COVID-19 and Counter Urbanization? An Investigation of Residential Price Trends in Flevoland and Surrounding Areas Between 2018 and 2021.

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ABSTRACT

The Covid-19 crisis has had a major impact on the economy worldwide, as well as on real estate markets, specifically the residential segment. Higher valuation of having more space regarding residential properties and other factors such as the working-from-home trend, result in counterurbanization in the form of urban-rural migration due to a change in locational preferences of residential consumers. This study adds to the existing literature on Covid-19 and housing markets by investigating residential price trends for various urbanity levels in Flevoland and surroundings. A survey questionnaire is conducted in a subsample of households that are observed in the residential transaction data in order to gain deeper insights in their motivations to move during Covid-19. This study does not find a clear trend indicating that house prices in rural and urban areas are converging during Covid-19, therefore finding little evidence for a change in locational preferences of residential consumers. Overall, the results indicate that property prices in the residential market are still increasing over time during the Covid-19 period in urban areas as well as rural areas.

Keywords: Covid-19; Residential Market; Urbanity; Housing Prices; Counter-urbanization;

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1. INTRODUCTION

1.1. Motivation

At the start of the Covid-19 crisis, hardly anyone could have foreseen the significant impact it would have on society as a whole around the world. Covid-19 has inflicted major shocks on economies in countries worldwide. Besides other major effects of Covid-19, one effect on the real estate sector that can be observed from analyzing newspapers and real estate industry reports is a trend of higher valuation of having more space regarding residential properties, resulting in counterurbanization in the form of urban-rural migration. Figures from Statistics Netherlands on relocations show that large cities are shrinking, and the countryside is growing (Hut, 2020). For example, in the first seven months of 2020, the Achterhoek (a rural region in the Netherlands which normally experiences a decline of population) experienced a growth in residents of 1200 (Hut, 2020). Among residential households, young families are most likely to migrate from an urban to a rural environment, which has been an ongoing trend for years. Reasons that are given for relocation are space shortages and a lack of green space (CBRE, 2021). Features of the counter urbanization trend are people working remotely from home, which seems to be a lasting format, and finding living space in a green environment in the rural areas of the Netherlands at lower prices (Haggeman, 2020). A central office and a good digital infrastructure will enable office workers to live further away from their work, as the daily presence in an office is no longer the norm (Cushman & Wakefield, 2020). Eveline van Leeuwen, professor of Urban Economics at the University of Wageningen, argues that migration from urban to more rural areas could be accelerated due to Covid-19. The population of Amsterdam decreased by nearly two hundred people between March 23 and April 17, 2020, according to figures from Statistics Netherlands. The change in trend is striking, due to the fact that in the period from the end of January to the beginning of March, just before the lockdown, the number of inhabitants of Amsterdam increased by more than three hundred (Couzy, 2020). CEO of real estate brokerage Redfin, Glenn Kelman, argues that demand for homes has shifted to rural areas as people react to the Covid-19 crisis and look to move out of dense urban areas, resulting in rural demand being much stronger right now than urban demand. The counter-urbanization trend that seems to be accelerated by the Covid-19 crisis proposes an interesting research subject for this thesis. The societal

relevance of this study is to research whether location preferences of residential consumers have changed due to the Covid-19 crisis and in which capacity. Overall, this study indicates a larger price increase over the years in which Covid-19 was present for the most rural areas in central Netherlands. Prices in urban and rural regions are slightly converging, providing evidence for the hypothesis that house prices in non-urban areas have increased relatively more than house prices in urban areas. Overall real estate prices are still rising, which is in line with literature on the effect of Covid-19 and real estate prices.

1.2 Literature review

The concepts of counterurbanization and household preferences is extensively researched in the literature on housing markets. The concept of counterurbanization is described by Berry (1976) as "a process of population deconcentration; it implies a movement from a state of more concentration to a state of less concentration." Various motives for urban to rural migration can be distinguished from existing literature on housing markets. These motives include housing conditions, local, natural and social amenities and job opportunities (Hansen & Aner, 2017). According to Volkers and Huigen (1989) two factors of rural locations can be distinguished that attract urban migrants: the distance to major urban areas, which allows people to commute, and the quality of the residential environment (amenities on a local and regional scale). Other reasons for choosing a specific rural area are a mixture of housing characteristics, the physical qualities of the environment, personal reasons and the lower house prices in the area (Bijker et al., 2012).

The Covid-19 crisis has been over for some time now and quite some literature about this subject has been published. Some articles incorporate counter-urbanization and house prices in the context of Covid-19. Recent studies about the relationship between Covid-19 and real estate prices indicate that the Covid-19 pandemic brought house price and rent declines in city centres, increasing the price and rent away from the centre (Rosenthal et al, 2021; Hu et al, 2021; Cheung et al, 2021). Furthermore, Covid-19 led to a significant shift in housing demand away from large cities (Liu and Su, 2021; Kaynak et al, 2021) and a significant change in housing preferences involving a desire for larger residential properties (Marona and Tomal, 2021; Szczepek, 2021; Tanrıvermiş, 2020). Although house prices rebounded after

the lockdown period, price gradient models show that the price gradients were flattened from the epicentre to the urban peripherals (Cheung et al, 2021). However, Gnat (2022) found that price differentiation between the centre of an agglomeration and smaller neighbouring cities also increased during the pandemic period.

Jones and Grigsby-Toussaint (2020) identify push and pull factors that are impacted by Covid-19: affordability and population density. Jones and Grigsby-Toussaint (2020) state that individuals who are searching for housing, are using physical distance as a positive criterion for where to relocate, due to Covid-19. Brueckner, Kahn and Lin (2021) find that Working-From-Home (WFH) puts downward pressure on housing prices and rents in high-productivity counties, a result of workers starting to relocate to cheaper metro areas during the Covid-19 crisis without forsaking their desirable jobs. Glaeser et al. (2020) estimate that at least 16 percent of American workers will switch from professional offices to working at home at least two days per week as a result of Covid-19, most likely influencing decisions ranging from where people live to where companies locate.

Since the Covid-19 crisis is such a recent phenomenon, there is hardly any literature of the impact of Covid-19 on residential location preferences. Therefore, the contribution of this study is to present an empirical analysis on how house prices have developed during Covid-19 in the central Netherlands region and whether Covid-19 plays a major role in households' motivation to move during Covid-19. This addition can be considered relevant because of the scarce volume of literature on the effect of Covid-19 on the real estate market in the Netherlands. Converging house prices between urban and rural areas in the Netherlands indicating a change in location preferences of residential consumers has hardly been studied yet and therefore this study provides a new perspective on existing literature.

1.3. Research problem statement

Filtering out the effects of Covid-19 and other reasons for counterurbanization is a challenging task. Therefore, the aim of this thesis is twofold: First, this thesis investigates the residential price trends for each urbanity level. The variation in trends gives us a first indication of counterurbanization (as standard

economic theory expects relative price differences to be smaller between urban and non-urban areas during periods of counterurbanization). Second, a survey questionnaire is sent to a subsample of households that are observed in the residential transaction data to ask about their motivations to move, and whether Covid-19 played a major role in their relocation decision.

The research for this study will be conducted using a mixed-methods approach which combines qualitative and quantitative methods (Starr, 2014). The central research question is: 'To what extent does Covid-19 contribute to counter urbanization in residential housing markets? This central research question will be answered by dividing it into three sub-questions.

