HOUSEHOLDS, HOUSING TENURE AND LIVING SPACE COMPARED BETWEEN DIFFERENT REGIONS AND HOUSING MARKETS IN THE NETHERLANDS

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Abstract

A major supply shortage in housing has led to large differences between housing market conditions in certain areas in the Netherlands. This may have caused a mismatch between the housing needs of household types, tenure, and living space. The research aimed to investigate the relationship between household types, housing tenure, and living space across different regions of the Netherlands with varying housing market conditions. By comparing the different regions with the prevailing housing market conditions, an attempt was made to find this possible mismatch. The central question is divided into two sub-questions with two outcomes, tenure and living space. A multinomial logistic regression is used to analyze tenure and household types in different regions, and an ordinary least squares (OLS) regression to examine living space and household types in different regions. The regressions performed for this research found significant evidence for a relationship between household types and tenure and between household types and living space. However, the findings indicate that only the influence of single-person and one-parent households on the chosen tenure form varies across different housing market conditions. This implies that the chance of homeownership for single-person households and one-parent families is smaller in tighter housing market areas. Future research could clarify whether this has to do with the current housing market crisis or whether this phenomenon has another cause by investigating other years and regions.

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Introduction

Background

The housing market in the Netherlands has become an important social theme in the past few years. A major supply shortage has led to various socioeconomic issues such as a reduction in the affordability of owner-occupied properties, high rents, and ensuing health problems due to financial stress (Verheul & Hobma, 2022; Cundiff et al, 2020). These consequences of the Dutch housing crisis relate to all types of tenure in the Netherlands. These types of housing tenure are owner-occupied housing, social rental housing, and private rental housing (Government of the Netherlands, n.d.a). In 2021, the housing shortage indicator was at a record low value due to the relatively high demand for housing compared to the supply. Owner-occupied housing prices and rents of private rental housing have risen sharply due to this shortage. Therefore, it is difficult for residents of social rental houses or first-time buyers to move on to an owner-occupied home, as a result of which the waiting lists for social rental houses have become enormous (Boelhouwer & Van der Heijden, 2022; NVM, 2022; NVM, 2021). In addition to the tenure types, residential properties in the Netherlands can be divided into several dwelling types, such as detached houses, semi-detached houses, terraced houses, and apartments. These dwelling types can differ from each other in terms of, for example, living space, required rooms, and sanitary facilities (Statistics Netherlands, 2022).

Based on prior academic research (Mulder, 2013; Bennet & Dixon, 2006), there may be a relation between the housing needs of household types and living space, since on average family households have the need for more living space compared to single-person households. However, existing research claims that the housing policy of the Dutch Government during this housing crisis has led to social inequality among households (Boelhouwer, 2020). According to Boelhouwer's (2020) research, households that already have a house have a positional advantage compared to, mostly young, households that are trying to acquire a home for the first time. This inequality is increasing rather than decreasing, partly because of various housing policies of the Dutch Government, such as the Code of Conduct for Mortgage Loans. Based on these findings on housing inequality, it is interesting for Dutch policymakers to investigate whether there is a possible mismatch between the housing needs of households, housing tenure, and living space in the Netherlands. These household types can be distinguished in various ways such as socioeconomic class, age, or formation. Household types divided by formation can be the following categories: single-person household, couple, couple and child or children, one-parent family, and non-family household such as unrelated roommates.

Furthermore, the chosen tenure and living space may not always align with the actual housing needs of households. For instance, a couple with children may ideally prefer an owner-occupied home with multiple rooms rather than a small rental apartment. However, due to financial and economic factors such as possible budget and location constraints and a limited supply of housing, the chosen tenure and living space of a household is not necessarily the preferred form of housing. According to the existing literature, tenure, and living space are mainly based on individual life events, such as pregnancy, financial status, and housing market circumstances (De Groot et al, 2013; Mulder, 2004).

A possible mismatch between the needs of these household types, tenure, and living space may be shown with a comparison between different regions in the Netherlands, because of variations in housing market conditions prevailing in these regions. Data from the NVM (2021) indicates that the extent of the housing shortage is not the same in all parts of the Netherlands. An example of this is that the extent of the housing shortage in cities in the Randstad, under which Utrecht, Haarlem, and Delft, is greater than in more rural regions, such as Zeeuws-Vlaanderen (NVM, 2021).

Despite the extensive literature on household types, tenure, and living space, no link is made between these topics and the regional variations in a country. Statistics Netherlands (2022) indicates that the average living space is larger in rural areas than in relatively large cities, such as Amsterdam and Rotterdam. On the other hand, housing prices are higher in urban areas (Statistics Netherlands, 2023). The data of Statistics Netherlands (2022) implies that there are housing market differences between the urban areas, like the Randstad, and the rural areas. The place where someone lives or wants to live could thereby relate to the household type, tenure, and living space, because of various housing market conditions. Therefore, a specification of regional differences regarding household types, tenure, and living space would complement the existing literature.

Research problem

The research aims to investigate a possible relationship between what type of tenure a certain household type lives in, the living space of these household types, and if this varies between different housing market circumstances. The first main objective of the research is to find out whether there is a mismatch between the housing needs of household types, tenure, and living space in the Netherlands in 2021. As described earlier, a comparison between the Randstad and other Dutch regions and the corresponding housing market conditions may indicate this possible relationship. Secondly, the results of this research could be an addition to the existing literature concerning the themes: households, tenure, and living space, because in these studies no link has been made to regional differences. In order to investigate this possible relationship, the following research question has been formulated:

What is the relationship between household types and housing tenure and living space across different regions of the Netherlands with various housing market conditions?

This includes the following sub-questions:

- *What is the relationship between household types and homeownership across regions with tighter housing market conditions in the Netherlands?*

- *What is the relationship between household types and living space across regions with tighter housing market conditions in the Netherlands?*

Theoretical framework

The theoretical framework describes various international literature relevant to this research. The literature related to housing tenure and household types is described in a complementary form because the literature is unanimous on the factors involved. In contrast, opposing perspectives about the literature on living space and household types have been explained. In addition, the differences between housing market conditions of certain regions in the Netherlands were clarified using relevant literature. Finally, a conceptual model and hypotheses arising from the reviewed literature are described.

