and combined tested in SPSS, with as goal to see if there is a correlation between the rise of buy-to-let dwellings and a decline in first time buyers in neighbourhoods that have a high amount of Airbnb's. This is done in the Dutch cities of Amsterdam and The Hague.

The conclusion is that at least for Amsterdam, it seems somewhat plausible that Airbnb influences the market for first time buyers. This is because in some neighbourhoods, especially near the city centre, many neighbourhoods with relatively many Airbnb's have a decline in first time buyers. In addition to that, the statistical research gives a significant correlation between the two. For The Hague, it's not very likely, but there is insufficient data to come to a clear conclusion.

Introduction

Background

After the collapse of the housing market in 2008, houses became much cheaper, but recently prices have been on the rise again, especially in bigger cities (Volkskrant, 2016). Big cities, such as The Hague and Amsterdam, which already had a tight housing market, are going through a process of gentrification right now. There's also a decline in social housing, making way for more privately owned housing (Teernstra, 2015). This leads to more and more people of lower income having to move out of the city centre and it becomes much harder for newcomers to the city, unless they are already wealthy enough (Hochstenback & Musterd, 2018).

An important group that is hit by these problems is the group of first time buyers (NRC, 2018). It's difficult for many consumers due to different factors, but it's especially difficult for first time buyers. According to the NRC, people tend to not sell their old house until they have a new one, and taking into account the fact that it is harder for everyone to get a new house, the flow is interrupted here. To paint a picture of the situation: in 2015 first time buyers accounted for over 50 percent of the total mortgages, in the first half of 2018, this was between 35 and 40 percent (de Vries & Wisman, 2018). Because of this, lots of first time buyers are forced to either continue renting a house, making it more difficult to save up money long-term, or they have to go back to living with their parents.

During the past few years, a new possible interruption has made its way into the already complex housing market: Airbnb, an online platform that allows you to rent out a room or your house for short stay. Since its establishment in 2008, it has grown exponentially, with over five million properties on the website in total (Airbnb, 2018).

However, it seems Airbnb leaves its mark on the housing market. Gurran and Phibbs (2017) found that Airbnb influences the rental vacancy stock, and the Dutch bank ING concluded that in theory, Airbnb could lead to a rise in mortgages of 95.000 euros (ING, 2016). Although it is only very marginally documented due to being largely illegal in the Netherlands, there's also another issue: permanent Airbnb's. As shown by Tegenlicht (2016), there are houses that are bought for the sole purpose of being rented on Airbnb, making an already tight housing market even tighter.

Now, municipalities are starting to create legislation concerning Airbnb. In Amsterdam, for example, a house can only be rented 60 days per year, with that number being lowered to 30 from 2019 on. It also has the requirement that a host must be in the house at least 6 months per year, to avoid people buying a house solely to rent it out on Airbnb (Nieuwland & van Melik, 2018). Although these rules seem solid at first, illegal renting is still a big problem in Amsterdam, with Guttentag (2015) calling it 'widespread'. When local television channel AT5 (2018) tested whether or not these rules were actually checked, the 60 day rule was very easy to get around by simply posting the same listing again.

Other municipalities, for example The Hague, are less strict.. There is no rule for how many nights one can let their house on Airbnb (denhaag.nl, 2018), but one is not allowed to structurally let their house on Airbnb. In 2017 The Hague's municipality established a so-called pandbrigade, a group whose main concern is checking whether or not some houses are structurally rented on Airbnb illegally (AD, 2017), meaning that it's an issue here as well.

Research problem

The above information gives us a small insight in some problems surrounding Airbnb on the housing market. It is apparently a factor that municipalities do have to make specific regulations for, showing that it does influence the market negatively. Then, there is also the matter of first time buyers, who seem to have some troubles on the housing market as well.

Although there is a lot of literature on both subjects separately, there is no information yet on whether or not Airbnb immediately influences the housing market for first time buyers. By researching the possibility of Airbnb playing a role on this market, a more complete model of both the effects of Airbnb and the current housing situation for first time buyers can be created. In addition to that, research in the spatial patterns of first time buyers in the Netherlands is rather scarce as well, so this research could add this to the field.

For this research, two important cities in the Netherlands will be used as a case study: Amsterdam and The Hague. Both cities have a somewhat troubled housing market, have a rise of Airbnb dwellings and are important touristic cities in the Netherlands, making them good examples of this specific problem. However, the issue seems to be much more pressing

in Amsterdam, allowing for a comparison between an extremely touristic city and a more normal big city. To find out whether or not Airbnb does indeed influence the housing market for first time buyers, the following research question will be answered:

- To what extent and in which neighbourhoods does Airbnb influence the availability of houses for first time buyers in neighbourhoods in Amsterdam and The Hague?

To get an answer to this question, the following sub-questions will be explored:

- Which neighbourhoods tend to have many Airbnb's in both Amsterdam and The Hague?
- What is the current trend concerning buy to let properties in both Amsterdam and The Hague?
- What is the current trend concerning first time buyers in Amsterdam and The Hague?
- Is there a spatial overlap between neighbourhoods with many Airbnb's, a rise in buy to let dwellings and a decline in first time buyers and where is that overlap mainly concentrated?
- Is there a correlation between a rise in buy to let and a lower inflow of first time buyers in neighbourhoods with a lot of Airbnb's?

Thesis structure

Firstly, the theoretical framework for this research will be explained. This theoretical framework will mainly focus on the three important aspects of this research: the buy to let trend, Airbnb and first time buyers. All three of these concepts will be explored in two ways: the overall development of these markets and the spatial trends.

After that, the numbers that have been collected on these subjects will be used to create maps to see which neighbourhoods are relevant for this research, followed by a statistical analysis of the numbers on buy to let, Airbnb and first time buyers in these neighbourhoods. Based in this, a conclusion will be drawn, followed by a discussion of the results.

Theoretical framework

First time buyers

An important group researched is that of first time buyers. This is the group of buyers on the housing market that is buying a house for the first time. The most common age in this group is people between 25 and 34 years old, who have often already rented for a long time (Lindblad et al, 2017).

Recently, this group has gotten some interest when it comes to housing, as research carried out by the Dutch Kadaster (2018) suggests that first time buyers are having a more difficult time on the housing market. In the entirety of the Netherlands, the amount of first time buyers as a percentage of all housing transactions has gone down from almost 55% in 2012 to roughly 33% in the first quarter of 2018. This percentage has been on a steady decline ever since 2012 and the prognosis is that this trend is only going to continue. Although these numbers apply to the country as a whole, in big cities, this trend is even stronger (de Vries & Wisman, 2018). There are a few developments that could have contributed to this decline.

Recently the profile of first time buyers has changed. The most important change is that the corresponding age group tends to have more so-called flexible contracts: in 2012, 57% of all flex-workers (roughly 490,000) were younger than 35 (Boumeester, 2015). The other two age groups distinguished by Boumeester (2015), 35-55 and 55+, only held 33 and 10 percent of all flex-contracts respectively. In comparison, people younger than 35 only held 21% (roughly 733,320) of all permanent contracts. Overall, comparatively speaking, younger people hold more flex-contracts than older people. In this same research, Boumeester (2015) researches how this influences flex-workers' chances on the housing market. Compared to people with a permanent contract, flex-workers with a wish to buy their first house tend to only have a 46% percent rate of doing so, as compared to 80% of people with a permanent contract. This probably for financial reasons, as 58% of flexworkers earns less than Dutch modal income. This makes it harder to buy a house for flex-workers. In addition to that, flex-contracts tend to come with a higher level of financial uncertainty, making buying a house less attractive for both first time buyers and banks (de Vries & Wisman, 2018).

Another development on the first time buyers' end is the kind of neighbourhoods they like. Younger people tend to gravitate towards big cities, preferably close to city centres, which are lively and close to working places. However, the popularity of the inner cities raises the housing price, making it more difficult to buy a house in these areas. Boterman et al. (2013) name starting gentrifying neighbourhoods as the most popular neighbourhoods for first time buyers to move to. The main reasons named for this are the fact that houses in these neighbourhoods are usually still relatively affordable and the fact that first time buyers expect these neighbourhoods to slowly evolve into better places to live over time. Already gentrified neighbourhoods continue to be popular as well.

Although the crisis did slow down the process of gentrification, it has started again after the crisis subsided. Hand in hand with this is a decline in social housing and because of these two factors, poorer households tend to move away from central neighbourhoods (Hochstenbach & Musterd, 2018).

Because getting a house in the big cities seems to become more difficult, many younger people have to resort to moving back in with their parents after finishing their education. This is a phenomenon known as 'Boomerang children'. As of 2015, roughly 25% of young adults who leave their parents' house have returned five years later. The most named reasons for this are usually the end of a relationship or the end of their education. However, after the crisis of 2008, two reasons show up more and more: financial problems (which grew from 10,9% to 22% between 2004 and 2015) and a difficulty to find good housing (which grew from 10,9% to 14%) (CBS, 2016).