The first sub-question that is related to the central research question is: 'What is the mechanism between Covid-19 and counter urbanization, and how could this impact residential housing markets according to the academic literature? I will answer this question by performing a literature review of literature on counter-urbanization and hedonic pricing theories. The literature review is performed by using the search engines SmartCat from the university of Groningen and Google Scholar. Examples of keywords that were used in order to find relevant literature for this study are 'Counter-urbanization on the Dutch housing market', 'Hedonic pricing on the residential market', 'The impact of Covid-19 on house prices' and 'Covid-19 and the residential market'. The second sub-question is: 'How did residential price trends of various levels of urbanity develop in Flevoland and surrounding areas during Covid-19?' This question will be answered by applying an Ordinary Least Squares (OLS) regression analysis on a dataset that I have created from data of my internship at an NVM-broker. This regression analysis will be conducted on the basis of the hedonic pricing theory. The hedonic pricing method models the financial performance of a property influenced by individual characteristics such as locational characteristics and property characteristics. I will use cross-sectional data from an NVM-broker during a period of January 2020 till May 2021, and I will focus specifically on the region where VSO makelaars operates, which is central Netherlands (Flevoland and the area around the Veluwe). The third sub-question is: 'What are the motivations of recent movers who migrated from an urban area to a non-urban area in Flevoland and surrounding areas during Covid-19?' I will answer this question by conducting a qualitative survey

among residential consumers of my dataset. With conducting a survey, a deeper insight is gained into the motivations of house buyers to migrate from an urban to non-urban environment during the Covid-19 period. The conceptual model of this study is described in Figure 1 below:
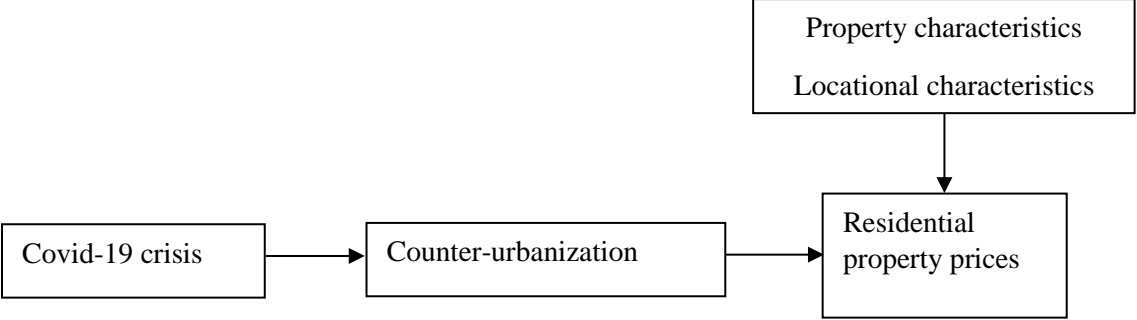
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Figure 1. Conceptual model

2. THEORY

2.1 Hedonic pricing theory

House price indices

The concept of the hedonic price model has been extensively studied in scientific literature. The common features of the hedonic pricing theory constitute that the price of one house relative to another will differ with the additional unit of the different attributes inherent in one house relative to another house (Rosen, 1974). The relative price of a house is then the summation of all its marginal or implicit prices estimated through regression analysis. The relationship between attribute preference and the price of properties has been extensively examined by researchers using the hedonic pricing theory. Freeman (1979) showed that the market price of a housing unit can be determined by the buyers' evaluations of the housing unit's bundle of inherent attributes, such as locational, structural, or neighbourhood attributes.

Kagie and van Wezel (2006) have constructed a hedonic price model for house prices for six geographical submarkets in the Netherlands and they find the size of a house to be the most important variable of input for all but one region. The hedonic indices show that over time not only prices have

increased, but also the quality of the dwellings has decreased, mainly because houses have become smaller.

Heterogeneity in housing markets

Visser, van Dam and Hooimeijer (2008) research the extent to which spatial variations in house prices in the Netherlands can be explained by differences in physical, social and functional characteristics of the residential environment. It is demonstrated that regional house price variations can indeed largely be explained by characteristics of the residential environment. An important factor in these regional price differences is the accessibility to employment opportunities. House price levels in the Netherlands decrease from the core to the periphery. In particular the variables that measure the access to jobs are instrumental in explaining the regional differentiation in house prices. Indeed Renes et al. (2006) found that long term housing shortages prevail in the areas where access to jobs is most abundant. The highest mean sales prices are found in the western and most urbanised parts of the Netherlands where the four major cities (Amsterdam, Rotterdam, The Hague and Utrecht) are located (Visser, van Dam and Hooimeijer, 2008). Burnley and Murphy (2004) suggested that the convergence in housing prices may see treechange or seachange areas in Australia (rural areas) becoming less affordable than in the past. Costello (2007) explores the impact that urban-rural migration has on local housing markets such as increases in house prices and decreases in affordability. She finds that there have been increases in house prices in the rural area of study as a result of exurban migration, but it would be foolhardy to suggest these were directly caused by movements of people to rural environments.

Divergence vs. convergence

Hochstenbach and Arundel (2020) identify a substantial polarising trend that appears a structural one: it has proven "crisis resistant" and exists across space and scales. Housing-market polarisation increases in periods of economic growth when overall house-price gains are matched by even stronger increases in already expensive locations. Surprisingly, the opposite is not the case: in the economic downturn following the outbreak of the Global Financial Crisis, the housing-market collapse and house-price

decreases were not matched by declining levels of spatial inequality. Instead, inequality levels stabilised over this period or even saw continued slight increases (Hochstenbach and Arundel, 2020).

This indicates that spatial polarisation in house values is a structural phenomenon that, at least partly, defies the dramatic swings in housing-market volatility that we have seen over recent boom–bust–boom periods. Galati and Teppa (2017) find that the speed of convergence of house price dynamics and the efficiency of housing markets depends on the geographical location, the degree of urbanization, and the type and year of construction of a house. They identify a relationship between house price dynamics and degree of urbanization that appears to be U-shaped. House prices in very highly and highly urbanized areas or areas with a very limited degree of urbanization tend exhibit significantly higher parameters of mean reversion and a higher parameter measuring market efficiency compared to areas with a moderate or limited degree of urbanization (Galati and Teppa, 2017).

2.2 Counterurbanization

The concept of counterurbanization and household preferences is extensively researched in the literature on housing markets. The concept of counterurbanization is described by Berry (1976) as "a process of population deconcentration; it implies a movement from a state of more concentration to a state of less concentration." Fielding (1983) refers to counterurbanization as the process of spatial deglomeration of the population. This can be said to have come about when there is an inverse relationship between the sizes of place and their rate of population change. In their study for crisis-led counterurbanization, Remoundou, Gkartzios and Garrod (2016) take socio-economic factors such as the social and cultural environment (i.e., family networks, cultural capital) into consideration and find that urban migrants are more likely to select rural areas that are close to big cities and that offer high cultural opportunities.

Various motives for urban to rural migration can be distinguished from existing literature on housing markets. These motives include housing conditions, local, natural and social amenities and job opportunities (Hansen & Aner, 2017). Additionally, age and household composition play important roles in the motives for relocating (Hansen & Aner, 2017). In their article about preferences for rural living, Van Dam, Heins and Elbersen (2002) state that images and representations of the rural, preferences for living in rural residential environments, and urban–rural migration are strongly linked. Rural idyll is an

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important motivation for moving to a rural area (Bijker, Haartsen and Strijker, 2012; Van Dam et al., 2002) because people prefer to live in a green, quiet, spacious, orderly and safe residential environment (Van Dam et al., 2002). According to Volkers and Huigen (1989), two factors of rural locations can be distinguished that attract urban migrants: the distance to major urban areas, which allows people to commute, and the quality of the residential environment (amenities on a local and regional scale). Other reasons for choosing a specific rural area are a mixture of housing characteristics, the physical qualities of the environment, personal reasons and the low house prices in the area (Bijker, Haartsen and Strijker, 2012).

2.3 Theory of house prices and counter-urbanization in the context of Covid-19

The Covid-19 crisis has been over for some time now and quite some literature about this subject has been published. Recent studies about the relationship between Covid-19 and real estate prices indicate that the Covid-19 pandemic brought house price and rent declines in city centres, increasing the price and rent away from the centre. Gupta et al. (2021) explained that housing markets predict that urban rent growth will exceed suburban rent growth for the foreseeable future. Rosenthal et al. (2021) showed that the rent premium associated with employment density declined sharply following the Covid-19 shock for all cities. Hu et al. (2021) highlighted a negative relationship between prior Covid-19 cases and daily housing returns using the daily hedonic housing price index for five Australian capital cities. Liu and Su (2021) tested the impact of the Covid-19 pandemic on the location demand for housing. The findings of their study show that the pandemic has led to a shift in housing demand away from neighbourhoods with high population density and a significant shift in housing demand away from large cities (Kaynak, Ekinci and Kaya, 2021). Marona and Tomal (2020) identify a significant change in housing preferences, involving the desire to move to a larger flat with a garden or balcony as a result of Covid-19. Their findings are supported by Szczepek (2021), who states that the secondary sale market has noted an increase in the number of offers, which may be an effect of people selling apartments due to change for bigger places, as living patterns have changed, while at the same time the average area of flats on offer decreased. The selling flats are ones located around downtown.