Housing tenure and household types

In 2021, 57.1% of the total housing stock of almost 8 million homes in the Netherlands are owner-occupied houses. In addition, 28.8% are social rental houses and 13.9% are private rental houses (Dutch Ministry of the Interior and Kingdom Relations, 2021). In existing research is claimed that especially households with a relatively low income live in rental properties rather than owner-occupied housing. A cause could be related to the higher financing costs associated with buying a home (Elsinga, 1998). The distinction between social rental housing and private rental housing is made to keep rental housing affordable for relatively lower-income households. The rents of social rental houses have a maximum rent limit and are mainly owned by housing corporations and municipalities that use the rental income from the social rental properties to improve social housing (Government of the Netherlands, n.d.b; Elsinga & Wassenberg, 2014).

The existing literature suggests that three main factors could be related to what determines the choice of tenure. The first factor is the financial status of an individual (Mulder 2004). Compared to rental housing, homeowners are not entitled to rent allowances and the financing costs for purchasing a property are relatively high (Elsinga & Wassenberg, 2014; Elsinga, 1998). Additionally, job stability may be a determining factor, as loans are more likely to be made to households with permanent contracts (Arundel & Doling, 2017).

Secondly, the prevailing housing market circumstances, since potential buyers depend on the housing supply at a certain location and at a certain time (De Groot et al, 2013; Mulder, 2004; Clark et al, 1994). In some locations, this supply may be relatively low, which may cause sales prices to rise. Research by Carter (2011) supports this statement by arguing that the tendency to buy a home decrease when housing prices increase. These higher prices can exclude certain household types, such as young couples and single-earners. A recent example is the housing crisis in the Netherlands, as a result of which young households who want to move from their parental home find it difficult to buy a home due to the low supply, the associated high housing prices, and not enough financial resources compared to their competition (Boelhouwer, 2020; Arundel & Doling, 2017).

Thirdly, the existing literature indicates that household types and their associated life events might play a role in housing tenure. If the financial and market conditions allow it, households will look for a form of housing that is appropriate for the relevant situation of a household. In Western countries, marriage, pregnancy, or retirement can be a decisive factor regarding the decision to buy or sell a house (De Groot et al, 2013; Painter & Lee, 2009; Mulder, 2006). For example, married couples are more likely to live in owner-occupied houses than single-person households (Abramsson & Andersson, 2016; Thomas & Mulder, 2016). The high financing costs when buying a home are generally easier to finance by couples than

single-person households (Mulder, 2006; Elsinga, 1998). Furthermore, owner-occupied properties are more suitable and simpler to adjust for families because of, on average, more appropriate locations and larger properties (Mulder & Wagner, 1998).

Living space and household types

It is claimed by Opoku & Abdul-Muhmin (2010) that the chosen size of housing may be related to tenure preferences and the factors that determine these tenure preferences which are explained above. Other research (Kooiman, 2020) supports this concept and claims that couples in the Netherlands who live in high-density urban areas tend to move to areas with a lower level of density because of financial reasons. The current supply shortage of single-family properties in the larger cities of the Netherlands has been described as a crucial factor regarding the choice of moving. Urban couples with children or the desire to have children are forced in a way to move from their multi-family houses in the cities to single-family houses outside the urban area since multifamily properties generally have too little living space to raise children. Therefore, this could indicate that living space could be related to housing market circumstances, financial possibilities, and individual life events of households.

Continuing on life events, retirement can also be a decisive factor regarding living space. A portion of retired older adults feel the need to move to a smaller home that has amenities suitable for the older adults and with lower monthly costs. A retired household may also have a desire to live closer to family and settle for a smaller living space compared to the previous property (Banks et al, 2012; Luborsky et al, 2011). Based on research by Painter and Lee (2010), the choice of older adults to move to a smaller home may be related to the financial capability of a retired household. Older adults who have relatively few financial resources are more likely to move to a smaller home.

In contrast, other research (Lau & Wei, 2018; Day, 2000) indicate that not only housing market conditions, financial possibilities, and life events of households can influence living space, but that under certain circumstances some households settle for less living space than desired. Lau and Wei (2018) and Day (2000) argued that smaller households are more likely to be satisfied with a home, in their price range, with relatively little living space if the distance to work is small and the ability to move is flexible. However, despite the rise in the number of single-person households in Western countries, there is no increase in demand for smaller homes (Wulff et al, 2004). Because of this phenomenon, Wulff et al. (2004) have argued that the living space of a property is becoming less and less dependent on the type of household.

Regions with different housing market conditions

The Netherlands has different regions with its own housing market conditions. A well-known distinction between regions in the Netherlands is the difference between the Randstad, consisting of the provinces: North Holland, South Holland, Utrecht, and Flevoland, and the more rural provinces with a few relatively large cities. The Randstad is the largest urban area in the Netherlands with cities such as Amsterdam, Rotterdam, and The Hague (Huis van de Nederlandse Provincies, 2023). The existing literature confirms the differences between the housing market conditions of the Randstad and the regions outside the Randstad. Research by Klarl (2018) claims housing market dynamics in the Netherlands differ between these regions, indicating these dynamics depend heavily on location.

Another research on differences between housing market areas was conducted by Coulter and Kuleszo (2022) by examining homeownership across certain regions in Great Britain. Coulter and Kuleszo (2022) argue that for many regions, the timing of first-time homeownership does not vary greatly. However, the region that differed noticeably from the other regions was the region of the capital city of London. Since the Dutch capital Amsterdam is part of the Randstad, these results could indicate that these differences in first-time homeownership between a country's capital region and the other regions also relate to the possible different housing market conditions between the Randstad and other Dutch regions.

Conceptual model

Various variables have been distinguished in this research. A conceptual model has been drawn up to provide a clear overview of these variables, which is shown in figure 1. As mentioned before, the research aims to investigate a possible relationship between household types, housing tenure, and living space across regions with different housing market conditions in the Netherlands. Based on the research of Coulter & Kuleszo (2022) and Klarl (2018) the different housing market conditions of the various regions are examined by comparing the Randstad with the other regions of the Netherlands. The geographic variations between the different regions and the corresponding housing market conditions may show the mismatch between the needs of households and housing tenure and living space. The household types and the regions are the independent variables since these variables are fixed. On the other hand, the outcomes of tenure and living space might depend on the household types and which region a certain household lives in. For that reason, housing tenure and living space are the dependent variables.

In addition to the independent and dependent variables, several control variables will be used to ensure that the results of a relationship between the dependent and independent variables are not based on other variables. Therefore, an attempt will be made to avoid research bias by using control variables. Based on the explained literature, age, highest education level, immigration status, ethnicity, and housing affordability are used as control variables in this research. Finally, it is argued in the explained theories that life events, such as marriage and childbirth, relate to housing tenure and living space. Religious considerations could also relate to life events and therefore housing tenure and living space. However, this variable is not considered in this research and is defined as an unobserved variable.

