The Startersloan: a leg-up onto the Dutch housing market for first-time buyers? A study on the effectiveness of targeted incentive policy

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A study on the effectiveness of targeted incentive policy

Master Thesis Economics & Governance

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1.Introduction

The research question and research goal

The purchase of a first home is considered a milestone in people's lives as home ownership does not only provide wealth accumulation and security in old age, it is also 'a key element of a 'successful' lifestyle package' (Helderman, 2007; McKee, 2012). However, the purchase of a first home has become a difficult affair in many European countries, as outsiders on the housing market struggle to find a home within their price range (Voigtländer. 2019, p. 54). According to McKee (2012, p. 855) the insider and outsider conflict or inter-generational conflict on the housing market demands government interference as 'to avoid the creation of a lost generation' of young adults that are forced to postpone or cancel the purchase of their first home. The Startersloan or 'Starterslening' is a local policy that aims to repair a part of this major problem by providing first-time buyers with an extra loan on top of their mortgage to buy their desired house (SVn. 2018, 21 November). In 2002 the Startersloan was introduced by SVn or 'Stimuleringsfonds Volkshuisvesting Nederlandse gemeenten', a non-profit organisation that finances the loans with contributions from participating municipalities, provincial governments and housing associations (Elsinga, Hoekstra & Dol, 2014).

The goal of this research is to establish whether the Startersloan is effective in achieving its main aim, to increase home ownership rates among first-time buyers. Based on existing literature on both the effectiveness of generic and targeted incentive policy, the expectation is that the Startersloan is effective in increasing the accessibility into homeownership among first-time buyers (Atterhög, 2006; Chen & Enström-Öst, 2005; Verwoerd, Schep and Mulder, 2014; Bloxham, McGregor and Rankin, 2010). The main question of this research is:

Is the Startersloan effective in increasing accessibility into homeownership for first-time buyers, compared to a situation without the Startersloan?

This research question will be answered by measuring the effect of the Startersloan on the level of relocated first-time buyers for 355 municipalities over the period of 2010 to 2020. The Startersloan is a local policy that is not offered to first-time buyers in all municipalities and the level of municipalities that offer the loan changes over time (SVn. 2018, 21 November). By making use of this temporal and spatial variation in the Startersloan the 'what if' question can be answered (Verwoerd et al., 2014) as naturally a treatment group, municipalities that offer the Startersloan, and control group, municipalities that do not, are created over time. This makes it possible to compare the levels of relocated first-time buyers of these two groups to answer the question what would have been the level of relocated starters if it had not been for the Startersloan or treatment effect. The independent variable is a dummy variable that captures the presence (1) or absence (0) of the Startersloan for each municipality for each year. Data from Statistics Netherlands is used for the dependent variable relocations that captures the level of relocated people in the age group of 20 to 40 years (CBS. 2021, 3 September). This age group is selected because the Startersloan is a local and specifically targeted policy that is only responsible for a small share of total home purchases (SVn, 2020).

The data will be analysed by using a Fixed Effects (FE) Model with a Least-Squares Dummy Variables (LSDV) model as a benchmark.

Scientific and Societal relevance

While the different types and the effectiveness of generic policies that aim to increase homeownership are more widely researched (Whitehead & Scanlon, 2002), this not the case for targeted incentive policy at first-time buyers. Atterhög (2006) and Chen and Enström-Öst (2005) found that generic incentive policies are effective in increasing homeownership rates. Verwoerd et al. (2014) and Mulder et al. (2014) researched the effect of the Startersloan, but only for the years 2013 and 2014 and Mulder et al. (2014) only researched the region of Amersfoort. It is mainly the lack of a time dimension in these studies that weakens the results that do show that the Startersloan is effective in increasing first-home purchases. Empirically measuring the effect of public policy is difficult as it is often not possible to capture policy at all (Atterhög, 2006, p. 20) or because there is not enough variation in this policy over time and location to really isolate its effect (Dungey et al., 2011). Furthermore, Flatau (2003, p. 1) argues that the long-term effect of incentive policies that aim to increase homeownership is unclear. The main contribution of this research is that it captures the effect of policy on real-life data, by making use of the variation in this policy over time and location, for a longer time period and for the entire country. Furthermore, this research not only provides useful insights into the effectiveness of a widely used but under-researched Dutch policy but also into the effectiveness of (targeted) incentive policies on the housing market in general. To conclude, this research also addresses the much broader question whether government interference on the housing market is not only effective on paper but also in real-life, which is highly relevant for research in the field of Public Administration.