A study that touches upon the subject of the impact of Covid-19 on housing markets is the article of Jones and Grigsby-Toussaint (2020) about housing stability and the residential context of the Covid-19 pandemic. They identify push and pull factors that are impacted by Covid-19: affordability and population density. Jones and Grigsby-Toussaint (2020) state that individuals who are searching for housing, are using physical distance as a positive criterion for where to relocate, due to Covid-19. Consequently, they state that the Covid-19 crisis has created a 're-reversal' of urban to non-urban migration flows, where individuals and families who once moved from the suburbs to the city, move outside of the city again. In addition to the large land area demand and demand for settlement in rural areas due to Covid-19, there is an increase in the demand for land to establish settlements, farmhouses, and hobby gardens (Harun Tanrıvermiş, 2020). Of the people that are migrating to rural areas, 30-year-olds are still the largest group, but the proportion of people under the age of 30 who leave has risen in the last 10 years (PBL, 2019). Brueckner, Kahn and Lin (2021) find that Working-From-Home (WFH) puts downward pressure on housing prices and rents in high-productivity counties, a result of workers starting to relocate to cheaper metro areas during the pandemic without forsaking their desirable jobs. They also show that WFH tends to flatten intracity house-price gradients, weakening the price premium associated with good job access (Brueckner, Kahn & Lin, 2021).

Gnat (2022) performed a study to verify whether the pandemic and the socio-economic processes triggered by it, such as the development of remote working, changed the process of divergence of residential property prices into a process of convergence, and whether the faster growth of residential property prices in the main city of an agglomeration, which started years ago, has not been stopped. The hypothesis in his study is that Covid-19 influenced the formation of prices in the housing market by increasing the attractiveness, and thus the greater demand and price growth in cities that are part of a larger agglomeration, compared to prices in the central city. This hypothesis is supported by declarations of real estate market participants that in the era of remote work, they will not have to bear higher costs of purchasing real estate in a large city where they work. However, Gnat (2022) found that price differentiation between the centre of an agglomeration and smaller neighbouring cities also increased during the pandemic period, although in this case, due to the small number of observations, it is difficult

to find a clear trend. Cheung, Yiu and Xiong (2021) find a 4.8% (Hedonic model) and a 5.0–7.0% (Distance Gradient model) year-on-year fall in house prices immediately after the pandemic outbreak in their study to identify the pandemic's impact on house prices in China. Although house prices rebounded after the lockdown period, the gradient models show that the price gradients were flattened from the epicentre to the urban peripherals. The price premiums in high-density areas were also substantially discounted after the city's lockdown, as a result of changed preferences in residential living areas. Contrasting, Wang (2021) studied the effect of Covid-19 on house prices in five areas in the US and found no evidence suggesting that the Covid-19 effects on house prices are related to the stay home orders or the business restrictions. Only one area experienced a decrease in house prices during Covid-19, the other areas experienced an increase in house prices.

Concluding, the following hypothesis is derived from literature on counter-urbanization and house prices and will be tested:

Hypothesis: During Covid-19, house prices in non-urban areas have increased relatively more than house prices in urban areas.

The hypothesis is founded on the assumption that relative price differences are smaller between urban and non-urban areas during periods of counterurbanization, following standard economic theory, as house prices in urban areas are usually higher than in rural areas. If house prices in rural areas have increased relatively more than in urban areas, this would be an indication for a counterurbanization trend, which is formed by the Covid-19 crisis. The expectation is that during the qualitative part of this study, Covid-19 is mentioned as one of the motivations why respondents have moved from an urban to non-urban area, providing evidence for a counter-urbanization trend.

3. DATA & METHODOLOGY

3.1 Data and variables

The dataset used in this study is extracted from a regional broker that is a member of The Dutch Cooperative Association of Real Estate Agents and Valuers (NVM). This real estate broker is specialised in the sale of single-family homes. The data consists of individual level transactions of sales from single-family and semi-detached properties which are located in the working field of the broker, which is central Netherlands. The data is not publicly available and is exclusively accessible for members of the NVM, therefore it is not allowed to share the data outside of the NVM network. It is stored in an online system for real estate agents. The dataset provides transaction dates, the transaction prices, addresses and housing characteristics, such as type of property (single or semi-detached homes), the number of rooms and bedrooms, year of build, total living area, total square footage, and lot size. The transactions were collected over a time period of January 2018 to August 2021. Furthermore, publicly available data from CBS (Central Bureau for Statistics) is used for a measure of urbanity of the different municipalities that are incorporated in the dataset. The classification of municipalities according to urbanity is based on the local address density of the municipality (CBS, 2021).

In order to obtain the net-sample dataset, which was suitable for this study, the raw data had to be refined to increase the scientific reliability. Firstly, all negative observations for all variables have been removed from the dataset. The variables transaction price in euro, living space in sqm and plot size in sqm have been transformed to natural logarithms because they were skewed right, see Appendix A. Outliers in the observations for several variables were removed in order to make the dataset more general for the population. Observations with a value of 1500 sqm and above for the variable plot size were removed, as well as observations with a value of 325 sqm and above for the variable living space. Furthermore, the age of the property is set at maximum 90 years old. The time a property is for sale at the market is set at maximum 500 days.

The variables included in this study have been commonly used by previous researchers (Bijker et al., 2012; Liu and Su, 2021; Hu et al., 2021). A dummy variable corona_after is created to capture the time effect of Covid-19, accounting for the period of February 2020 till October 2021. The independent variable corona_after is depicted in table 1 below, showing the frequency of transactions prior to Covid-19, from a period of January 2018 till February 2020 (as 0), and during the period in which Covid-19 was present, which is in the period of February 2020 till October 2021 (as 1). This dummy for Covid-19 is the independent variable, the dependent variable is the natural logarithm of the transaction price and there are several control variables such as the natural logarithms of living area and plot size in sqm, the age of the properties, the number of (bed)rooms, year and month. The control variable urbanity is also depicted in table 1, which contains a classification of municipalities according to urbanity based on the local address density of the municipality. The classification is constructed with a value of 2 for highly urban properties, a value of 3 for moderately urban properties, a value of 4 for hardly urban properties (moderately rural) and a value of 5 for rural properties. The part of non-urban properties is larger in this dataset, given the fact that the broker specializes in the sale of single-family homes in mostly rural areas. The control variable Type of Property is described in table 1 as well, with 6 different types of properties, such as detached and semi-detached houses and the frequencies of each category in the dataset.

Table 1. Frequency tables of transactions during Covid-19, urban vs rural properties and type of properties.

corona_after	Freq.	Percent	Cum.
0	2,147	58.90	58.90
1	1,498	41.10	100.00
Total	3,645	100.00	

urbanity			
2	68	1.87	1.87
3	1,208	33.14	35.01
4	1,367	37.50	72.51
5	1,002	27.49	100.00
Total	3,645	100.00	

Type of property			
Semi-detached house	850	23.32	23.32
Linked semi-detached house	190	5.21	28.53
Linked house	168	4.61	33.14
Corner house	540	14.81	47.96
Terraced house	1,200	32.92	80.88
Detached house	697	19.12	100.00
Total	3,645	100.00	

