

# A longitudinal analysis of the role of age and income in housing tenure preferences and outcomes: a comparison of 2006 and 2021

## **Abstract**

The private rental market is growing alongside the development of increasing inaccessibility and unaffordability of the owner-occupied market. Theories already address demographic and socio-economic factors as an important determinant in households' housing tenure decisions. Though, research incorporating homebuying preferences and measuring changes over time is scarce. This study investigates whether households remain longer in the private rental market as they age and as their income grows, despite potential preferences for homeownership, as this appears to be contributing to the growth of the private rental market. This study conducts a longitudinal analysis on quantitative data from the Dutch housing survey from 2006 and 2021 in a repeated cross section framework. Therefore, this study uses a multinomial and a binary logistic regression analysis. The results show a higher share of private renters with homebuying preferences, especially middle-aged renters, and show an increased share of overall households that are in the private rental market in 2021 compared to 2006, especially young households, and middle- and upper-income households. The results emphasize the need for suitable and affordable owner-occupied housing, especially for young and middle-aged households, and stress the importance of stimulating the flow of middle- and high-income households into homeownership. This way, the private rental market remains available for those unable to access homeownership.

**Keywords:** Housing market, household demographics, socio-economic status, housing tenure, homeownership, private rent

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# Colophon

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# 1. Introduction

Homeownership rates were rising alongside ongoing economic expansion and increasing mortgage markets up until the global financial crisis in 2007, which reduced the opportunities to access homeownership and led to an upturn of the private rental market (Lennartz et al, 2015; Arundel & Doling, 2017). In recent decades, the private rental market is expanding in many wealthy countries because of decreasing home ownership rates and restrictions on social housing (Hulse & Yates, 2017). There is an increasing demand from both low- and high-income households for private rentals, while supply is concentrating on mid-market housing (Hulse & Yates, 2017). Even though households tend to have preferences for homebuying on the long-term (McKee et al., 2017), the increasing demand from low and high incomes alongside the scarce supply of affordable housing and inaccessibility of homeownership is causing households to remain stuck in the rental market (Myer et al., 2016; Hoolachan et al., 2016; McKee et al., 2017). Already before the Covid-19 pandemic, there was seen a trend of wealthier people, who can afford to buy, participating in the rental sector and causing a shortage of suitable housing for the middle- and low incomes (Khan et al, 2022). Such problems in the housing market are driving social inequalities as well as societal, economic, and political uncertainty (Boelhouwer, 2020).

The size of the private rental sector is a topic of substantial international studies. Research dated from after World War II emphasizes a decline of the private rental sector at that time and argues that economic circumstances as well as government policies worsened the position of the private rental market (van der Heijden & Boelhouwer, 1996). However, a study from the mid-1990s rather shows the growth potential of the rental market and argues that various economic and social changes have a positive impact on the private rental market. For instance, the rising demand for private rental housing is affected by factors such as increased workforce flexibility and labor mobility as well as the concern about potential income and growing household income disparity (Yates, 1996). The growth in the private rental market has also been addressed by research over recent decades, which particularly points to household demographics and socio-economic status as an explanation for the growth in the sector. For example, high income households are associated with a higher likelihood of buying a house compared to less affluent households (Dieleman et al., 1989; Eichholtz and Lindenthal, 2014; Mehmet, 2022) and it is argued that households are more common to be homeowners as they age, but as people approach retirement their likelihood of being a homeowner falls (Eichholtz and Lindenthal, 2014).

This evidence shows that demographic and socio-economic factors play an obvious role in households' decisions to buy or rent. However, the evidence does not provide an understanding of how the role of household's demographics in housing decisions has changed over time and is limited to examining housing tenure without considering housing tenure preferences. Since the literature reveals a growth in the private rental market and suggests that households are stuck in the private rental market, this study examines whether there is an ongoing trend of households remaining longer in the private

rental market as they age and as their income grows, despite potential preferences for homeownership. This study analyzes survey data from the Netherlands' housing survey (Woononderzoek Nederland), because in recent years, the medium and expensive rental market in the Netherlands grew (Rijksoverheid, 2022), alongside increasing prices in the owner-occupied market (CBS, 2022). This study combines data from 2006 and 2021 to measure the change over time and this enables the study to examine long-term trends and capture major economic shifts like the global financial crisis and the economic recovery thereafter.

This study aims to gain a better understanding of the growth in the private rental sector since it brings issues of social inequality and social, economic, and political uncertainty. Due to the trend of declining affordability of owner-occupied homes, it becomes more difficult for households to buy a home. Therefore, this study is interested in whether there are more private renters with preferences to buy a home and thus this study investigates whether there is a higher share of private renters which are intended to move to an owner-occupied house in 2021 compared to 2006. Thereafter, this study investigates whether households do indeed stay longer in the private rental market than before, given their age and income as this would contribute to reduced opportunities in the housing market for young and low-income households. This leads to the central research question: *What is the relationship between households' age and income and their homebuying preferences and housing tenure outcomes?* Therefore, this study addresses four sub questions: (1) *What does theory say about the relationship between households' demographics and socio-economic status and their housing tenure preferences and outcomes?* (2) *How did the role of age and income in homebuying preferences of private renters change in the period between 2006 and 2021?* (3) *How did the role of age in households' housing tenure change in the period between 2006 & 2021?* (4) *How did the role of income in households' housing tenure change in the period between 2006 & 2021?* Understanding these dynamics on the demand side of the housing market is interesting for several reasons. For example, it offers an insight into socio-economic patterns, and could help guide policy design. By doing so, this insight may help to realize suitable and affordable housing options for all kinds of households.

First, this paper provides more in-dept knowledge on the existing literature and clarifies the empirical context of the Netherlands. Thereafter, the research questions, research method and data cleaning process are further explained in the data and method section. The final sections consist of the results, discussion, and conclusion.

## 2. Background

### *Homeownership versus renting*

The housing market consists of a rental market and an owner-occupied market. In the owner-occupied market people obtain a mortgage loan which they pay back over a certain time, while in the rental market, prices are determined by the market and private landlords manage tenancies (Hoolachan et al, 2016). The economic literature offers different approaches to examine individuals' tenure decisions from which appears that whether people buy or rent a home is affected by a variety of factors. For example, the model of King (1980) addresses housing tenure choice and housing service demand and Henderson & Ioannides' (1985) model threats tenure choice including discrete and continuous elements of housing market behavior and capital market imperfections. Other examples are the models of Zorn (1988), Goodman (1995) and Ioannides & Kan (1996) who consider intertemporal housing choices.

In a comparison analysis of the different models, it is argued that housing tenure is determined by life cycle variables: permanent income, age, education level and the most important one: marital status. In addition, it is argued that the transition from renting to owning is determined by lifecycle variables as well, in addition to variables that relate to prices and transaction cost: relative price, number of bedrooms, household size and duration (Raya & Garcia, 2012). This is consistent with literature on first time entry into the housing market, which identifies that first time entry into the housing market is influenced by expected lifetime earnings, family history, previous unemployment, local unemployment rate, and local comparable housing prices (Di salvo & Ermisch, 1997). This relates to demographics and socio-economic status, varies by individuals, and changes over the lifetime.

According to Acolin et al. (2016), renters are on average younger than homeowners. For example, because young persons have other income, employment, and household characteristics compared to old persons, but also due to their higher levels of mobility and due to borrowing constraints which limits access to mortgages and cause delays in accessing homeownership. This indicates that household characteristics influence whether one can buy a house or not.

The literature argues that policies in many countries around the world favor homeownership over renting for various reasons, among which the private and social benefits that are associated with homeownership (Acolin, 2022). According to the literature, key advantages associated with homeownership are the preferential tax system, access to credit through a mortgage loan, and the insurance function against rental price risk (Diaz & Luengo-Prado, 2010; Dietz & Haurin, 2003). Besides, it is stated that the high levels of security, independence, and financial benefits associated with homeownership contribute to higher levels of satisfaction (Elsinga & Hoekstra, 2005). In addition, literature argues that better outcomes of homeownership relate to higher levels of residential stability, though it seems to depend on how the housing market is organized and decrease as there are more similarities between the owner-occupied and rental market (Acolin, 2022).

Even though homeownership is associated with a variety of positive outcomes compared to renting, there are also some disadvantages involved which makes renting more favorable than owning. For example, it is stated that high transaction costs make homeownership inadequate to protect consumption from adverse shocks (Diaz & LuengoPrado, 2010). These high transaction costs also seem to lead to a higher immobility of homeowners compared to renters which may be caused by stronger connections to the neighborhood and surroundings (Dietz & Haurin, 2003). Furthermore, it appears from the literature that the owner-occupied market is less accessible than the rental market due to the high transaction costs and thus trends such as rising wealth and income disparity result in a growth of the private rental market (Hulse & Yates, 2017). For instance, middle- and high-income households that can buy at some location, may concentrate in the rental market as they prefer to live in the city where they cannot afford to buy. On the other hand, also lower income, mainly young, households may settle in the private rental market when their chances in the housing market have diminished as a result from house price inflation (Hulse & Yates, 2017).

### ***Housing demand in the context of economic motives***

Because buying a home is a major investment for households, it is argued that it depends on households' financial resources whether their preference to buy can be realized (Mulder & Wagner, 1998). Therefore, it seems that households rely on their possessed resources in their ability to become homeowners. This is consistent with research showing that renting is the most obvious option when liquid assets of a consumer are limited relative to disposable income or recurring expense (Artle and Varaiya, 1978), while high income households have a higher likelihood of buying a house (Dieleman et al., 1989). This indicates that high income households are more likely to be homeowners, while low-income households tend to be renters. This agrees with the finding that households postpone homeownership when incomes fall (Attanasio et al., 2012) and housing demand grows when consumer income increases (Mehmet, 2022).

On the other hand, it appears that as it becomes more expensive to buy a house, a households' ability to become a homeowner diminishes. For example, a study conducted among households in China show that increasing housing prices deter households from buying a home and reduces their homebuying intentions (Dong et al, 2020). Mehmet (2022) provides a similar explanation which is the negative effect of increased mortgage interest rates on homebuying decisions. Overall, these outcomes are consistent with the evidence concerning the effect of house price shocks and income shocks on housing demand. Positive house price shocks turn out to reduce demand for housing while positive income shocks seem to increase housing demand (Attanasio et al., 2012). According to Zheng et al. (2018), especially in the rental market, temporary income shocks result in rising demand.

### ***Housing demand in the context of life courses***

The life course perspective refers to a connection between life courses and housing careers and helps to understand people's housing choices throughout their lives. The literature already provides explanations of the stage of life as an important determinant of homeownership. It is argued that the life course depends on careers build from education, employment, health, family, and housing (Stone et al., 2014). However, according to Mulder & Wagner (1998), the benefits and costs of homeownership relative to renting varies for households and changes over the life course.

Throughout the life course, people grow older. In general, it appears that housing demand increases by age, while it seems that this demand tends to decrease after retirement. Especially, when households have high education levels, good health, and high incomes, their probability of becoming homeowners increases (Eichholtz and Lindenthal, 2014). Thus, the increasing demand for homeownership over the lifetime seems to be particularly true for households that are highly educated, have a good health, and have high incomes. Anyhow, when people age and approach retirement, they might leave homeownership behind and return to the rental market.

Besides, family is an important part of the life course (Stone et al., 2014). Family dynamics and the organization of life course careers are already stressed by prior research as important determinants of first transitions into homeownership (Clark et al, 1997). This is consistent with findings that single individuals seem to deter homeownership until forming co-residential partnership. An explanation for this is that partnerships generally increase households' income and provide the recourses that are required to access homeownership (Clark et al, 1997; Feijten, 2015). This is consistent with evidence from Clark et al (1997), which argues that dual earner households have a higher probability of being homeowners compared to single earner households.

Besides partnership, literature argues that family formation is associated with an increased probability of homeownership (Clark & Dieleman, 1996). It appears that family formation including fertility events increase the homebuying preferences since homeownership is related to residential stability, spacious livings, improved social enhancement and suburban neighborhoods ((Mulder & Wagner, 1998; Mulder, 2006). For this reason, it is assumed that the composition of households, including whether a household is a single household, a couple or whether there are children involved, is another important determinant in housing tenure preferences and decisions.