Housing regime

Not only changes on the first time buyers' end have influenced the housing market. Housing regimes, which detail how much the government intervenes on the housing market, have played a role as well. In his research on housing regimes, Kemeny (1995) identifies the Netherlands as having a unitary housing regime before the crisis. Unitary housing regimes have high and tenure-neutral public spending on housing, with relatively low government support for home-ownership. Compared to countries that fall under a so-called dual housing regime, which put more focus on home-ownership with only social housing for the very lowest social class, the Netherlands had a low percentage of home-ownership. This exact percentage has gone through a few motions over the course of the past few years: up until 2008 it was rising, but after the 2008 crisis the amount of mortgages went down again. Now, in 2018 the percentage of home-ownership is rising again (de Vries & Wisman, 2018).

This brings us to another important aspect of the housing market: the mortgage market. Despite being classified as a unitary system, the Dutch government has been trying to increase the level of home-ownership ever since World War II. They do this by liberalising the mortgage market, which in practice makes inequality on the housing market only bigger (Wind, 2018), but there are still some rules that are enforced. De Vries et al. (2016) took a look at some changes concerning the regulation on the mortgage market. There were two measures that would influence the market for first time buyers: a change of the borrowing norms and a change in loan-to-value. This first measure leads to first time buyers being able to borrow less money if the interest rate doesn't change too much. The second measure allows everyone in general to borrow less money, as one is now only allowed to borrow 101% of the housing price instead of 102%. This is problematic because first time buyers usually borrow the largest amount possible (de Vries et al., 2016). Since the change in loan-to-value means that one's own contribution needs to be higher than before, this is a problem when taking the aforementioned flex-contracts into account.

There's one last important part in the Dutch housing market: social housing. The Netherlands is one of the biggest providers of social housing in the EU, with social housing covering 31% of the overall housing market in the

Netherlands in 2012 (Priemus & Boelhouwer, 2014). After the crisis of 2008, budget cuts were needed and much social housing had to be sold. Although one might expect that this would make the housing market more accessible for first time buyers as this means there are more houses available, Priemus & Boelhouwer (2014) say that this is not the case: the houses will mainly end up with private landlords.

Airbnb's

In the past few years, Airbnb has come up as a new possible factor. Airbnb is an online platform meant for connecting people that want to rent out for example a spare room in their house to tourists. It's part of the sharing economy, a new form of economy that is based on peer-to-peer networks. Although it's not the only online platform of this type, it's by far the biggest has by far the biggest influence on its surroundings (Guttentag, 2015).

Airbnb was first established in 2008 and took off after 2010. It's been growing exponentially, with more than 100% per year in certain cities, and it's expected to continue growing (Lane & Woodworth, 2016). Reasons for its popularity are that it allows people to get in touch with locals (Guttentag, 2015) and Airbnb's come with lots of amenities that many normal hotels do not have, such as a kitchen (Lane & Woodworth, 2016).

It's already been mentioned that Airbnb comes with its downsides, as there is reason to assume that Airbnb has some influence on the availability of houses. Gurran and Phibbs (2017) found that in the city of Sydney there was a significant correlation between the rise of Airbnb's and a decrease in the vacant rental stock. According to Smith (2018), this problem mainly persists in neighbourhoods that are more appealing to low-income groups, meaning that Airbnb could influence inequality.

Other authors have already observed that there are landlords buying a house only to rent it on Airbnb, as Airbnb can be very lucrative (Gurran & Phibbs, 2017; Nieuwland & van Melik, 2018). There are laws in place to prevent this, but in practice, many of these laws are easy to avoid as Airbnb itself does very little to actually enforce them. Thus, although Airbnb would in theory not immediately influence the housing market, it's probable that it does by people buying houses solely to put them on Airbnb.

Buying a house to put it on Airbnb permanently is part of the buy-to-let trend, in which someone buys a house with the sole purpose of then renting it, both short-term and long-term. Often these are people who have already paid off a house, making it easier for them to get a mortgage on a new house. It's considered a relatively safe investment, as it puts savings into a house instead of on a bank account and allows for regular income in the form of rent. It started off with a boom, but the growth seems to have stabilized. An interesting factor that seems to set buy to let apart from many other investments in the housing market is the fact that it is done by individuals, rather than companies, making the market relatively heterogeneous (Gibb & Nyaard, 2005).

Buy to let seems come with multiple side effects. One mentioned often is that it significantly lowers the availability of housing for first time buyers, since there seems to be an overlap between houses that are interesting for first time buyers and houses of interest for investors in the buy to let market. In addition to that, there seems to be a steep rising of housing prices in houses in the lower price segments, a pricing segment that is also popular with buy to let owners (Sprigings, 2008). In addition, research by Paccoud (2017) has shown that there is a correlation between gentrification and neighbourhoods with many buy to let houses, strengthening Sprigings' hunch that buy to let has an influence on housing availability for lower income house buyers.

On a regulatory level, the Dutch government has been actively stimulating the buy to let market. It's a solution for people whose income is too high for social housing, but too low to get a mortgage easily. However, as a side effect of this treatment from the government, prices of houses on the private rental market tend to go up, thus driving people with a lower income (but with a too high income to qualify for social housing) from the city centres (Aalbers et al, 2018).

As of right now the only legislation on Airbnb is a restriction on the amount of nights in both cities. In some countries, however, it's already mandatory to get a permit before one is allowed to rent their house on Airbnb: for example Japan uses this system. (The Japan Times, 2018).

The overarching buy-to-let trend is not very strictly enforced either. In both cities the tenant only needs to apply for a permit if the house is less than a certain amount of euros rent per month (den Haag.nl, 2019 & amsterdam.nl, 2019). This means that there is very little overall oversight on how big the buy-to-let trend is.

Spatial patterns

Besides the governmental and the economic components, this subject has one more important part: spatial patterns. Overall, the Netherlands seems to have a trend of suburbanisation where low-income families are involved. A lot of neighbourhoods in city centres are now subject to gentrification, usually stimulated by the government. This leads to higher housing prices in these neighbourhoods, often leading to low income households moving towards suburban areas or satellite cities. However, many households also find other ways to deal with the rise in price, such as taking on higher rent burdens or sharing a house with relatives or room mates (Hochstenbach & Musterd, 2018). As first time buyers prefer the centres of big cities, it might be that they are among this group that finds a way to cope with gentrification. Airbnb seems to abide by a similar pattern. In his research van der Zee (2018) notes that many Airbnb's tend to be located close to the city centre. Another pattern that can be established is that Airbnb's tend to be clustered in neighbourhoods that have many hotels, restaurants and tourist attractions. These findings are also supported by Sans & Domínguez (2016). This is interesting, as Guttentag (2015) explicitly mentions that part of Airbnb's popularity is the fact that it allows people to get into contact with locals. However, it seems Airbnb follows a pattern that is more similar to the normal tourist sector instead.

Buy to let seems to share a similar pattern. According to their research on Buy to Let in the Netherlands, Aalbers et al. (2018) found that buy to let is mainly on the rise in student cities and big cities overall. In addition to that, the trend seems to mainly centre, once again, around the city centres, with the city centre of Amsterdam seeing the highest rise in private rental dwellings. This makes sense, as it's already been established that city centres are by far the most important locations for living and have rising prices. In that same research Aalbers et al. (2018) mention that many investors in buy to let are companies, which would have more money to invest.

Because of these developments, it's easy to assume that more and more dwellings in the city centre are becoming rental dwellings. In combination with the fact that it's become much more difficult for younger people to buy a house, this generation has already been dubbed 'generation rent'. The expectation is that if they want to stay in the cities, this generation will be stuck renting houses for a really big part of their lives (The Independent, 2018).

Hypotheses

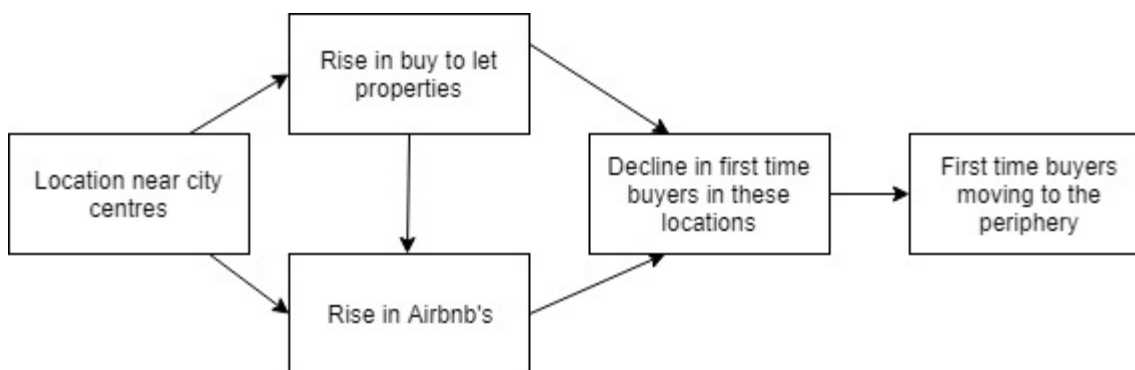
Based on the literature, the hypotheses for the sub-questions and main question are as follows

- Airbnb's will mainly be found in neighbourhoods around the city centre and in traditionally touristic places.
- There will be an increase of buy-to-let properties in both The Hague and Amsterdam, and these will be located in neighbourhoods near the city centre as well.
- There is a decrease of first time buyers in houses near the city centre.
- There is overlap between neighbourhoods with many Airbnb's, a rise in buy to let and a declining number of first time buyers, mainly near the city centre.
- An increase in buy to let properties and a high percentage of Airbnb's both have have a statistically significant effect and lower the amount of first time buyers in neighbourhoods.