3.2 ArcGIS and descriptive statistics

In order to visualize the data, the software ArcGIS PRO has been used which allows researchers to input postal addresses and consequently generate spatial maps of those coordinates. In figure 1 the transaction points of property sales are depicted. As can be seen, the transaction points are situated in the central part of the Netherlands, which is the working area of the broker.
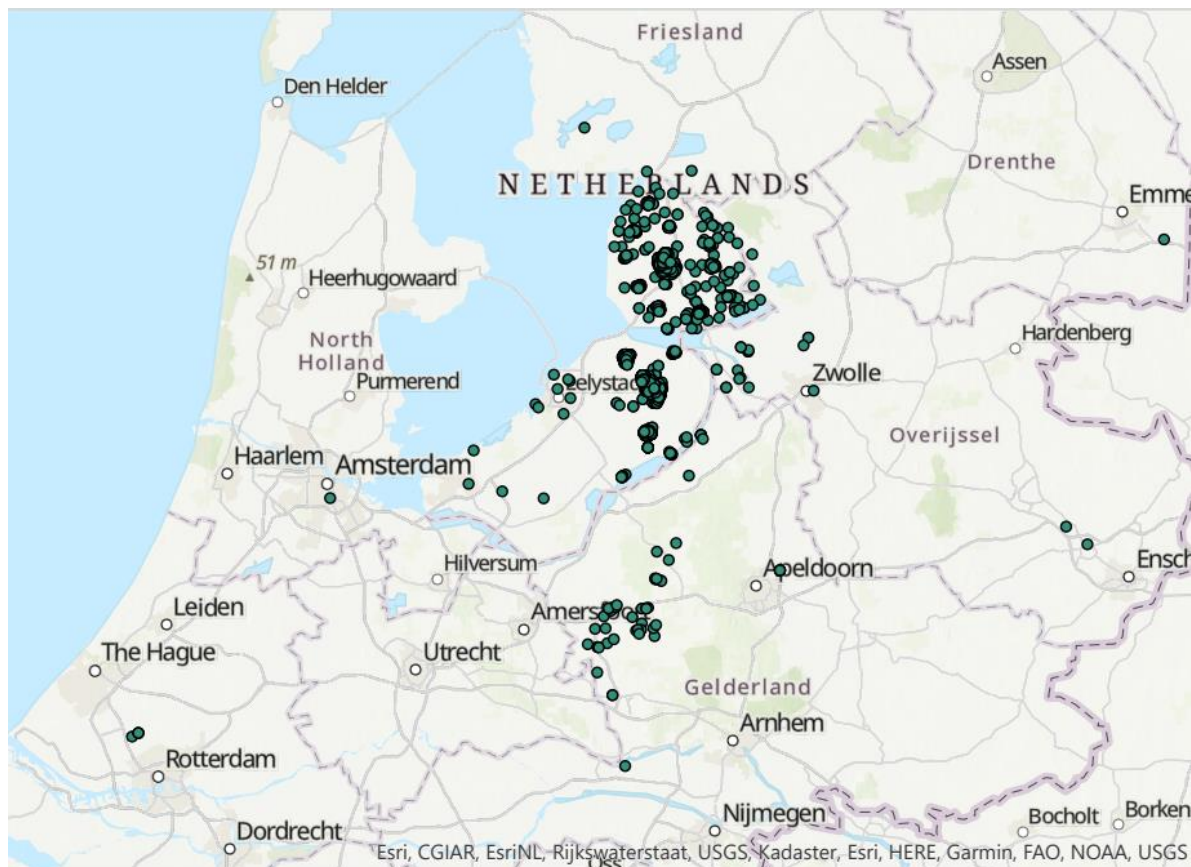

Figure 1. Location of transactions in the central Netherlands.

Descriptives:

Table 2 offers an overview of the descriptive statistics of the variables included in this study.

Table 2. Descriptive statistics (N = 3645).

Variable	Mean	Std. Dev.	Min	Max
Transactionprice (Euro)	273577.5	10357	132000	870000
Days on the market	61.446	78.669	1	496
Livingspace (m²)	127.604	31.274	30	306
Plotsize (m²)	332.258	220.638	102	1480
Age	31.646	18.652	0	90
Number of rooms	5.153	1.130	1	10
Semi-detached house	.233	.423	0	1
Linked semi-detached house	.052	.222	0	1
Linked house	.046	.209	0	1
Corner house	0.148	0.355	0	1
Terraced house	0.329	.470	0	1
Detached house	0.191	0.393	0	1
Covid-19	0.411	.492	0	1
Urbanity	3.906	.820	2	5
Year	2019.315	.974	2018	2021
Month	6.299	3.297	1	12

3.3 Methods

Following Nygaard and Parkinson (2021), this study uses hedonic price models to research how

residential price trends of various levels of urbanity developed in Flevoland and surrounding areas

during Covid-19. The Ordinary Least Squares (OLS) method is one of the most commonly used

techniques for regression analysis. Therefore, I will be applying an Ordinary Least Squares (OLS)

regression analysis on my dataset. The effect of Covid-19 on house prices will be studied empirically

with several regression models. The researched dependent variable in this study is the natural

logarithm of the individual property's transaction price. Furthermore, this study also incorporates a

qualitative research method. In order to gain deeper insights into the motivations of residential movers

to migrate from an urban to a rural area in the period that Covid-19 was present and to examine whether their migration can be attributed to Covid-19, a survey questionnaire is sent to a subsample of households that are observed in the residential transaction data. The main focus of the online survey was to find out whether Covid-19 played a major role in their relocation decision.

In the base line model, several control variables are included that consist of housing characteristics such as the type of property, number of rooms and amount of living space. This base line model provides a first indication of how housing characteristics affect property prices., similar to the study of Galati and Teppa (2017). The variables Living Space and Plotsize are converted to natural logarithms because they were skewed right, see Appendix A. However, in the base line model, the variables Urbanity and Covid-19 are not yet included, therefore failing to explain the effect of Covid-19 on house prices.

In the second step of model building in this study, the variables Covid-19 and Urban are added to the base line model, which are both dummy variables that either contain a 0 or a 1. However, including these two variables separately didn't capture the full scope of analysing the effect of Covid-19 on house prices. Therefore, to study the effect that the degree of urbanity and Covid-19 have on residential transaction prices, a further model has been tested. In this final regression model, the interaction variable β_{11}Covid-19 * Urban is constructed, which tests the effect of urbanity (whether a property is located in an urban or rural area) on the period in which Covid-19 is present (February 2020 till October 2021). The final model is shown below:

Model equation:

$$lnP_{it} = \beta_0 + \beta_1 Days\ at\ the\ market_i + \beta_2 lnLiving\ Space_i + \beta_3 lnPlotsize_i + \beta_4 Age_i + \beta_5 Number\ of\ rooms_i + \beta_6 Type\ of\ Property_i + \beta_7 Year_i + \beta_8 Month_i + \beta_9 Covid19_i + \beta_{10} Urban_i + \beta_{11} Covid19 * Urban_i + \varepsilon_{it}$$

With:

LnP_{it}: the natural logarithm of the transaction price of property i in period t;

β_0: the constant;

β_1: Days at the market: the number of days the property is offered on the market;

β_2: lnLiving Space: the amount of living space in square meters;

β_3: lnPlotsize: the parcel size in square meters;

β_4: Age: the age of the property from the year it was build;

β_5: Number of rooms: the number of rooms in the house;

β_6: Type of Property: the type of property, such as detached or semi-detached house;

β_7: Year: the year of transaction, which are 2018, 2019, 2020 and 2021;

β_8: Month: the month in which the property was sold;

β_9: Covid-19: the dummy for the period in which Covid-19 was present;

β_{10}: Urban: a dummy for whether a property is located in an urban or non-urban area;

β_{11}: Covid-19 * Urban: the effect of a property being located in an urban or rural area on the effect of the period in which Covid-19 was present;

ε_{it}: the error term.

4. RESULTS AND DISCUSSION

4.1. Regression Analysis

By including the interaction variable measuring the effect of a property being located in an urban or rural area in the period in which Covid-19 was present on house prices, an attempt is made at answering the second sub-question of this study: 'How did residential price trends of various levels of urbanity develop in Flevoland and surrounding areas during Covid-19?'

Analyzing the results of the final model (3) in Table 3 below, it becomes clear that property prices are increasing over the years 2018-2021 during Covid-19, with an overall long-term increase in house prices. The interaction of the most important variables year (a variable to measure whether Covid-19 is present or not) and urbanity result in the highest price increase in urbanity level 5, which are the most

rural areas of this study. For urban areas that are included in this study, which are classified as level 2 for urbanity, property prices have increased as well but way less than for non-urban areas. Overall, this study indicates a larger price increase over the years for the most rural areas in central Netherlands. However, there may be other factors and variables of interest that influence the relative higher price increase of rural areas compared to urban areas and this relative higher price increase may not be attributed to Covid-19.

