

Sale of social housing: market impacts and trends in the province of Groningen

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26-09-2022

Abstract

In recent times housing associations have been encouraged to sell part of their housing stock for various reasons. This thesis tries to find insights into how the sale of social housing homes by housing associations in the province of Groningen has impacted different aspects of the housing in the period 2009-2018. This is done by analyzing Kadaster datasets with a statistical model. The model is based around comparing prices paid for housing in with different variables such as if the sale was made by a housing association, is the buyer a starter or the location of the sale. Results indicate that the sale of social housing has an influence on the housing market of Groningen as these sales provide a steady supply of low-cost houses to the market each year. The impacts of these sales on starters are noticeable and the highest impact of the sale of social housing is in the municipality of Groningen. However indications of a potential shift in the impact are also visible throughout the years.

Keywords: Social housing; Housing market; starters; Groningen; House price

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List of abbreviations

CBS= Centraal Bureau voor de Statistiek

Introduction

Housing associations are a unique part of the housing market of the Netherlands as while they function independently of the government they are financially secured by the government and have strict regulations to keep their unique status. Housing associations in the Netherlands have the task to provide social housing to people that have lower incomes as they do not have the financial means to compete in the housing market. They receive no direct subsidies from the government but are given state-backed loans to fund their activities(van Gent and Hochstenbach, 2020). The regulations that govern the housing associations have fluctuated a lot ever since their conception. The policy has shifted from strict control by the government over the housing associations to almost no oversight at all over the years. However, the latest policy changes for housing associations are a response to a crisis within the social housing sector, after multiple mismanaging scandals within the boards of housing associations after they got deregulated in previous policy changes(van Gent and Hochstenbach, 2020).

Social housing associations sell part of their housing stock each year, but the reason for it is multifaceted. Part of it is for strategic reasons as the housing corporations look to (partly) exit certain neighbourhoods or streets to better align with their future strategic goals. Another part of it is to raise financial means to fund new projects in the future to create more social housing. Housing corporations are the main provider of low-cost housing in the Netherlands and thus are often looking at new projects or refurbishment of their current stock. (Os, Kam and RIGO, 2014)

In recent years the housing situation in the Netherlands has been growing in ways that many perceive as problematic, especially for younger age cohorts(*Vastgoed Actueel*, 2022). It has been found that as of 2020 there is a shortage of 315.000 dwellings or 4% of the housing stock in the Netherlands as a whole and is expected to only rise in the years after(Capital value, 2020). This is both due to rising demand while simultaneously a decline in housing production was observed since 2013 (Boelhouwer, 2020)As the prices for both renting houses and buying them have risen year after year the housing shortage has grown at the same time due to rising pressure from the demand side and lowering pressure from the supply side. Starters have seemingly been hit the hardest by these developments as they have fewer financial instruments on average and are mostly outpriced by older age cohorts when buying homes as they have often built up more capital and have an easier time gaining a mortgage. Especially in the Netherlands, this has led to a public and policy focus on how starters can be helped to enter the housing market and compete in the current situation. In 2021 the Dutch government introduced an exemption for transaction taxation when buying homes for people that are under 35 years of age(Rijksoverheid, 2021).

Starters in the Netherlands are defined as a newly formed household that becomes the main inhabitant of a privately owned house for the first time. Research by Boon(2021) shows that close to two-thirds of the starters are aged between 25 and 34 years old followed by 35 to 44 years old. It is stated that a gap has been growing in the housing market between the rental and ownership sectors. An increasing part of the population has started to fall into a gap where they earn too much for social rent but not enough to

get mortgages to compete in the housing market due to the fast-rising prices(Bartelsman et al., 2012). These people often feel left out of the market as private rent is often not seen as a beneficial long-term situation and is often overcrowded in desired locations. This gap can be explained partly by the change in laws surrounding the housing associations in the Netherlands. Research shows that housing associations have changed their core focus since 2007, they shifted towards focusing only on low-income groups and shifted away from social returns to focus more on financial returns as the new rental property taxes got passed into law(Nieboer and Gruis, 2016). While the demand for middle sector private rent has been growing as a result of people being unable to buy a house so has the shortage of these types of rental houses as the construction is lagging behind in many municipalities(Capital value, 2020).

Some of the main reasons starters are having trouble entering the current housing market in the Netherlands are that the income growth has been outpaced by the growth in real estate prices and that due to a combination of low-interest rates and high prices in the private rental markets due to liberalization it is becoming increasingly harder to save up for mortgage deposits which can lead to people getting 'stuck' in the rental market with no clear way of becoming home-owners in the near future(Briene, 2021).

The effects of these exclusions of certain people from parts of the housing market can have great social consequences, Mulder (2006) states that when people are unable to enter the housing market for quality housing they might postpone marriage and cohabitation which in turn influence the birth rates among these groups. While these types of effects might be less noticeable in the short term they could lead to bigger consequences in future generations. Furthermore, other researchers argue that when these younger age cohorts are unable to acquire house ownership this could lead to conflicts between younger cohorts that are house-deprived and older generations were able to own houses at similar ages in the past(McKee, 2012).

Aside from the social effects, financial effects are also observed to result from an exclusion from the housing market. For many people owning a house is one of the bigger contributors to building up wealth and storing it(Arundel, 2017). While some argue that renting a home instead of buying one can free up money and flexibility to build up wealth through other investments, research however has shown that there are no clear substitutions to homeownership that generate equal outcomes(Arundel, 2017). This shows how a separation in society can come into play based on if people are able to access the housing market and start their homeownership career or get left behind financially when they are forced towards the renting market.

House prices have been much researched over the years and many different indicators for predicting what a house price will be have been found and applied. One of these is the difference between rural and urban settings where houses are sold. House prices have risen substantially across the globe in both rural and urban areas. Urban areas have had a bigger rise compared to rural areas across the world(Knoll, Schularick and Steger, 2017). In the Netherlands specifically, research has been done to compare how different rural areas have developed in price over time. This research found that rural areas close to large cities grow slightly faster than other areas and also adapt faster to

changes in the GDP. (van Dijk *et al.*, 2011) For this research, it will be interesting to see if any differences can be measured between the different regions in the province of Groningen in relation to the sale of social housing.

Previous research has been done in both Amsterdam (Breure, 2009) and in the whole of the Netherlands (Conijn and Kramer 2010) on the sale of social housing by housing associations but both pieces of research are analyzing data up to 2009 while this research will focus on data from 2009 up to 2018. Therefore this research can shed some light on how recent economic and policy changes have affected both the practice of selling off by housing associations and the effects of these sales on both starters and non-starters and rural and urban areas. This research thus aims to fill this knowledge gap and expand the existing knowledge with new data and insights from the 2009-2018 time period.

From this the following research question is constructed: *How has the sale of social rental units by housing associations within the province of Groningen affected the housing market in the 2009-2018 period?*

And to answer this research question two sub-questions are proposed to gain the deeper understanding needed to answer the main research question.

What are the advantages of the sale of social housing units for starters with regards to the housing price in the province of Groningen? This should provide insights into if a key demographic, starters, are benefitting or being hindered by the sale of social housing during the research period. Furthermore, it could give insights if new policies to either stimulate or disincentivize the sale of social housing can improve the future situation of starters in the housing market.

How has the sale of social rental units by housing associations affected in price by the municipality where the sales took place?

Answering this question will provide insights into the differences there are between Groningen, the core urban region of the province, and the rest of the province which is one of the most rural areas of the Netherlands.

Relevance

Scientific

While there is quite some research done on housing corporations in the Netherlands, most of it has been done on the national scale or focused on municipal or city levels. Most research was also done with a focus on the rental market and the influences housing corporations have there as this is the core task of housing corporations. This research however looks at a different scale by going looking at the provincial level and looking into the effect of the sale of social housing units in particular. The aim of this research is to add to the existing literature by providing insights into how this process of selling social housing units influences the housing market. By adding insights in how this process works in the province of Groningen other researchers can then use that

when looking into how the different social housing projects in other countries compare to the system in the Netherlands in more detail.

Societal

Housing is a need that all people have and the way it is provided has been ever-changing over the centuries. As housing is a key factor in the economy, politics, and planning any insights gained into the effects of housing policies can be seen as relevant to society as the advancement of knowledge can help shape the policies that make housing more available to all demographic groups and prevent new shortages from slowly cropping up again.

For planners in particular there is a big task in the years ahead to use targeted strategies in housing to best combat the current housing shortage. By understanding the different housing submarkets and how the housing associations can influence these by selling social rental units new tools could be created to target specific target groups of people and submarkets of housing that could help ease the transition.

Theoretical Framework

The housing market in the Netherlands

The housing market in the Netherlands can be divided into three sectors: Private rental, private ownership, and housing associations (Conijn and Kramer, 2010). Housing associations use their financial capital to accomplish social projects that are often not interesting for private parties as they are not profitable enough or even at all (Os, Kam and RIGO, 2014). Providing social housing is the prime example of this and also their main focus. But another practice of housing associations in the Netherlands is to sell off rental units at or slightly below market prices. This has multiple motivations. Firstly it offers renters opportunities to own a house themselves that they might not get in the private housing market. Secondly, it generates capital for the housing association that can be used for future projects such as renovations or the building of new social housing.

Housing corporations

Housing corporations in the Netherlands are an important part of the housing market of the Netherlands as they are not driven by profit but to provide social housing to those who need it. Social corporations are corporations that differ from normal corporations in that they stand in between the public and private domains. Some researchers have called this the third domain next to the private and public domains. (Price, 2008) They are private companies but are fulfilling a public task. This leads to them operating not to generate profit for their shareholders but to generate public value for society. (Os, Kam and RIGO, 2014) They are similar to other public-oriented sectors in the Netherlands such as healthcare and education in that they operate as private companies to generate public value. But the big difference with the corporations in these sectors is that housing corporations not only execute based on policy but also generate policy themselves. Housing corporations have large amounts of capital that they use to create new housing units. (Koning, 2010)

House pricing

House prices are the key indicator in how wanted a house is in the current housing market. As shown in figure 1, house prices are determined by housing supply and demand. If the supply of housing is elastic an increase in demand will only gradually increase the price of houses as the supply will be able to keep up and produce new homes. When supply is inelastic however house prices start to rise rapidly as a supply can't keep up with the demand creating a shortage (Glaeser, Gyourko and Saks, 2005). As mentioned previously the Netherlands has an inelastic housing supply as there has been a housing shortage that is only projected to keep growing for the foreseeable future (Capital value, 2020). When house prices start to shift either upwards or downwards this can have great effects on the owners. If the prices rise the owners can use the price appreciation to finance other projects by taking out an extra mortgage. On the other hand when prices depreciate owners often lose the ability for them to move to another home as they are unable to afford a new down payment as their house value to mortgage ratio shrinks (Bourassa et al., 2009). A potential downside to rising house

prices is that this might delay people from being able to enter the housing market as those who do not own a home while the prices rise are effectively missing out on gains. If the prices outgrow the speed at which these people can generate money to buy a house this can lead to an increasing gap between home-owners and people who don't own a home(Haffner and Boumeester, 2010).