The hypothesis for the main research question is that there will be a significant correlation between an increase in buy-to-let, a large amount of Airbnb dwellings and a lower inflow of first time buyers in different neighbourhoods.

Conceptual model

Below is a conceptual model of the theoretical framework as mentioned above.



Methodology

Sources and data quality

Since this research encompasses a big scale, it's difficult to use primary data. Thus, the data will be collected from other sources instead. The cases used will be the different neighbourhoods in the two cities: this means 99 cases for Amsterdam and 44 for The Hague. Both cities have 1 neighbourhood that has no information available, leaving 98 and 43 cases respectively.

For the SPSS analysis, the amount of cases has been reduced to 74 due to lacking either information on first time buyers or having no Airbnb's in some areas.

There are three main institutions that are used to gather data from: the CBS (the Dutch institution for statistical data) and the municipalities of The Hague and Amsterdam. From the CBS the database *Kerncijfers Buurten en Wijken* will mainly be used. This database includes a lot of information of the neighbourhoods, including the amount of inhabitants and the amount of private rental dwellings in the neighbourhood, both of which are used in this research. If this does not suffice, both the municipality of The Hague and Amsterdam have a portal for data in their neighbourhoods as well.

These are Den Haag in *Cijfers* (2018) and OIS (2018) respectively.

These databases don't include information on first time buyers. This information must be collected from the municipalities. For Amsterdam, information on first time buyers from 2010 is available in research from Boterman et al. (2013) and information on first time buyers in 2017 can be collected from the municipality itself. The municipality of The Hague does not have this information available. As a work-around, some data on the right age group and home-ownership will be taken from Den Haag in *Cijfers* (2018). Although not extremely reliable, neighbourhoods that have a high rate of both might have more first time buyers.

The reason for using these databases is that this research is on too large a scale to collect it myself. These databases, on the other hand, include all information necessary on the scale necessary. In addition to that, these numbers have been collected by official institutions, making them more reliable than self-collected data.

The information on Airbnb's will be taken from two different sources: *InsideAirbnb* and *AirDNA*. Airbnb itself does not give away much information and collecting it manually would be extremely time-consuming, so these websites will be used. These websites collect information on Airbnb's using a technique called *scraping*, which means they add every new listing to their database immediately. The reason for using two different sources is that although *InsideAirbnb* is much more thorough, it only has information on Amsterdam. For The Hague, *AirDNA* must be used instead.

The quality of the data from the CBS and the municipalities can be counted on as being reliable, as they are proper, large-scale researches done by bigger institutions. However, it should be noted that there is some data missing concerning the first time buyers in Amsterdam. Especially neighbourhoods with a low amount of inhabitants have no information available, simply due to the fact that while collecting the data, not enough house owners were found. These neighbourhoods are thus excluded from the map on first time buyers and the statistical research.

The Airbnb data is less reliable, as it includes the occasional double advertisement or a house that is still on the website, but not available any more. This has been filtered out as much as possible, but there is still the possibility of some faulty information.

Analysis

The analysis will be done using two different programs. For the spatial analysis, ArcGIS will be used, whereas SPSS will be used for the statistical analysis.

In ArcGIS, firstly maps of both Amsterdam and The Hague will be imported. These maps will include the neighbourhoods. Then, multiple maps will be created for both cities. The maps on buy to let will be made by calculating the differences in buy to let properties based on the CBS information of 2010 and 2017. This difference will then be made into a table and that table will be joined with the city maps, creating the buy to let maps. This M.O will also be used for the first time buyer maps and the age and home-ownership maps for The Hague.

The Airbnb maps will be density maps. Firstly, a selection of relevant Airbnb's will be made. These are Airbnb's that are available more than 60 days per year, and are complete houses. *InsideAirbnb* includes coordinates, allowing for an easy import, but *AirDNA* does not, so those Airbnb's have to be included on the map manually. After that, a density map will be created. These maps combined will show the spatial patterns of the different components of the research.

For the statistical part, three main numbers will be used: the difference in in buy to let properties, the amount of relevant Airbnb's as a percentage of the total amount of houses and the difference in first time buyers. As the last number isn't available for The Hague, this test will only be run for Amsterdam. A map of this will also be made for a better overview. The test run will be a multiple linear regression, using the development of first time buyers as a dependant variable and the amount of Airbnb's and the development of buy to let properties as independent variables. This test allows to find a linear correlation and will show the direction of this correlation. By doing this, it will be possible to see if a high amount of Airbnb's and a raise in buy to let properties correlates with a significant decline in first time buyers.

Ethics

Most of this data was collected from secondary sources. All of the CBS and municipality data is completely anonymous and only includes percentages in neighbourhoods. Because of this, it is pretty much impossible to retrace any information back to individuals.

The Airbnb data does include names and locations, but none of the names will be shown anywhere in this research. The same goes for the location of the Airbnb's: these will not be given, and only density maps will be shown.

Results

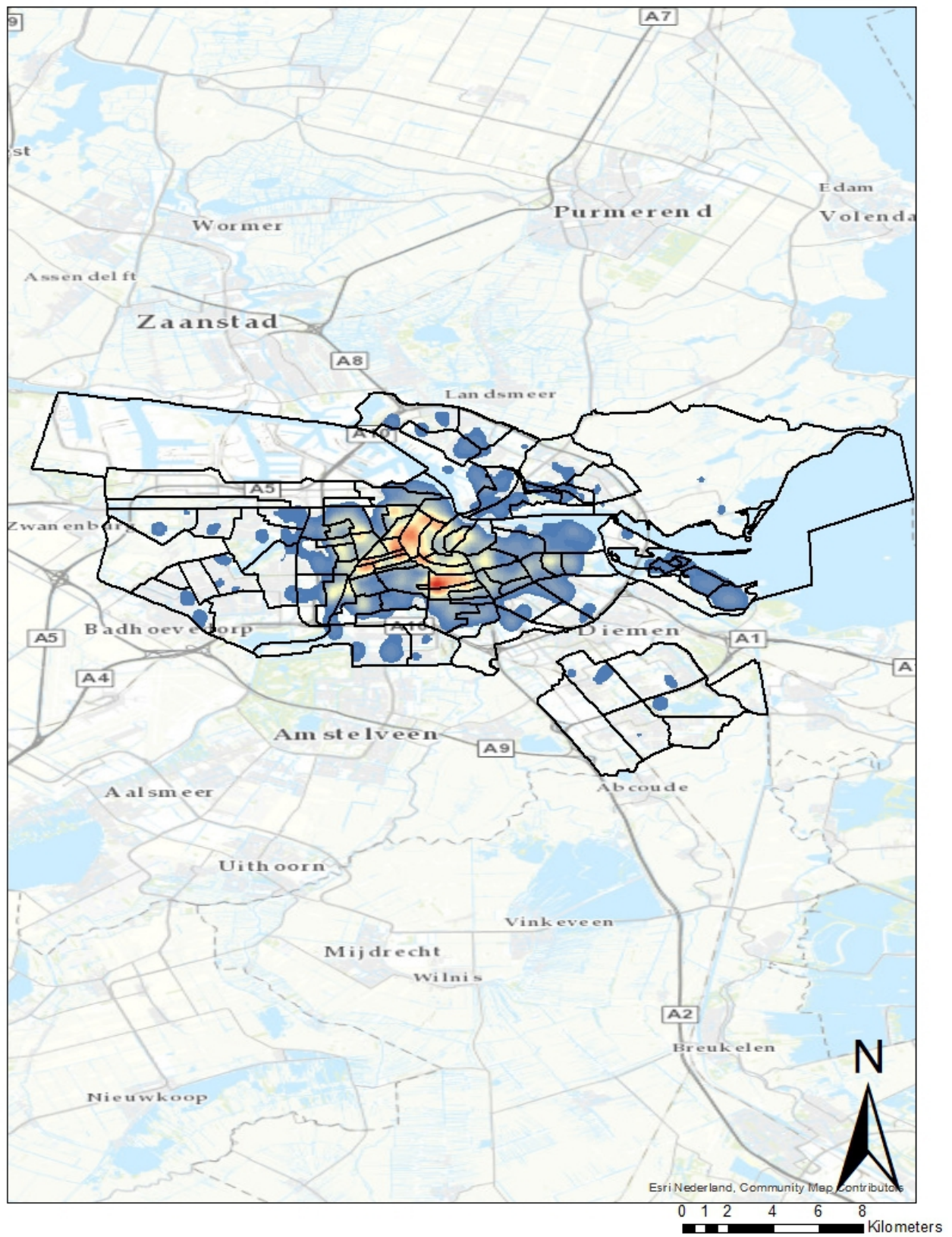


Figure 1: Density of Airbnb's in Amsterdam. Source: InsideAirbnb (2018)