Table 3. OLS results

Variable	(1) logTransactionprice	(2) logTransactionprice	(3) logTransactionprice
Urbanity level 2[1]		-0.096***	-0.151***
		(0.012)	(0.060)
Urbanity level 4		0.124***	0.087***
		(0.005)	(0.006)
Urbanity level 5		0.255***	-0.124***
		(0.005)	(0.022)
Year 2019[2]			0.352***
			(0.016)
Year 2020			0.621***
			(0.005)
Year 2021			0.676***
			(0.008)
2019*urban level 2			0.117
			(0.104)
2019*urban level 4			-0.115***
			(0.018)
2019*urban level 5			0.165***
			(0.028)
2020*urban level 2			0.070
			(0.061)
2020*urban level 4			0.037***
			(0.012)
2020*urban level 5			0.428***
			(0.023)
2021*urban level 2			0.060
			(0.069)
2021*urban level 4			0.034*
			(0.012)
2021*urban level 5			0.450***
			(0.024)
Days for sale	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
logLiving Space	0.211***	0.084***	0.076***
	(0.030)	(0.008)	(0.008)
logPlotsize	0.023	0.026***	0.021***
	(0.017)	(0.005)	(0.005)

[1] Urbanity level 3 is the reference category for the variable Urbanity
[2] 2018 is the reference category for the variable Year
[3] A terraced house (type 5) is the reference category for the variable Type of Property
Note: Dependent variable is the natural logarithm of transaction price. Robust standard errors are noted in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Age	-0.006***	-0.002***	-0.001***
	(0.001)	(0.000)	(0.000)
Semi-detached house[3]	0.069***	-0.008	-0.012***
	(0.019)	(0.005)	(0.005)
Linked semi-detached house	0.086***	-0.008	-0.013*
	(0.028)	(0.008)	(0.007)
Linked house	0.043	0.001	-0.010
	(0.029)	(0.008)	(0.007)
Corner house	-0.010	-0.005	-0.005
	(0.018)	(0.005)	(0.005)
Detached house	0.177***	0.062***	0.045***
	(0.027)	(0.008)	(0.007)
Month		0.010***	0.012***
		(0.000)	(0.000)
Constant	11.37***	11.37***	11.44***
	(0.138)	(0.041)	(0.038)
Observations	3645	3645	3645
R-squared	0.119	0.931	0.942

The OLS results are visualized in figure 2 below. As expected, the house prices in the second urbanity level (the most urban level) are somewhat decreasing in the period of 2019 till 2021 compared to the third urbanity level, which is the reference category. This is in line with the study by Liu and Su (2021), who tested the impact of the Covid-19 pandemic on the location demand for housing. The findings of their study show that the pandemic has led to a shift in housing demand away from neighbourhoods with high population density and a significant shift in housing demand away from large cities. The findings in this study are also in line with the literature by Rosenthal et al. (2021), who stated that Covid-19 reduced the value of density and city centres (urban cities), by showing that the rent premium associated with employment density declines sharply following the Covid-19 shock for all cities. House prices in the third, fourth and fifth urbanity level are increasing, which is in line with the expected findings of my study. Prices in the second (urban) and fourth (rural) urbanity levels are slightly converging, providing some evidence for the hypothesis that house prices in non-urban areas have increased relatively more than house prices in urban areas. However, the converging trend of house prices between urban and rural areas is not as strong as was expected based on existing literature on the impact of Covid-19 on housing markets. Overall real estate prices in urban and rural areas are still rising during the Covid-19 period, which is in line with some literature on the effect of Covid-19 and real estate prices. The OLS results from this study are in line with the findings of Wang

(2021), who studied the effect of Covid -19 on house prices in five areas in the US and found no evidence suggesting that the Covid -19 effects on house prices are related to the stay home orders or the business restrictions. Only one area experienced a decrease in house prices during Covid-19, the other areas experienced an increase in house prices. The results of this study show that house prices in 3 out of 4 urbanity categories are rising during Covid-19, but it is hard to find a clear trend in the data that shows converging residential prices between properties located in urban and rural areas. Residential properties located in urbanity level 3 show the largest price increase. This finding does not provide clear evidence for the hypothesis that during Covid-19, house prices in non-urban areas have increased relatively more than house prices in urban areas.
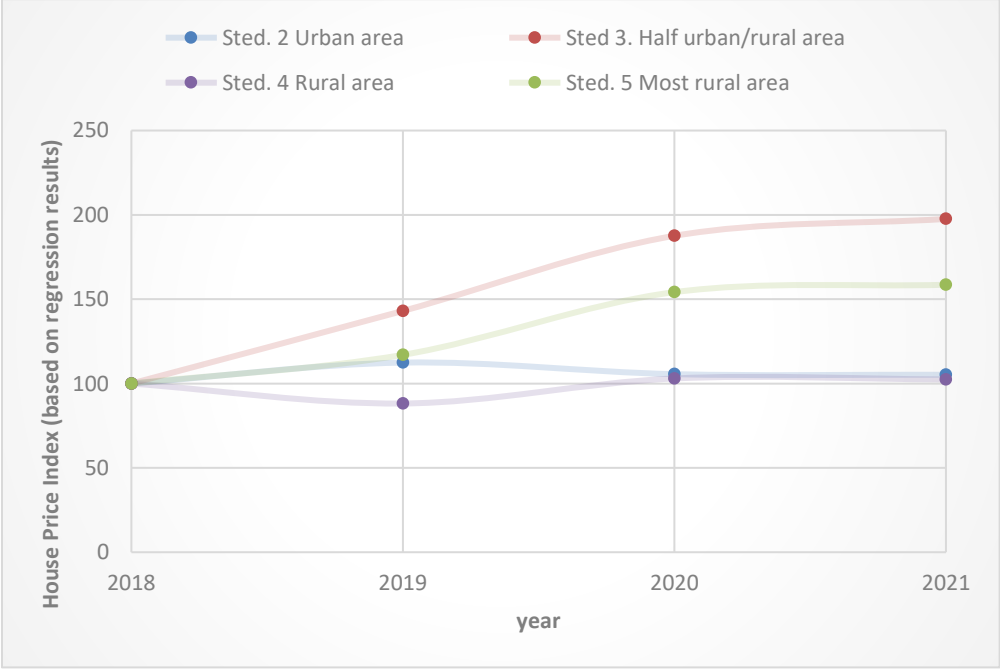
Figure 2. House Price Index based on regression results.
* The HPI is calculated by adding the exponent of the coefficients of the interaction variable Covid-19*Urban to the year 2018 as reference category

4.2 Qualitative survey

In order to gain deeper insights into the motivations of residential movers to migrate from an urban to a rural area in the period that Covid-19 was present and to examine whether their migration can be attributed to Covid-19, I have conducted a qualitative online survey among residential consumers of

my dataset. The survey was conducted online in order to be able to reach a group of residential consumers as large as possible and consequently, reach a higher response rate which will yield more reliable results that are relevant for this study. The survey is constructed through an online website and is stored on a personal account in the program. The online survey was sent out via email to 150 residential consumers that purchased a house via mediation of the NVM-broker where I retrieved my data from, in the period of February 2020 till October 2021. The number of residential movers that filled out the survey was 43, creating a response rate of 29%. All 43 responses were valid for my analysis since there were no missing observations or false answers. The participants also filled in their postal code, their age, the date on which they purchased their house and the number of people in their household, hereby increasing the reliability and applicability of the results of the survey. The survey, as filled out by the participants, is shown in Appendix B. It consists of 1 question with multiple choice answers, 4 questions with answers based on a Likert scale and 4 control questions such as the number of people in the household of participants.