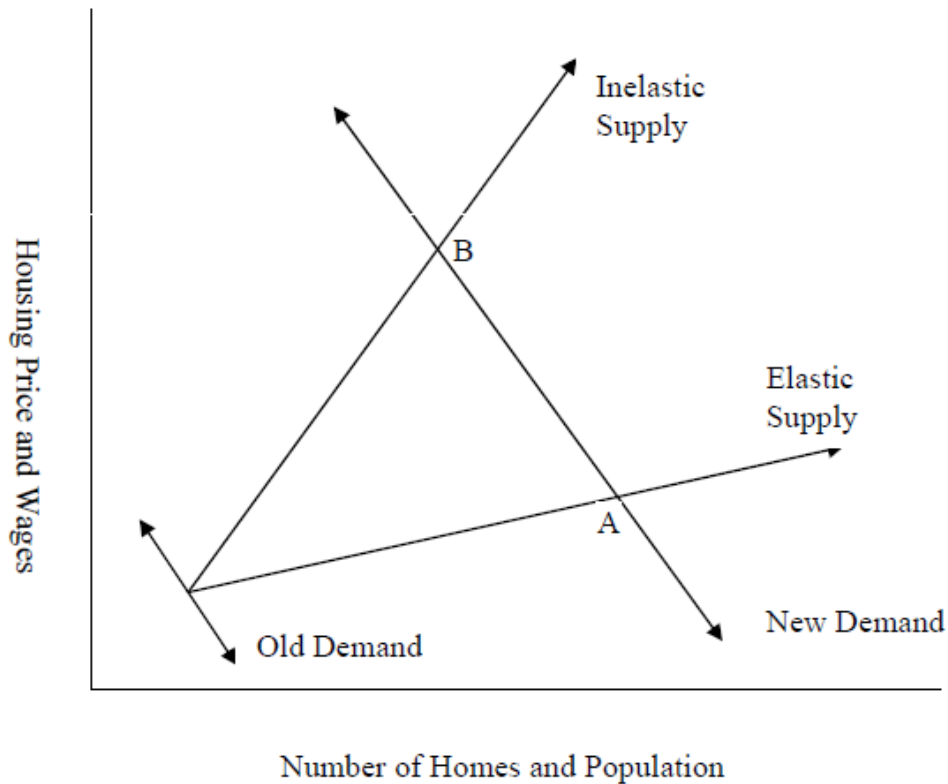


Figure 1: Housing supply and demand shocks impact on price(Glaeser, Gyourko and Saks, 2005)

House price research

To predict and analyze house prices during research researchers use statistical data to create their models. Regression models are often used in this type of research due to their ability to judge how different variables or indicators interact to influence the dependent variable. Another reason many researchers prefer to use statistical regression for this type of research is that the data will reflect what buyers and sellers do compared to what buyers say that they will do in quantitative research in a hypothetical situation(Jackson and Pitts, 2010). Researchers differ between both simple linear regressions and multiple linear regression analysis in their research depending on their exact methodology. However, research has shown that multiple linear regression can provide better performance than simple linear regression in house price predictions(Bansal *et al.*, 2021)

Urban and rural municipalities

Due to the inability to move houses from one place to another the location of a house is an important factor in determining its price. As a person is bound to the location of their house, the range of amenities in the general area around the house are an important factor(Kiel and Zabel, 2008). Homes in dense urban areas are often priced higher than

similar homes in rural areas as they have greater and easier accessibility to various amenities and job opportunities. Furthermore living further from urban areas often means longer and more expensive commute to work. On the other hand homes in rural areas often have larger access to greenspace and are priced lower for similar house characteristics as homes in urban areas.

House characteristics

Housing characteristics are an important indicator of the price of a house. For example homes with a greater floorspace have been measured to have greater the returns on investment when later resold(Jud, 2005). It seems that the more is invested in the creation of the house the higher the price is in general. On the other hand houses with atypical characteristics had a lower than average return on investment.

Housing submarkets

Housing submarkets are subdivisions of the housing market based on certain housing characteristics. To better categorize and study the housing market researchers started to divide the housing market according to different submarkets(Keskin and Watkins, 2017). They argue that the difference in preference over time can lead to pricing variations between different submarkets between similar properties. When a submarket has high demand but limited supply this can lead to quickly rising prices even though there might be supply in other submarkets. Another factor that is believed to impact these submarkets is neighborhood attachment, as people prefer certain neighborhoods over others this can lead to inertia in the housing system which in turn can slow or disturb the filtering within the housing markets(Keskin and Watkins, 2017). Jones, Leishman and Watkins (2005) state that targeting specific submarkets could be a useful tool in initiating a chain of submarket adjustments as households starts to move to and from that submarket. The main challenges that submarket research and policies face are that while its existence is generally accepted the way to define different submarkets is not. There are multiple ways to analyze the available data ranging from statistical approaches to using real estate agents as experts(Keskin and Watkins, 2017). Furthermore, the structure of data is not equal across different administrative boundaries. For this research submarkets are very interesting as the conversion from social rental houses to private ownership is not one that happens often as the shift in function and submarket of these houses is quite drastic and mostly irreversible. It will be interesting to see how this transition between submarkets might affect the market overall.

Starters

Starters are a key demographic of the housing market as they keep expanding the market by entering it. People who buy a house for the first time in their life are known as starters. Most often they are transitioning from renting to owning a house. This transition is often made after households have a fixed income that is capable of sustaining a mortgage. Most starters are found in the younger age cohorts while almost no one older than 60 transitions towards homeownership. This is explained by the financial investment homeownership represents for a household as for most it is the biggest investment in their lifetime. As mortgages are long term loans it makes sense

that older people rarely take them on as the chance of being able to fulfill it becomes quite small.(Dieleman and Everaers, 1994)

Filtering theory

Filtering theory is an important theory about how the housing market keeps refreshing and upgrading the high end stock and in that process also trickly down the quality. It is a theory that low-income households are dependent on the depreciation of house prices, due to factors such as deterioration over time, obsolesce, and neighborhood changes, for shelter(Harris, 2012)This is called the filtering of houses where high-income households move out of these depreciated homes towards newer and pricier houses. This then leaves their old homes on the market at prices that are affordable for lower-income families. The reason that this filtering is necessary is that it is acknowledged commercial builders cannot produce houses that are both decent and affordable for low-income households(Harris, 2012). From this, it can thus be seen that to provide adequate housing for lower-income households policies are needed to artificially stimulate the building for this target group. One example of such a policy is inclusionary housing.

Inclusionary housing

Inclusionary housing is a concept that was created in the 1970s in the United States when a need was felt for the creation of affordable housing that was driven by market-based solutions(Calavita, Mallach and Lincoln Institute of Land Policy, 2010). Since then this practice was observed and implemented in many other countries as well such as Canada, Australia, and western Europe. The main aim of this concept is to combine market developments with the creation of affordable or social housing. While each country has its own exact policies to achieve effects best suited to its own markets the core of this theory is to force project developers to include a minimum percentage of social housing, usually around 10-20 percent, for projects that they undertake. In 2008 this practice of inclusionary housing was also adopted in the Netherlands with the spatial planning act(De Kam, 2014). This new law gives the option to include a form of inclusionary housing in new housing projects. While it might not seem logical that inclusionary housing has only been adopted in 2008 in the Netherlands due to its reputation as a country with a strong social housing system, it could be explained that this strong social housing system has made it unneeded to adopt this legislation until the housing crisis made governments look toward developers to shoulder part of the costs of social housing(Calavita, 2010).

Conceptual model

By transforming the theory discussed around the housing market and how it relates to different topics such as the sale of social housing and starter into measurable variables that relate to the research questions a conceptual model was made.

In figure 2 the conceptual model is shown, it shows the relation between the different variables created from the theory and how they will interact in the statistical model. It can be seen that the house price is affected from 3 different sides, the year of the sale, the characteristics of the buyer and finally the characteristics of the house itself. This model is used to create a statistical model that can then show how the different variables

relate to each other when all the values are put in. The house characteristics, age and year of sale can be seen as control variables for the purpose of this study as the main interest is in how the sale of social housing, starters and location interact with the house prices and each other. It is expected that social housing units have a lower house price than average houses as they are originally built to house low-income renters. Meanwhile starters are expected to be paying lower prices compared to non-starters as they are on average of a younger age and lower financial security meaning that they are unable to buy high-priced homes. Finally it is expected that rural municipalities will offer lower house prices compared to the Municipality of Groningen since they are more rural areas that typically indicate lower home prices.