McKee (2012, p. 857) and Voigtländer (2019, p. p. 54) argue that the exclusion of young adults on the housing market has become an international phenomenon in the last decade. A survey in the Netherlands among 6.300 prospective first-time buyers in 2021, initiated by SVn among others, illustrates the difficult position of first-time buyers. In this survey, 78% of the respondents considers the housing market unfavourable, 89% thinks that buying a house in not a good idea at the moment and of the respondents that live with their parents 92% indicate that this is out of pure necessity (Startenopdewoningmarkt.nl, 2021). The societal relevance of this research is that it is important for policymakers, municipalities and most of all first-time buyers, to establish whether the Startersloan is actually effective in aiding first-time buyers. Furthermore, there might be drawbacks to the Startersloan policy. The Startersloan, like similar policies, might increase housing prices through increased demand (Lee & Reed, 2014). Although empirical evidence on this relationship is scarce (Lee & Reed, 2014; Verwoerd et al., 2014) , the view that the Startersloan might increase housing prices is shared by some local councillors and estate agents who therefore advice against this policy (Van Kooten. 2021, 8 August). Another drawback is that the Startersloan is not risk free, for both recipients and municipalities. Opponents of the Startersloan argue that this policy encourages young people to pile debt on debt (Bekkers. 2014, 8 August), which can lead to financial problems (Vogels. 2021, 11 October).

A risk of the Startersloan for municipalities is that it is unclear whether municipalities get repaid after compulsory sale as it concerns a second mortgage (Bekkers. 2014, 8 August; Mulder et al. 2014, p. 25). Overall, the Startersloan is the most costly product SVn provides with a total value at the end of 2020 of 621 million (SVn, 2020). Because of the possible drawbacks of the Startersloan it is important from a societal perspective to establish its effectiveness. Furthermore, this research is also relevant in light of the increasing popularity of the Startersloan as a policy instrument to make homeownership possible for young adults (SVn, 2020).

Main results and structure

The results partly confirm the prediction of the effect of the Startersloan. The Startersloan has a positive significant effect on the level of relocated first-time buyers that relocate within their own municipality, but not on the level of relocated first-time buyers that have settled in a municipality from elsewhere. In the next chapter the theoretical framework is discussed that first addresses the Startersloan and its broader context and then moves on to the effectiveness of both generic and targeted incentive policy. Chapter 3 discusses the data and chapter 4 discusses the methodology and choice of research method. The results are presented in chapter 5, followed by a discussion in chapter 6 and the conclusion in the final chapter.

2. Theoretical Framework

2.1. The Startersloan

The Startersloan covers the difference between the maximum mortgage the bank can provide and the purchase price of a house (SVn. 2018, 21 November). Even though there is a public mortgage guarantee scheme NHG (Nationale Hypotheek Garantie) that enables home buyers to get a top mortgage without having to pay higher interest rates, the maximum of this mortgage depends on the income of applicants. For first-time buyers with a limited income the maximum mortgage can therefore be lower than the purchase price of the desired house (Dol, Hoekstra & Elsinga, 2012, p. 6). With the Startersloan these first-time buyers are still able to buy the house.