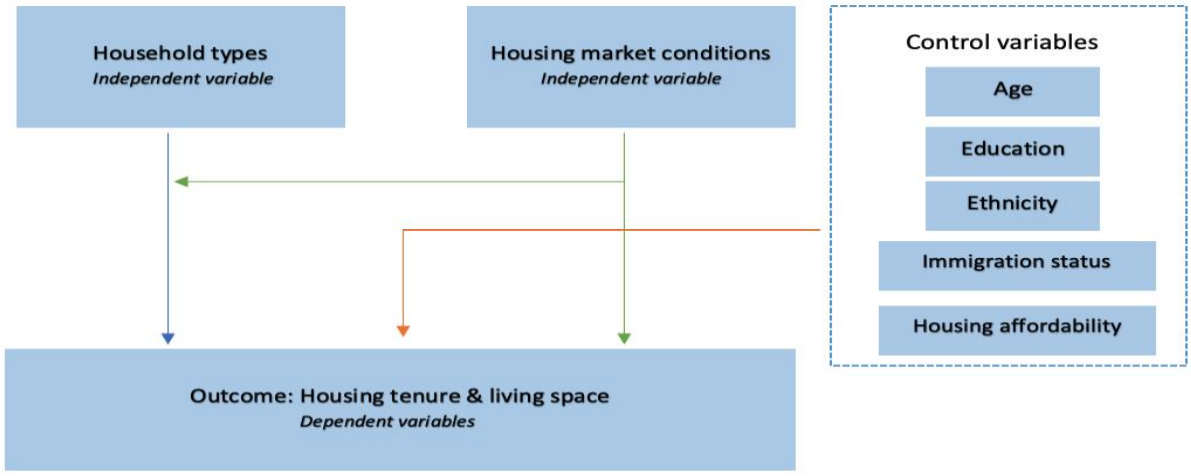

Figure 1: Conceptual model of research

Hypotheses

Several expectations could be made based on the theoretical framework. Firstly, family households are expected to live in owner-occupied homes more often than single-person or non-family households for financial reasons, among other reasons. On the other hand, it is expected that single-person households are more likely to live in rental housing. The family households that also live in rental housing are expected to be low-income families for social housing and couples without children for private rental housing. Regarding living space, family households are more likely to live in larger houses compared to single-person households and non-family households. Furthermore, single-person households from the Randstad live most likely in apartments. The households from more rural regions are expected to live more often in houses with more living space than households, with similar age and education levels, from the Randstad. To investigate a possible mismatch between the needs of households and housing tenure and living space, hypotheses are tested to indicate a possible significant relationship between the tenure and living space and the household types across the different regions. To test this possible relationship, the following hypotheses are formulated:

- H1: Family households are less likely to live in owner-occupied houses in regions of the Netherlands with tighter housing market conditions
- H2: Family households are less likely to live in larger homes in regions of the Netherlands with tighter housing market conditions

Methodology

The data

The data that is used to conduct the research comes from the Woononderzoek Nederland (WoON) of 2021. The WoON is a large-scale survey of 46,658 inhabitants of the Netherlands in which all kinds of questions were asked about the living situation of the participants between August 2020 and September 2021. The respondents completed the survey anonymously and were identified by a participation number. Since the WoON is conducted on behalf of the Dutch Government, it can be assumed that the data is of high quality. The data was obtained from a national archive repository, Data Archiving and Networked Services (DANS). The research is quantitative since the data analysis is between the numbers from the WoON. Furthermore, the research is secondary, because all the data that will be used has already been obtained. Therefore, the research method that is applied is secondary data analysis. The statistical software tool SPSS was used to analyze the data set in a clear manner.

The variables

The dependent variable 'housing tenure' and the independent variables 'household type' and 'housing market circumstances' are categorical variables without a rank or order. The dependent variable 'living space' is continuous. Additionally, the control variables age, highest education level, immigration status, ethnicity, and housing affordability are used as control variables to avoid research bias.

Some variables have a different name in the WoON dataset but represent the same outcome or can be identified using an available variable from the database. The housing market circumstances are measured by comparing differences between the Randstad and the other regions in the Netherlands. The subdivision between these regions is chosen based on the literature explained in the theoretical framework of this research. Furthermore, immigration status is examined by distinguishing the country of birth of the respondents into two categories: Dutch and Non-Dutch. Finally, housing affordability is measured in the housing quote. This is a certain percentage of a household's income that must be spent on housing. The categories of the remaining variables will be further explained in the descriptive statistics section of this research.

Analytic sample

Not all respondents of the WoON dataset are included in the regressions. An analytic sample was used to eliminate missing cases and thus increase the quality of the study. Respondents who do not live in owner-occupied, socially rented, or privately rented housing or did not answer the tenure question of the WoON of 2021 are excluded from the research (N =7,473). Moreover, this also applies to the respondents whose highest level of education is unknown (N = 380). As a result, a total of 38,805 out of the 46.658 cases were examined.

Data analysis

Various tests are used to establish if there is a significant relationship between the variables. In the process, it is important to conclude the variable types when selecting the right method for data analysis. Resulting of the variable types, a multinomial logistic regression is used to examine the possible relationship between housing tenure and household types across the different regions. Tenure, in this research, is measured in three categories so a choice had to be made on a test where a categorical outcome applies. Furthermore, an ordinary least square (OLS) regression is used to analyze whether there is a relationship between the household types and the living space of their homes across the different regions with the various housing market conditions. The choice of this test is based on living space as a continuous variable, as the outcome of the test.

It is checked whether the regressions and the corresponding variables are significant with a 95% confidence level and considering a type I or type II error. Secondly, reference categories are used in the regressions to compare the results of the different variables. In advance, it was estimated which categories differ the most and which were the middle categories. These most different and middle categories were used as reference categories to compare against. Thereafter, based on the results of the multinomial logistic regression and the OLS regression, conclusions can be drawn about the strength of the relationship and any influences of the independent and the control variables on the outcome.

Both regressions were run three times. In the first model, the coefficients were examined without looking at the different regions (M1). So, this variable was not included in the first model of both regressions. Then the regions were added to see potential differences between the different housing market conditions (M2). Finally, in the third model, it was investigated whether there is a significant interaction between the two independent variables by adding the interactions to the regressions (M3).