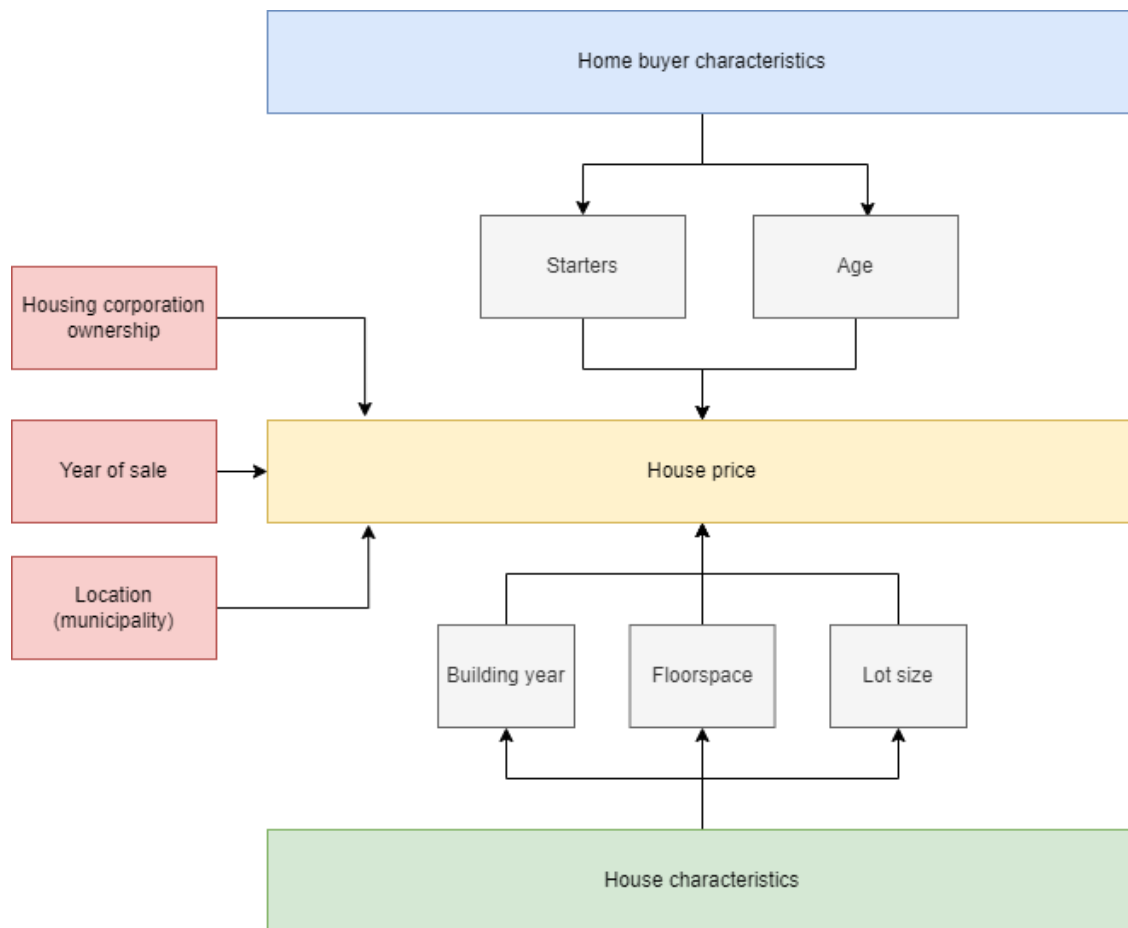


Figure 2: Conceptual model

Hypothesis

Based on the literature and conceptual model it is to be expected that the house prices of social rental units are below the average house price. Similarly, the price for houses in rural municipalities should be lower compared to houses in the municipality of Groningen. Furthermore, it is to be expected that if house prices continually grow at a high rate that starters trying to enter the market will be disadvantaged especially starters with lower incomes will have a hard time getting enough savings for a mortgage.

Methodology

Research design

This research is a quantitative case study where secondary data is gathered and analyzed from multiple sources such as kadaster, CBS and sales of the housing associations. This data will first be analyzed and visualized in an exploratory descriptive analysis using GIS and SPSS to provide context for the main statistical regression analysis. The dataset provided by kadaster of all housing sales between 2009-2018 in the province of Groningen has been edited to prepare the variables for regression analysis. This was done by re-coding some variables and adding various dummy variables so that the model is statistically sound. This method of research was chosen as a statistical approach to the research question is more likely to reach conclusive results as it allows for a lot more data to be processed and be accounted during the research compared to a qualitative approach. A qualitative approach on the other hand would be likely lead to inconclusive results as the scope of the research would end up limited and prone to bias due to nature of quantitative research in the housing market. As mentioned in the literature review quantitative research is more reliant on what buyers and seller state they would do in a hypothetical situation compared to the factual data used in quantitative research.

Data collection

The main dataset containing all kadaster transactions in the province of Groningen in the time period from 2009 until 2018 was provided by George de Kam and further refined by my supervisor Sarah Mawhorter. This dataset contains many variables such as the date, location, price, and an indication for starters. The full list of variables can be found in the appendix.

After the data used in this research has been collected multiple municipalities have been merged into 3 new municipalities and two smaller municipalities have been fused into the Groningen municipality. So to make the results more representative of the current situation a new variable was created in the dataset where these municipal fusions were processed. An overview of the old and new municipalities can be seen in the appendix.

Variable descriptions

Log_Koopsom / constant

The dependent variable consists of the price paid for a house. This was chosen as the dependent variable as the housing price is seen as the leading factor in buying a house. This variable was made logarithmic to get a normal distribution. Looking at the distribution of the original Koopsom variable in Figure 5 it can be seen that it is quite skewed from the normal curve. To make the distribution of the dependent variable a new variable was created: *Log_Koopsom*. $\text{Log}(\text{Koopsom})$ is distributed a lot closer to a normal distribution as it is less skewed which can be seen in Figure 5. This makes the *Log_Koopsom* variable better suited for the regression analysis that was performed for this research.

Social housing unit

This is a key variable for the model as it gives information about the trends in the sale of social housing and this variable is used in the interactions of the model to calculate the effects it also has on variables other than the dependent variable. It is expected that social housing units are sold at a price lower than the market average as their originally intended target group is on the lower end of the wealth scale.

Starter

This variable is included in the model as this research looks to see what the effects of being a starter in the housing market of Groningen are. The effect that is expected is that starters on average buy houses at lower than market average prices as they often lack the financial capabilities compared to non-starters.

Municipality

This variable looks at in which municipality a sale was made and is added to see what effect this has on the price. The location of a house has a significant impact on its price so by looking at the municipality where a sale was made it is expected that municipalities other than Groningen will have lower prices.

*Social*Starter*

This is the interaction term between starters and social housing units. It is expected that as both starters and social housing units are on average of low financial weight that this interaction will show how these effects intertwine in the housing market

*Social*Rural*

This is the interaction term between the sale of social housing and rural municipalities. It is expected that social housing units will sell for lower prices in rural municipalities compared to the municipality of Groningen

Control Variables	
Age of buyer	The age of buyers split in 10 year cohorts.
Year of sale	The year in which the transaction was completed
Construction year	The year of construction of the house
House surface area	The total floorspace in square meters
Lot size	The total lot size of the home

Figure 3: Control variables for regression

As can be seen in the overview of descriptive statistics in figure 4 only 7.1% of the sales in the dataset are from social housing corporations which shows that while this is a significant portion of the market it is not a major part of it. Meanwhile the starters represent a great part of the market with being involved in 38.1% of the sales. Furthermore the statistics would be as expected with Groningen having by far the largest share of the sales of all municipalities as it is the core of the province.

	Descriptive statistics of variables			
	<i>Frequency</i>	<i>%</i>	<i>Mean</i>	<i>Median</i>
Social housing unit	3641	7,1		
Non-social housing unit	47550	92,9		
Non-starter	31351	61,2		
Starter	19517	38,1		
Municipality of sale				
Groningen	22287	43.5		
Eemsdelta	3249	6.3		
Het Hogeland	3766	7.4		
Midden-Groningen	4394	8.6		
Oldambt	3284	6.4		
Pekela	865	1.7		
Stadskanaal	2875	5.6		
Veendam	2617	5.1		
Westerkwartier	5165	10.1		
Westerwolde	2137	4.2		
Year of Sale				
2009	4403	8.6		
2010	4347	8.5		
2011	4092	8.0		
2012	3722	7.3		
2013	3588	7.0		
2014	4747	9.3		
2015	5420	10.6		
2016	6434	12.6		
2017	7294	14.2		
2018	7144	14.0		
Control				
Age of buyer				
<30 years old	14599	28,5		
30-40 years old	11683	22,8		
40-50 years old	9460	18,5		
50-60 years old	7777	15,2		
60-70 years old	4032	7,9		
70+ years old	1598	3,1		
Construction year	-	-	1961	1968
House surface area	-	-	126	112
Lot size	-	-	513	212