Characteristics of the Startersloan

Since the introduction of the Startersloan around half of all municipalities have provided this policy at some point in time. The maximum amount of loans that a municipality can provide per year depends on the municipal budget. Both the provision of the loan and the take-up can vary between municipalities and over the years (Verwoerd, Schep and Mulder, 2014). SVn sets the general rules and conditions of the Startersloan of which the main one is that only first-time buyers can apply when they have found their desired house (Elsinga, Hoekstra & Dol, 2014). Firstly, no interest has to be paid over the first three years of home occupancy. After three years interest needs to be paid, but at a fixed rate for the first 15 years. Secondly, the capital gains of the house do not have to be paid back to the lender. Thirdly, income tests will point out whether the home owners can afford interest payments and repayments on the loan. Recipients of the Startersloan have to pay back the loan before they move house or within a period of 30 years (Elsinga et al., 2014. p. 248-252) Overall the Startersloan is more affordable than conventional owner occupation, which is a situation in which home buyers are not entitled to affordable home ownership products (Elsinga et al., 2014, p. 254). According to SVn, beneficiaries of the Startersloan do not get into financial difficulties, as 17% has completely repaid the loan after 6 years and 76% is already repaying the loan after this time period (SVn. 2018, 21 November).

Next to the general rules of SVn, municipalities are entitled to ask conditions of applicants before the loan is provided. The most frequent asked conditions are conditions on the type of house, whether applicants have a historical, social or economic connection to the municipality, the maximum loan and the minimum and maximum age of applicants (Verwoerd, Schep and Mulder, 2014). The first condition indicates whether applicants are allowed to buy newly built, existing built or both of these home types. The second condition is a binding requirement. A historical connection means that applicants have lived or still live within municipal boundaries. A social connection demands that applicants have family living within municipal boundaries. The economic connection demands that applicants have at least a parttime job in the municipality (Verwoerd, Schep and Mulder, 2014). The reason why some municipalities ask binding requirements of applicants is that they want to give local starters the opportunity to start their housing career in a place they are connected with, as opposed to outsiders who are newcomers. A connected reason can be that the municipal budget only allows for a small

amount of loans to be supplied and that municipalities want to ensure that these loans are given to insiders (Dol, Hoekstra & Elsinga. 2020, p. 21). Lastly, the condition on the maximum loan is not a condition asked of applicants but one set by the municipality. But is can be seen as conditioning because the maximum loan can vary between a minimum of 10.000 to a maximum of 70.000 which provides recipients with different possibilities for their future home (Verwoerd et al., 2014). Even though these conditions can vary between municipalities the condition on age shows little variation. According to Mulder, Schep and Verwoerd (2014, p. 38) since 2002 all recipients of the loan have been between the ages of 20 to 40, which corresponds with the target group as all municipalities have a minimum age of 18 and a maximum age of 40 or 45 at most.

In view of other affordable housing products this loan has accumulated a sizeable market share. In 2012 around 14.000 home purchases took place with the Startersloan and in 2018 this number had risen to more than 40,000 transactions (Elsinga et al., 2014; SVn, 2018, 21 November). From 2018 to 2020 onwards each year around 2500 loans were supplied to starters, with a total financial worth between 61 to 68 million. While SVn provides other products to municipalities, the Startersloan is by far the most costly product for both SVn and participating municipalities (SVn, 2018; SVn, 2019; SVn, 2020). The Startersloan has no competition from similar policies as there are no substitute policies for starters that need extra funds to cover their mortgage. The starters interest rule, 'starters renteregeling', provided by housing associations pays 20% of the interest rate on a mortgage in advance for the first ten years (Dol et al., 2012). This policy is not a substitute for the Startersloan as it has a much smaller market share and it only relevant for people who have already bought a house but are struggling with the expenses of home ownership (Elsinga et al., 2014).