The most notable answers and the most selected answers will be discussed here. For question 1. 'What were your motives to move'?, 53 % of participants selected 'Characteristics of the new house' as their answer, as well as 51 % of participants selected 'finding peace and space' as their answer. The second most selected answer (28%) was 'the preference to live in a rural area' as their reason to move in the Covid-19 period. For the statement 'The Covid-19 crisis played a major role in moving to a new house', all participants indicated that they were neutral or disagreed with the statement. For the statement 'Due to the Covid-19 crisis, I have a need for more peace and space around me' the participants were neutral. For the statement 'In my search for a new house, I searched for houses further away from urban areas', most participants were neutral or slightly agreed. For the statement 'I am willing to pay more for a house with more space and closer to nature', all participants agreed on this.

The findings of the survey are not very much in line with the theoretical considerations as provided by the literature. The results do not support the theoretical expectation as discussed in chapter 2 that

Covid-19 has had a major impact on locational preferences of residential consumers. Marona and Tomal (2020) identify a significant change in housing preferences, involving the desire to move to a larger flat with a garden or balcony as a result of Covid-19. Their findings are supported by Szczepek (2021), who states that the secondary sale market has noted an increase in the number of offers, which may be an effect of people selling apartments due to change for bigger places, as living patterns have changed, while at the same time the average area of flats on offer decreased. Liu and Su (2021) found that the pandemic has led to a shift in housing demand away from neighbourhoods with high population density and a significant shift in housing demand away from large cities. However, the results of the online survey do not indicate that the decision to move of residential consumers was influenced by the Covid-19 crisis. The participants of the survey indicated that 'traditional' motives were the largest drivers in their decision to move during the Covid-19 period. Characteristics of their new house, more peace and space around the property and the preference to live in a rural area are stated by the participants as motives to move during Covid-19. These findings are in line with the existing literature on counter-urbanization in housing markets where various motives for urban to rural migration can be distinguished, without taking into account any effect of Covid-19. These motives include housing conditions, local, natural and social amenities and job opportunities (Hansen & Aner, 2017). Additionally, age and household composition play important roles in the motives for relocating (Hansen & Aner, 2017). In their article about preferences for rural living, Van Dam, Heins and Elbersen (2002) state that images and representations of the rural, preferences for living in rural residential environments, and urban–rural migration are strongly linked. According to Volkers and Huigen (1989), two factors of rural locations can be distinguished that attract urban migrants: the distance to major urban areas, which allows people to commute, and the quality of the residential environment (amenities on a local and regional scale). Other reasons for choosing a specific rural area are a mixture of housing characteristics, the physical qualities of the environment, personal reasons and the low house prices in the area (Bijker, Haartsen and Strijker, 2012).

5. CONCLUSION

5.1 Summary

In this master's thesis, an empirical analysis on the effect of Covid-19 on counter urbanization in residential housing markets is provided. With conducting a literature review on theory of counter-urbanization and hedonic pricing theories and their application in the context of Covid-19, an answer is formulated to the first research question of this thesis. Recent studies about the relationship between Covid-19 and real estate prices indicate that the Covid-19 pandemic brought house price and rent declines in city centres, increasing the price and rent away from the centre. However not all literature supports the convergence of residential property prices. A shift in locational preferences can be found in literature with a demand for larger residential properties in more rural areas. In the chapter on results and discussion, the second and third research questions are answered. Overall, this study indicates a price increase in residential properties over the years 2018-2021 for 3 out of 4 urbanity levels. Prices in the second (urban) and fourth (rural) urbanity level are slightly converging, providing some evidence for the hypothesis that house prices in rural areas have increased relatively more than house prices in urban areas for the most rural areas in central Netherlands. However, there is no clear trend that can be found indicating that house prices in rural and urban areas are converging, with increasing prices in the most rural areas and decreasing prices in the most urban areas as a result of the Covid-19 crisis. Moreover, there may be other factors and variables of interest that influence the relative higher price increase of rural areas compared to urban areas and this relative higher price increase may not be attributed to Covid-19. The results of the qualitative survey were not conclusive on whether Covid-19 played a role in the motivations of residential consumers to migrate to a rural area. The movers indicated that Covid-19 did not play a significant role in their decision to move to a new house.

It is important to note that in academic literature, the factor affordability is often mentioned as underlying motivation for residential mobility in the form of urban-rural migration. Housing characteristics and in particular lower house prices in rural areas provide a major motivation for

residential movers to leave urban areas and to settle in a rural region. This is in line with the results of the online survey in this study, where residential movers indicated that characteristics of the new property are their main motivation in their decision to move to a rural region. In relation to the factor affordability, Covid-19 appears to be accelerating and amplifying existing trends of people moving to amenity regions and making a financial decision to sell property in a high-price market and buy added amenity in a more affordable setting (McManus, 2022). Major reasons for choosing a specific rural area are a mixture of housing characteristics, the physical qualities of the environment, personal reasons and the low house prices in the area (Bijker, Haartsen and Strijker, 2012).

5.2 Policy Implications

This thesis presents an empirical analysis on how house prices have developed during Covid-19 in the central Netherlands region and whether Covid-19 plays a major role in households' motivation to move during Covid-19. This addition can be considered relevant because of the scarce volume of literature on the effect of Covid-19 on the real estate market in the Netherlands. The results of the study indicate slightly converging house prices between urban and rural areas in the Netherlands however this is a marginal effect and a clear trend in the data indicating a change in location preferences of residential consumers is missing. An implication that can be derived from this research is that house prices in urban areas as well as rural areas are still rising over time and that the direct impact of Covid-19 is negligible. Therefore, policy makers should not put too much focus on the counter-urbanization trend but keep in mind the still rising prices of residential properties.

The research conducted in this thesis can provide useful to governmental institutions in Flevoland and surroundings and managers/brokers working in the real estate sector, specifically the residential segment. Precisely, governmental institutions and real estate brokers located in the areas of this research that are trying to determine the effects of Covid-19 on residential prices and consequently locational preferences of consumers may be challenged by a lack of data on house prices in Flevoland and surroundings during the Covid-19 period. This study can therefore be useful for governmental

institutions to make research-based decisions on how to cope with the effects of the Covid-19 crisis on housing markets.

5.3 Limitations and further research

Important to consider, both when studying this master's thesis and when commencing a similar study, are the limitations of the empirical study conducted in this thesis. The part of rural residential properties is much larger than urban residential properties in this dataset, given the fact that the broker is specialized in the sale of single-family homes in mostly rural areas. The results of the study are therefore specific for the province of Flevoland and surroundings and the generalizability of the conclusions on residential properties on the whole of the Netherlands can be deemed meagre. Further research into other provinces and regions in the Netherlands could have different results, especially in highly urban regions. Furthermore, due to a limited time frame, the online survey was sent out to only 150 households of the net sample dataset, with a response rate of 29%. The number of participants in the survey is minor compared to the number of observations in the dataset. Therefore, the results of the survey could have been different if it was sent out to a larger group of residential consumers who purchased a house during the Covid-19 period. With the survey, deeper insights into the motivations of residential movers to migrate from an urban to a rural area in the Covid-19 period are obtained and formulate a valuable deepening of the empirical analysis, especially when a clear trend in the data is missing and the evidence to support the hypothesis that during Covid-19, house prices in non-urban areas have increased relatively more than house prices in urban areas is limited. Since a clear trend is missing from the data and consensus in the existing literature on the effect of Covid-19 on the residential market is missing, further research is needed to fully comprehend whether Covid-19 contributes to counter urbanization in residential housing markets.