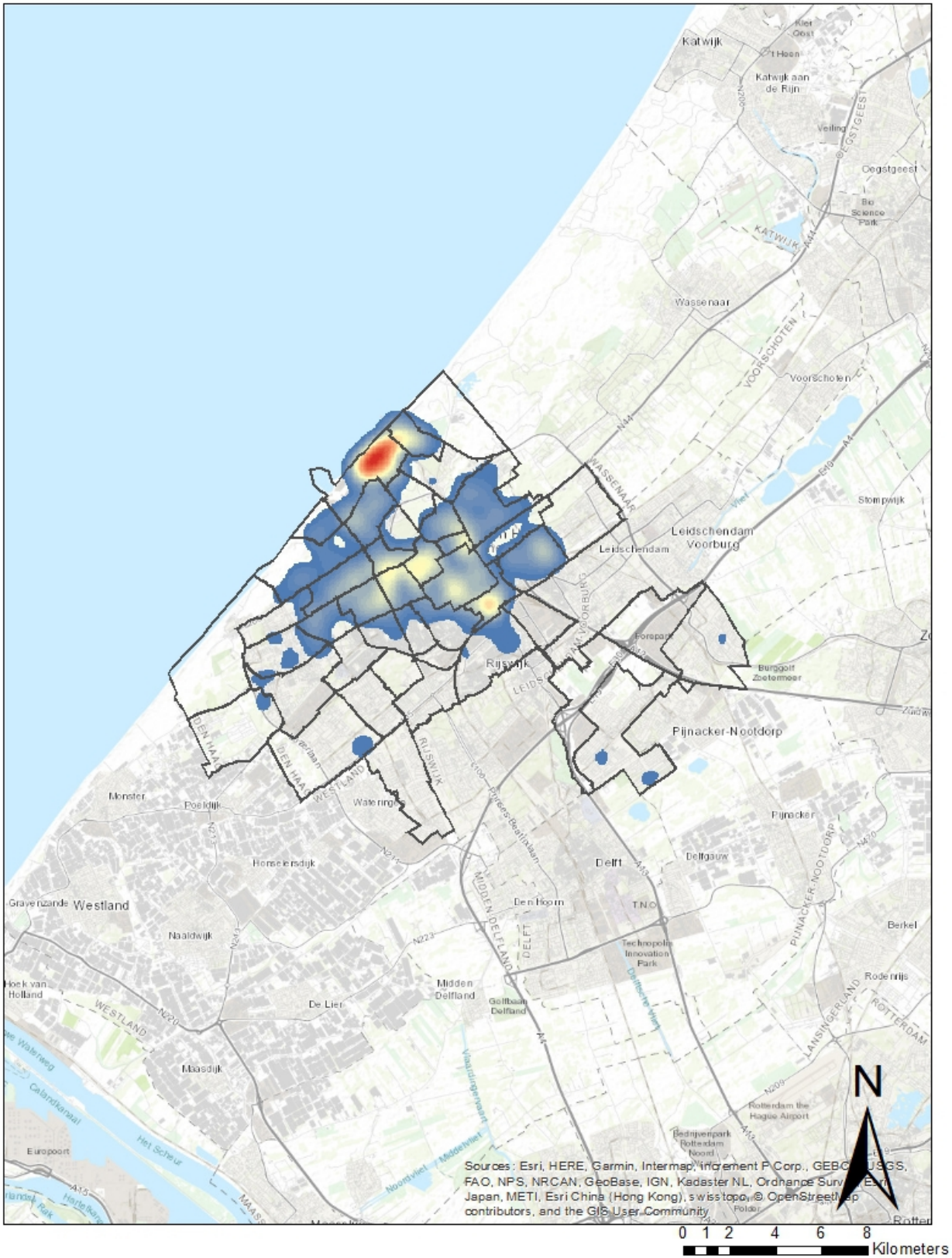


Figure 2: Density of Airbnb's in The Hague. Source: AirDNA (2018)

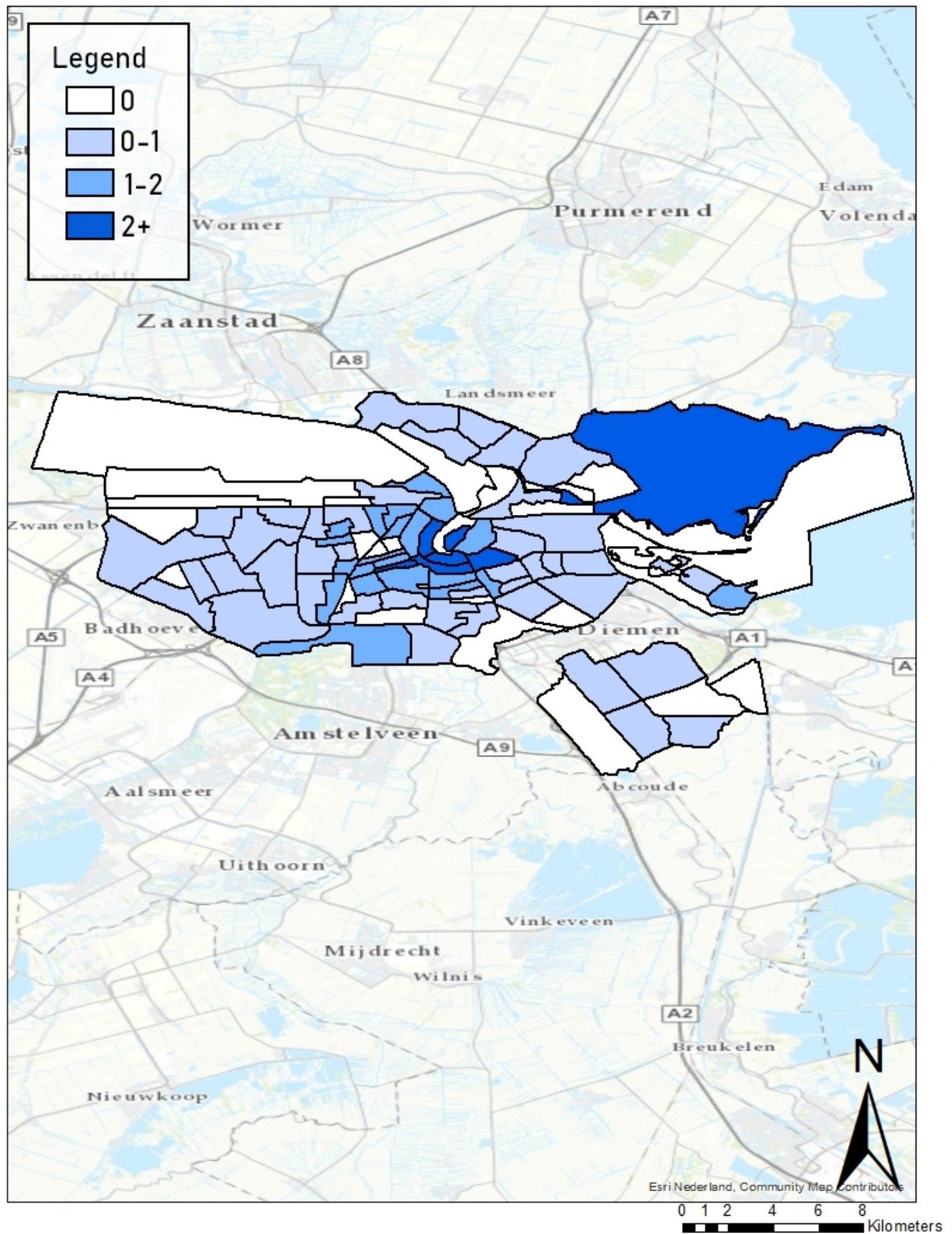


Figure 3: The amount of Airbnb's as percentage of all houses in the relevant neighbourhoods in Amsterdam. Source: Boterman et al. (2013) and the municipality of Amsterdam (2018)

Spatial analysis: Airbnb

Figure 1 and 2 show the density of Airbnb's in Amsterdam and The Hague, respectively. As can be seen, the two maps differ quite a bit: Airbnb's in Amsterdam tend to be much more spread out than in The Hague. The Hague on the other hand has one very specific neighbourhood that seems to have the most Airbnb's by far: Scheveningen. Scheveningen is a famous seaside resort in the Netherlands, so it makes a lot of sense that that area houses many Airbnb's. This checks in with the findings of van der Zee (2018) and Sans & Domínguez (2016) that Airbnb's are often in tourism-heavy areas. Although Scheveningen is by far the most Airbnb-heavy area, there is one other location that seems to have a relatively high density. This is the Station-neighbourhood, located near the centre of the map, and is the neighbourhood in which one of the most important train stations of The Hague, Hollands Spoor, is located. In addition to that, the neighbourhood is located right next to the city centre, which is the neighbourhood immediately north of the Stationsbuurt. The rest of the Airbnb's in this area are also in neighbourhoods close to the city centre. This follows the second spatial pattern recognised by aforementioned authors, namely that Airbnb's are often in central areas.