### ***Housing demand in the context of an imbalanced market***

The literature refers to the imbalance of supply and demand in the housing market as another driving force behind falling home ownership rates. Australian evidence shows a mismatch of an increasing demand for private rentals from both low and high incomes while there is a rising supply of midmarket housing (Hulse and Yates, 2016). A remarkable finding from the United Kingdom shows that young people tend to have long-term preferences for homeownership, however this preference seems unachievable (Mckee et al.,



2017). It turns out that due to the increasing demand and scarce supply of affordable owner-occupied and private rental dwellings, households are unable to find suitable accommodation (Myer et al., 2016). This is contributing to social inequalities and leads to a growing phenomenon of young people remaining longer in the private rental market, widely referred to as 'generation rent' (Hoolachan et al., 2016; McKee et al., 2017). Thus, it appears that young households often want to buy, but simply are not able to access homeownership as result of supply which is not adequately meeting demand in the housing market.

### ***Intergenerational inequalities in homeownership***

Research stresses the development of decreased and postponed homeownership and argues that this development has occurred both on a generational time scale and at a rapid rate in recent decades (Coulter & Kuleszo, 2022). It turns out that around 6 million would-be homeowners left the housing market or shifted to the rental market (Myers et al. 2016). A study from California provides an explanation for the decreasing homeownership rates among, currently, the youngest generations: generation Z and Millennials. It is argued that Millennials and Generation Z are disproportionately impacted by rising housing costs and a dearth of affordable housing because these generations have grown up in a housing crisis (Lopez et al, 2023). This is consistent with research arguing that particularly the younger households are dealing with the problem of housing affordability. Since these generations are in the early stages of their careers, their resources are limited and therefore they have difficulties with accessing homeownership (Ismail & Shaari, 2019).

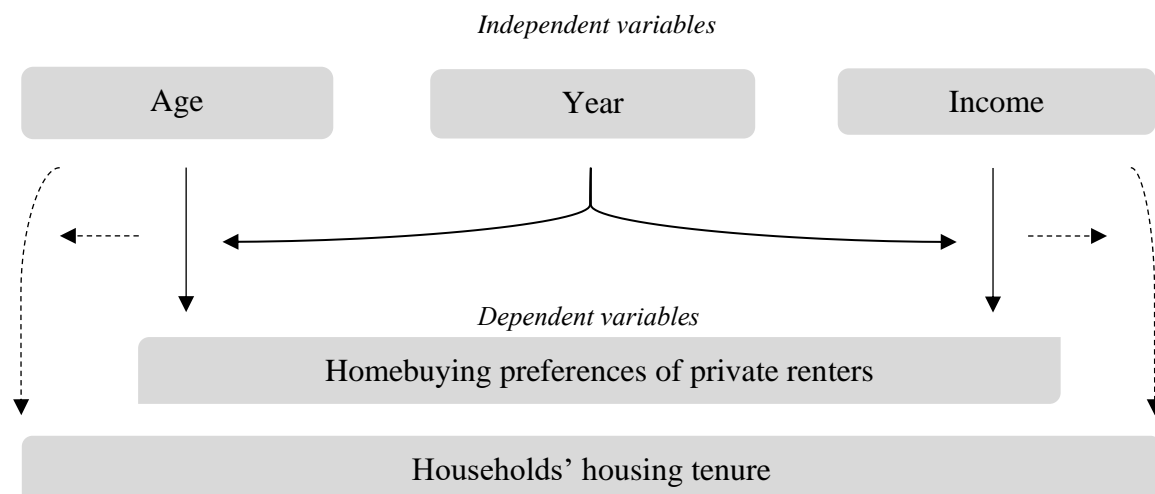
The literature which suggests that newer generations such as generation Z and Millennials experience difficulties with buying a home is consistent with findings that homeownership rates are lower among millennials compared to Gen Xers and baby boomers (Choi et al., 2018). The study from the United States shows that delayed marriage, greater racial diversity, increased education debt, increased rents, and delayed childbearing are contributing to decreasing homeownership among Millennials compared to previous generations. For example, postponing marriage and delayed childbearing seem to result in postponed homeownership since buying a home is very difficult with only one income and since the stability and security of tenure is preferred (Mulder, 2013).

### ***Conceptual framework***

In summary, prior research investigating housing demand often provide corresponding findings. The existing literature concentrated on declining homeownership rates and came up with various explanations such as life course careers, associated with all sorts of other factors such as education, income, health, but also with housing market conditions. The literature already addresses the issue of the growing rental market. For example, it is argued that currently high-income young households are postponing homeownership and compete with low-income old singles for accessing rental housing (Yates

and Wulff, 2005). However, this does not provide an explanation for the increased demand for private rental housing. Based on the literature this study expects to find that (1) there is a higher share of households in the private rental market preferring to buy, (2) households are remaining longer in the private rental market as they age, and (3) households are remaining longer in the private rental market as their income grows. This study contributes to existing literature by addressing a more comprehensive question on the growth in the private rental market focussing on a demand side explanation, considering households' demographics and socioeconomic status in renters' homebuying preferences and households' housing tenure outcomes.

The conceptual model (Figure 1) illustrates that the study theorizes on the relationship between the households' age and income as determinants of renters' homebuying preferences and households' housing tenure. This study observes two different years to analyse changes over time. While investigating this relationship, household composition, birth country, urbanity and province are included to capture household and location specific characteristics.

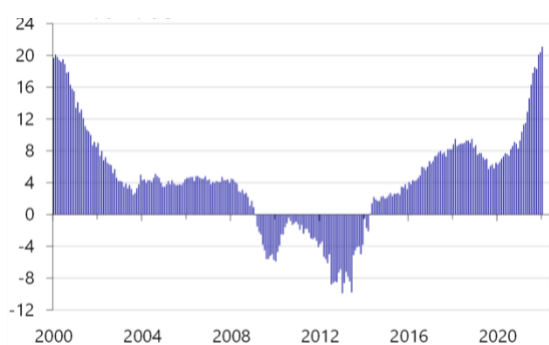


**Figure 1.** Conceptual model

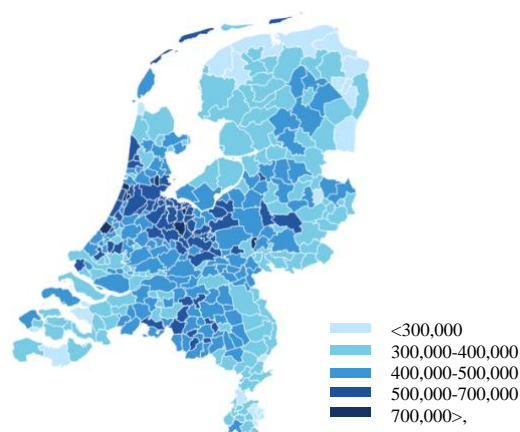
### 3. Empirical context: the Netherlands

In the Netherlands, the rental market consists of social rental housing and private rental housing. Social rental homes are typically managed by housing associations. The initial rent is lower than the liberalization limit which is currently set at 808,06 Euro, and social housing is only accessible for low-income households. As opposed to social housing, private rentals have no limited rent and are accessible for all-income households (Rijksoverheid, 2023). Therefore, private rentals are defined as occupied private dwellings with a rent that exceeds the liberalization limit (Stuart-Fox et al., 2022).

The expensive private rental sector has experienced significant growth in recent decades, while the number of social (regulated) homes decreased. It is argued that, because of policy around 1990, high-income households moved to the owner-occupied sector while the proportion of low-income households in social rental market increased (Kempen et al., 2002). According to Boelhouwer (2014), middle incomes were disadvantaged due to a lack of financial support. Figure 2 shows the evolution of increasing housing values on the Dutch property market since 2013, contributing to the reduced affordability of housing. In 2021, the average sales price of existing homes was below 300 thousand euros in only a few provinces in the Netherlands (Figure 3). Short supply of affordable homeownership as well as affordable dwellings in the private rental market results in few alternative housing market options for the middle-income segment (Hoekstra and Boelhouwer, 2014). However, in 2023 Dutch policies introduce the regulation of mid-market rentals (Wet Regulering Middenhuur) aimed at better affordability of mid-market rental homes. These regulations intend to ensure tenants with protection against high prices, while keeping mid-market rents attractive to investors (Rijksoverheid, 2022).



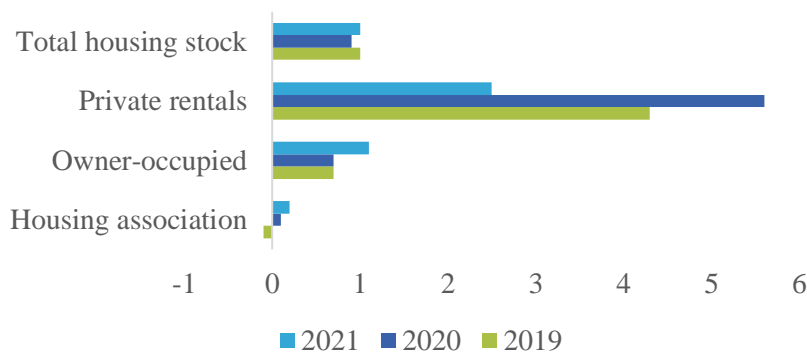
**Figuur 2.** Housing values: year-on-year price increase in percentages (Rabobank, 2022)



**Figuur 3.** Average sales price of existing owner-occupied homes, 2021 (CBS, 2023)

According to the Dutch housing survey (Woononderzoek Nederland 2021), the number of homes in the private rental market has increased from 354,000 in 2018 to 509,000 in 2021. The growth in the expensive private rental sector is particularly striking, which increased from 136,000 in 2018 to

239,000 in 2021. The growth in the number of private rental homes continued according to figures from Statistics Netherlands and increased by more than 2.5% in 2021. Relatively speaking, the number of private rented homes grew faster than the number of owner-occupied homes and housing association homes (Figure 4). At the beginning of 2022, more than 14 percent of the total housing stock in the Netherlands consisted of private rental homes (CBS, 2023). As a result, from the growing private rental market, other housing markets are suffering (Parool, 2022). It is argued that deliberate government policy in the Netherlands, led to a housing market situation in which the private rental market mainly exists of affluent young households and many households with a relatively high income live in inexpensive rental dwellings. Meanwhile, less affluent households have difficulties with gaining access in the private rental market and a considerable number of relatively low-income take recourse to more expensive rental dwellings (Dieleman and van Kempen, 1994; Howard et al., 2021). This raises questions, for example about how the growth of expensive rent affects the housing possibilities for newcomers in the housing market (Companen, 2022). There has been an overall increase of people in young age categories (people in their 20's and 30's) in the period between 2006 and 2021 (CBS, 2023), and the literature suggests that young households represent the large growth in private rentals (Howard et al., 2021). Therefore, particularly the question whether households remain longer in the private rental market as they grow older, and as their income increases is highly relevant.



**Figure 4.** The development of the number of homes: % change from a year earlier (CBS, 2023).

## 4. Data and Methods

This study observes Dutch housing market data to measure the role of age and income households in the increasing demand for private rentals over time. Data is obtained from the Netherlands housing survey (Woononderzoek Nederland) provided by Data Archiving and Networked Services (DANS). This study conducts a longitudinal analysis by comparing the survey data from 2006 and 2021 to measure the change over time in a repeated cross section framework.

### 4.1 Dataset

The housing survey is conducted by Statistics Netherlands every three years as a cooperation between the Ministry of the Interior and Kingdom Relations (BZK) and Statistics Netherlands. The datasets of the housing survey (Woononderzoek Nederland) provide high quality, nationally representative data on moving and housing wishes in the Netherlands, the satisfaction of residents and several other subjects that are not or hardly included in register data. The targeted population consists of persons of 18 years old or older living in a private household in the Netherlands (CBS, 2022). The housing survey carries out fieldwork consisting of 40,000 questionnaires. The sample provides reliable results at supra-local level, which concerns the national, provincial, and regional level, but also the area clusters. However, since local samples are simply too small to draw conclusions, the accuracy at the municipal level is not the same as at the national level. Therefore, some regions and provinces participate in oversampling to provide high-quality policy information on housing at a low spatial scale (Hooft van Huijsduijnen et al., 2007).