Ethical considerations

In terms of ethical considerations, the data from the WoON is not accessible and shared publicly. Permission of the DANS is necessary to obtain the data. After the data was handed over, it was necessary to sign several conditions about not sharing the data with other individuals, organizations, and authorities. All these measures indicate how important data management and storage are regarding the WoON data. In this research, the data was stored on a laptop that cannot be accessed without entering a personal password or a fingerprint. Moreover, the respondents of the WoON are labeled with a number and are thereby completely anonymous.

Results

Descriptive statistics

Before the regressions were performed, the descriptive statistics of all variables were reviewed using various frequency tables, histograms, and other types of tables and graphs. The most important statistics are presented in table 1. Firstly, the outcome variables, housing tenure and living space, are discussed. About two-thirds of the respondents from the sample indicated they lived in owner-occupied housing, 23.1% in socially rented housing, and the remaining 10.9% in privately rented housing. In terms of living space, the mean living space of the respondents is 125.4 square meters with a standard error of 0.4 square meters. In addition, it was found that single-person households and couple households both covered about one-third of the analytic sample, and couples with children about one-quarter. On the other hand, the regions are more balanced with the other regions outside the Randstad having a slight majority of 54.1%. As for the control variables, age is quite balanced with only a few respondents between the ages of 17 and 24 and the most common highest level of education is havo, vwo, or mbo1 with 36%. A vast majority have the Netherlands as their country of origin and are of native ethnicity with 90.2% and 84.0% respectively. Finally, the mean of the housing quote, representing housing affordability, is 0.324.

Variables	**N**	**N in %**		**N**	**Mean**	**SE**
Categorical variables			**Continuous variables**			
Housing tenure			Living space	38.806	125.430	0.429
Owner-occupied housing	25.622	66.0%	Housing affordability	38805	0.324	0.017
Social rental housing	8.951	23.1%				
Private rental housing	4.232	10.9%				
Household types						
Single-person household	12.235	31.5%				
Couples	13.361	34.4%				
Couples with child(ren)	10.084	26.1%				
One-parent household	2.298	5.9%				
Non-family household	827	2.1%				
Regions as housing markets						
Randstad	17.795	45.9%				
Other regions	21.010	54.1%				
Age						
Between 17 and 24	1.031	2.7%				
Between 25 and 34	5.211	13.4%				
Between 35 and 44	5.713	14.7%				
Between 45 and 54	6.870	17.7%				
Between 55 and 64	7.710	19.9%				
Between 65 and 75	7.158	18.4%				
Older than 75 years	5.112	13.2%				

Education level		
Primary education	3.095	8.0%
Lower secundary mbo1	6.941	17.9%
Havo, vwo and mbo	13.983	36.0%
UAS/Univ- bachelor	9.031	23.3%
UAS/Univ- master	5.755	14.8%
Immigration status		
Dutch	34.992	90.2%
Non-Dutch	3.813	9.8%
Ethnicity		
Native	32.590	84,0%
Non-Western	2.719	7,0%
Western	3.496	9,0%

Table 1: Descriptive statistics of the variables

Homeownership in various regions

In order to investigate a possible relationship between homeownership, household types, and the different housing market conditions, a multinomial logistic regression is used. The regression was conducted three times. First, without the regions, representing the different housing market conditions, to determine the main effects between tenure and household types (M1). Secondly, the regions were included to indicate differences in housing market conditions (M2). Lastly, the interaction effects were included to investigate whether the possible effect of household types on homeownership depends on the prevailing housing market conditions in a certain region (M3). The main results of these models are presented in table 2.

Before interpreting the coefficients, the significance levels of the models and the variables were examined to determine whether there was a significant relationship between the various independent or control variables and housing tenure as the dependent variable. The significant models showed that there is not enough evidence to indicate that there is a significant relationship between a university of applied sciences or a university master's degree and owner-occupied housing in all three models.

In general, a trend can be appointed that the coefficients stay more or less the same as the regions (M2) are added to the regression. More specifically, it can be claimed that significant evidence has been found that single-person, one-parent, and non-family households living in private rental housing are between 24% and 48% as likely to live in owner-occupied houses, compared to the reference category: couple households. In other words, the probability of these household types of living in an owner-occupied house is lower compared to couple households. On the other hand, the likelihood of couples with children being homeowners is significantly greater (219%) compared to couple households.

Model 3 shows the relationship between certain household types and housing tenure and whether it differs by region. The interaction effect of being a single-person household or being a one-parent household and living in the Randstad has a significant and positive effect. So, the tighter housing market conditions in Randstad significantly influence the homeownership of single-person households and one-parent families. No evidence was found of significant interaction terms regarding couples with children and non-family households. However, based on an unchanged Nagelkerke R-square (0.350) after leaving out the

insignificant interaction terms, all interaction effects were included in the model when interpreting the results. In addition, it does not necessarily imply that the tenure of couples with children and non-family households does not vary by housing market area since it might indicate that only no significant evidence was found for these interactions in this research setting.

Multinomial logistic regression: Owner occupied compared to private rental housing

	Model 1		Model 2		Model 3	
	Exp (B)	**SE**	**Exp (B)**	**SE**	**Exp (B)**	**SE**
Household types (ref. couple)						
Single-person household	0.351***	0.044	0.356***	0.044	0.302***	0.060
Couple with child(ren)	3.199***	0.066	3.187***	0.066	2.944***	0.066
One-parent household	0.480***	0.083	0.478***	0.083	0.312***	0.109
Non-family household	0.226***	0.102	0.239***	0.103	0.202***	0.103
Regions as housing market (ref. other regions)						
Randstad	-	-	0.657***	0.038	0.527***	0.053
Age (ref. between 55 and 64)						
Between 17 and 24	0.042***	0.107	0.042***	0.107	0.041***	0.107
Between 25 and 34	0.127***	0.065	0.127***	0.065	0.128***	0.065
Between 35 and 44	0.402***	0.074	0.404***	0.074	0.407***	0.074
Between 45 and 54	0.755***	0.076	0.757***	0.076	0.760***	0.076
Between 65 and 74	0.839*	0.071	0.836*	0.071	0.833*	0.071
Older than 75 years	0.664***	0.074	0.656***	0.074	0.658***	0.074
Education (ref. havo, vwo, mbo)						
Primary education	0.536***	0.081	0.532***	0.081	0.532***	0.081
Lower secundary and mbo1	0.839**	0.059	0.834**	0.059	0.834**	0.059
UAS/Univ- bachelor	1.108*	0.048	1.133**	0.048	1.130*	0.048
UAS/Univ- master	0.962	0.054	1.034	0.054	1.035	0.054
Immigration status (ref. Dutch)						
Non-Dutch	0.572***	0.076	0.538***	0.076	0.584***	0.076
Ethnicity (ref. native)						
Non-Western	0.674***	0.087	0.740***	0.087	0.733***	0.087
Western	0.640***	0.067	0.649***	0.067	0.647***	0.067
Housing affordability						
Housing quote	0.788***	0.048	0.788***	0.047	0.788***	0.047
Interaction effects (ref. Couple*Regions)						
Single-person household*Regions	-	-	-	-	1.365***	0.086
Couple with children*Regions	-	-	-	-	1.160	0.125
One-parent household*Regions	-	-	-	-	2.369***	0.159
Non-family household*Regions	-	-	-	-	1.360	0.204