Figure 4: Table of descriptive statistics of variables

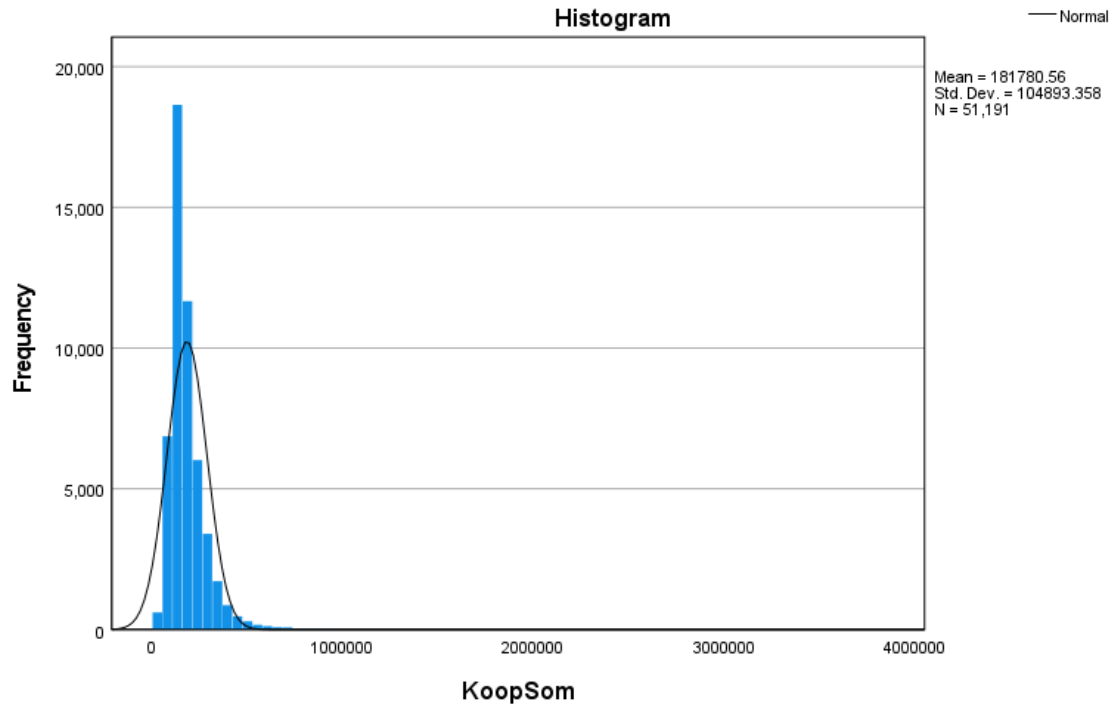


Figure 5: Distribution of Koopsom

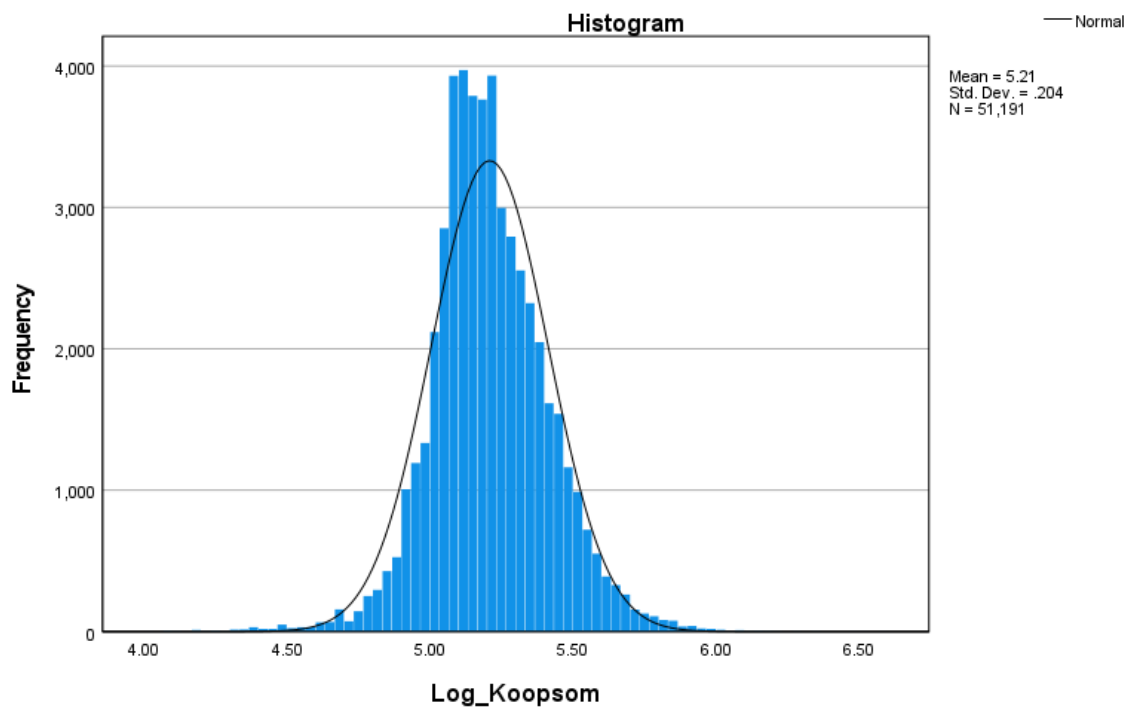


Figure 6: Distribution of Log_Koopsom

Housing stock

Data about the housing stock in the province of Groningen and how much of that is owned by housing associations has been retrieved from the CBS(CBS, 2021) in figure 7. This data will be used in combination with the transactions dataset to gain insights into how much relative impact the housing associations have on the total housing stock.

Regio's	Perioden	Totale woningvoorraad			Huurwoningen Eigendom woningcorporatie		
		Totaal	Bewoonde woningen	Niet bewoonde woningen	Totaal	Bewoonde woningen	Niet bewoonde woningen
		aantal					
Groningen (PV)	2012	265 332	250 946	14 386	80 729	77 519	3 210
	2013	267 466	253 549	13 917	81 662	78 300	3 362
	2014	271 087	257 294	13 793	82 403	79 069	3 334
	2015	272 774	259 458	13 316	85 546	81 739	3 807
	2016	274 719	261 641	13 078	84 886	81 304	3 582
	2017	276 728	263 918	12 810	84 418	81 093	3 325
	2018	277 113	264 623	12 490	82 673	79 438	3 235
	2019	279 662	266 736	12 926	83 606	79 966	3 640
	2020	282 047	269 174	12 873	83 181	79 695	3 486
	2021	285 012	272 092	12 920	82 199	78 486	3 713

Bron: CBS

Figure 7: Housing stock in the province of Groningen(CBS,2021)

Ethical issues and position of researcher

For this research data has been used that has been gathered from secondary sources (kadaster, CBS) this means that the researcher has not gathered the data himself. This in turn means that the reliability of the data is reliant on the reliability of the sources of the data. It can be argued that the data sources used are quite reliable as they are government agencies that collect and process this data for use by other parties and have worked and redone this research often over time. The position of myself as researcher in the problem is that as a student one is dependent on the social housing associations and private landlords to provide low-cost housing as there is low financial independence. This could lead to a bias representing the housing agencies and government policy in a certain way as they directly affect the housing of the researcher.

Results

Exploratory descriptive statistics

In this part of the results, different variables have been represented in various graphs, tables and maps to showcase some important context to place the research into the situation in the province of Groningen during the 2009-2018 time period.

Housing stock

Housing corporations have traditionally played an important role in the housing market of the Netherlands by providing housing for low-income groups. Most of their portfolio is based on renting out homes but they sell some as well each year. Based on data provided CBS Housing associations own around 29% of the whole housing stock of the province of Groningen. By combining the data from the CBS (figure 7) about the housing stock owned by the housing associations in Groningen and the master data set (figure 8) it can then be calculated that the housing associations have sold around 0,4 % of their stock each year between 2012 and 2018. This shows that the associations mostly view the sale of their housing stock as a side activity to raise funds for potential new projects and not as one of their core tasks. Which is in line with the policy design given to them by the government. 2014 sees a stark increase in both the absolute and relative amount of stock sold by the housing associations, this implicates a potential change in their policies as this trend continues the year after before slowing down again in 2016.

Year	Social housing sold	Total social housing stock	% of stock sold
2012	347	80729	0,43%
2013	369	81662	0,45%
2014	501	82403	0,61%
2015	489	85546	0,57%
2016	329	84886	0,39%
2017	247	84418	0,29%
2018	231	82673	0.28%

Figure 8: The sale of social housing in the province of Groningen

A potential explanation for this observation is that the mean housing prices of social housing units sold started increasing very rapidly after 2014 as can be seen in figure 9. These high prices might have forced traditional target groups for these units out as their budgets could not match the price increase. In 2018 the mean price of a housing association unit even exceeded the mean price of a house sold to starters.

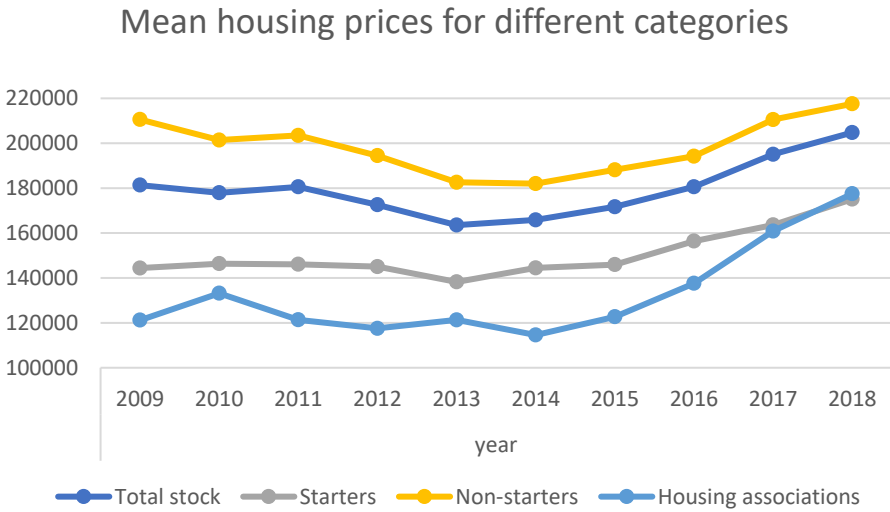


Figure 9: Mean housing prices in the province of Groningen

When looking at the different municipalities in figure 10 and comparing them over time we again see the rapid changes to prices happening around the year 2014. But the effect seems most pronounced in the municipality of Groningen city with other municipalities starting similar trends a bit later and less pronounced.

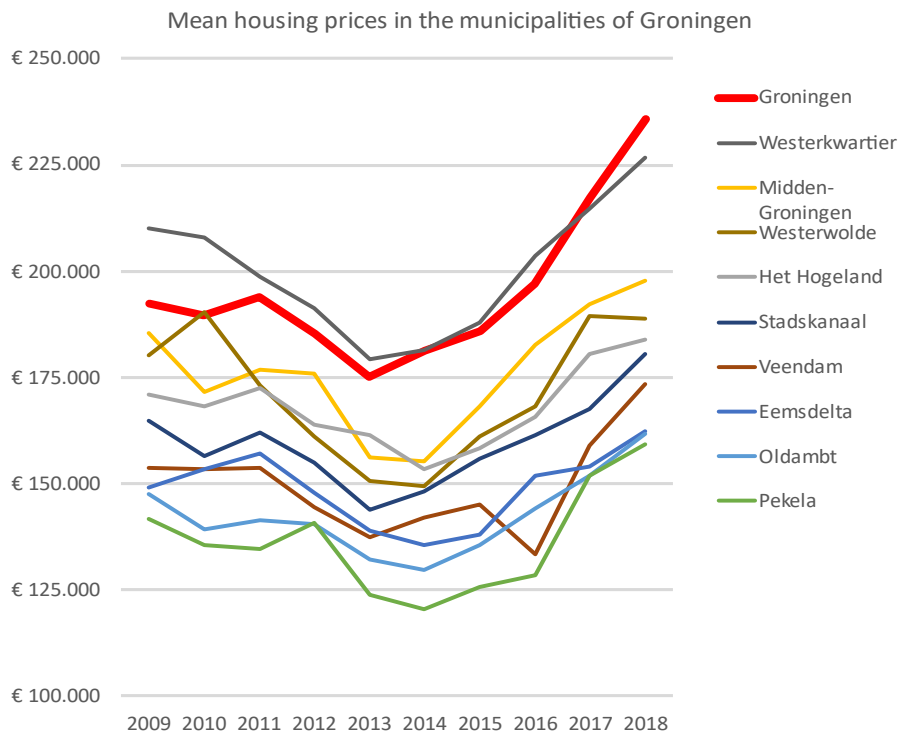


Figure 10: The mean housing prices in the different municipalities of the province of Groningen

Rural versus urban Municipalities

In the Figure 11, an overview is given of the province of Groningen on which can be seen how much the sale of social housing impacts the total market in the different municipalities. It can be seen clearly how there is a big divide between different municipalities. The figure shows that almost all of the urban area in the province of Groningen is located around the municipality of Groningen and that the other municipalities are rural. When looking at figure 11 it is clear to see that there is a strong connection between the relative impact of the sale of social housing and the urbanity of an area. Urban municipalities are more dependent on the sale of social housing units for their housing markets compared to the more rural municipalities.