The data from 2006 ( $n=64,005$ ) is appended to the data from 2021 ( $n=67,523$ ) resulting in 131,528 number of observations in the merged dataset. The social renters ( $n=34,070$ ) are excluded from the analysis, since this study is interested in the comparison of homeownership and the private rental market, which is less regulated with no limited rent and accessibility for all-income households. Of the remaining 97,458 observations, 20,442 cases have missing values for the variable which measures households' current housing tenure. These cases and all cases with an observed income below zero ( $n=144$ ) are removed from the dataset. The final analytic sample ( $n=76,872$ ) consist of 34,212 observations in 2006 and 42,660 in 2021. The sample includes homeowners in 2006 ( $n=30,013$ ) and in 2021 ( $n=37,292$ ) and private renters in 2006 ( $n=4,199$ ) and in 2021 ( $n=5,368$ ).

This study uses two separate samples. First, the study excludes the homeowners ( $n= 67,305$ ) from the analysis so that only private renters remain to investigating the homebuying preferences of private renters ( $n= 9,567$ ). Therefore, the analytic sample remains with 4,199 observations in 2006 and 5,368 observations in 2021. Since this is still many observations, the sample size is sufficient for running a statistical regression analysis. Thereafter, this study adjusts the analytic sample so that both private

renters and homeowners from 2006 and 2021 are included in the analysis to investigate the role of age and income in households' housing tenure ( $n=76,872$ ).

## **4.2 Measures**

### ***Homebuying preference***

The measure 'homebuying preference' is included as the dependent variable to answer sub-question 2. This question captures whether households in the private rental market want to buy. In the survey of 2006 and 2021, the variable 'propensity to move' covers the question whether respondents are intended to move, this question is followed by the question whether the preferred home is an owner-occupied or rental home. This study uses the two questions from the surveys, to construct a new categorical variable to be included in the analytic sample: homebuying preference. This variable consists of three levels: want to become homeowner, want to stay renter, and no propensity to move (the reference category). This allows the study to investigate whether private renters have the propensity to move and if so, whether they prefer to buy a house.

### ***Current housing tenure***

In this study, current housing tenure is the outcome variable in answering sub-question 3 and 4. Both surveys from 2006 and 2021 include information on 'ownership form'. This variable exists of three levels: social renters, private renters, and homeowners. However, as is already specified, the social renters are excluded from the analytic sample. Therefore, the variable has a binary nature: (0) homeowners, and (1) private renters.

### ***Year***

This study conducts a longitudinal analysis comparing between the role of households' age and income in housing tenure preferences and outcomes in 2006 and 2021. Combining the survey results (Woononderzoek Nederland) from both years allows the study to measure change which may help to understand the increasing demand for private rentals. After the data merge, this study generates a dummy variable which can measure the year of observation: 2006 (the reference category) and 2021. This allows the study to add interaction between the year of observation and the main independent variables. This way, the study has the strength to measure the changing role of the independent variables (age and income) in housing tenure over time.

### ***Age***

This study is interested in the question whether households are remaining longer in the private rental market as they become older. Therefore, the measure age is included as an independent variable, using the variable 'age of the main household' which is represented in the datasets of 2006 and 2021.

Household age is coded as four categories rather than seven since larger groups contribute to statistical power in drawing conclusions. The four categories that are specified are: 18-34 years, 35-44 years (the reference category), 45-64, 65 years and older. This allows the study to compare between young, middle-aged, and aged households.

### ***Income***

Household income is included in the analyses as an independent variable, to capture the question whether households are remaining longer in the private rental market as their income increases. The data contains the variable 'gross household income', which is included in the dataset as a continuous variable. Though, this study generates a new categorical variable including income groups. Separately for both years, incomes are divided into five equal income groups representing the households' incomes in percentages: lowest 20%, low middle, middle 20%, upper middle, and upper 20% incomes. This way, the study deals with economic dynamics, such as inflation, between the period of 2006 and 2021. Notice that this new generated variable is coded as five categories with 'middle income' as the reference category.

### ***Household characteristics***

Several demographic variables might affect the relationship between age and income and housing tenure (Dieleman et al., 1989; Choi et al., 2018). For example, high education levels as well as family formation including partnership is related to a higher likelihood of homeownership (Eichholtz and Lindenthal, 2014; Clark et al, 1997; Feijten, 2005). Besides, greater racial diversity seems to decrease homeownership rates among the younger generations (Choi et al., 2018). To capture these effects, several predictors have been defined in the analysis. This study includes two household specific characteristics: household composition and birth country. Household composition is coded as five dummies: one person, couple, couple with kids (reference category), 1-parent family, and non-family. Birth country is coded as three dummies: Dutch, western (reference category), non-western. Education attainment is deliberately not included in the analysis because this is generally related to income. Similar, household size is excluded as a control variable as the Cramér's V value based on the Pearson's Chi-squared statistic shows that it highly correlates with households' composition (Appendix A).

### ***Location characteristics***

Homeownership opportunities may differ by region and thus regional differences may significantly impact the predictability of changing housing tenure (Coulter & Kuleszo, 2022). This study includes two measures to capture location specific characteristics: urbanity and province. The study includes the variable 'residential environment' which distinguishes between five categories of urbanity: centre-urban, outside center, green-urban (reference category), center village and rural. In addition, province

is coded as twelve categories: South holland, North holland, North Brabant, Gelderland, Utrecht (reference category), Overijssel, Limburg, Friesland, Groningen Drenthe, Flevoland, and Zeeland.

### **4.3 Descriptive statistics**

Table 1 presents the main sample characteristics for both homeowners and private renters, separately presented for households in 2006 and in 2021. The sample characteristics of the household specific and location specific control variables can be found in Appendix B. In Table 1, it is noticeable that there is no significant difference in the proportion of homeowners and private renters between both years. This may be due to excluding the social renters from the sample. Anyhow, the share of private renters in 2006 is corresponding to the literature (Haffner et al, 2008).

Another important note on Table 1 is that there is a larger number of observations in the sample from 2021 ( $n=42,660$ ). Though the sample size from 2006 is sufficient to compare ( $n=34,212$ ). Buyers make up most of the sample in both years, however, the number of private renters in 2006 ( $n=4,199$ ) and in 2021 ( $n=5,368$ ) are sufficient for statistical analysis. The difference in sample size is visualized in bar charts (appendix C), showing that the number of observations in almost each age class grew significantly. The proportion of private renters at the young age categories increased in the period between 2006 and 2021, while the proportion of homeowners declined. Furthermore, regarding income it seems the proportion of high-income households in the owner-occupied market decreased, while this group increased in the private rental market alongside a decrease of low-income households in the private rental market. However, these differences in private tenancy are hardly significant. Table 2 presents the descriptive statistics of households' gross household income revealing that the mean incomes of each income group in 2006 are significantly lower than the mean incomes in 2021. It also appears that the mean income for homeowners is larger than the mean income for renters in both years. However, remarkable is the tiny difference in mean incomes between homeowners and renters from the middle and upper middle-income group.



**Table 1.** Main sample characteristics by year and housing tenure.

| Woononderzoek<br>Nederland 2006 &<br>2021                | 2006                              |  | 2021                              |  | Difference                       |     |  |     |
|--|-----------------------------------|--|-----------------------------------|--|----------------------------------|-----|--|-----|
| Respondents in<br>analytic sample<br>( <i>n</i> =76,872) | ( <i>n</i> = 34,212)              |  | ( <i>n</i> = 42,660)              |  | <i>t</i> -test                   |     |  |     |
|  | Prop.                             |  | Prop.                             |  | Difference between 2006 & 2021   |     |  |     |
|  | Homeowners<br>( <i>n</i> =30,013) | Private<br>renters<br>( <i>n</i> =4,199) | Homeowners<br>( <i>n</i> =37,292) | Private<br>renters<br>( <i>n</i> =5,368) | Homeowners<br>( <i>n</i> =7,279) |     | Private<br>renters<br>( <i>n</i> =1,169) |     |
| <b>Current housing<br/>tenure</b>                        | .877                              | .123                                     | .874                              | .126                                     | -.003                            |     |  |     |
| <b>Preferred housing tenure</b>                          |                                   |  |                                   |  |                                  |     |  |     |
| Home-owner   | .149                              | .174                                     | .239                              | .308                                     | .090                             | *** | .133                                     | *** |
| Renter   | .022                              | .169                                     | .046                              | .259                                     | -.104                            | *** | .085                                     | *** |
| No propensity to<br>move                                 | .828                              | .657                                     | .714                              | .433                                     | .565                             | *** | .259                                     | *** |
| <b>Age groups</b>  |                                   |  |                                   |  |                                  |     |  |     |
| 18-34 years  | 0.151                             | 0.259                                    | 0.108                             | 0.397                                    | -0.04                            | *** | 0.139                                    | *** |
| 35-44 years  | 0.240                             | 0.141                                    | 0.158                             | 0.116                                    | -0.082                           | *** | -0.025                                   | *** |
| 45-64 years  | 0.428                             | 0.237                                    | 0.438                             | 0.230                                    | 0.010                            | *   | -0.007                                   |     |
| 64 years and older                                       | 0.180                             | 0.363                                    | 0.296                             | 0.256                                    | 0.115                            | *** | -0.106                                   | *** |
| <b>Income groups</b>                                     |                                   |  |                                   |  |                                  |     |  |     |
| Low income   | .156                              | .512                                     | .156                              | .505                                     | -.000                            |     | -.006                                    |     |
| Lower middle income                                      | .196                              | .229                                     | .200                              | .199                                     | .004                             |     | -.029                                    |     |
| Middle income  | .211                              | .120                                     | .209                              | .134                                     | -.002                            |     | .014                                     |     |
| Upper middle income                                      | .217                              | .079                                     | .216                              | .090                                     | -.001                            |     | .010                                     |     |
| Upper income   | .220                              | .060                                     | .218                              | .072                                     | -.001                            |     | .0119                                    |     |

\* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001

**Table 2.** Descriptive statistics of household gross income in euros.

| Woononderzoek Nederland<br>2006 & 2021       | 2006        |          |                 |          | 2021        |          |                 |          |
|--|-------------|----------|-----------------|----------|-------------|----------|-----------------|----------|
| Respondents in analytic sample<br>(n=76,872) | (n= 34,212) |          |                 |          | (n= 42,660) |          |                 |          |
|  | Homeowners  |          | Private renters |          | Homeowners  |          | Private renters |          |
|  | Mean        | st. dev. | Mean            | st. dev. | mean        | st. dev. | mean            | st. dev. |
| Income (€)                                   | 56,762      | 43,258   | 33,411          | 24,796   | 75,612      | 58,317   | 45,399          | 39,769   |
| Income by income group (€)                   |             |          |                 |          |             |          |                 |          |
| Low income                                   | 19,025      | 5,786    | 17,630          | 5,498    | 28,299      | 6,947    | 22,702          | 9,132    |
| Lower middle income                          | 34,520      | 3,957    | 33,710          | 3,955    | 45,080      | 4,548    | 44,352          | 4,504    |
| Middle income                                | 47,640      | 3,785    | 47,017          | 3,763    | 61,146      | 4,882    | 60,388          | 4,868    |
| Upper middle income                          | 62,834      | 5,314    | 61,660          | 5,005    | 81,202      | 7,254    | 80,650          | 7,188    |
| Upper income                                 | 106,273     | 66,478   | 102,200         | 39,822   | 145,748     | 88,524   | 135,685         | 86,713   |

Note: The income categories in euros in both years differ due to inflation. Low income (€): 0 – 27,419 (2006) & 0 - 37,085 (2021), lower middle income (€): 27,420 - 41,082 (2006) & 37,086 - 52,854 (2021), middle income (€): 41,083 - 54,408 (2006) & 52,857 - 69,738 (2021), upper middle income (€): 54,411 - 72,877 (2006) & 69,739 - 95,284 (2021), upper income (€): 72,885 - 2,126,828 (2006) & 95,302 - 1,528,980 (2021).