Amsterdam follows a slightly different pattern. Most of the Airbnb's are found in or near the city centre. Most Airbnb-heavy neighbourhoods include De Pijp, the Jordaan and the Overtoomse Sluis. These are part of the city centre and house tourist attractions as well. In addition to that, most of these neighbourhoods are known for having lots of restaurants and cafes and they are still going or have already largely gone through the process of gentrification. Figure 3 shows the amount of Airbnb's as a percentage of the total amount of houses in that neighbourhood. When compared to the density map, this clearly shows relatively many Airbnb's in neighbourhoods near the city centre, with the amount declining the further the area is from the city centre. There are some exceptions, but most neighbourhoods seem to follow this pattern.

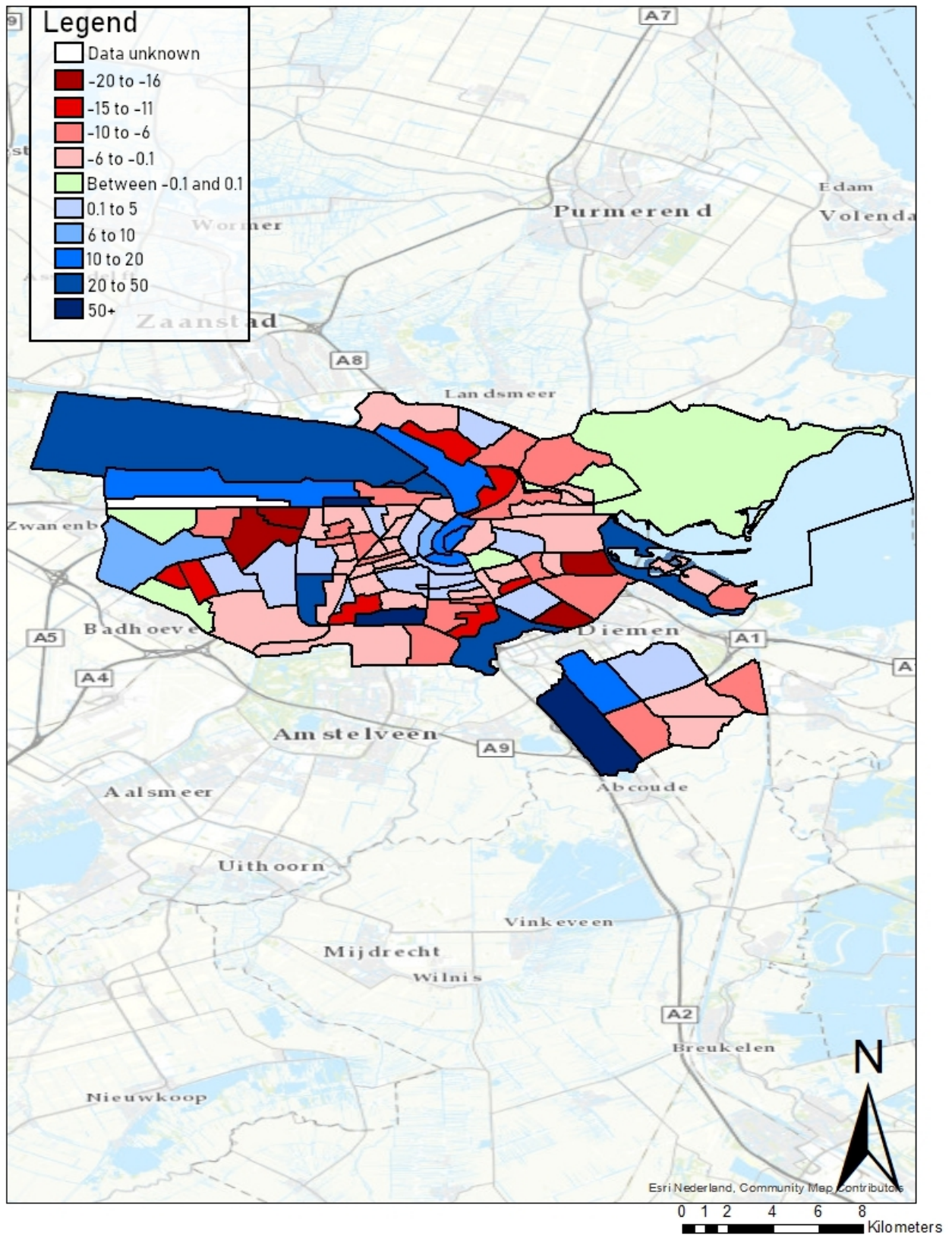


Figure 4: Change in private rental dwellings in Amsterdam between 2010 and 2017. Source: CBS (2018)

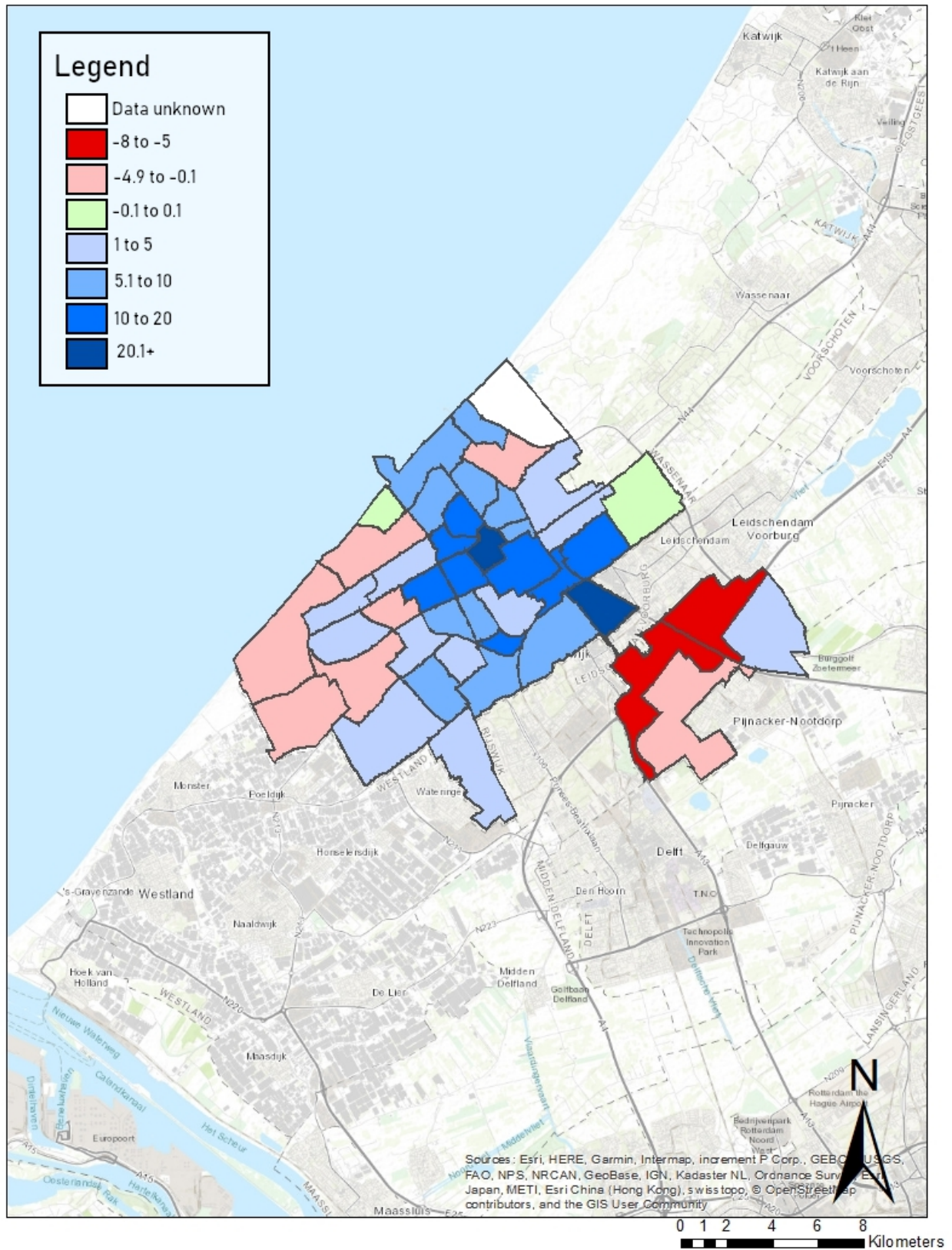


Figure 5: Change in private rental dwellings in The Hague between 2010 and 2017. Source: CBS (2018)

Buy to let

Next are the spatial patterns of buy to let, as shown in figure 4 (Amsterdam) and 5 (The Hague). The spatial changes in buy-to-let trends seem to also follow a pattern of staying closer to the city centres. This is mainly visible in The Hague, where the neighbourhoods tend to have a growing buy to let rate, whereas many of the more peripheral neighbourhoods have a small decrease in buy to let. In addition to that, the buy to let trend seems to be going upwards in The Hague overall.