** p < 0.05, ** p < 0.01, *** p < 0.001, none = insignificant*

Multinomial logistic regression: Social housing compared to private rental housing

	Model 1		Model 2		Model 3	
	Exp (B)	**SE**	**Exp (B)**	**SE**	**Exp (B)**	**SE**
Household types (ref. couple)						
Single-person household	1.441***	0.048	1.448***	0.048	1.296***	0.070
Couples with child(ren)	1.570***	0.077	1.562***	0.077	1.473***	0.112
One-parent household	2.084***	0.086	2.076***	0.086	1.555***	0.116
Non-family household	0.637***	0.106	0.656***	0.106	0.587***	0.165
Regions as housing market (ref. other regions)						
Randstad	-	-	0.825***	0.041	0.713***	0.076
Age (ref. between 55 and 64)						
Between 17 and 24	0.185***	0.100	0.184***	0.100	0.184***	0.100
Between 25 and 34	0.304***	0.071	0.305***	0.071	0.306***	0.071
Between 35 and 44	0.557***	0.081	0.560***	0.081	0.563***	0.081
Between 45 and 54	0.785**	0.083	0.788**	0.083	0.790**	0.083
Between 65 and 74	0.929	0.076	0.927	0.076	0.925	0.076
Older than 75 years	0.692***	0.078	0.688***	0.078	0.689***	0.078
Education (ref. havo, vwo, mbo)						
Primary education	1.994***	0.079	1.990***	0.079	1.994***	0.079
Lower secundary and mbo1	1.559***	0.061	1.555***	0.061	1.556***	0.061
UAS/Univ- bachelor	0.557***	0.054	0.564***	0.054	0.563***	0.054
UAS/Univ- master	0.270***	0.069	0.280***	0.069	0.280***	0.069
Immigration status (reference: Dutch)						
Non-Dutch	0.854*	0.078	0.861	0.078	0.862	0.079
Ethnicity (reference: Native)						
Non-Western	2.246***	0.086	2.332***	0.086	2.313***	0.086
Western	0.913	0.072	0.923	0.072	0.921	0.072
Housing affordability						
Housing quote	0.982	0.010	0.982	0.010	0.982	0.010
Interaction effects (ref. Couple*Regions)						
Single-person household*Regions	-	-	-	-	1.211*	0.095
Couple with children*Regions	-	-	-	-	1.105	0.146
One-parent household*Regions	-	-	-	-	1.745***	0.166
Non-family household*Regions	-	-	-	-	1.205	0.206

** p < 0.05, ** p < 0.01, *** p < 0.001, none = insignificant*

Table 2: Coefficients and standard errors of the multinomial logistic regression with tenure as the dependent variable

Figure 4 shows the predicted values of homeownership calculated from the results of the multinomial logistic regression (M3). These predicted values show that the probability of being a homeowner is higher in the regions outside the Randstad. Additionally, this clarifies that the probability of homeownership is highest among couple households and couples with children. The results are presented with some nuance as no significant evidence was found that the effects of couples with children and non-family households on homeownership vary across regions.

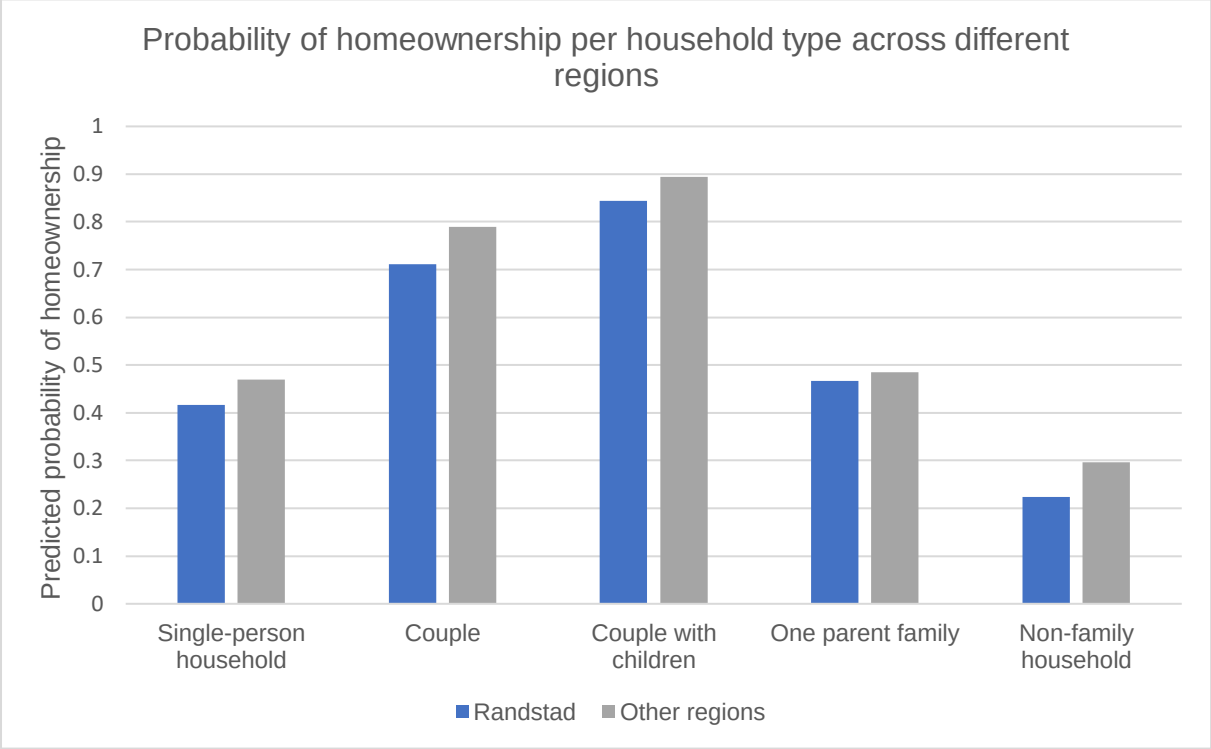

Figure 4: Bar chart of predicted values of homeownership between 5 household types

Living space in various regions

To investigate the possible relationship between living space, household types, and the regions, an ordinary least squares (OLS) regression was used which, as the multinomial logistic regression, was performed three times. Table 3 summarizes the main results with living space measured in square meters. Before the coefficients were assessed, the models were examined to see if they were significant. From this examination, it was determined that all models were significant with a p-value of < 0.001. Also, it was verified that there are no collinearity issues as the tolerance values are higher than 0.1 and the VIF values are lower than 10.