#### 4.4 Approach

The first purpose of this study is to examine whether there is a higher share of private renters which are intended to move to an owner-occupied house in 2021 compared to 2006. Therefore, the study conducts a multinomial logistic regression analysis because of the categorical nature of first dependent variable ‘homebuying preference’. Thereafter, this study investigates whether households in 2021 are remaining longer in the private rental market as they age and as their income grows compared to households in 2006. Therefore, this study conducts a logistic regression analysis because of the binary nature of the dependent variable ‘current housing tenure’. Details on the assumptions of logistic regression are provided in appendix D.

The first set of regression models (1) investigates the homebuying preferences of private renters by year, age, and income. In this analysis, the dependent variable ‘homebuying preference’ is represented by three categories: want to become homeowner, want to stay renter and no propensity to move (reference category). This model includes household and location specific control variables: household composition, birth country, urbanity, and province.

$$(1) \ln(\text{Pref\_ht})_{i,r,t} = \mu + \beta_1 \text{Year}_t + \beta_3 \text{Age}_i + \beta_4 \text{Income}_i + \beta_5 \text{Comp}_i + \beta_6 \text{Bcount}_i + \beta_7 \text{Urb}_i + \beta_8 \text{Prov}_r + \varepsilon_{i,r,t}$$

Subsequently, the second set of regression models (2) examines households’ current housing tenure by year, age, and income. The dependent variable ‘current housing tenure’ is represented by two categories:

homeownership (reference category) and private tenancy. This model also controls for household and location specific characteristics: household composition, birth country, urbanity, and province. The notational glossary of the statistical models can be found in Appendix E.

$$(2) \quad \ln(\text{Cur\_ht})_{i,r,t} = \mu + \beta_1 \text{Year}_t + \beta_2 \text{Age}_i + \beta_3 \text{Income}_i + \beta_4 \text{Comp}_i + \beta_5 \text{Bcount}_i + \beta_6 \text{Urb}_i + \beta_7 \text{Prov}_r + \varepsilon_{i,r,t}$$

## 5. Results & discussion

### 5.1 Results

#### *Analysis: Homebuying preferences of private renters*

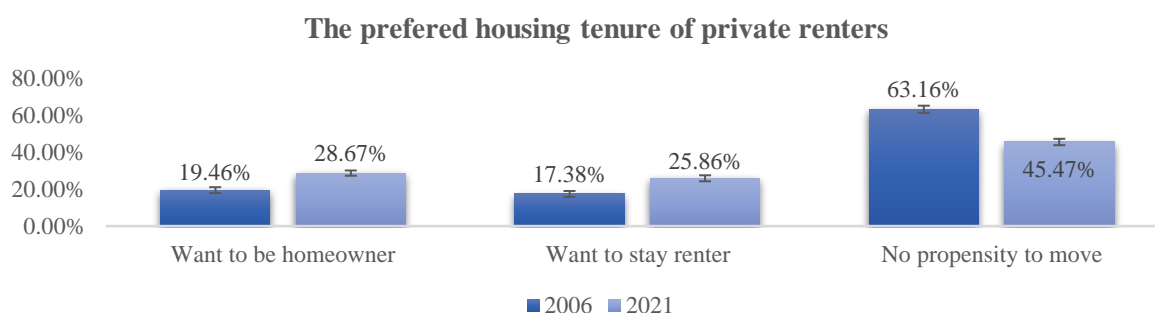
First, this study examines whether the share of private renters with homebuying preferences increased in the period between 2006 to 2021. Table 3 presents the results of this set of regression models for the homebuying preferences of renters. The full model results are attached in Appendix F. The dependent variable consists of three categories: want to become homeowner, want to stay renter and no propensity to move (the reference category). In the first model, adjusting for household composition, birth country, urbanity and province, the risk ratios for year are 2.566 and 2.244 ( $P < 0.001$ ). This indicates that a higher share of private renters in 2021 have moving propensities compared to 2006, and a higher share of renters have preferences to buy a house in 2021 compared to 2006. This also appears from the visual representation in Figure 5.

The risk ratios for the age categories show a relationship between the age of renters and their homebuying preferences and indicate differences across age categories. Renters in the youngest age-category are strongly associated with moving propensities, especially with preferences to buy. However, the age group 64 years and older have a weak association with moving propensities, especially with preferences to buy. Furthermore, the risk ratios for income groups are significant indicating a relationship between renters' income and their homebuying preferences. The risk ratios identify differences across income groups, where lower income renters have a weaker association with homebuying preferences and higher income renters have a stronger association with homebuying preferences ( $p < .001$ ). The visualization of the results (Figure 6) shows that across income groups, a higher share of high-income renters has homebuying preferences and a lower share of low-income renters have homebuying preferences while the propensities to move remain stable across income groups.

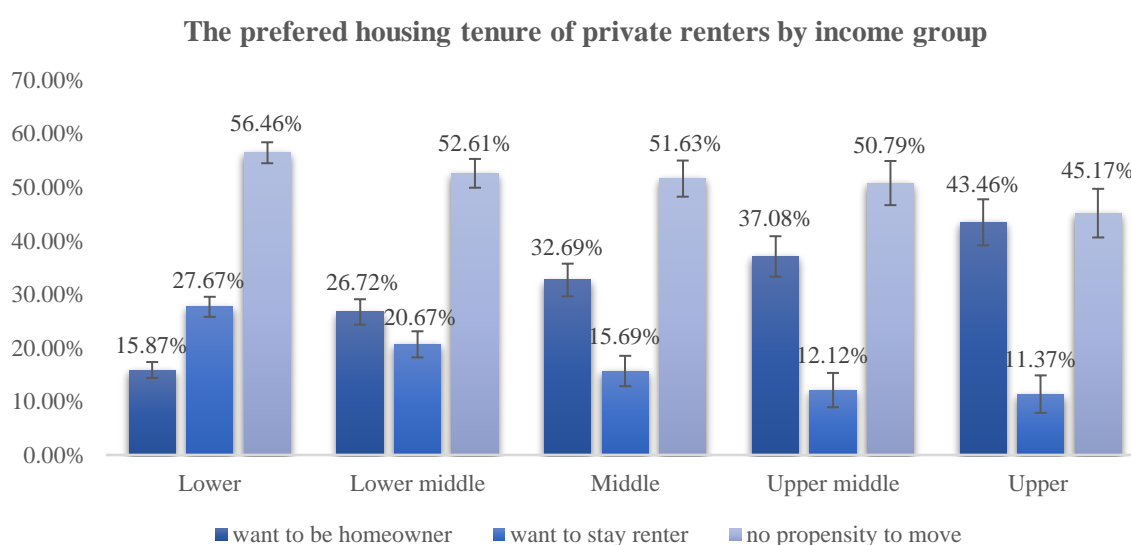
**Table 3.** Set of multinomial logistic regression models for renters' homebuying preferences

| Multinomial logistic regression (n=9,567)             | Model 1                  |                     | Model 2                  |                     |
|---|--------------------------|---------------------|--------------------------|---------------------|
| DV: Homebuying preference, ref. no propensity to move | Want to become homeowner | Want to stay renter | Want to become homeowner | Want to stay renter |
|   | RRR                      | RRR                 | RRR                      | RRR                 |
| Constant  | 0.397***<br>[0.08]       | 0.199***<br>[0.041] | 0.378***<br>[0.08]       | 0.208***<br>[0.046] |
| Year, ref. 2006                                       |                          |                     |                          |                     |
| 2021  | 2.566***<br>[0.16]       | 2.244***<br>[0.128] | 2.940***<br>[0.406]      | 2.126***<br>[0.343] |
| Age category, ref. 35-44 years                        |                          |                     |                          |                     |
| 18-34 years   | 1.690***<br>[0.148]      | 1.273*<br>[0.128]   | 2.092***<br>[0.261]      | 1.275<br>[0.184]    |
| 45-64 years   | 0.297***<br>[0.027]      | 0.816*<br>[0.08]    | 0.286***<br>[0.04]       | 0.765<br>[0.11]     |
| 64 years and older                                    | 0.033***<br>[0.005]      | 0.427***<br>[0.044] | 0.020***<br>[0.006]      | 0.407***<br>[0.058] |
| Income group, ref. middle income                      |                          |                     |                          |                     |
| Low income  | 0.352***<br>[0.033]      | 1.506***<br>[0.147] | 0.356***<br>[0.034]      | 1.506***<br>[0.147] |
| Lower middle income                                   | 0.740**<br>[0.071]       | 1.266*<br>[0.134]   | 0.742**<br>[0.072]       | 1.265*<br>0.134     |
| Upper middle income                                   | 1.228<br>[0.139]         | 0.799<br>[0.117]    | 1.234<br>[0.14]          | 0.801<br>[0.117]    |
| Upper income  | 1.867***<br>[0.229]      | 0.893<br>[0.145]    | 1.870***<br>[0.23]       | 0.896<br>[0.145]    |
| Year (ref. 2006) × Age category (ref. 35-44 years)    |                          |                     |                          |                     |
| 2021 × 18-34 years                                    |                          |                     | 0.689*<br>[0.114]        | 0.968<br>[0.185]    |
| 2021 × 45-64 years                                    |                          |                     | 1.041<br>[0.192]         | 1.112<br>[0.217]    |
| 2021 × 64 years and older                             |                          |                     | 1.903<br>[0.67]          | 1.079<br>[0.205]    |
| Household specific control characteristics (2)        | yes                      |                     | yes                      |                     |
| Location specific control characteristics (2)         | yes                      |                     | yes                      |                     |
| Observations  | 9,567                    |                     | 9,567                    |                     |
| Pseudo R-squared                                      | 0.1813                   |                     | 0.1822                   |                     |

Note: the dependent variable is homebuying preferences of private renters. The explanatory variables are year, age and income. The household specific and location specific control characteristics are household composition, birth country, urbanity and province (Appendix F shows the full model). St. Errors are included in the model between brackets. The income categories in euros in both years differ due to inflation. Low income (€): 0 – 27,419 (2006) & 0 - 37,085 (2021), lower middle income (€): 27,420 - 41,082 (2006) & 37,086 - 52,854 (2021), middle income (€): 41,083 - 54,408 (2006) & 52,857 - 69,738 (2021), upper middle income (€): 54,411 - 72,877 (2006) & 69,739 - 95,284 (2021), upper income (€): 72,885 - 2,126,828 (2006) & 95,302 - 1,528,980 (2021). \*p < .05, \*\*p < .01, \*\*\*p < .001.