Amsterdam, on the other hand, is a bit more irregular where private rental dwellings are concerned. Many neighbourhoods see a small decline in private rental housing, but a lot of the neighbourhoods that have an increasing rate, have a really high increasing rate as well, easily reaching over a 20% rise. A possible reason for this could be the sale of social housing, which would then be sold to private landlords (Priemus & Boelhouwer, 2014). In addition to that, Amsterdam has recently started building many more new neighbourhoods. Many of the neighbourhoods showing much growth are relatively new, which explains the big rise.

An issue with the buy-to-let trend, however, is that it's relatively hard to keep track of. It's been mentioned before that for many houses in this segment, no permit is needed for letting. This means that although a lot of the private rental dwellings are included in these numbers, there is a large amount of houses that are in this database counted as owner-occupied, even though they might not be in practice. This could explain why especially Amsterdam does not follow the predicted pattern of an overall rise in private rental dwellings. Sadly, this also means that there is no immediate insight in the exact development of the buy-to-let trend in the city.

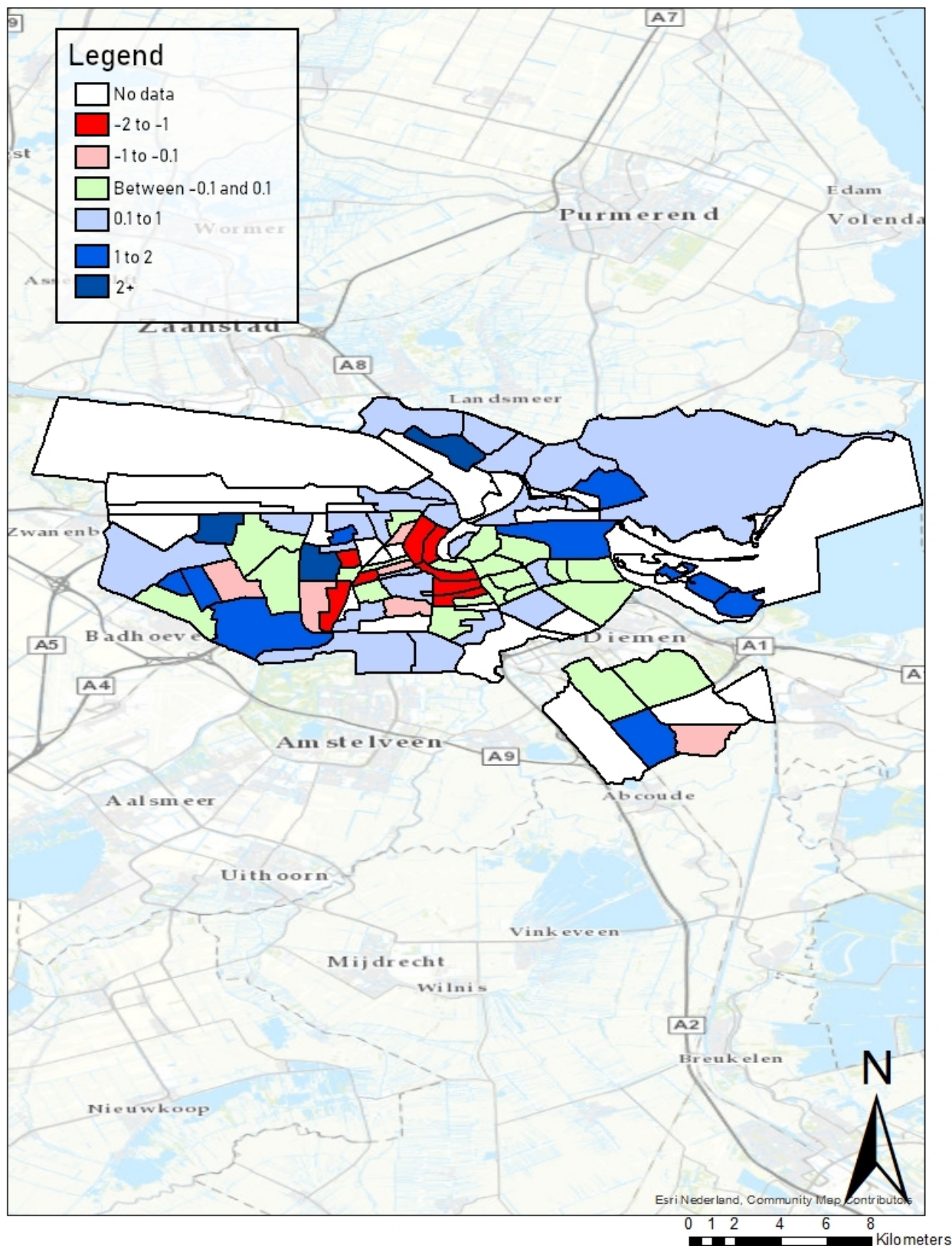


Figure 6: Change in the amount of first time buyers as percentage of all live-in house-owners in the neighbourhoods of Amsterdam in 2017. Source: Municipality of Amsterdam (2018)

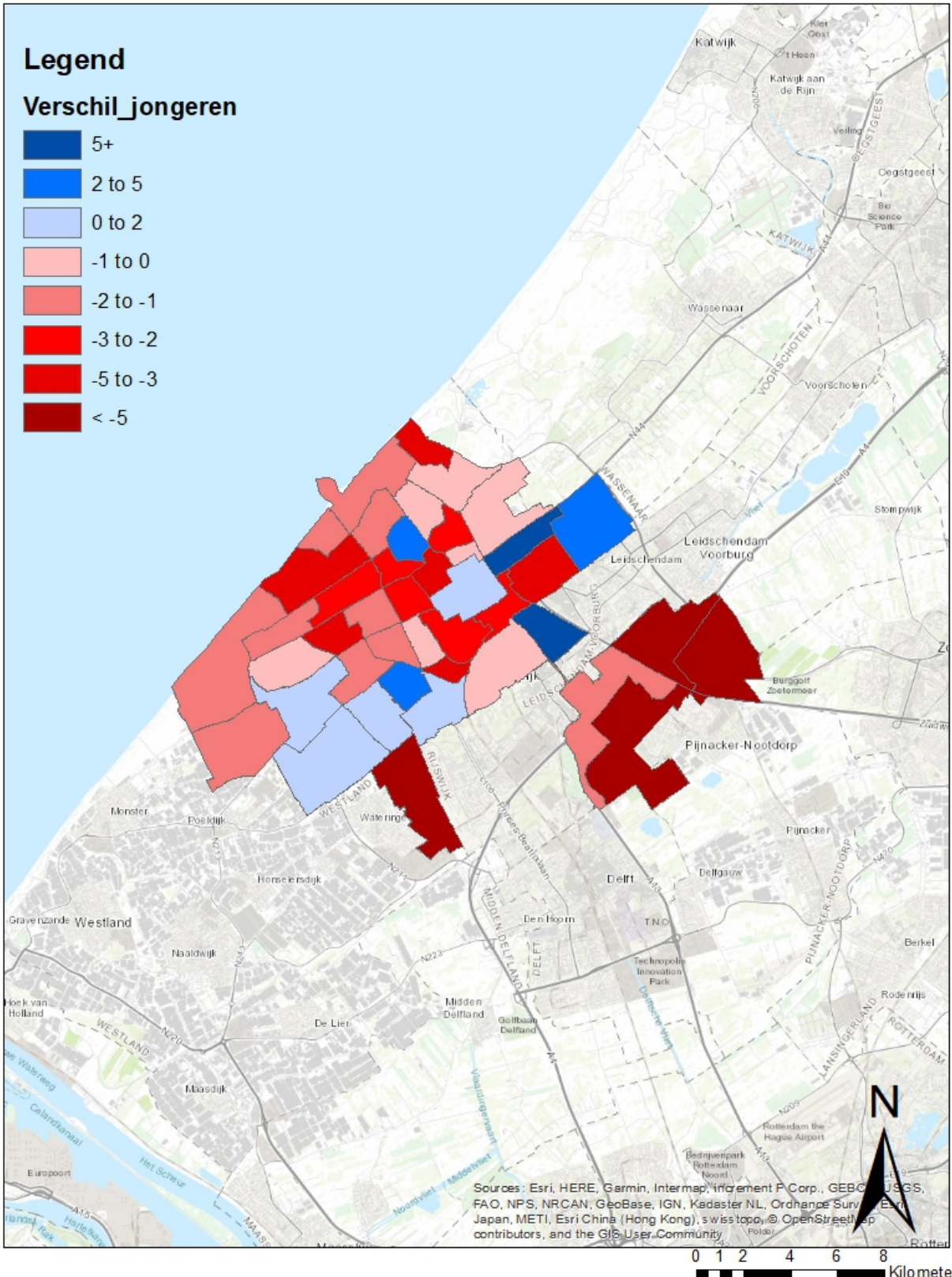


Figure 7: Difference in percentage of people in the age range of 25-44 between 2010 and 2017 in The Hague. Source: CBS (2018)