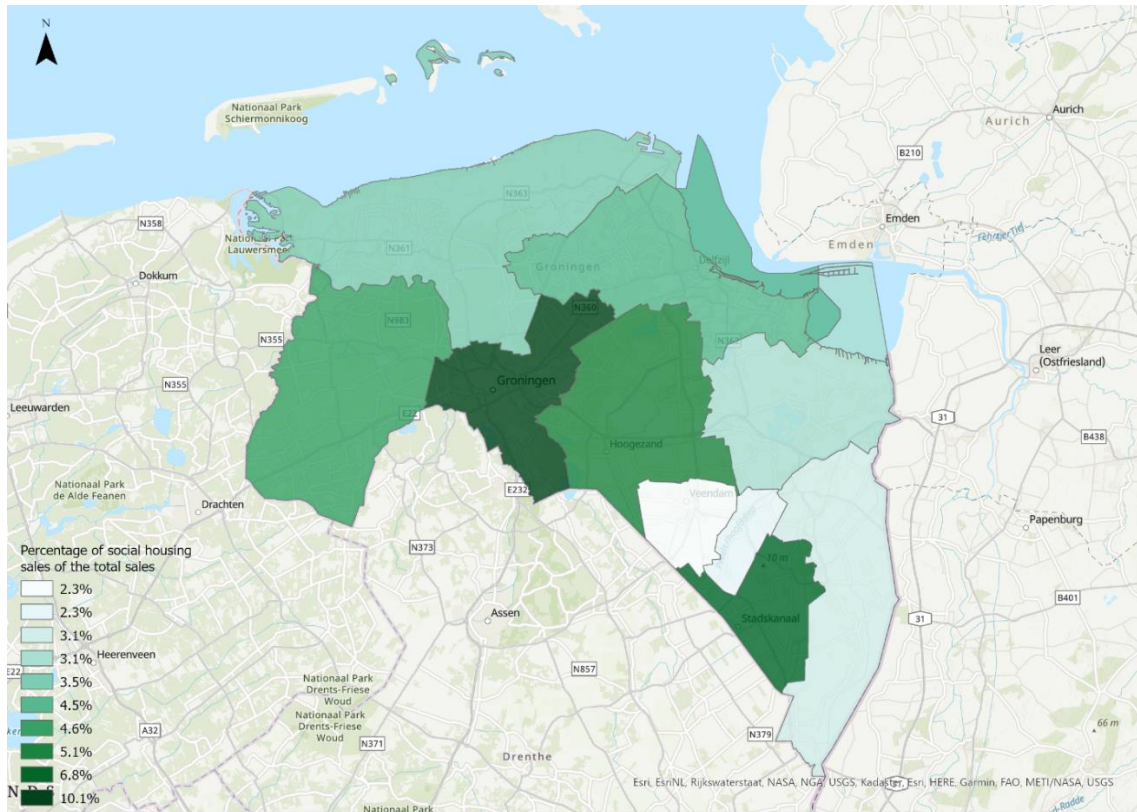


Figure 11: A Visualization of the relative amount of sales by social housing associations to the market

The data in the figures 12, 13 and 14 shows that the housing markets of urban and rural areas differ in some aspects such as mean prices and the total amount of sales. In figure 12 it can be seen how the amount of sales in urban areas outgrows the rural areas from 2013 until 2016. After this, the rural market grows quickly to catch up while the urban areas stagnate and decline a little. This could indicate that the shortage in urban areas has started to make people look into more rural areas for alternatives. Another difference is that it can be seen that in urban areas the mean housing prices have congregated towards a similar price point while in the rural areas the different categories have stayed more segregated in price. The mean housing prices of sales by

housing associations have risen the most in both urban and rural areas.

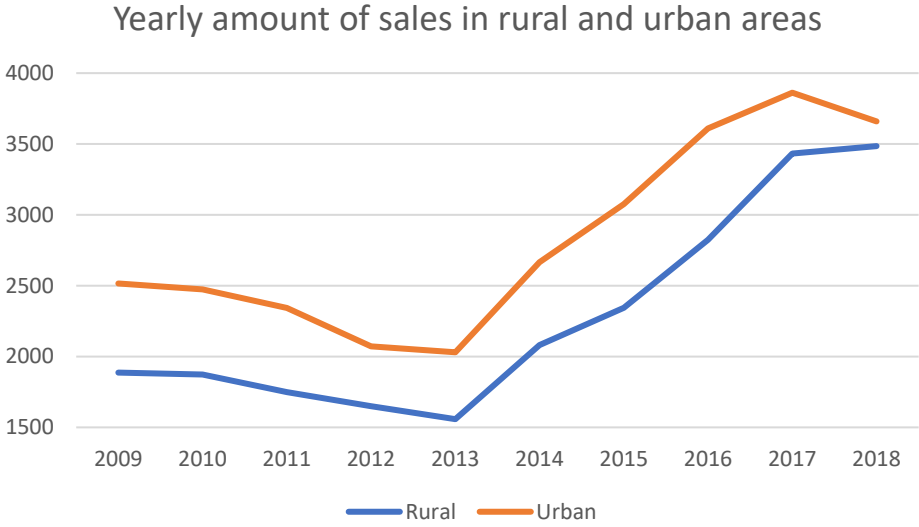


Figure 12: Yearly amount of sales in rural and urban areas

When looking at figures 13 and 14 it can be clearly seen how there are quite some differences between rural and urban areas over the years. Urban areas show the trend of quickly rising prices after the year 2014 leading to the prices of the different categories coming closer together as the rises rose overall. In the rural areas, housing prices have stayed a lot more stable overall and as a result, a more clear divide between the different categories stays visible.

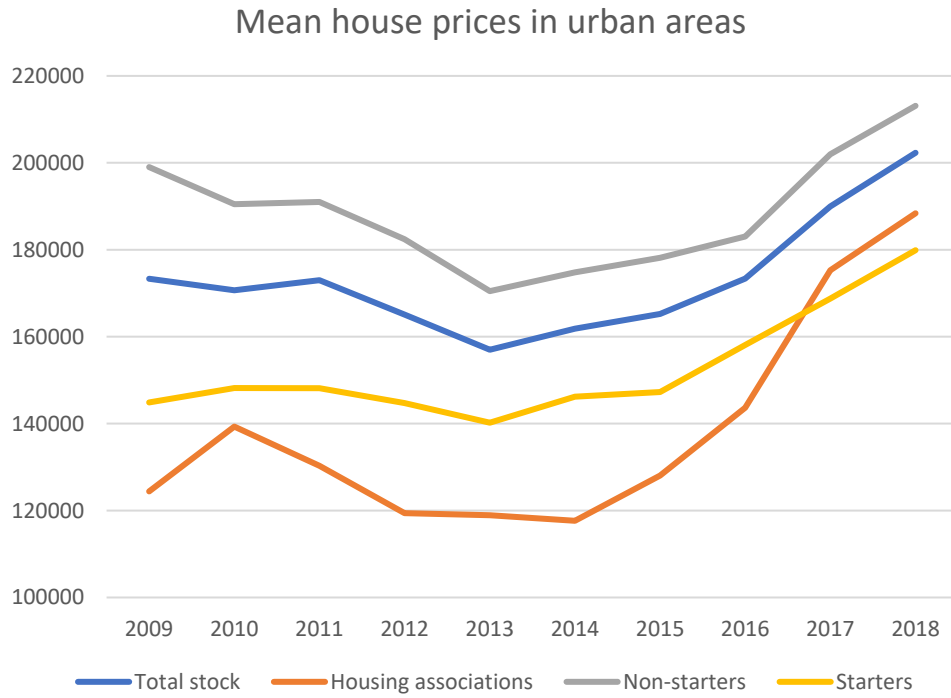


Figure 13: Mean house prices in urban areas

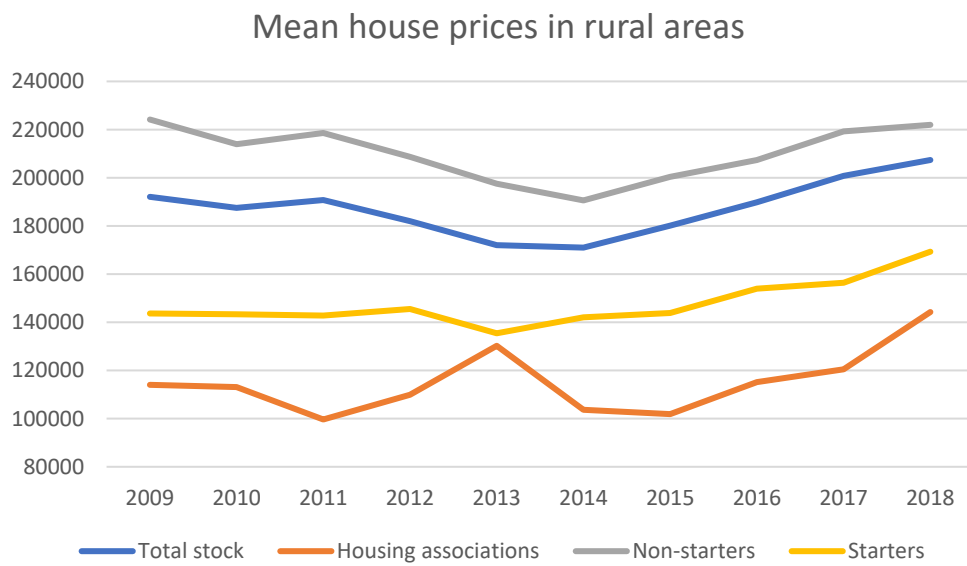


Figure 14: Mean house prices in rural areas

Starters

Housing associations have provided a substantial part of the number of housing sales to starters, but the data shows that this amount has more than halved since 2015. In figures 15 and 16 below the division of the house sales in the province of Groningen between private parties and the house sales by housing associations is shown. For starters, housing market figure 15 shows that housing associations provided around 15% of the market at their peak in 2011 but have steadily declined towards 4,8% in 2018. In the non-starter market shown in figure 16 the share of housing associations peaked in 2014 at 8% of the non-starter market and in the 4 years after 2014 it rapidly declined to 2.6% in 2018. Both figures show a rapid decline after the year 2015. This data implicates that one of the reasons that the housing market for starters has not been able to keep up with the rest of the housing market is that the supply from housing associations has fallen drastically in recent years.