**Figure 5<sup>1</sup>.** Predictive margins of homebuying preferences of private renters by year

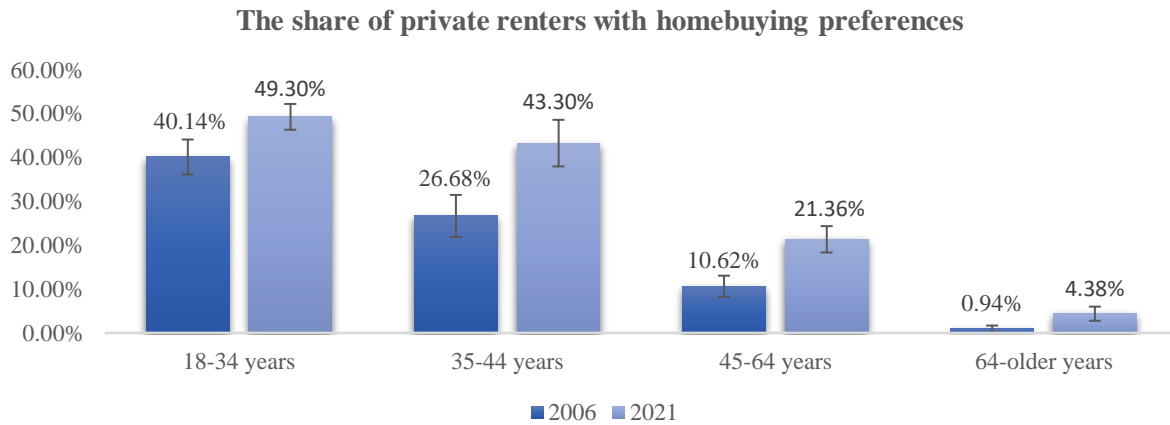


**Figure 6<sup>1</sup>.** Predictive margins of homebuying preferences of private renters by income group

Yet, the question remains whether there is a larger share of young and middle-aged households in the private rental market, preferring to buy a home in 2021 compared to 2006. Therefore, Model 2 includes interaction between year and age. The risk ratio for the interaction effect for the youngest age group is 0.689 ( $p < 0.05$ ) and indicates that the relationship between renters' age and their homebuying preference is significantly affected by year. When making a graphical presentation of the regression results (Figure 7) it appears that across all age categories, a higher share of renters has homebuying preferences in 2021 compared to 2006. The difference is especially strong for the middle-age categories 35-44 and 45-64 years old. Initially, this study also performed a third model including interaction between year and income to investigate whether the role of income in renters' homebuying preferences changed in the period between 2006 and 2021. However, this analysis provides insignificant outcomes and gains no evidence to assume an effect of year in the relationship between renters' income and their

<sup>1</sup> Note: In creating these graphical presentations of the results this study applies a confidence interval of 83%, which provides a visual representation of the one-tailed 95% confidence intervals based on recommendations of previous literature (Austin & Hux, 2002; Knol et al, 2011).

homebuying preferences. Therefore, this study cannot conclude whether a higher share of high-income renters have homebuying preferences in 2021 compared to 2006.



**Figure 7<sup>2</sup>.** Predictive margins of private renters with homebuying preferences by age category.

***Analysis: current housing tenure***

Next, this study examines whether there is a higher share of private renters than homeowners in 2021 compared to 2006, given households’ age and income. Table 4 presents the main results of this set of regression models for households’ current housing tenure. The full model results are attached in Appendix G. In the first model, adjusting for household composition, birth country, urbanity and province, the odds ratio for year is 0.975 and is not statistically significant. This indicates that the model finds no measurable difference in households’ housing tenure between both years. The insignificance may be caused by the small difference in the proportion of homeowners and renters between 2006 and 2021 as was already noted in the method section under descriptive statistics. Anyhow, the odds ratios of the main explanatory variables (age & income) in this study appear to be significant. Looking at the odds ratios for the age categories, this study finds a relationship between housing tenure and age, with differences across age categories. Especially households in the youngest age-category are common to be a private renter, while the middle-aged households are least common to be a private renter. Thus, households reaching the age category of 64 years and older, are more common to be a private renter than middle-aged households, but less common to be a private renter compared to young households. ( $p < 0.001$ ).

In the second model, incorporating income groups, the odds ratio for year increases to 1.017, but is yet not statically significant. Still, young households appear to have a strong association with private renting compared to older households. The odds ratios for the income groups indicate a

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<sup>2</sup> Note: In creating these graphical presentations of the results this study applies a confidence interval of 83%, which provides a visual representation of the one-tailed 95% confidence intervals based on recommendations of previous literature (Austin & Hux, 2002; Knol et al, 2011).

relationship between housing tenure and income, showing differences across income levels. Low-income households are most common to be in the private rental market, while households in higher income groups are less common to be in the private rental market. Households in the upper income group are least common to be private renters ( $p < .001$ ).

The question remains whether there is a changing role of households' age and income in households' housing tenure between 2021 and 2006. Therefore, model 3 and 4 incorporate interaction effects. In the third model, incorporating interaction between year and age, the odds ratio for year increases to 1.203 and has become statistically significant ( $p < 0.01$ ) meaning that this model finds a measurable difference in households' housing tenure between both years. In addition, the odds ratios for the interaction effects between year and age indicate that the relationship between age and housing tenure is significantly affected by year ( $p < .001$ ). Young households in 2021 are more common to be a private renter compared to young households in 2006, while older households in 2021 are less common to be a private renter compared to older households in 2006 ( $p < .001$ ). The graphical presentations of the results (Figure 8) show the differences in housing tenure by age between 2006 and 2021. There is especially a higher share of young households and a lower share of old households in the private rental market in 2021 compared to 2006, while this study finds no significant differences between the current housing tenure of middle-aged households in 2021 and 2006.

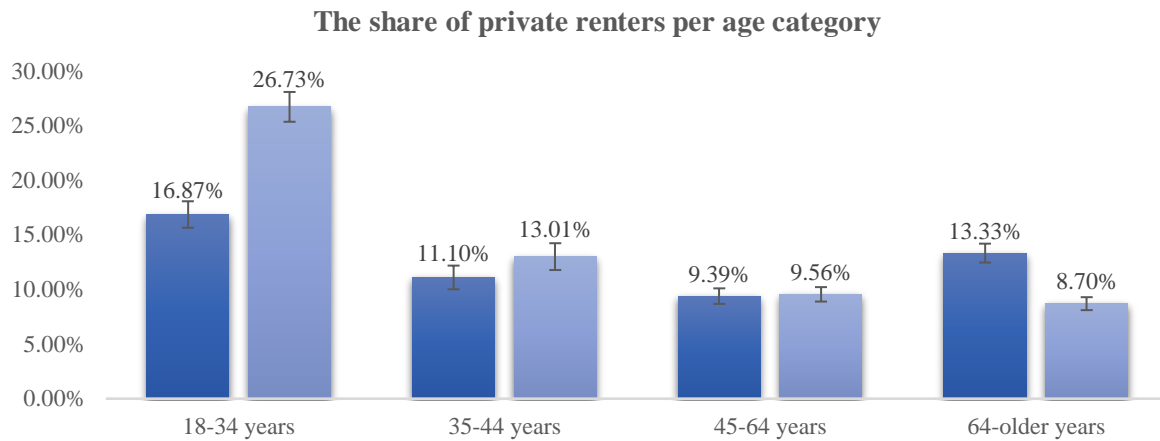
The fourth model, incorporating interaction between the year and income, increases the odds ratio for year to 1.189 ( $p < .05$ ) and identifies that the relationship between income and housing tenure is also significantly affected by year. The odds ratio for the low-income group in 2021 is 0.795 ( $p < .01$ ) and the odds ratio for the lower middle-income group in 2021 is 0.739 ( $p < .001$ ). This suggests that lower income households are less common to be a private renter in 2021 compared to lower income households in 2006. Since the interactions for the upper middle-income and upper-income groups are insignificant, we cannot assume differences in housing tenure of upper middle- and upper-income households between 2021 and 2006. The graphical presentation of the result (Figure 9) shows the differences in housing tenure by income between 2006 and 2021, finding a lower share of low-income households and a higher share of high-income households in the private rental market in 2021 compared to 2006. However, these are only tiny differences which may be causing the insignificance of some of the interaction effects in model 4. A final clear observation is that the interaction between year and age is more robust than the interaction between year and income, suggesting that age is more important than income in explaining the difference in housing tenure between 2006 and 2021.



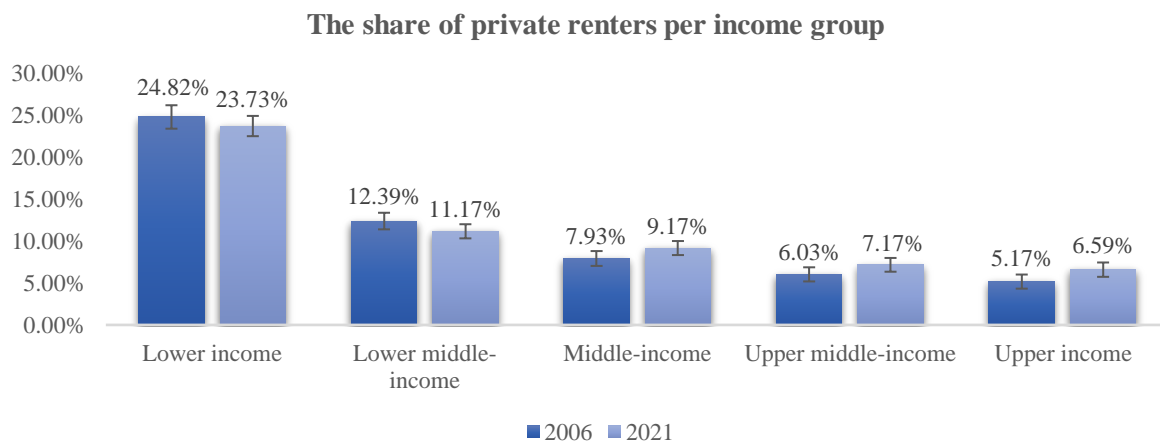
**Table 4.** Set of logistic regression models for current housing tenure

| Logistic regression (n=76,872)                               | Model 1  |       | Model 2  |       | Model 3  |       | Model 4  |       |
|--|----------|-------|----------|-------|----------|-------|----------|-------|
| DV: Current housing tenure: private rent, ref. homeownership | OR       | S.E.  | OR       | S.E.  | OR       | S.E.  | OR       | S.E.  |
| Constant   | 0.078*** | 0.006 | 0.098*** | 0.009 | 0.088*** | 0.008 | 0.090*** | 0.009 |
| Year, ref. 2006  |          |       |          |       |          |       |          |       |
| 2021   | 0.975    | 0.024 | 1.017    | 0.025 | 1.203**  | 0.078 | 1.189**  | 0.075 |
| Age category, ref. 35-44 years                               |          |       |          |       |          |       |          |       |
| 18-34 years  | 2.812*** | 0.113 | 2.412*** | 0.101 | 1.788*** | 0.108 | 2.414*** | 0.101 |
| 45-64 years  | 0.733*** | 0.029 | 0.731*** | 0.03  | 0.805*** | 0.047 | 0.725*** | 0.03  |
| 64 years and older   | 1.269*** | 0.052 | 0.831*** | 0.036 | 1.280*** | 0.075 | 0.824*** | 0.036 |
| Income group, ref. middle income                             |          |       |          |       |          |       |          |       |
| Low income   |          |       | 3.981*** | 0.156 | 3.840*** | 0.152 | 4.540*** | 0.264 |
| Lower middle income  |          |       | 1.462*** | 0.059 | 1.453*** | 0.059 | 1.729*** | 0.105 |
| Upper middle income  |          |       | 0.736*** | 0.036 | 0.735*** | 0.036 | 0.728*** | 0.055 |
| Upper income   |          |       | 0.646*** | 0.034 | 0.645*** | 0.034 | 0.611*** | 0.05  |
| Year (ref. 2006) × Age category (ref. 35-44 years)           |          |       |          |       |          |       |          |       |
| 2021 × 18-34 years   |          |       |          |       | 1.666*** | 0.135 |          |       |
| 2021 × 45-64 years   |          |       |          |       | 0.828*   | 0.066 |          |       |
| 2021 × 64 years and older                                    |          |       |          |       | 0.463*** | 0.036 |          |       |
| Year (ref. 2006) × Income group (ref. middle income)         |          |       |          |       |          |       |          |       |
| 2021 × low income  |          |       |          |       |          |       | 0.795**  | 0.059 |
| 2021 × lower middle income                                   |          |       |          |       |          |       | 0.739*** | 0.06  |
| 2021 × upper middle income                                   |          |       |          |       |          |       | 1.021    | 0.1   |
| 2021 × upper income  |          |       |          |       |          |       | 1.102    | 0.116 |
| Household specific control characteristics (2)               | yes      |       | yes      |       | yes      |       | yes      |       |
| Location specific control characteristics (2)                | yes      |       | yes      |       | yes      |       | yes      |       |
| Observations   | 76,872   |       | 76,872   |       | 76,872   |       | 76,872   |       |
| Pseudo R-squared   | 0.1673   |       | 0.2091   |       | 0.2158   |       | 0.2096   |       |

Note: the dependent variable is households' current housing tenure. The explanatory variables are year, age and income. The household specific and location specific control characteristics are household composition, birth country, urbanity and province (Appendix G shows the full model). St. Errors are included in the model between brackets. The income categories in euros in both years differ due to inflation. Low income (€): 0 – 27,419 (2006) & 0 - 37,085 (2021), lower middle income (€): 27,420 - 41,082 (2006) & 37,086 - 52,854 (2021), middle income (€): 41,083 - 54,408 (2006) & 52,857 - 69,738 (2021), upper middle income (€): 54,411 - 72,877 (2006) & 69,739 - 95,284 (2021), upper income (€): 72,885 - 2,126,828 (2006) & 95,302 - 1,528,980 (2021). \*p < .05, \*\*p < .01, \*\*\*p < .001.