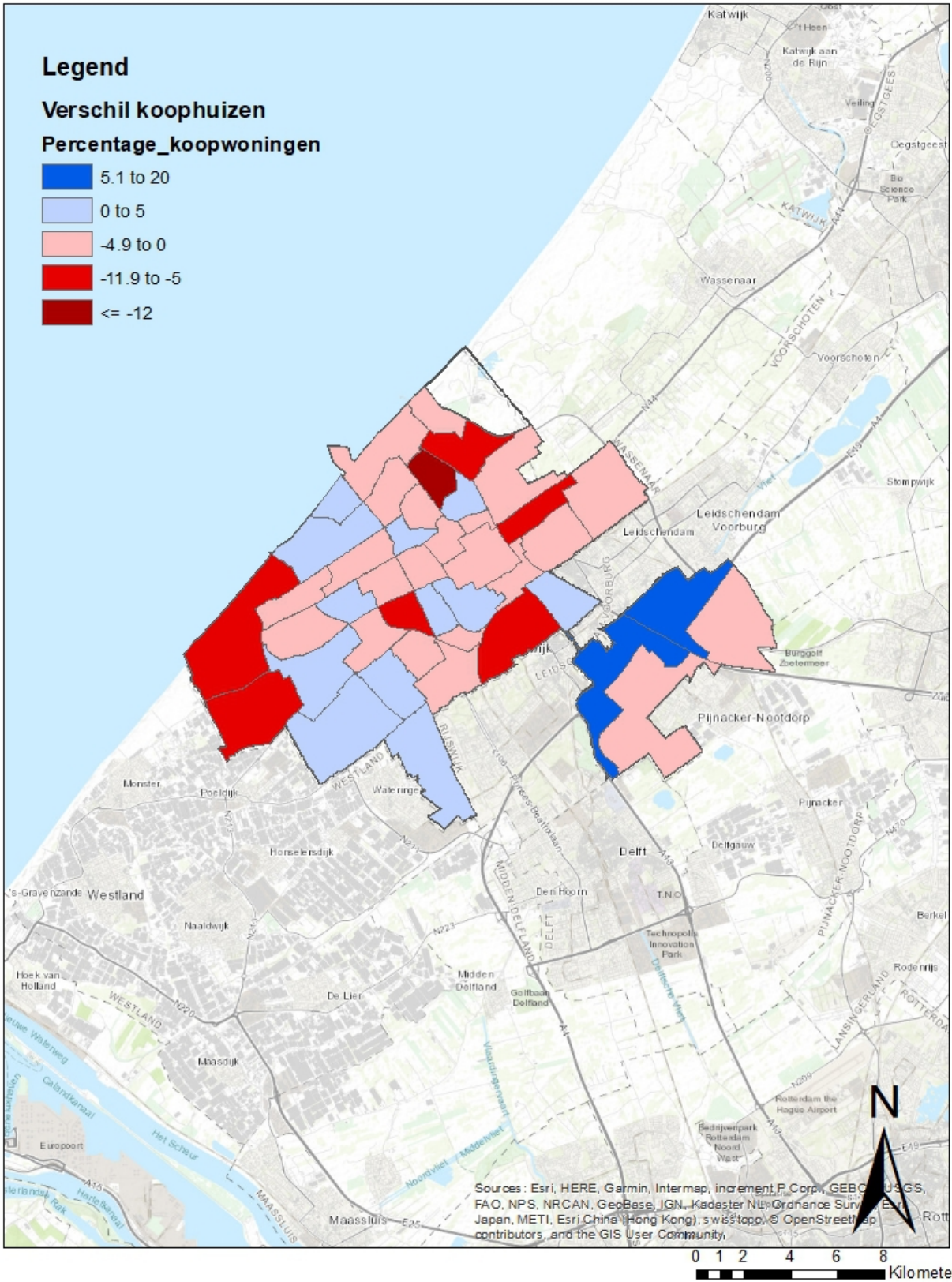


Figure 8: Difference in percentage of home-ownership in The Hague between 2010 and 2017. Source: CBS (2018)

First time buyers

On figure 6, the amount of change in percentage of the entire amount of first time buyers in the city per neighbourhood is shown for Amsterdam. White neighbourhoods mean there was no data available.

In the neighbourhoods with available there seems to be a slight pattern. There is a collection of neighbourhoods that have a clear decline in first time buyers. There is one big cluster of neighbourhoods in the city centre: these include neighbourhoods such as the Jordaan, de Pijp, and the Weteringschans. In addition to that, there is another cluster more to the west of the city centre that has a decline in first time buyers.

A lot of neighbourhoods show a slight incline in first time buyers. With the a few exceptions, most of these are neighbourhoods that are somewhat further from the city centre than the neighbourhoods with declining numbers. Then there is a big number of neighbourhoods that don't have a significant decline or rise in first time buyers, especially to the south west of the city centre.

The Hague is slightly more difficult to figure out, as there are no immediate numbers available on first time buyers. Thus, an estimate must be made based on the information that is available. In this case, two maps were created: one showing the change in percentage of people in the age range of 25-44 (figure 7), which is the main age range for first time buyers, and one map showing the change in house ownership in these neighbourhoods (figure 8). Although this is a pretty big simplification, it still gives us some insight in where first time buyers could be moving in the municipality. For the biggest part, neighbourhoods that have a decrease in younger people, have a small decrease in home ownership and vice versa. For the neighbourhoods that have an increase in younger people, this means that they will probably move into a rented house. In the other neighbourhoods, this probably means that for whatever reason, be it price or just a lack of interest, younger people don't tend to move there.

There is also a cluster of neighbourhoods in the south west of the city, encompassing the neighbourhoods of Bouwlust, Loosduinden, Morgenstond and Moerwijk, and the neighbourhood Brinckhorst in the south east, that have an increase in both younger people moving there and home-ownership. A possibility is that these neighbourhoods are the ones that right now, people in the first time buyers age segment buy a house, making these possible candidates for neighbourhoods with relatively many first time buyers. Interestingly, however, with the exception of Brinckhorst, none of the neighbourhoods is extremely close to the city centre. Although some of the neighbourhoods popular with younger people are indeed near the city centre, this leads to plenty of other popular neighbourhoods not being close to the city centre, which is different from what the theory would suggest.

Then that leaves the group of neighbourhoods that has seen a decline in both younger people and home-ownership. The two neighbourhoods that have a lot of Airbnb's, the Stationsbuurt and Scheveningen, follow this pattern. The combination of both a lower percentage of home-ownership and a lower percentage of younger people, could indeed indicate that first time buyers might be chased out of the neighbourhood in favour of buy-to-let.

SPSS analysis of Amsterdam

Model 1	Significance	Coefficient
Constant	0.001	0.624
Percentage Airbnb's	0.003	-0.013
Change in private rent	0.246	-0.457
Overall model	0.001	x

Table 1: The results of the multiple linear regression

Above are the relevant results of the SPSS analysis. It shows the overall statistical significance of the model, followed by the significance of the separate variables. The p-value is 0,05.

This means that the model overall is significant. This means that there is a statistical correlation between a difference in private rental dwellings and the relative amount of Airbnb's in a neighbourhood on the one hand, and a change in first time buyers on the other hand.

The constant is statistically significant and positive. This means that even if there were no change in private rental dwellings and if there were no Airbnb's, there would still be a rise in first time buyers.

Difference in private rental dwellings by itself shows no significant correlation. This means that even if there is a rise in these dwellings, there would be no significant change in first time buyers.

Airbnb's do have a statistical significance and a negative coefficient. This means that a higher amount of Airbnb's in a neighbourhood would lead to a decrease in first time buyers.

Statistically speaking there is an overall rise in first time buyers in Amsterdam. Then, there is a correlation between a higher amount of Airbnb's in a neighbourhood and a decline in first time buyers, suggesting that the two might be related.

Conclusions

Spatial analysis

Above a short analysis has been made of the three most important factors for this research and the trends in these sectors. This ties back to the research questions asked in the beginning, which will now be answered.