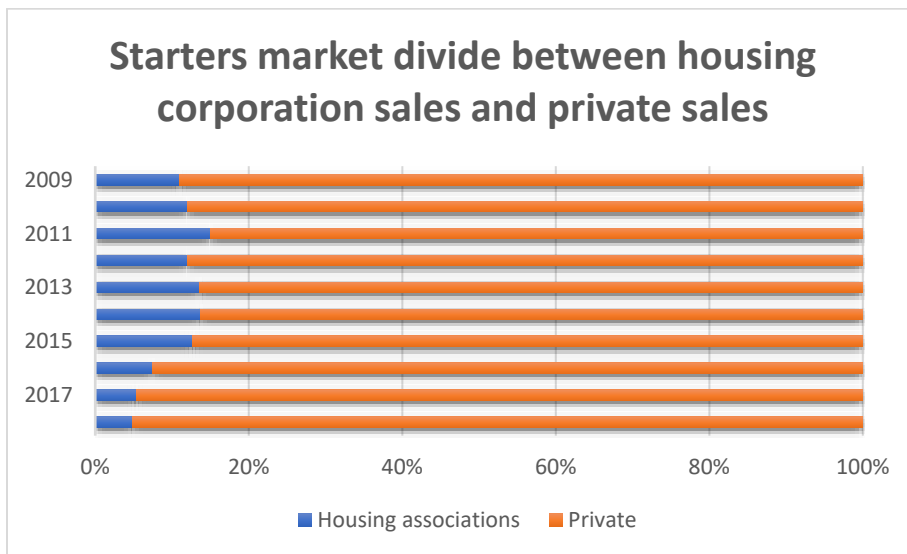


Figure 15: starter house market division between private sales and sales by housing associations

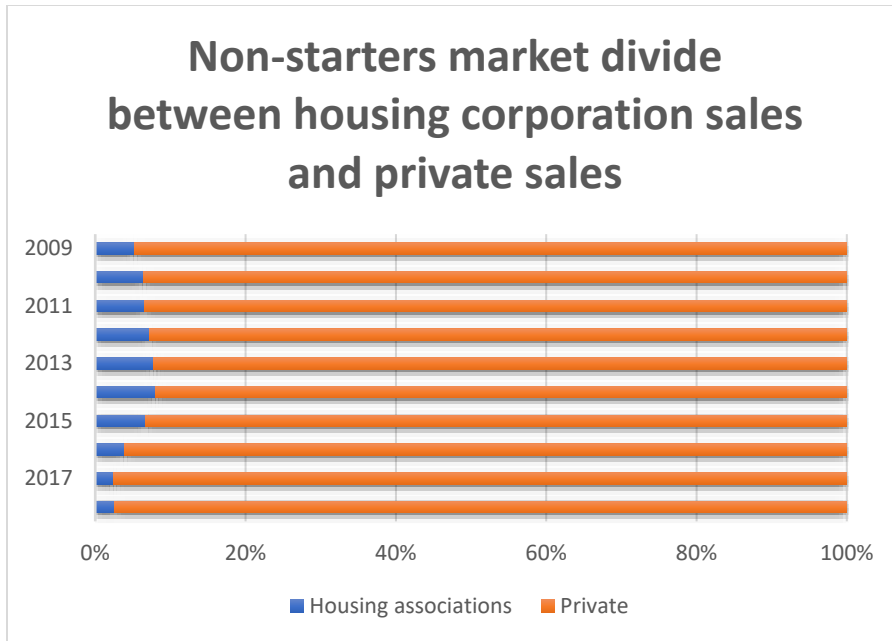


Figure 16: non- starter house market division between private sales and sales by housing associations

The housing market has grown a lot during the 2009-2018 period but a big divergence can be noted especially when comparing housing sales to starters and non-starters. While the market for non-starters has more than doubled during this time period the starter market has stayed almost the same.

Figure 17 shows how the divide between housing sales starters and non-starters has changed from being quite even in 2009 to more than double in 2018. For both starters and non-starters, the total amount of sales has risen but it is interesting to note how the non-starter market starts to quickly outpace the starter market after 2014.

In figure 18 it can be seen how the sale of social housing to both starters and non-starters has trended over the years. The main point of interest to see is how the sale started has steadily declined from just above 60% of the sales to 45% of the total sales and that especially after 2014 the total sales went down quite substantially.

Combining the data of all these graphs and the data about the development of prices over time shown earlier a possible explanation for the relative decrease becomes clear. The growing prices of units sold by housing corporations have outgrown the spending budget of many starters. This has led to them being priced out of this segment of the market that used to be quite a large part of their pond.

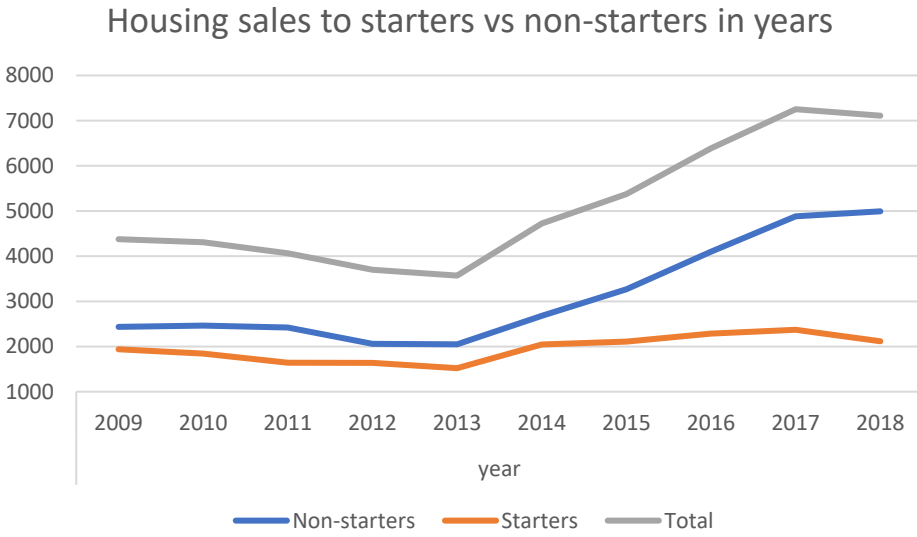


Figure 17: House sales to starters vs non-starters

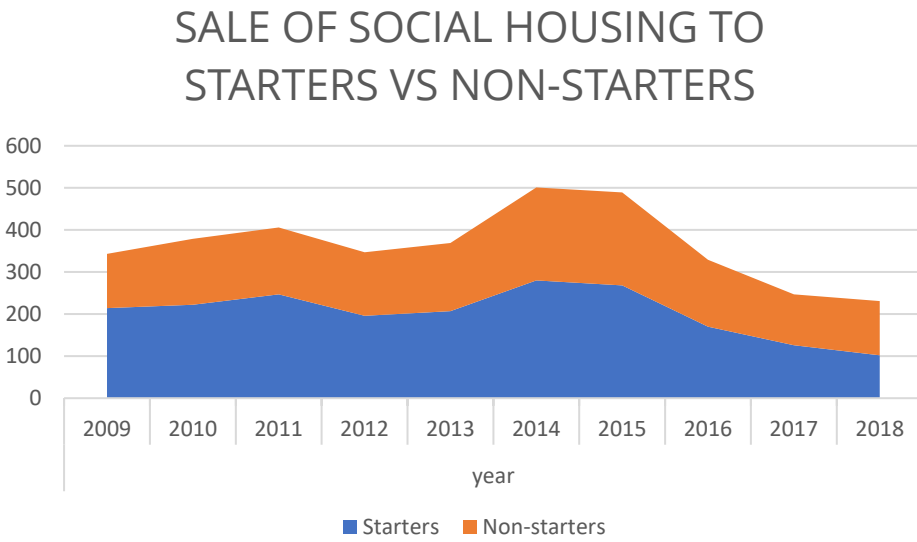


Figure 18: The sale of social housing to both starters and non-starters

The sale of social housing for starters

To test the first sub-research question: What are the advantages of the sale of social housing units for starters with regard to the housing price in the province of Groningen? A statistical regression model was created using the following formula: $\log(\text{price}) = \beta_0 + \beta_1 \text{Social} + \beta_2 \text{starter} + \beta_3 \text{Year} + \beta_4 \text{municipality} + \beta_5 \text{age} + \beta_6 \text{control} + \varepsilon$.

In this figure 19, it can be seen how all the relevant indicator variables are inserted to calculate the $\log(\text{price})$. We can then calculate the expected change in housing price for starters being $\exp(-0.046)=0.955$ which shows that starters pay on average 4.5% less for houses they buy than non-starters. When looking at housing corporation units it can be calculated by taking $\exp(-0.114)=0.892$ that they have on average a 10.8% lower price than normal houses.

Looking at figure 20 it can be seen how with the addition of the interaction that is interesting for the research question we get the following formula: $\log(\text{price}) = \beta_0 + \beta_1 \text{Social} + \beta_2 \text{starter} + \beta_3 \text{Year} + \beta_4 \text{municipality} + \beta_5 \text{age} + \beta_6 \text{control} + \beta_7 \text{Social} * \text{starter} + \varepsilon$. It can then be interpreted with this model by calculating $\exp(0.045)=1.046$ that starters buying housing corporation units pay on average 4.6% more than the market average.