**Figure 8<sup>3</sup>.** Predictive margins of private renters by age category



**Figure 9<sup>3</sup>.** Predictive margins of private renters by income group

## 5.2 Discussion

This study expected to find a higher share of private renters preferring to buy in 2021 compared to 2006, as the literature argues on the development of decreased and postponed homeownership (Coulter & Kuleszo, 2022). This study finds specifically a strong preference for homeownership among young private renters in both years. This agrees on the literature arguing on young people with long-term unachievable preferences for homeownership (Mckee et al., 2017). When comparing 2021 to 2006, this study finds that private renters have stronger moving propensities in 2021 and that private renters of all age categories have stronger preferences to buy in 2021, especially the middle-aged private renters. This indicates it is not only the young people with long-term unachievable preferences for homeownership, but it is prevalent among all age groups.

<sup>3</sup> Note: In creating these graphical presentations of the results this study applies a confidence interval of 83%, which provides a visual representation of the one-tailed 95% confidence intervals based on recommendations of previous literature (Austin & Hux, 2002; Knol et al, 2011).

In addition, this study finds a relationship between income and renters' tenure preferences, whereas private renters with high incomes are stronger related to homebuying preferences in comparison to low-income renters. However, this study finds no change in the preferences for homeownership among private renters between 2021 and 2006, across income levels.

Subsequently, this study addresses the role of age and income in households' current housing tenure. Findings show that housing tenure changes over the lifetime, whereas young households and elderly are associated with private renting, while the middle-aged households are associated with homeownership. This is consistent with the literature which argues that benefits and costs of homeownership and renting change over the lifetime and states that demand for homeownership increases as people grow older and tends to decrease after people enter retirement (Eichholtz and Lindenthal, 2014). Furthermore, the results agree on the literature that housing tenure depends on household financial resources (Mulder & Wagner, 1998). This study finds that private renting is most common among low-income households and least common among upper income households. This is consistent with evidence that households with less to spend have higher chances of private renting and high-income households have higher chances of homeownership (Artle and Varaiya, 1978; Dieleman et al., 1989).

Finally, the literature argues that households remain stuck in the rental market due to the increasing demand alongside the scarce supply of affordable housing and inaccessibility of homeownership (Myer et al., 2016; Hoolachan et al., 2016; McKee et al., 2017). For those reasons, this study expected to find that households are remaining longer in the private rental market as they age and as their income grows and thus this study especially expected to find a higher share of middle-aged and a higher share of high-income households in the private rental market in 2021 compared to 2006. The outcomes show an overall increase of households in the private rental market. Especially the higher share of young households in the private rental market in 2021 compared to 2006 is striking, while this study finds no significant difference in the share of middle-aged households in the private rental market. In line with expectations, this study finds a higher share of middle- and high-income households in the private rental market in 2021 compared to 2006, although the differences appear to be small.

Overall, the findings advance our understanding of the role of households' demographics and socio-economic status as a determinant of housing tenure preferences and outcomes. The results are interesting since it shows that young private renters have the strongest homebuying preferences, but apparently, they cannot access the market since their share in the private rental market grew. Especially a higher share of middle-aged renters has homebuying preferences in 2021 compared to 2006, even though this study finds not significantly a higher share of middle-aged households in the private rental market. Furthermore, high-income private renters are strongly associated with homebuying preferences, although this study does not find differences between 2021 and 2006, while it does find a higher share of high-income households in the private rental market. This may indicate that even those higher income households experience increased difficulties with accessing the owner-occupied market.

This study has limitations. First, due to the cross-sectional nature of this analysis the results do not allow to establish cause-and-effect relationships. Since this study observes and compares single points in time, it is unable to provide actual explanations on which trends and changes led to the observed outcomes. Second, this study only provides a demand side explanation for changes in the private rental market and does not consider factors from the supply side which might as well be affecting the market, such as policies putting pressure on the private rental market or other housing market constraints. Another limitation relates to the homebuying preferences of private renters that are analysed in the multinomial regression analysis. A variety of complex aspects influence households' housing preferences, such as individual circumstances, financial concerns, and market dynamics. It is challenging to completely understand these choices because the factors frequently interact and overlap. Even among individuals with comparable demographic and socioeconomic characteristics, it is a challenge to interpret homebuying preferences due to individual differences.

This paper makes several key contributions. This research contains new information about households' housing tenure, as it concerns the results of the most recent version of the Dutch housing survey (Woononderzoek Nederland 2021), which has not been the subject of much research yet. This information provides a step towards a better understanding of the role of household demographics and socio-economic status in housing tenure in the Netherlands. By doing so, this study provides new insights into dynamics on the demand side of the housing market as an explanation for the increase in the private rental market. This study goes beyond investigating housing tenure alone, by including homebuying preferences of renters. Additionally, this study captures a longitudinal effect by comparing 2021 to 2006. The results are an interesting starting point for future research to investigate what is causing the changing effect of age and income in housing tenure and housing tenure preferences. From another point of view, this study focusses on demographics and socio-economic status and is not representing an explanation from the supply side of the housing market. Therefore, examining changes on the supply side of the housing market is interesting as this might as well affect housing tenure preferences and outcomes, contributing to the increase in the private rental market.

## 6. Conclusion

This report provides an insight into the relationship between households' age and income and their housing tenure preferences and outcomes through answering the main research questions: *What is the relationship between households' age and income and their homebuying preferences and housing tenure outcomes?* Consistent with expectations, the results reveal that age and income are important determinants of households' housing tenure preferences and outcomes of private renters.

The main findings of the first analysis in this study are that homebuying preferences are most common among young and high-income renters and that compared to 2006, there is a higher share of renters with homebuying preferences in 2021, especially a higher share of middle-aged renters. This is in line with the first expectation of this study which was to find a higher share of households in the private rental market preferring to buy. Furthermore, the key findings of the second analysis of this study are that private renting is most common among young and low-income households, while less common among middle-aged and high-income households. When comparing 2021 to 2006, findings show there is a higher share of young and a lower share of old households in the private rental market in 2021, while finding no significant differences among the share of middle-aged households. This is not in line with the second expectation of this study, which was to find households remaining longer in the private rental market as they age. The third expectation of this study was that households are remaining longer in the private rental market as their income grows. The finding that a higher share of middle- and high-income households live in the private rental market in 2021 compared to 2006 is in line with this third expectation. This finding is especially interesting because the homebuying preferences of renters across income groups don't seem to have changed over time. Thus, while the share of high-income households in the private rental market is increasing, there is no greater share that prefers to buy and so there appears to be an increasing preference for private renting. This may relate to economic changes, demographic changes, policy design or changing housing preferences. However, the design of this study is unable to identify the actual explanation. A final observation is that income appears to be a less important determinant of housing tenure than age according to this study.

This research is relevant to current debates on government support for the housing market in the Netherlands and highlights the importance of Dutch policies aimed at improved accessibility and affordability of owner-occupied dwellings. The findings mainly underline the importance of focusing on the young and middle-aged households in supplying housing in the owner-occupied market. Furthermore, the findings substantiate the importance of preventing high-income households from taking recourse of available affordable private rental housing and stress the importance of encouraging those households to enter the owner-occupied market. The insights might provide support for various Dutch legislation such as the regulation of the rental market, policies stimulating affordable housing and policies that support homeownership & supply.

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# Appendices

## Figures and tables

Appendix A. Cramér's V for Pearson's Chi-squared<sup>a</sup>

|               | Year   | Age    | Income | Size          | Composition | Birth country | Urbanity | Province |
|---------------|--------|--------|--------|---------------|-------------|---------------|----------|----------|
| Year          | 1      | 0.1322 | 0.0001 | 0.0675        | 0.0703      | 0.0336        | 0.0491   | 0.1720   |
| Age           | 0.1322 | 1      | 0.2251 | 0.2956        | 0.3362      | 0.0690        | 0.0660   | 0.0360   |
| Income        | 0.0001 | 0.2251 | 1      | 0.2582        | 0.2741      | 0.0263        | 0.0296   | 0.0296   |
| Size          | 0.0675 | 0.2956 | 0.2582 | 1             | 0.6965      | 0.0588        | 0.0663   | 0.0428   |
| Composition   | 0.0703 | 0.3362 | 0.2741 | <b>0.6965</b> | 1           | 0.0666        | 0.0753   | 0.0435   |
| Birth country | 0.0336 | 0.0690 | 0.0263 | 0.0588        | 0.0666      | 1             | 0.0971   | 0.0864   |
| Urbanity      | 0.0491 | 0.0660 | 0.0296 | 0.0663        | 0.0753      | 0.0971        | 1        | 0.2216   |
| Province      | 0.1720 | 0.0360 | 0.0296 | 0.0428        | 0.0435      | 0.0864        | 0.2216   | 1        |

<sup>a</sup>All Pearson chi-squares are significant at  $p < 0.001$

Appendix B. Sample characteristics of the control variables by year and housing tenure.

| Woononderzoek<br>Nederland 2006 & 2021       | 2006        |                    | 2021        |                    | Difference    |                     |
|--|-------------|--------------------|-------------|--------------------|---------------|---------------------|
| Respondents in analytic<br>sample (n=76,872) | (n= 34,212) |                    | (n= 42,660) |                    | <i>t-test</i> |                     |
|  | Prop        |                    | Prop        |                    | Difference    |                     |
|  | Homeowners  | Private<br>renters | Homeowners  | Private<br>renters | Homeowners    | Private renters     |
|  | (n=30,013)  | (n=4,199)          | (n=37,292)  | (n=5,368)          | (n=7,279)     | (n=1,169)           |
| <b>Household composition</b>                 |             |                    |             |                    |               |                     |
| 1 person household                           | 0.1738247   | 0.4882115          | 0.2108495   | 0.4586438          | 0.0370248     | *** -0.0295677 **   |
| Couple                                       | 0.3681738   | 0.2843534          | 0.3897619   | 0.2831595          | 0.0215881     | *** -0.001194       |
| Couple + kids                                | 0.4174524   | 0.1340795          | 0.3501555   | 0.1097243          | -0.0672969    | *** -0.0243553 ***  |
| 1 parent family                              | 0.0312198   | 0.0509645          | 0.0417516   | 0.0655738          | 0.0105318     | *** 0.0146093 **    |
| Non-family household                         | 0.0093293   | 0.042391           | 0.0074815   | 0.0828987          | -0.0018478    | 0.009 0.0405076 *** |
| <b>Birth country</b>                         |             |                    |             |                    |               |                     |
| Dutch  | 0.9178689   | 0.8637771          | 0.9352408   | 0.876304           | 0.0173719     | *** 0.0125269       |
| Non-western                                  | 0.0391497   | 0.0662062          | 0.0286657   | 0.0469449          | -0.010484     | *** -0.0192614 ***  |
| Western                                      | 0.0429814   | 0.0700167          | 0.0360935   | 0.0767511          | -0.0068878    | *** 0.0067344       |
| <b>Urbanity</b>                              |             |                    |             |                    |               |                     |