The results of the OLS regression were interpreted using unstandardized coefficients. The OLS regression uses an R-value to indicate the strength of the relationship. In this regression, the R of 0.308 indicates a weak to moderate positive relationship between the variables from the regression. Regarding the models, a notable difference between model 1 and model 2 is that the category of non-family households becomes significant after entering the regions in the regression. Additionally, the variable "housing affordability," measured in housing quote, is not significant in all three models, unlike all other variables for which significant evidence of a relationship was found. Furthermore, model 3 shows that there is no

significant evidence for a relationship between household types and the regions with different housing market conditions that influence the living space, as all interaction effects are insignificant.

The number of square meters per household type remained more or less the same when regions were added to the regression (M2). Compared to couple households, single-person households have about 30 square meters less living space, and one-parent families have about 15 square meters less living space based on the results of the OLS regression. In contrast, significant evidence has found that couples with children (≈23m²) have more living space than couple households.

Ordinary least squares regression

		Model 1		Model 2		Model 3	
R	0.308	**B**	**SE**	**B**	**SE**	**B**	**SE**
R^2	0.095						
Adjusted R^2	0.095						
Household types (ref. couple)							
Single-person household		-30.547***	1.027	-29.288***	1.017	-30.749***	1.371
Couple with child(ren)		22.842***	1.230	22.660***	1.217	24.336***	1.543
One parent household		-15.164***	1.903	-14.734***	1.883	-17.668***	2.545
Non-family household		5.694	3.099	9.547***	3.069	8.709	4.793
Regions as housing market (ref. other regions)							
Randstad		-	-	-23.816***	0.827	-24.233***	1.397
Age (ref. between 55 and 64)							
Between 17 and 24		-36.701***	2.859	-36.765***	2.828	-36.745***	2.828
Between 25 and 34		-38.479***	1.481	-37.961***	1.465	-37.967***	1.466
Between 35 and 44		-19.002***	1.493	-18.768***	1.478	-18.734***	1.479
Between 45 and 54		-6.783***	1.398	-6.821***	1.383	-6.842***	1.383
Between 65 and 75		3.635**	1.348	3.556**	1.333	3.559**	1.334
Older than 75 years		4.506**	1.512	3.962**	1.496	4.064**	1.497
Education level (ref. havo, vwo, mbo)							
Primary education		-16.770***	1.667	-17.079***	1.649	-17.001***	1.649
Lower sec. and mbo1		-10.453***	1.219	-10.757***	1.206	-10.688***	1.206
UAS/Univ- bachelor		7.102***	1.090	7.957***	1.079	7.946***	1.079
UAS/Univ- master		14.249***	1.272	17.801***	1.265	17.874***	1.265
Immigration status (ref. Dutch)							
Non-Dutch		-7.107***	1.917	-5.815**	1.897	-5.824**	1.897
Ethnicity (ref. Native)							
Non-Western		-15.944***	2.125	-10.112***	2.112	-10.155***	2.114
Western		-6.180***	1.636	-5.261***	1.620	-5.212**	1.620
Housing affordability							
Housing quote		0.036	0.120	0.053	0.119	0.053	0.119

Interaction effects						
Single-person household*Regions	-	-	-	-	3.043	2.003
Couple with children*Regions	-	-	-	-	-3.654	2.119
One-parent household*Regions	-	-	-	-	6.178	3.606
Non-family household*Regions	-	-	-	-	1.490	5.908

** p < 0.05, ** p < 0.01, *** p < 0.001, none = insignificant*

Table 3: Coefficients and standard errors of ordinary least squares regression with living space as the dependent variable

The coefficients for the interaction terms could have provided insights into the relationship between household types and living space varying across different housing market conditions. However, the OLS regression found no significant evidence of such effects between these variables. Despite no evidence of significant interactions, the unstandardized coefficients were used to calculate predicted values that clearly show the differences between household types by region and are presented in a bar chart in figure 5. It is shown that family households are expected to have more living space than non-family households and that household types in regions outside the Randstad also have a greater chance of having more living space than household types in the Randstad.