When calculating the interaction terms more in-depth it can be seen in figure 21 that there is a greater difference for starters between social housing units and private market prices compared to non-starters. Starters pay 1,8% more for private houses compared to private market sales. On the other hand, non-starters pay 2.7% more for private homes compared to social housing units. This indicates that both starters and non-starters pay similar house prices for social housing units while non-starters pay more for private home sales.

Looking at the data in figure 21 it can be seen that being either a starter or buying a housing corporation unit in itself gives a price advantage compared to the market price. But when buying a housing corporation unit as a starter it is a disadvantage as there is a price markup compared to the average market price. Concluding from this data it can thus be seen that starters do not gain a pricing advantage when buying from housing corporations but a price disadvantage instead.

Housing prices in Groningen(province)					
	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
Constant	3.171	.044		72.421	.000
Social housing unit Starter	-.114	.003	-.144	-38.397	.000
	-.046	.002	-.110	-22.935	<,001
Municipality of sale					
Eemsdelta	-.148	.003	-.179	-46.932	.000
Het Hogeland	-.096	.003	-.125	-32.586	<,001
Midden-Groningen	-.083	.003	-.115	-29.858	<,001
Oldambt	-.177	.003	-.214	-56.036	.000
Pekela	-.200	.006	-.127	-34.292	<,001
Stadskanaal	-.097	.003	-.111	-29.104	<,001
Veendam	-.153	.003	-.167	-44.136	.000
Westerkwartier	-.034	.003	-.051	-12.858	<,001
Westerwolde	-.119	.004	-.118	-30.902	<,001
Year of Sale					
2010	-.003	.004	-.005	-.939	.348
2011	-.007	.004	-.010	-1.943	.052
2012	-.028	.004	-.035	-7.260	<,001
2013	-.054	.004	-.067	-13.979	<,001
2014	-.055	.004	-.079	-15.432	<,001
2015	-.045	.003	-.068	-12.949	<,001
2016	-.028	.003	-.046	-8.304	<,001
2017	.007	.003	.013	2.199	.028
2018	.035	.003	.061	10.771	<,001
Control					
Age of buyer					
30-40 years old	.048	.002	.100	21.194	<,001
40-50 years old	.025	.003	.048	9.669	<,001
50-60 years old	.001	.003	.002	.373	.709
60-70 years old	.029	.003	.039	8.726	<,001
70+ years old	.031	.005	.027	6.764	<,001
Construction year	.001	.000	.171	45.801	.000
House surface area	.001	.000	.358	88.922	.000
Lot size	1.402E-5	.000	.111	27.582	<,001

Dependent Variable: Log_Koopsom

Figure 19: Regression model for housing prices in Groningen

Housing prices in Groningen(province) + interaction starters					
	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
Constant	3.170	.044		72.453	.000
Social housing unit	-.139	.004	-.174	-31.738	<,.001
Starter	-.049	.002	-.118	-24.057	<,.001
Social*Starter	.045	.006	.043	7.637	<,.001
Municipality of sale					
Eemsdelta	-.148	.003	-.179	-46.972	.000
Het Hogeland	-.097	.003	-.125	-32.628	<,.001
Midden-Groningen	-.083	.003	-.116	-29.981	<,.001
Oldambt	-.177	.003	-.214	-56.131	.000
Pekela	-.200	.006	-.127	-34.331	<,.001
Stadskanaal	-.098	.003	-.111	-29.243	<,.001
Veendam	-.153	.003	-.167	-44.191	.000
Westerkwartier	-.034	.003	-.051	-13.002	<,.001
Westerwolde	-.119	.004	-.118	-31.001	<,.001
Year of Sale					
2010	-.003	.004	-.005	-.916	.360
2011	-.007	.004	-.010	-1.977	.048
2012	-.027	.004	-.035	-7.203	<,.001
2013	-.054	.004	-.067	-13.942	<,.001
2014	-.055	.004	-.079	-15.394	<,.001
2015	-.045	.003	-.068	-12.920	<,.001
2016	-.028	.003	-.046	-8.292	<,.001
2017	.007	.003	.012	2.191	.028
2018	.035	.003	.061	10.766	<,.001
Control					
Age of buyer					
30-40 years old	.048	.002	.100	21.112	<,.001
40-50 years old	.025	.003	.048	9.601	<,.001
50-60 years old	.001	.003	.002	.474	.635
60-70 years old	.029	.003	.039	8.681	<,.001
70+ years old	.031	.005	.027	6.703	<,.001
Construction year	.001	.000	.171	45.876	.000
House surface area	.001	.000	.357	88.773	.000
Lot size	1.398E-5	.000	.111	27.518	<,.001

Dependent Variable: Log_Koopsom

Figure 20: Regression model for housing prices in Groningen with interaction between social housing and starters

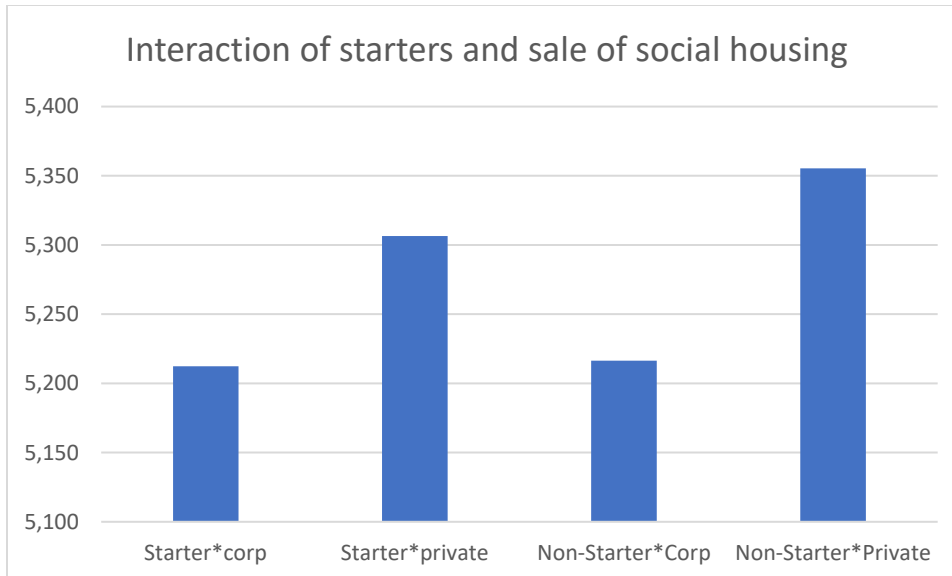


Figure 21: Interaction of starters and the sale of social housing

The sale of social housing in rural and urban municipalities

To test the second sub-question: *How has the sale of social rental units by housing associations affected in price by the municipality where the sales took place?* Another regression model was created using this formula: $\log(\text{price}) = \beta_0 + \beta_1 \text{Social} + \beta_2 \text{starter} + \beta_3 \text{Rural} + \beta_4 \text{Year} + \beta_5 \text{age} + \beta_6 \text{control} + \varepsilon$. In figure 22 the results of this model are shown and by calculating the exponential of the coefficients we can infer some insights. Taking $\exp(-0.111) = 0.895$ we see that in this model social housing units sell for a 10,5% lower price than the average market price. By calculating $\exp(-0.109) = 0.897$ it's shown that house prices in rural municipalities are 10.3% lower than in the municipality of Groningen.

After the interaction rural municipalities and social housing units is added to the model the following formula is created: $\log(\text{price}) = \beta_0 + \beta_1 \text{Social} + \beta_2 \text{starter} + \beta_3 \text{Rural} + \beta_4 \text{Year} + \beta_5 \text{age} + \beta_6 \text{control} + \beta_7 \text{Social} * \text{Rural} + \varepsilon$. The results of this model can be seen in figure 23 and by calculating $\exp(-0.17) = 0.844$ it can be seen that social housing units in rural municipalities are on average 15.6% cheaper than the average market price for a house in the province of Groningen.

When taking an in-depth look at the interaction terms of the rural municipalities and the social housing units it can be seen how there are quite significant price differences between the rural municipalities and the municipality of Groningen in both the private market and the sale of social housing. By taking the data from figure 24 it can be calculated that the social housing units in rural municipalities have a 2,5% lower price than those in the municipality of Groningen and a similar percentage compared to private market prices in rural municipalities. Compared to private sales in the municipality of Groningen there is a 4.4% lower price.

Taking into account the complete model it can be seen that there are clear price advantages for buying houses in rural municipalities compared to the municipality of Groningen. However buying social housing units in Groningen is comparable to buying a private house in a rural municipality.