|                 |           |           |           |           |            |     |            |     |
|-----------------|-----------|-----------|-----------|-----------|------------|-----|------------|-----|
| Centre-ruban    | 0.0579749 | 0.1419386 | 0.0479996 | 0.178465  | -0.0099753 | *** | 0.0365264  | *** |
| Outside centre  | 0.3186286 | 0.4760657 | 0.2974901 | 0.4049925 | -0.0211385 | *** | -0.0710732 | *** |
| Green-urban     | 0.136041  | 0.1295547 | 0.1189531 | 0.1104694 | -0.0170879 | *** | -0.0190852 | **  |
| Centre-village  | 0.360877  | 0.1955227 | 0.3959562 | 0.211997  | 0.0350793  | *** | 0.0164743  | *   |
| Rural           | 0.1264785 | 0.0569183 | 0.139601  | 0.094076  | 0.0131225  | *** | 0.0371577  | *** |
| <b>Province</b> |           |           |           |           |            |     |            |     |
| Groningen       | 0.0264552 | 0.0252441 | 0.0228467 | 0.0264531 | -0.0036085 | *** | 0.0012089  |     |
| Friesland       | 0.0309199 | 0.018814  | 0.029202  | 0.0255216 | -0.001718  | *** | 0.0067076  | *   |
| Drenthe         | 0.0370839 | 0.0238152 | 0.0218546 | 0.0134128 | -0.0152294 | *** | -0.0104024 | *** |
| Overijssel      | 0.0960917 | 0.0773994 | 0.0670385 | 0.0652012 | -0.0290532 | *** | -0.0121982 | *   |
| Flevoland       | 0.0279546 | 0.0138128 | 0.0364958 | 0.0242176 | 0.0085412  | *** | 0.0104048  | *** |
| Gelderland      | 0.1220471 | 0.111217  | 0.1516143 | 0.1289121 | 0.0295672  | *** | 0.0176951  | **  |
| Utrecht         | 0.0636058 | 0.0614432 | 0.0568755 | 0.0812221 | -0.0067303 | *** | 0.0197789  | *** |
| Nort Holland    | 0.1008563 | 0.175518  | 0.0853534 | 0.1289121 | -0.0155029 | *** | -0.0466059 | *** |
| South Holland   | 0.2513577 | 0.3269826 | 0.254505  | 0.3161326 | 0.0031472  |     | -0.01085   |     |
| Zealand         | 0.0927265 | 0.0481067 | 0.0374075 | 0.0203055 | -0.055319  | *** | -0.0278012 | *** |
| North Brabant   | 0.1091527 | 0.0826387 | 0.1439987 | 0.0983607 | 0.034846   | *** | 0.0157219  | **  |
| Limburg         | 0.0417486 | 0.0350083 | 0.0928081 | 0.0713487 | 0.0510595  | *** | 0.0363404  | *** |

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Appendix C. Bar charts of housing tenure

Figure C1. Housing tenure by year and age group

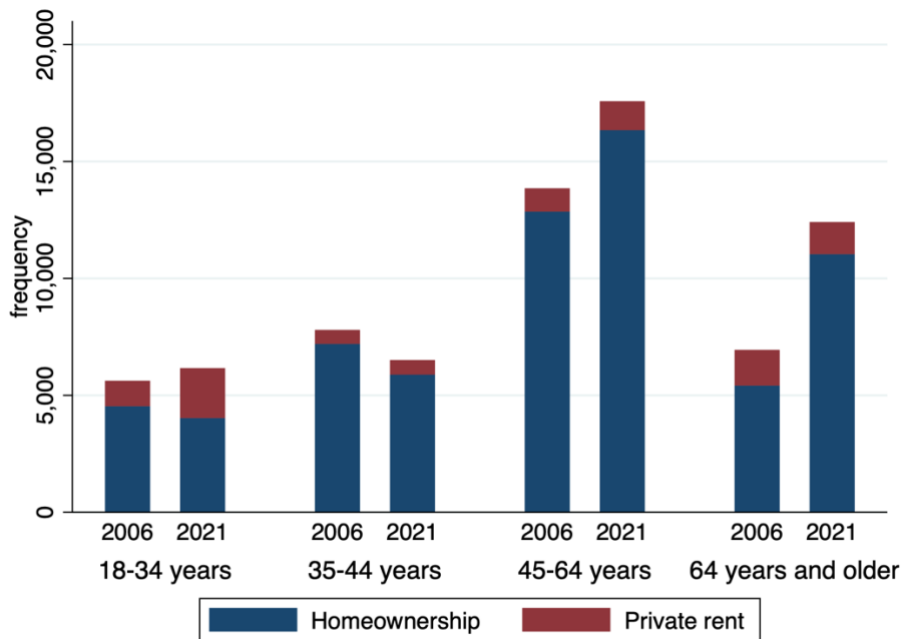
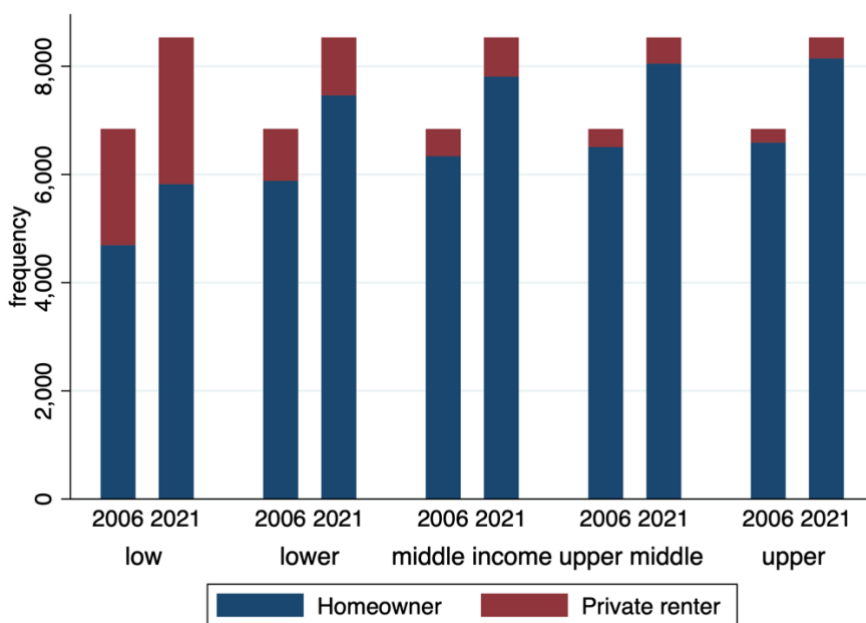


Figure C2: Housing tenure by year and income group



Appendix D. Assumptions of logistic regression analysis

| <i>Assumption</i>  | <i>Explanation</i>  |
|--|---|
| Binary nature of the dependent variable                      | Logistic regression requires some basic assumptions among which the binary nature of the dependent variable (Stoltzfus, 2011). This assumption is satisfied in this study since one of the dependent variables consists of two categories: homeowner and private renter.  |
| Multinomial nature of the dependent variable                 | Multinomial logistic regression requires some basic assumptions among which the multinomial nature of the dependent variable. This assumption is satisfied in this study since one of the dependent variables consists of three categories: want to stay renter, want to become homeowner & no propensity to move.  |
| Independency of observations                                 | Logistic regression requires independence of observations. This assumption is met since the unit level of the data is on household level.   |
| No multicollinearity   | The logistic regression model assumes there is no multicollinearity between the independent variables. The Cramér's V values for Pearson's Chi-squared (Appendix A) shows there is no high correlation between the included independent variables. Relying on the rule of thumb it is assumed there is no multicollinearity when these values are below 0.5.  |
| Linearity  | The logistic regression model assumes linearity between the independent continuous variables and log odds of the dependent variable. However, this does not apply in this research since all predictors that are included in the model have a categorical nature.   |
| Large sample size and absence of strong influential outliers | Logistic regression analysis requires a large sample size and absence of strong influential outliers. Due to the large size of the original datasets, there are 76.872 remaining observations after completing the data cleaning process. This is ample sufficient to perform such a regression analysis. In addition, due to the categorical nature of the variables there is no effect of outliers assumed. |

## *Notational glossary*

### Appendix E. Emperical models

$$(1) \quad \ln(\text{Pref\_ht})_{i,r,t} = \mu + \beta_1 \text{Year}_t + \beta_2 \text{Age}_i + \beta_3 \text{Income}_i + \beta_4 \text{Comp}_i + \beta_5 \text{Bcount}_i + \beta_6 \text{Urb}_i + \beta_7 \text{Prov}_r + \varepsilon_{i,r,t}$$

$$(2) \quad \ln(\text{Cur\_ht})_{i,r,t} = \mu + \beta_1 \text{Year}_t + \beta_2 \text{Age}_i + \beta_3 \text{Income}_i + \beta_4 \text{Comp}_i + \beta_5 \text{Bcount}_i + \beta_6 \text{Urb}_i + \beta_7 \text{Prov}_r + \varepsilon_{i,r,t}$$

Where:

$\text{Pref\_ht}_{i,r,t}$  is the homebuying preference of private renters (1 = want to become homeowner, 2 = want to stay renter, 0 = no propensity to move) on household level ( $i$ ) in year ( $t$ ), in province ( $r$ ),

$\text{Cur\_ht}_{i,r,t}$  is the current housing tenure (1 = private renter, 0 = homeowner) on household level ( $i$ ) in year ( $t$ ), in province ( $r$ ),

$\mu$  is the intercept and,

$\text{Year}_t$  is the year of observation

$\text{Age}_i$  is the age class of the main household,

$\text{Income}_i$  is the gross household income group of the household,

$\text{Comp}_i$  is the composition of the household,

$\text{Bcount}_i$  is the country of birth of the respondent,

$\text{Urb}_i$  is the urbanity of the location

$\text{Prov}_r$  is the province in which the respondent lives

$\varepsilon$  is the error term.

## Output regression analyses

### Appendix F. Multiple logistic regression analysis

| Multinomial logistic regressions<br>(n=9,567)               | Model 1                     |                        | Model 2                     |                     |
|---|-----------------------------|------------------------|-----------------------------|---------------------|
| DV: Preferred housing tenure, ref. no<br>propensity to move | Want to become<br>homeowner | Want to stay<br>renter | Want to become<br>homeowner | Want to stay renter |
|   | RRR                         | RRR                    | RRR                         | RRR                 |
| Constant  | 0.397***<br>[0.08]          | 0.199***<br>[0.041]    | 0.378***<br>[0.08]          | 0.208***<br>[0.046] |
| Year, ref. 2006   |                             |                        |                             |                     |
| 2021  | 2.566***<br>[0.16]          | 2.244***<br>[0.128]    | 2.940***<br>[0.406]         | 2.126***<br>[0.343] |
| Age category, ref. 35-44 years                              |                             |                        |                             |                     |
| 18-34 years   | 1.690***<br>[0.148]         | 1.273*<br>[0.128]      | 2.092***<br>[0.261]         | 1.275<br>[0.184]    |
| 45-64 years   | 0.297***<br>[0.027]         | 0.816*<br>[0.08]       | 0.286***<br>[0.04]          | 0.765<br>[0.11]     |
| 64 years and older  | 0.033***<br>[0.005]         | 0.427***<br>[0.044]    | 0.020***<br>[0.006]         | 0.407***<br>[0.058] |
| Income group, ref. middle income                            |                             |                        |                             |                     |
| Low income  | 0.352***<br>[0.033]         | 1.506***<br>[0.147]    | 0.356***<br>[0.034]         | 1.506***<br>[0.147] |
| Lower middle income   | 0.740**<br>[0.071]          | 1.266*<br>[0.134]      | 0.742**<br>[0.072]          | 1.265*<br>0.134     |
| Upper middle income   | 1.228<br>[0.139]            | 0.799<br>[0.117]       | 1.234<br>[0.14]             | 0.801<br>[0.117]    |
| Upper income  | 1.867***<br>[0.229]         | 0.893<br>[0.145]       | 1.870***<br>[0.23]          | 0.896<br>[0.145]    |
| Year (ref. 2006) × Age category (ref. 35-44 years)          |                             |                        |                             |                     |
| 2021 × 18-34 years  |                             |                        | 0.689*<br>[0.114]           | 0.968<br>[0.185]    |
| 2021 × 45-64 years  |                             |                        | 1.041<br>[0.192]            | 1.112<br>[0.217]    |
| 2021 × 64 years and older                                   |                             |                        | 1.903<br>[0.67]             | 1.079<br>[0.205]    |
| Household characteristics                                   |                             |                        |                             |                     |
| Household composition, ref. couple with kids                |                             |                        |                             |                     |
| 1 person household  | 1.125<br>[.109]             | 1.194<br>[.129]        | 1.124<br>[.109]             | 1.194<br>[.129]     |
| Couple  | 1.238*<br>[.119]            | 1.250*<br>[.140]       | 1.246**<br>[.120]           | 1.251*<br>[.140]    |
| 1 parent family   | 1.217<br>[.172]             | 1.513**<br>[.213]      | 1.201*<br>[.170]            | 1.509**<br>[.212]   |
| Non-family household  | 0.585***<br>[0.086]         | 2.310***<br>[0.329]    | 0.606**<br>[0.089]          | 2.344***<br>[0.334] |
| birth country, ref. western                                 |                             |                        |                             |                     |
| Dutch   | 1.474***<br>[0.167]         | 0.882<br>[0.089]       | 1.475***<br>[0.167]         | 0.882<br>[0.089]    |
| Non-western   | 0.993                       | 1.21                   | 0.973                       | 1.199               |