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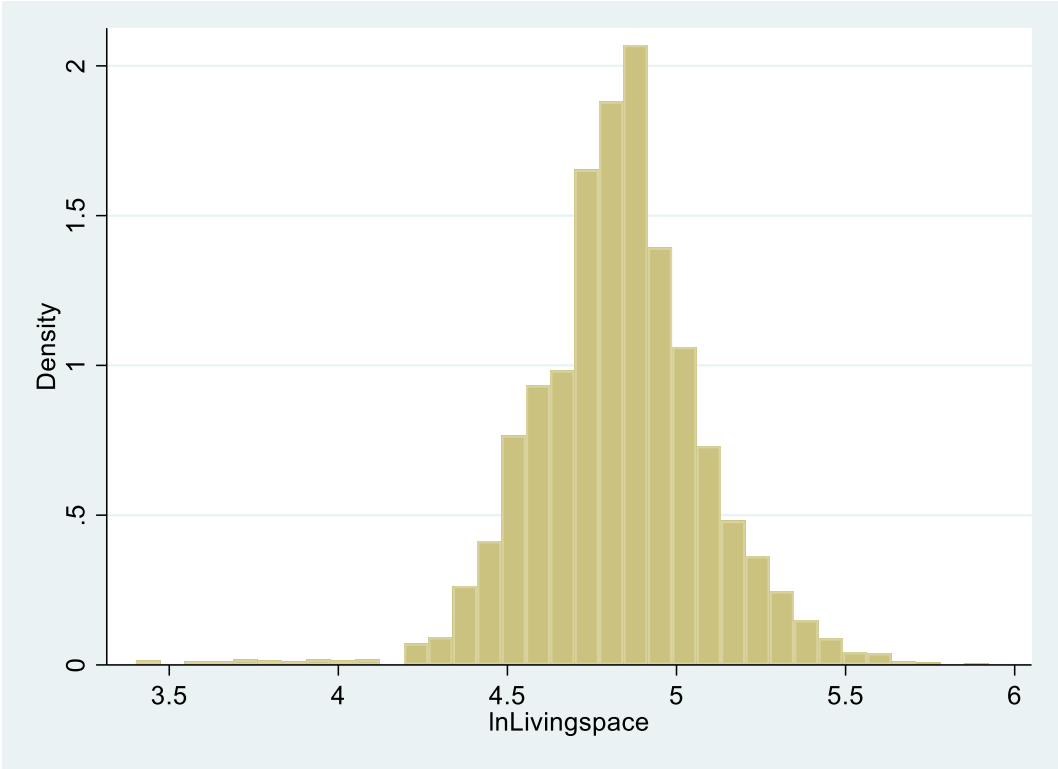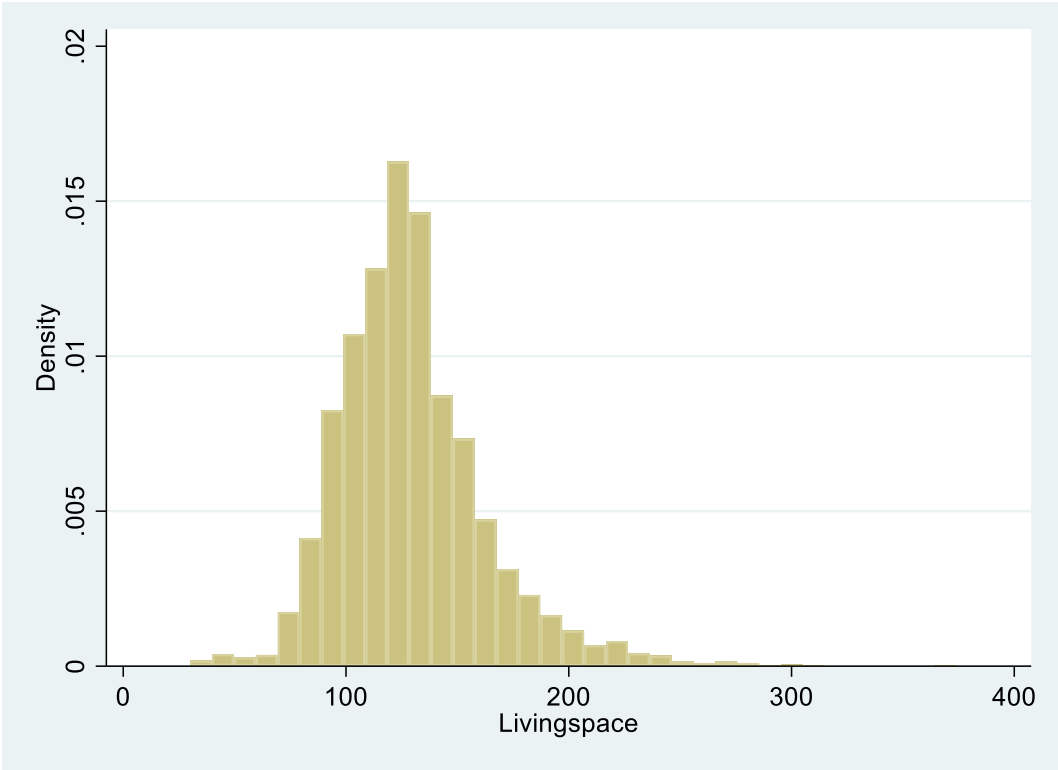
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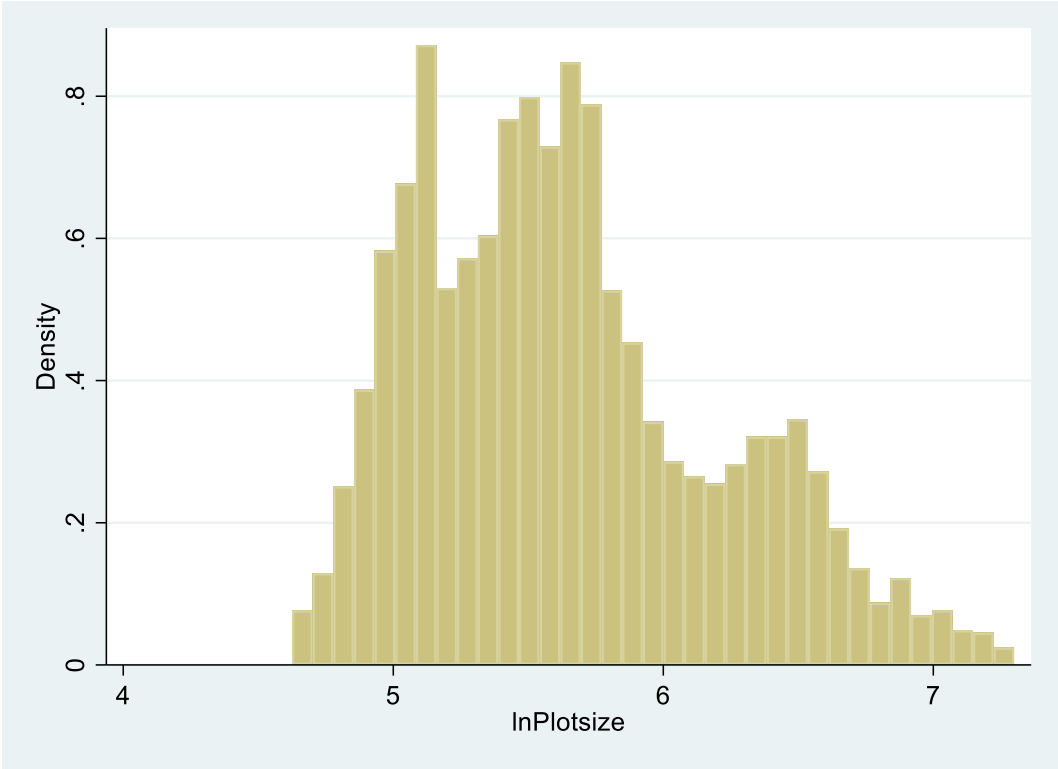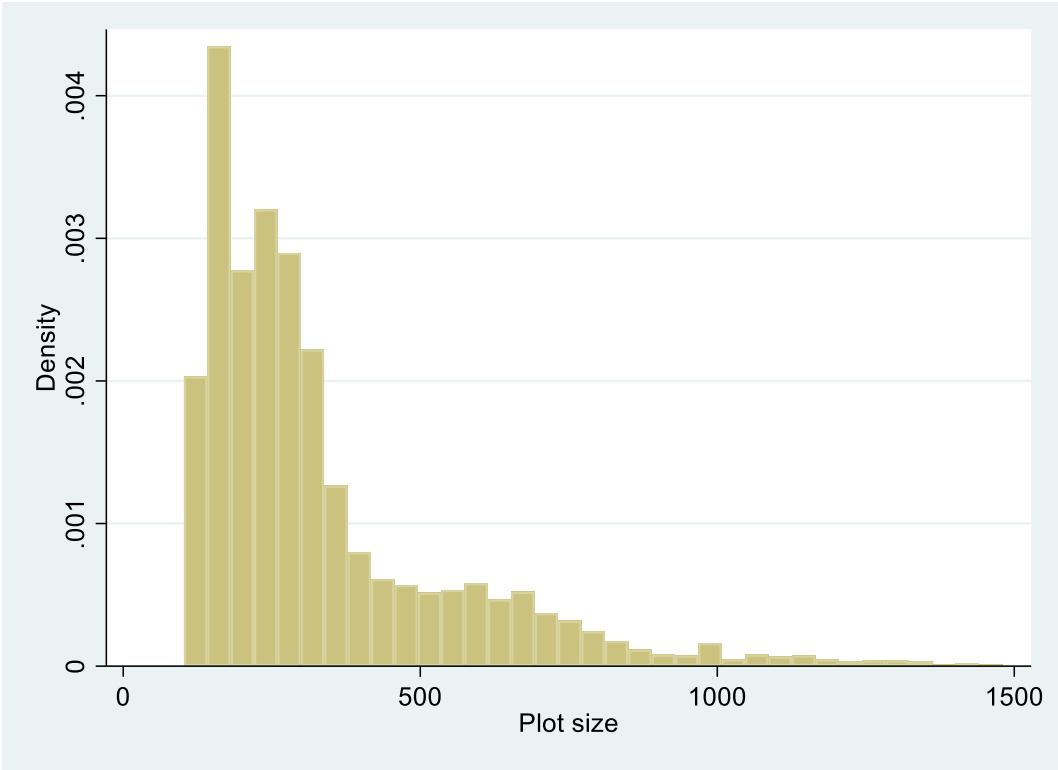
APPENDIX A