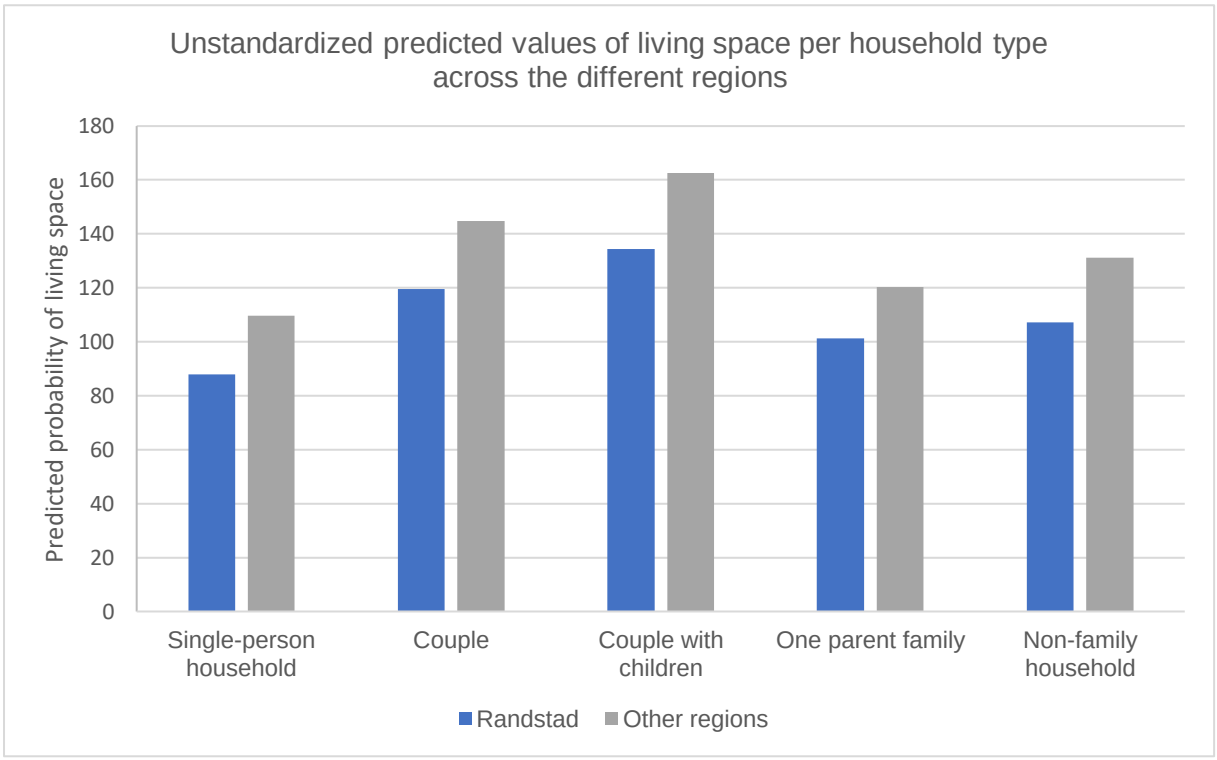

Figure 5: Bar chart of predicted values of living space between 5 household types

Discussion

The research examined the possible relationship between household types on the one hand and tenure and living space on the other, and whether this varies across different regions with the associated housing market conditions in the Netherlands. By investigating this relationship, the research aimed to find a possible mismatch between the needs of certain household types, their chosen forms of tenure, and the number of square meters of living space. In doing so, the research attempted to close the research gap described and contribute to the research already conducted on these topics.

The first sub-question of the research addressed the relationship between household types and homeownership and the differences between regions with tighter housing market conditions in the Netherlands. Based on the results of the multinomial logistic regression, it can be argued that for single-person households and one-parent families, the extent of homeownership can vary between different housing market conditions. For the other household types, no significant evidence has been found that tighter housing market conditions influence homeownership. This implies that the housing market conditions only matter for single-person and one-parent households regarding homeownership. However, it remains uncertain whether this effect also applies to couples with or without children and non-family households, as the research did not find sufficient evidence to confirm that the tenure of these household types varies across different housing market areas.

The results correspond with the existing literature (De Groot et al, 2013; Mulder, 2004), as it could deduce that tenure choice was based on the housing market circumstances, financial conditions, and individual life events of households. The significant interaction terms of single-person and one-parent households as one adult households, and therefore most likely to be single earners, correspond with Carter (2011), among other literature, because the findings indicate that these financially less powerful household types have I higher chance of exclusion from homeownership in tighter housing market conditions. Moreover, it is argued by Mulder (2006) and Elsinga (1998) that it is more difficult to finance housing for households with one adult. Additionally, the results also indicate that the findings of Coulter and Kuleszo (2022) and Klarl (2018) are only applicable to the findings of this research for single-person and one-parent households since there is only found significant evidence on that these household types are more likely to encounter struggles regarding obtaining homeownership in a tighter housing market like in the Randstad.

The second sub-question attempted to examine the relationship between household types and living space across regions with different housing market conditions by conducting an OLS regression. The results of the research are in line with the existing literature (Kooiman, 2020; Opoku & Abdul-Muhmin, 2010) because it can be argued that significant evidence has been found that there is a relationship between household types and living space and the different regions and living space, controlling all other variables. However, the insignificant interaction effects imply that the living space of a certain household type does not vary between different housing market conditions. Nevertheless, not all literature is supported by the results. Wulff et al. (2004) argued that living space is becoming less and less dependent on household types which contradicts the significant evidence for a relationship between living space and household types. Other discussed literature (Lau & Wei, 2018; Day, 2000) with similar views is not disproved or confirmed by the results of the research.

Conclusion

The research found significant evidence for a relationship between household types and tenure and between household types and living space. However, the influence of household types on homeownership only varies across different housing market circumstances for certain household types. The research findings suggest that single-person and one-parent households are more likely to face difficulties in attaining homeownership in regions with tighter housing market conditions, such as the Randstad. Additionally, no evidence has been found that the relationship between household types and living space is influenced by whether a household lives in the Randstad or not. Therefore, the differences in living space among various household types are not significantly affected by different housing market circumstances.

The findings show that it can slightly nuanced be claimed that there is a mismatch between the housing needs of households and tenure. Family households appear to be less affected by a tight housing market, compared to households with one adult. Furthermore, the differences between the predicted values of the mean living space of the regions have illustrated that there might also be a mismatch between the housing needs of household types and the, probably desired, living space. However, it cannot be significantly proven that this mismatch is actually due to tighter housing market conditions in certain areas.

In conclusion, these findings support the predefined hypotheses as it has been shown that family households are less likely to live in an owner-occupied home or a home with more living space compared to housing market areas with more favorable conditions. Although the influence of the housing market conditions, regarding living space, cannot be significantly evidenced.

Limitations

Despite the high quality of the dataset and the large sample size, it should always be considered that these findings are based on an analytical sample and a cross-sectional analysis. Claims regarding the entire population can be made with 95% certainty based on this research, considering a type I or II error. In addition, the WoON data was measured at a specific moment in time and thereby does not have to be representative of an entire period. Moreover, the insights of the housing market conditions are limited due to the distinction of the region types. The regions outside the Randstad also include relatively large cities that also have considerably tighter housing market conditions than rural areas.

Future research ideas

The limitations of this research could potentially serve as a basis for future research. A comparison can be made with previous years to examine whether the current housing market crisis is causing the mismatch or whether, even in periods without relatively tight housing markets, single-person households and one-parent households are less likely to own a house in a tighter housing market area. Furthermore, the regions can be expanded by distinguishing the relatively larger cities, such as Groningen and Eindhoven, and the more rural areas. This could potentially give new insights regarding variations between particular housing market areas.

Bibliography

Abramsson, M. & Andersson, E. (2016). Changing Preferences with Ageing – Housing Choices and Housing Plans of Older People. *Housing, Theory and Society*, 33(2), 217-241.

Arundel, R. & Doling, J. (2017). The end of mass homeownership? Changes in labour markets and housing tenure opportunities across Europe. *Journal of Housing and the Built Environment*, 32(4), 649-672.