|                            |                    |                    |                   |                    |
|----------------------------|--------------------|--------------------|-------------------|--------------------|
|                            | [0.162]            | [0.172]            | [0.159]           | [0.17]             |
| Urbanity, ref. green-ruban |                    |                    |                   |                    |
| Centre-ruban               | 1.186<br>[0.138]   | 1.19<br>[0.129]    | 1.179<br>[0.137]  | 1.189<br>[0.129]   |
| Outside centre             | 1.311**<br>[0.135] | 1.360**<br>[0.127] | 1.288*<br>[0.133] | 1.356**<br>[0.127] |
| Centre-village             | 1.171<br>[0.13]    | 0.933<br>[0.096]   | 1.147<br>[0.128]  | 0.928<br>[0.096]   |
| Rural                      | 0.814<br>[0.113]   | 0.819<br>[0.108]   | 0.788<br>[0.11]   | 0.811<br>[0.107]   |
| Province, ref. Utrecht     |                    |                    |                   |                    |
| Groningen                  | 1.256<br>[0.269]   | 1.381<br>[0.265]   | 1.246<br>[0.267]  | 1.379<br>[0.265]   |
| Friesland                  | 1.141<br>[0.248]   | 0.892<br>[0.191]   | 1.13<br>[0.245]   | 0.89<br>[0.19]     |
| Drenthe                    | 1.48<br>[0.387]    | 1.009<br>[0.244]   | 1.481<br>[0.389]  | 1.008<br>[0.244]   |
| Overijssel                 | 1.302<br>[0.197]   | 0.861<br>[0.128]   | 1.28<br>[0.194]   | 0.856<br>[0.128]   |
| Flevoland                  | 1.077<br>[0.269]   | 1.318<br>[0.273]   | 1.048<br>[0.261]  | 1.307<br>[0.271]   |
| Gelderland                 | 1.139<br>[0.156]   | 0.934<br>[0.124]   | 1.122<br>[0.154]  | 0.93<br>[0.124]    |
| Nort Holland               | 1.093<br>[0.142]   | 1.018<br>[0.128]   | 1.078<br>[0.14]   | 1.013<br>[0.127]   |
| South Holland              | 1.065<br>[0.126]   | 1.013<br>[0.116]   | 1.055<br>[0.125]  | 1.01<br>[0.115]    |
| Zealand                    | 1.197<br>[0.256]   | 1.023<br>[0.196]   | 1.204<br>[0.259]  | 1.022<br>[0.196]   |
| North Brabant              | 1.324<br>[0.192]   | 1.077<br>[0.15]    | 1.297<br>[0.188]  | 1.072<br>[0.15]    |
| Limburg                    | 1.14<br>[0.189]    | 0.93<br>[0.146]    | 1.116<br>[0.185]  | 0.924<br>[0.145]   |
| Observations               | 9,567              |                    | 9,567             |                    |
| Pseudo R-squared           | 0.1813             |                    | 0.1822            |                    |

Note: the dependent variable is housing tenure preferences of private renters. The explanatory variables are year, age and income. The household specific and location specific control characteristics are household composition, birth country, urbanity and province. St. Errors are included in the model between brackets. The income categories in euros in both years differ due to inflation. Low income (€): 0 – 27,419 (2006) & 0 - 37,085 (2021), lower middle income (€): 27,420 - 41,082 (2006) & 37,086 - 52,854 (2021), middle income (€): 41,083 - 54,408 (2006) & 52,857 - 69,738 (2021), upper middle income (€): 54,411 - 72,877 (2006) & 69,739 - 95,284 (2021), upper income (€): 72,885 - 2,126,828 (2006) & 95,302 - 1,528,980 (2021). \*p < .05, \*\*p < .01, \*\*\*p < .001.



Appendix G. Logistic regression analysis

| Logistic regressions (n=76,872)                              | Model 1   |       | Model 2  |       | Model 3  |       | Model 4  |       |
|--|-----------|-------|----------|-------|----------|-------|----------|-------|
| DV: Current housing tenure: private rent, ref. homeownership | OR        | S.E.  | OR       | S.E.  | OR       | S.E.  | OR       | S.E.  |
| Constant   | 0.078***  | 0.006 | 0.098*** | 0.009 | 0.088*** | 0.008 | 0.090*** | 0.009 |
| Year, ref. 2006  |           |       |          |       |          |       |          |       |
| 2021   | 0.975     | 0.024 | 1,017    | 0.025 | 1.203**  | 0.078 | 1.189**  | 0.075 |
| Age category, ref. 35-44 years                               |           |       |          |       |          |       |          |       |
| 18-34 years  | 2.812***  | 0.113 | 2.412*** | 0.101 | 1.788*** | 0.108 | 2.414*** | 0.101 |
| 45-64 years  | 0.733***  | 0.029 | 0.731*** | 0.03  | 0.805*** | 0.047 | 0.725*** | 0.03  |
| 64 years and older   | 1.269***  | 0.052 | 0.831*** | 0.036 | 1.280*** | 0.075 | 0.824*** | 0.036 |
| Income group, ref. middle income                             |           |       |          |       |          |       |          |       |
| Low income   |           |       | 3.981*** | 0.156 | 3.840*** | 0.152 | 4.540*** | 0.264 |
| Lower middle income  |           |       | 1.462*** | 0.059 | 1.453*** | 0.059 | 1.729*** | 0.105 |
| Upper middle income  |           |       | 0.736*** | 0.036 | 0.735*** | 0.036 | 0.728*** | 0.055 |
| Upper income   |           |       | 0.646*** | 0.034 | 0.645*** | 0.034 | 0.611*** | 0.05  |
| Year (ref. 2006) × Age category (ref. 35-44 years)           |           |       |          |       |          |       |          |       |
| 2021 X 18-34 years   |           |       |          |       | 1.666*** | 0.135 |          |       |
| 2021 X 45-64 years   |           |       |          |       | 0.828*   | 0.066 |          |       |
| 2021 X 64 years and older                                    |           |       |          |       | 0.463*** | 0.036 |          |       |
| Year (ref. 2006) × Income group (ref. middle income)         |           |       |          |       |          |       |          |       |
| 2021 × low income  |           |       |          |       |          |       | 0.795**  | 0.059 |
| 2021 × lower middle income                                   |           |       |          |       |          |       | 0.739*** | 0.06  |
| 2021 × upper middle income                                   |           |       |          |       |          |       | 1,021    | 0.1   |
| 2021 × upper income  |           |       |          |       |          |       | 1,102    | 0.116 |
| Houshold characteristics                                     |           |       |          |       |          |       |          |       |
| Household composition, ref. couple with kids                 |           |       |          |       |          |       |          |       |
| 1 person household   | 6.116***  | 0.231 | 2.919*** | 0.122 | 2.925*** | 0.123 | 2.929*** | 0.122 |
| Couple   | 2.063***  | 0.081 | 1.822*** | 0.074 | 1.825*** | 0.074 | 1.829*** | 0.074 |
| 1 parent family  | 5.620***  | 0.324 | 2.949*** | 0.182 | 2.931*** | 0.181 | 2.949*** | 0.182 |
| Non-family household   | 11.547*** | 0.829 | 6.009*** | 0.46  | 5.688*** | 0.436 | 5.891*** | 0.452 |
| Birth country, ref. western                                  |           |       |          |       |          |       |          |       |

|                            |          |       |          |       |          |       |          |       |
|----------------------------|----------|-------|----------|-------|----------|-------|----------|-------|
| Dutch                      | 0.548*** | 0.027 | 0.558*** | 0.028 | 0.564*** | 0.029 | 0.557*** | 0.028 |
| Non-western                | 0.863*   | 0.063 | 0.724*** | 0.054 | 0.776*** | 0.058 | 0.720*** | 0.054 |
| Location characteristics   |          |       |          |       |          |       |          |       |
| Urbanity, ref. green-ruban |          |       |          |       |          |       |          |       |
| Centre-ruban               | 2.226*** | 0.108 | 2.239*** | 0.112 | 2.188*** | 0.11  | 2.231*** | 0.112 |
| Outside centre             | 1.195*** | 0.047 | 1.125**  | 0.046 | 1.128**  | 0.046 | 1.122**  | 0.046 |
| Centre-village             | 0.600*** | 0.025 | 0.556*** | 0.024 | 0.553*** | 0.024 | 0.555*** | 0.024 |
| Rural                      | 0.726*** | 0.038 | 0.676*** | 0.036 | 0.680*** | 0.037 | 0.675*** | 0.036 |
| Province, ref. Utrecht     |          |       |          |       |          |       |          |       |
| Groningen                  | 1,138    | 0.1   | 0.885    | 0.08  | 0.913    | 0.083 | 0.884    | 0.08  |
| Friesland                  | 0.89     | 0.08  | 0.675*** | 0.062 | 0.700*** | 0.065 | 0.676*** | 0.062 |
| Drenthe                    | 0.782*   | 0.075 | 0.608*** | 0.06  | 0.631*** | 0.062 | 0.608*** | 0.06  |
| Overijssel                 | 0.868*   | 0.055 | 0.699*** | 0.045 | 0.728*** | 0.048 | 0.700*** | 0.046 |
| Flevoland                  | 0.626*** | 0.057 | 0.523*** | 0.049 | 0.548*** | 0.052 | 0.528*** | 0.05  |
| Gelderland                 | 1,031    | 0.058 | 0.883*   | 0.051 | 0.915    | 0.054 | 0.887*   | 0.052 |
| Nort Holland               | 1.286*** | 0.072 | 1.218*** | 0.07  | 1.254*** | 0.072 | 1.221*** | 0.07  |
| South Holland              | 1.140**  | 0.057 | 1,058    | 0.054 | 1,087    | 0.056 | 1,063    | 0.055 |
| Zealand                    | 0.668*** | 0.052 | 0.532*** | 0.042 | 0.536*** | 0.043 | 0.530*** | 0.042 |
| North Brabant              | 0.827**  | 0.049 | 0.711*** | 0.043 | 0.736*** | 0.045 | 0.714*** | 0.043 |
| Limburg                    | 0.937    | 0.063 | 0.743*** | 0.052 | 0.782*** | 0.055 | 0.748*** | 0.052 |
| Observations               | 76,872   |       | 76,872   |       | 76,872   |       | 76,872   |       |
| Pseudo R-squared           | 0.1673   |       | 0.2091   |       | 0.2158   |       | 0.2096   |       |

Note: the dependent variable is households' housing tenure. The explanatory variables are year, age and income. The household specific and location specific control characteristics are household composition, birth country, urbanity and province. St. Errors are included in the model between brackets. The income categories in euros in both years differ due to inflation. Low income (€): 0 – 27,419 (2006) & 0 - 37,085 (2021), lower middle income (€): 27,420 - 41,082 (2006) & 37,086 - 52,854 (2021), middle income (€): 41,083 - 54,408 (2006) & 52,857 - 69,738 (2021), upper middle income (€): 54,411 - 72,877 (2006) & 69,739 - 95,284 (2021), upper income (€): 72,885 - 2,126,828 (2006) & 95,302 - 1,528,980 (2021). \*p < .05, \*\*p < .01, \*\*\*p < .001.