Transformation of the dependent variable
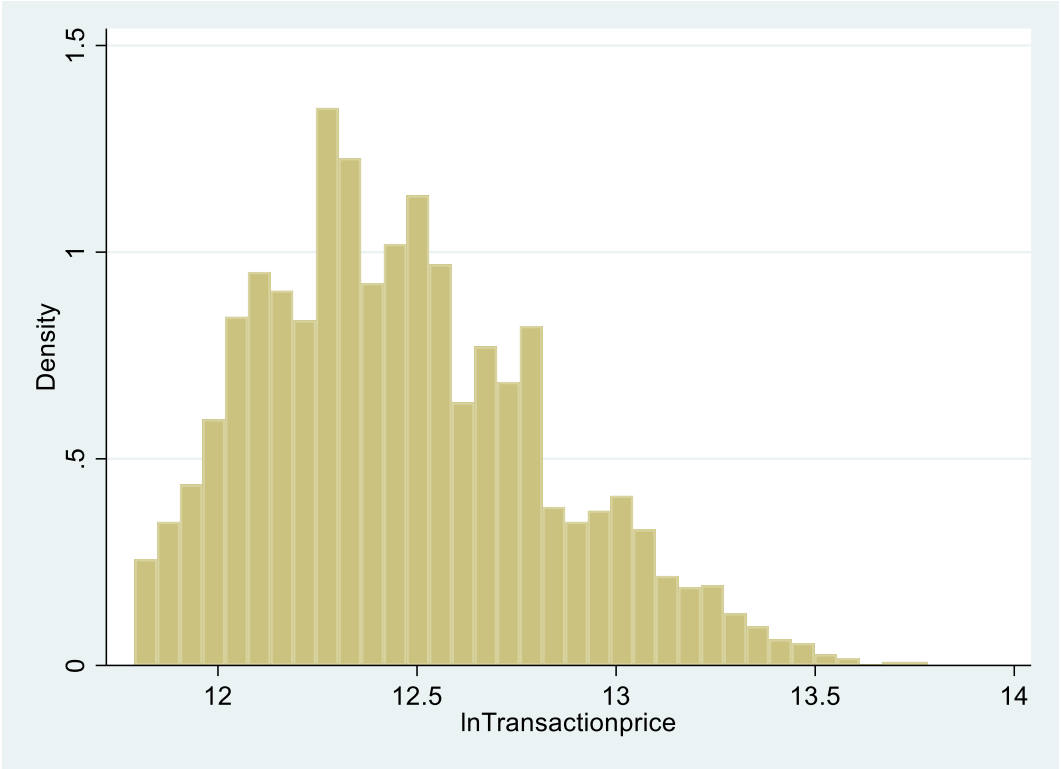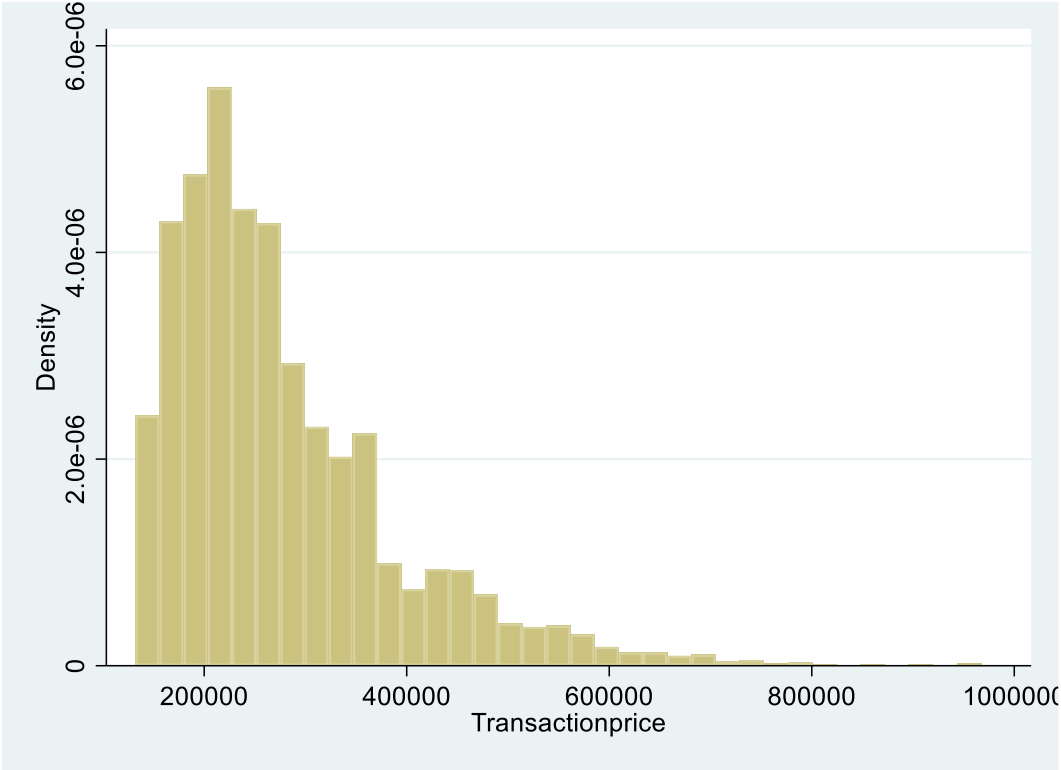
Transformation of the variable living space

Transformation of the variable plot size

APPENDIX B

Online Survey

Question 1: 'What were your motives to move'?

Possible answers:
- Characteristics of the new house
- Finding peace and space
- Preference to live in a rural area
- Family reasons (for example family extension)
- The possibility to work from home
- Lower house prices
- Local amenities
- Job opportunities
- Because of the Covid-19 crisis
- Other, namely …

Question 2: 'Please indicate to what extent you agree with the following statements: The Covid-19 crisis played a major role in my decision to move'.

Answer: Likert scale ranging from -3, completely disagree, to 3, completely agree.

Question 3: 'Due to the Covid-19 crisis, I need more space and peace around me'.

Answer: Likert scale ranging from -3, completely disagree, to 3, completely agree.

Question 4: 'In my search for a house, I started looking at houses further away from urban areas'.

Answer: Likert scale ranging from -3, completely disagree, to 3, completely agree.

Question 5: 'I am/was willing to pay more for a house with more space and closer to nature'.

Answer: Likert scale ranging from -3, completely disagree, to 3, completely agree.

Question 6: 'On which date did you purchase a house?'

Answer: open question.

Question 7: 'What is the number of people in your household?'

Answer: open question.

Question 8: 'What is your age?'

Answer: Open question.

Question 9: 'What is your postal code?'

Answer: Open question.