Banks, J., Blundell, R., Oldfiel, Z. & Smith, J.P. (2012). Housing Mobility and Downsizing at Older Ages in Britain and the USA: Housing mobility and downsizing at older ages. *Economica,* 79(313), 1-26.

Bennet, J. & Dixon, M. (2006). *Single person households and social policy: Looking forwards*. York: Joseph Rowntree Foundation.

Boelhouwer, P. & Heijden, H. van, der. (2022). De woningcrisis in Nederland vanuit een bestuurlijk perspectief: achtergronden en oplossingen. *Bestuurskunde*, 31(1), 19-33.

Boelhouwer, P. (2020) The housing market in the Netherlands as a driver for social inequalities: proposals for reform. *International Journal of Housing Policy*, 20(3), 447-456.

Carter, S. (2011). Housing tenure choice and the dual income household. *Journal of Housing Economics*, 20(3), 159-170.

Clark, W.A.V., Deurloo, M.C., & Dieleman, F.M. (1994). Tenure changes in the context of micro level family and macro level economic shifts. *Urban Studies*, 31(1), 137–154.

Coulter, R. & Kuleszo, J. (2022). Comparing regional patterns of homeownership entry across four British birth cohorts. *Housing Studies*, 1-21.

Cundiff, J.M., Morozink Boylan, J., Muscatell, K.A. (2020). The pathway from social status to physical health: taking a closer look at stress as a mediator. *In Current Directions in Psychological Science,* 29(2), 147-153.

Day, L.L. (2000). Choosing a House: The Relationship between Dwelling Type, Perception of Privacy and Residential Satisfaction. *Journal of Planning Education and Research,* 19(3), 265-275.

Dutch Ministry of the Interior and Kingdom Relations (2021). *Woningvoorraad (syswov).* Retrieved on March 10, 2023 from https://syswov.datawonen.nl//jive?workspace_guid=1bf26f72-1f75-4aee-9451-e1df456d6d4c. The Hague: Dutch Ministry of the Interior and Kingdom Relations.

Elsinga, M.G. (1998). The meaning of tenure under different conditions; empirical evidence from The Netherlands. *Journal of Housing and the Built Environment,* 13(2), 137-155.

Elsinga, M.G., Wassenberg, F. (2014*). Social housing in the Netherlands*. 978-1-118-41234-3. West Susses: Blackwell.

Government of the Netherlands (n.d.a). *Rented housing*. Retrieved on March 10, 2023 from https://www.government.nl/topics/housing/rented-housing. The Hague: Government of the Netherlands.

Government of the Netherlands (n.d.b). *Wat is het verschil tussen een sociale huurwoning en een huurwoning in de vrije sector?*. Retrieved on March 10, 2023 from https://www.rijksoverheid.nl/onderwerpen/huurwoning-zoeken/vraag-en-antwoord/wat-is-het-verschil-tussen-een-sociale-huurwoning-en-een-huurwoning-in-de-vrije-sector. The Hague: Government of the Netherlands.

Groot, C. de, Manting, D., Mulder, C.H. (2013). Longitudinal analysis of the formation and realisation of preferences to move into homeownership in the Netherlands. *Journal of Housing and the Built Environment,* 28(3), 469-488.

Huis van de Nederlandse Provincies (2023). *Regio Randstad.* Retrieved on May 17, 2023 from https://www.nl-prov.eu/regios/regio-randstad/

Klarl, T. (2018). Housing is local: Applying a dynamic unobserved factor model for the Dutch housing market. *Economics Letters*, 170, 79-84.

Kooiman, N. (2020). Residential mobility of couples around family formation in the Netherlands: Stated and revealed preferences. *Population Space and Place*, 26(8).

Lau, M.H.M. & Wei, X. (2018). Housing size and housing market dynamics: The case of micro-flats in Hong Kong. *Land Use Policy*, 78, 278-286.

Luborksy, M.R., Lysack, C.L. & Nuil, J. van. (2011). Refashioning one's place in time: Stories of household downsizing in later life. *Journal of Aging Studies*, 25(3), 243-252.

Mulder, C.H., & Wagner, M. (1998). First-time home-ownership in the family life course: A West German–Dutch comparison. *Urban Studies*, 35(4), 687–713

Mulder, C.H. (2013). Family dynamics and housing: Conceptual issues and empirical findings. *Demographic Research,* 29(14), 355-378.

Mulder, C.H. (2006). Home-ownership and family formation. *Journal of Housing and the Built Environment,* 21(3), 281-298.

Mulder, C.H. (2004). Home ownership and social inequality in the Netherlands. In K. Kurz, & H.-P. Blossfeld (Eds.), *Home ownership and social inequality in comparative perspective* (pp. 114–140). Stanford: Stanford University Press.

NVM (2021). *Analyse woningmarkt: 4e kwartaal 2021*. Nieuwegein: NVM.

NVM (2022). *Analyse woningmarkt: 4e kwartaal 2021*. Nieuwegein: NVM.

Opoku, R.A. & Abdul-Muhmin, A. (2010). Housing preferences and attribute importance among low-income consumers in Saudi Arabia. *Habitat International,* 34(2), 219-227.

Painter, G., & Lee, K. (2010). Housing Choices in Aging Households: The Influence of Life Cycle, Demographics, and Family. *USC Lusk Center For Real Estate*, Spring 2010

Painter, G. & Lee, K. (2009). Housing tenure transitions of older households: Life cycle, demographic, and familial factors. *Regional Science and Urban Economics*, 39(6), 749-760.

Statistics Netherlands (2022). *Woonoppervlakte Nederland*. Retrieved on March 1, 2023 from https://www.cbs.nl/nl-nl/achtergrond/2018/22/woonoppervlakte-in-nederland. The Hague: Statistics Netherlands.

Statistics Netherlands (2023). *Woningmarkt*. Retrieved on March 13, 2023 from https://www.cbs.nl/nl-nl/visualisaties/dashboard-economie/woningmarkt. The Hague: Statistics Netherlands

Thomas, M.J., Mulder, C.H. (2016). Partnership patterns and homeownership: a cross-country comparison of Germany, the Netherlands and the United Kingdom. *Housing Studies,* 31(8), 935-963.

Verheul, W.J., Hobma, F. (2022). Institutionele ruimte voor wonen: de woning-crisis en achterliggende systeemkwesties op de agenda. *Bestuurskunde,* 31(1), 3-18.

Wulff, M., Hearly, E. & Reynolds, M. (2004). Why dont small households live in small dwellings? - disentangling a planning dilemma. *People and Place,* 12(1), 57-70.