Housing prices in Municipality of Groningen and rural municipalities					
	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
Constant	3.018	.045		67.691	.000
Social housing unit	-.111	.003	-.140	-36.565	<.001
Starter	-.047	.002	-.113	-23.030	<.001
Rural municipalities	-.109	.002	-.266	-68.368	.000
Year of Sale					
2010	-.003	.004	-.004	-.698	.485
2011	-.006	.004	-.008	-1.647	.100
2012	-.027	.004	-.034	-6.836	<.001
2013	-.053	.004	-.066	-13.384	<.001
2014	-.052	.004	-.075	-14.314	<.001
2015	-.043	.004	-.066	-12.142	<.001
2016	-.026	.003	-.044	-7.745	<.001
2017	.009	.003	.015	2.601	.009
2018	.036	.003	.062	10.624	<.001
Control					
Age of buyer					
30-40 years old	.049	.002	.103	21.283	<.001
40-50 years old	.023	.003	.045	8.824	<.001
50-60 years old	-.002	.003	-.004	-.765	.444
60-70 years old	.025	.003	.034	7.448	<.001
70+ years old	.029	.005	.025	6.054	<.001
Construction year	.001	.000	.184	48.394	.000
House surface area	.001	.000	.356	86.749	.000
Lot size	1.523E-	.000	.121	29.463	<.001

Dependent Variable: Log_Koopsom

Figure 22: Regression model for housing prices in municipality of Groningen and rural municipalities

Housing prices in Municipality of Groningen and rural municipalities + interaction between social housing and other municipalities

	Unstandardized Coefficients		Standardized Coefficients		
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
Constant	3.016	.045		67.624	.000
Social housing unit	-.105	.004	-.133	-28.316	<,001
Starter	-.047	.002	-.113	-22.955	<,001
Rural municipalities	-.107	.002	-.263	-65.497	.000
Social*Rural	-.017	.006	-.013	-2.700	.007
Year of Sale					
2010	-.003	.004	-.004	-.739	.460
2011	-.006	.004	-.008	-1.683	.092
2012	-.027	.004	-.034	-6.905	<,001
2013	-.053	.004	-.066	-13.454	<,001
2014	-.053	.004	-.075	-14.391	<,001
2015	-.043	.004	-.066	-12.218	<,001
2016	-.027	.003	-.044	-7.822	<,001
2017	.008	.003	.015	2.520	.012
2018	.035	.003	.061	10.524	<,001
Control					
Age of buyer					
30-40 years old	.049	.002	.103	21.307	<,001
40-50 years old	.023	.003	.045	8.847	<,001
50-60 years old	-.002	.003	-.004	-.753	.451
60-70 years old	.025	.003	.034	7.480	<,001
70+ years old	.029	.005	.025	6.081	<,001
Construction year	.001	.000	.184	48.437	.000
House surface area	.001	.000	.356	86.710	.000
Lot size	1.520E-5	.000	.121	29.404	<,001

Dependent Variable: Log_Koopsom

Figure 23: Regression model for housing prices in municipality of Groningen and rural municipalities + interaction between social housing and rural municipalities

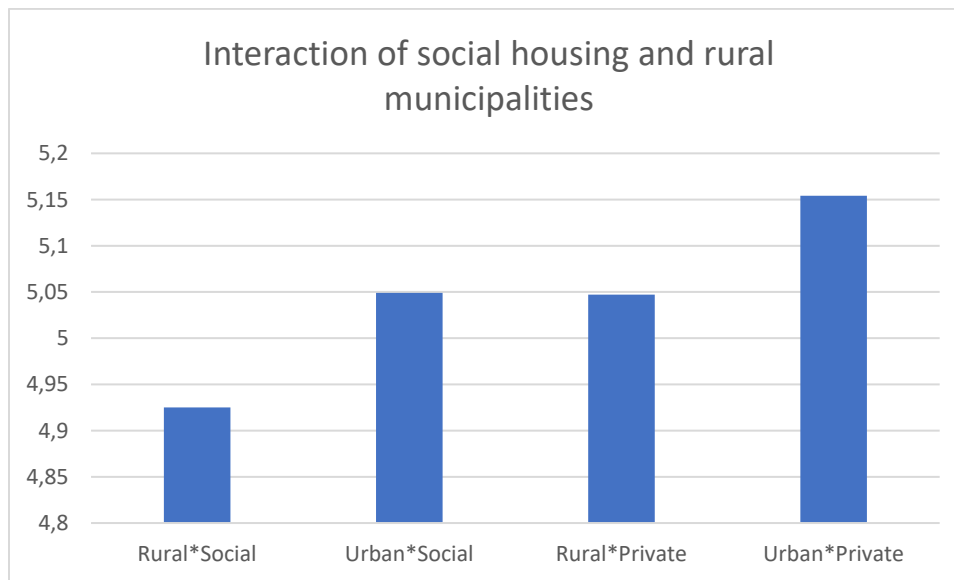


Figure 24: Interaction of social housing and rural municipalities

Conclusions and discussion

Looking back at the conceptual model it can be seen that the results of the analysis match up in most places as the variables had an expected effect on the house price. However, the interactions do show some interesting results that were not expected as starters pay over the average market rate for social housing units.

The main findings of this master thesis are that while social housing units are cheaper to buy than private market sales they do not especially favour starters as they pay a similar price as non-starters for the units. And combining the regression with the exploratory data it can be seen that starters are slowly pushed out of this segment of the market altogether as the rising prices seem to have pushed some starters out. If there is a need and political will to advantage starters it seems to be imperative that they give incentives to the housing corporations to sell more favourably to starters as they are seemingly not doing it inherently.

The research shows that for the province of Groningen the sale of social housing is especially important for the housing market in the municipality of Groningen where it provides a significant amount of the total sales.

Looking at the data and the sub-questions it becomes clear that a lot has changed in the housing market of the province of Groningen during the time period studied. Especially after the year 2014, the private housing market exploded in the number of sales it produced each year. The sale of social housing units has kept somewhat stable in absolute numbers but decreased relative to the private market. Surprisingly the mean house prices of units sold by housing corporations are the category that grew the most in both an absolute and relative sense leading to starters being priced out of this segment by non-starters that might be pushed down from traditionally more expensive segments as the prices overall have risen drastically this links to the theories of Haffner and Boumeester, (2010) that fast-rising prices can lead to exclusion from the housing market.

Combining these insights with the regression analysis it can be said that starters do have a small advantage in the market due to the sale of social housing as these units are usually in their price range. However, this advantage seems to be eroding due to the quickly rising prices. The sale of social housing units has seemingly shifted from low prices and relatively high amounts of starters towards higher prices and non-starter sales.

Looking at the rural municipalities it can be seen that the sale of social housing units is done at lower prices than in both the municipality of Groningen and then rural private market sales. This is in line with the expectations from the literature as rural areas have lower amenities and access to jobs (Kiel and Zabel, 2008). The growth of prices in rural municipalities has also been slower than in the municipality of Groningen showcasing that the market in rural municipalities is more stable, especially for the sale of social housing.

Finally to answer the research question: *How has the sale of social rental units by housing associations within the province of Groningen affected the housing market in the 2009-2018 period?* The housing market of the province of Groningen has been

impacted by the sale of social housing as it has provided the housing market with a steady supply of houses at a relatively low price. The impact on starters and rural municipalities seems to be mostly as could be expected from the literature as the price has been lower for starters and in rural municipalities. However, a turning point seems to possibly be on the horizon for starters buying social housing units as the prices are seeming to outpace their buying power.

A potential way to change the current system to have starters benefit better from the sale of social housing would be to have housing corporations start screening more to whom they are selling and adding a potential weight to the social benefits of selling to starters compared to non-starters. This could lead to housing associations selling more towards starters as their aim in the sale of social housing would shift from strategic and financial decision-making towards decision-making that would include the social benefits of selling towards certain groups of buyers such as starters.

Future Research

For future research, a look at the more recent data would be able to provide more valuable insights especially to see if the trends seen in the current data keep up. It would be very interesting to see how Covid has possibly impacted this and if starters are still able to buy social housing units or have turned to other alternatives. Another interesting thing would be to take a look at if the price advantage of buying a house outweigh the extra costs that living in a rural area over time.

Reflection

During the process of writing this master thesis there have been a lot ups and downs which in hindsight was to be expected. Some weeks I managed to make a lot of progress while in other weeks barely any progress was made due to the obligations of other courses. I think overall the visualization and transforming of the data went well but it took me a lot more effort to get the statistical knowledge and experience to successfully create and execute the regression models. It ended up taking longer than I would have wanted to finalize the direction and research questions for my research as it was hard for me to find the direction and scope that was both interesting and executable with the skills and data I had.

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Appendix A: Description of the dataset

The kadaster transactions dataset 2009-2018

Prepared by George de Kam december 2021, updated by Sarah Mawhorter april 2022

Number of records: 51.191, one for each transaction with buyer information for the oldest buyer

column	label	explanation
a	transactiedatum	date of registration of the transaction
b	Straat	street
c	Postcode	6 digit postcode
d	HuisNr	house number
e	HuisLr	house letter
f	HuisToev	addition to the address
g	PHT	identifier postcode - house number - addition (preferred variable for merging files at address level)
h	Xcoord	x- coord
i	Ycoord	y- coord
j	WTO	type of property: A = apartment; H= cornerhouse (in a row); K= two under a roof; O = unknown; T = house in the middle of a row; V = detached (vrijstaand)
k	Grootte	size of the lot (if applicable)
l	VBO_ID	id of the property in BAG (VBO = floor space)
m	VBO_OPPERVLAK	floorspace
n	KoopSom	price (euros)
o	BOUWJAAR	year of construction
p	Verhuisafstand	distance between address of the buyer and the property she/he has bought (in kilometers)
q	corop_geboorteplaats	region where buyer was born, seperate rows for each of two buyers
r	leeftat	age category of the buyer(s), seperate rows for each of two buyers
s	VkrWnplts	place of residence of the buyer
t	pc4_verkrijger	4 digit postcode of the buyer (only in larger places of residence like groningen, to get more spatial detail)
u	BUURT_CODE	neighborhood code (CBS) of the property
v	BUURT_NAAM	neighborhood name (CBS) of the property
w	WIJK_CODE	district code (CBS) of the property
x	WIJK_NAAM	district name (CBS) of the property
y	gemeente (2018)	municipality in which the prpoerty is situated (as defined in 2018)
z	ind_meerdere_verkrijgers	indication of more than one buyer (couples etc)
aa	ind_starter	indication that the buyer is a first time buyer
ab	ind_corporatiewoning	indication that the seller is a housingassociation
ac	ind_vervr_NNP	indication that the seller is not a natural person
ad	schadeklasse_woonplaats_verkrijger	level of earthquake damage in place of residence of the buyer at date of transaction(5 classes)
ae	PGV_2015_woonplaats_verkrijger	cumulatiev peak ground velocity in place of residence of the buyer, level 2015
af	impact_2015_woonplaats_verkrijger	level of earthquake damage in place of residence of the buyer (5 classes),(level of 2015)
ag	year	year of registration of the transaction
ah	month	month of registration of the transaction
ai	verkrijgers	number of buyers (couples etc.)

Appendix B: Municipal Changes

Old municipality	New municipality
De Marne	Het Hogeland
Bedum	Het Hogeland
Eemsmond	Het Hogeland
Winsum	Het Hogeland
Appingedam	Eemsdelta
Loppersum	Eemsdelta
Delfzijl	Eemsdelta
Leek	Westerkwartier
Marum	Westerkwartier
Zuidhorn	Westerkwartier
Grootegast	Westerkwartier
Ten Boer	Groningen
Haren	Groningen