The first sub-question was what neighbourhoods tend to have a lot of Airbnb's, with the hypothesis being that traditionally touristic neighbourhoods and central neighbourhoods tend to have many Airbnb's. In The Hague, this seems to ring true. There are two neighbourhoods that are Airbnb-heavy: one of them is near the city centre and an important station, whereas the other one is an extremely touristic neighbourhood already.

Amsterdam seems to mainly follow the pattern of establishing Airbnb's in central area's. When taking a look at figure 2, the neighbourhoods with the highest percentage are near the city centre as well. A lot of these are also more touristic neighbourhoods, showing that Airbnb's are indeed more established in central neighbourhoods and touristic neighbourhoods.

Then there is the development of buy to let. The hypothesis was that buy to let would be growing, mainly around the city centres. For both The Hague and Amsterdam, this seems to be the case. The Hague has a growth in private rental dwellings in most of the neighbourhoods. Amsterdam has a more scattered pattern, however. Having said that, most of the city centre has a rise in these dwellings, which ties in with the literature. This is most likely the effect of the city centres being more popular, making these more lucrative to possible landlords.

It is somewhat strange to see that there increase in private rental dwellings in Amsterdam is not more universally rising, as that is what would be expected based on the literature. A reason for this is already explained in the results section: the data doesn't register all buy-to-let dwellings. Thus, many of the red-coloured neighbourhoods most probably still have a rise in buy-to-let, making it very difficult to draw a clear conclusion.

It is rather hard to answer the research question on the development on first time buyers in The Hague. Based on the information found, there is a decline of both younger people and rates of home ownership in neighbourhoods near the city centre. This could support the hypothesis that there is a decline of first time buyers near the city centre. However, since there is no concrete data available, this is only a very careful conclusion.

Amsterdam does have a decline in first time buyers in many areas near the city centre, with a rise in more peripheral areas. Other neighbourhoods near the city centre show neither a decline or a rise. The fact that most neighbourhoods immediately surrounding the city centre show a decline or stay stable mildly supports the hypothesis. Interestingly, this seems only mildly connected to buy-to-let, as many neighbourhoods that have a decline in first time buyers have only a slight rise or even a decline in private rental dwellings. Other explanations are thus purely speculation, but a possibility is simply the rise in prices. This might be too steep for first time buyers, but not for other live-in owners.

Then there is the spatial overlap between the different factors. In The Hague, as buy to let is on the rise everywhere there, there is overlap between the Airbnb-neighbourhoods and neighbourhoods with a rise in private rental dwellings. It is very difficult to say if there is also some overlap between a decline in first time buyers and neighbourhoods with many Airbnb's, however, as there is a lack of proper data. However, it should be noted that there are only two neighbourhoods that have a large amount of Airbnb's in the first place. Since there is no reason to assume that these neighbourhoods are particularly attractive to first time buyers, the odds of Airbnb getting in the way of first time buyers aren't very high overall.

Amsterdam has a couple of neighbourhoods that show some clear overlap in having a high rate of Airbnb's, a rise in buy to let and a decline in first time buyers. Most importantly the Jordaan, the Pijp, the Grachtengordel (both South and West) and the Weteringeschans qualify. All of these are neighbourhoods that are rather close to or in the city centre, supporting the hypothesis. However, there are also a lot of different neighbourhoods that do not necessarily follow this pattern, though these are mainly neighbourhoods further from the city centre. Thus, overall, there is a chance that buy to let and Airbnb are chasing first time buyers away from the city centre.

It should be noted that Amsterdam lacks a lot of information as well. So, although there seems to be some overlap in the factors, there is still a chance that this isn't definite.

Statistics

The statistical analysis showed a significant correlation between a decline in first time buyers and a high percentage of Airbnb's, but not between a rise in buy to let and a decline in first time buyers. This only supports part of the hypothesis on the research question concerning the statistical correlation between the factors, as that assumed that a rise in buy to let would also lead to a decline in first time buyers.

The main reason for this conclusion could be the fact that there is a lot of missing data due to a lack of permits for buy-to-let properties. Plus, as established in the literature, many people simply suck up the higher housing prices if it means they get a house in a big city near the centre. Since younger people specifically seem to have a preference for living near city centres, it could be that this is what they are doing. Thus, even if there are competing landlords, they might simply get a higher mortgage or find other ways to finance a house.

The correlation between Airbnb's and a decline in first time buyers is significant, however. This would support the idea that Airbnb's make it more difficult for first time buyers to get a house: the most obvious conclusion would be that houses are bought specifically to put on Airbnb. Strangely enough, this doesn't correspond with a rise in buy-to-let,

however. This could be due to the fact that many of these Airbnb's are illegal and thus probably not registered as buy-to-let, making them difficult to track down in the data.

Overall conclusion

The research question was: To what extent and in which neighbourhoods does Airbnb influence the availability of houses for first time buyers in neighbourhoods in Amsterdam and The Hague? The hypothesis was that there is a significant correlation between Airbnb on the one hand and a decline in first time buyers on the one hand and that this influence would be mainly in tourism-heavy neighbourhoods.

In The Hague, the influence of Airbnb is a possibility, but there is insufficient data to set a conclusion.

Amsterdam gives more evidence supporting the hypothesis, with a collection of neighbourhoods that show a pattern of many Airbnb's, rise in buy to let and a decline in first time buyers. These neighbourhoods are mainly near the city centre: the more towards the periphery, the fewer Airbnb's are present, thus making this seem like mainly a problem around the city centres. In addition to that, the statistics show a significant correlation between decline in first time buyers and a high percentage of Airbnb's. Thus, for Amsterdam, it is likely that Airbnb influences the availability of houses for first time buyers, but due to the lack of data there is no conclusive evidence.

Overall, this means that there is a possibility that Airbnb influences the housing market for first time buyers, but this is probably restricted to extremely touristic cities and mainly near the city centre. There are other factors that probably play a bigger role in the housing market for first time buyers instead, such as the fact that it's financially easier for people who have already paid their mortgage to get another mortgage for a buy-to-let dwelling.

Reflection and future research

This research has one very clear Achilles' heel: the data available. As both the municipality of Amsterdam and The Hague themselves have admitted, there is not always data about first time buyers and the data that is available isn't always complete. The data for first time buyers in Amsterdam lacked information on neighbourhoods that were largely rental dwellings, whereas The Hague did not have any information to begin with. Although this goes to show that this is indeed something that needs to be researched, it made this specific research somewhat difficult. The same goes for the buy-to-let data: due to the fact that a permit isn't necessarily needed to rent out a house in either city, it's difficult to study this phenomenon in detail.

In addition to that, Airbnb data is rather difficult to get and to work with. Airbnb keeps the data mainly to itself and researchers are dependent on websites like AirDNA, which are slightly less reliable. They are still very valuable, but this means that there is still a lot of information missing, which could be used to make researches like these more thorough. Ideally Airbnb itself would keep track of this information, but since that is unlikely to happen, municipalities could play a role in this as well.

Another issue is the fact that the housing market is a very complex thing. For this research, only a few aspects have really been taken into account, but there are a lot more factors that could in theory play a role in the relationship between first time buyers and Airbnb. Thus, possible connections found in this research could very well be due to these factors as well.

For future research, an important factor that needs more research are first time buyers, especially simply collecting numbers. This mainly goes for the municipality of The Hague, but Amsterdam also only had partial numbers available. Considering those are two of the biggest municipalities of the Netherlands, it is assumed that many other municipalities lack this information as well. This makes research on this topic harder to do.

A way help research and new policies along would be to implement permits for landlords. This would lead to a better overview of how many houses are in the buy-to-let segment at this time. In addition to that, putting regulations on buy-to-let, such as a maximum amount of buy-to-let dwellings in a neighbourhood could be a solution. A permit for Airbnb's, specifically near the city centre, could also be a possible policy, or even forbidding Airbnb if it gets very bad. A group that might be interesting to approach in the future are the banks that provide the mortgages. They seem to have a rather good insight in movements on the housing market, making them valuable sources of information for future research.

Interesting possible research could be, for example, doing a more thorough version of this topic, taking into account more factors on the housing market. There is some research on the influence of Airbnb on in the built environment, but more research on Airbnb on the housing market could also be interesting.

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Appendix

SPSS tables:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,425 ^a	,181	,157	,8005

a.

Predictors:

(Constant),

Percentage_

woningvoorr

aad,

Huur_versch

il

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9,617	2	4,809	7,505	,001 ^b
	Residual	43,571	68	,641		
	Total	53,188	70			

a.

Dependent

Variable:

Verschil_sta

rters

b.

Predictors:

(Constant),

Percentage_

woningvoorr

aad,

Huur_versch

il

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	,624	,176		3,553	,001
	Huur_vershil	-,013	,011	-,137	-1,171	,246
	Percentage_woningvoorraad	-,457	,148	-,359	-3,079	,003

a. Dependent

Variable:

Vershil_starte

rs