Goal of the Startersloan

The main goal of the Startersloan is to make home ownership more accessible for first-time buyers (SVn. 2018, 21 November). This means that the Startersloan intends to increase home ownership rates among first-time buyers by providing them with a financial leg-up onto the property market. The Startersloan enables the purchase of a house that could not have been purchased otherwise (Elsinga et al., 2014, p. 248). Furthermore, increasing home purchases among first-time buyers will also increase other transactions on the housing market and especially in smaller municipalities the Startersloan is used to counteract the aging population (Dol et al., 2012, p. 21). Even though the Startersloan is a local policy measure, this policy and the goal it aims to achieve is also supported by the national government (Dol et al., 2012, p. 21-23). The national government acknowledges the difficulties of first-time buyers on the property market, which is visible in substantial national investments in the SVn Startersloan fund in 2006 and 2013. For every loan provided by a municipality, 50% of this loan would be paid by the national government. The overall aim was to encourage more municipalities to implement the Startersloan and to enable municipalities that already offered the Startersloan to aid twice as many first-time buyers (SVn. 2018, 21 November)[2]. SVn acknowledges that next to the Startersloan other supply side policies, like building new affordable homes, are necessary to increase accessibility to the property market for first-time buyers (SVn, 2020, p. 2).

2.2. Broader context of the problem the Startersloan addresses

Inter-generational conflict

Voigtländer (2019, p. 54) argues that countries in the Eurozone are faced with the risk that homeownership is becoming a luxury good only accessible and attainable for the rich. McKee (2012, p. 857) speaks of an inter-generational conflict on the housing market between the 'housing poor' young adults and their 'housing rich' elders. Because of this conflict young people are excluded from the property market which is visible in declining home ownership rates among young people, which is becoming an international phenomenon (McKee, 2012, p. 854). The conflict McKee (2012) speaks of is also referred to as the insider and outsider separation on the housing market caused by a failure of the housing market (Vandevyvere & Zenthöfer, 2012). Because demand for homes is elastic while supply of homes is inelastic, the supply of houses does not adapt swiftly to changes in demand. Resulting in a mismatch on the housing market. Furthermore the swift changing of demand also influences the housing prices, and although this change is not immediate it is quicker than the change in supply. Because of this mismatch people who could have moved on to another house that is more fitted to their work and housing career stay put, creating a shortage of affordable homes that are suited for starters (Vandevyvere & Zenthöfer, 2012, p. 10).

The position of starters on the housing market is defined by their youth and financial position. They can be characterized as young people between the ages of 18 to 35 years old (Kotler & Armstrong. 2008, p. 170) although the age at which they buy a first home is increasing (McKee, 2012). Furthermore, starters are characterised by their limited income and short work career (Martens, 2009). Which means they are inclined to buy a smaller house (Clark & Onaka, 1983), that is existing built and in the low- to middle price segment (Martens, 2009; Mulder & Wagner, 2001). Mulder & Wagner (2001, p. 147) state that home ownership is often pursued by couples, not so much singles, who wish to become parents at some point in the future. Due to the mismatch on the housing market the opportunity of buying a house that fits the characteristics of first-time buyers is small (McKee, 2012). According to Tähtinen (2005, p. 19) the threshold for the purchase of a first home can be viewed as a key requirement of a well-functioning housing market. In many western countries this threshold has become too high and young adults are being excluded from the property market (McKee, 2012; Voigtländer, 2019).

The gains of home ownership

McKee (2012, p. 859) states there may be serious implications for young adults who enter homeownership much later or not at all during their housing career. These implications are related to the benefits home ownership brings, as opposed to living in rented property. The main private benefit of home ownership is that owner-occupied homes are both consumption and investment goods that are major drivers of individual wealth accumulation (Voigtländer. 2019, p. 54). Even though the costs of owner-occupied living are the highest of any tenure form, the level of personal wealth accumulation per year for home owners is much higher than any other tenure form (Elsinga. 2005, p. 90). Even for first-time buyers, who have to deal with monthly mortgage payments on low incomes, buying is still financially superior to renting as it takes

them only a couple of years to break-even after home purchase (Mostafa & Jones, 2019, p. 113). Homeownership also comes with a higher quality of living as owner-occupied homes are often larger with a garden, while the location of these homes is related to community participation, good schools and high quality healthcare facilities (Atterhög & Song, 2009; Boelhouwer, Doling, Elsinga & Ford, 2005). Furthermore, home ownership comes with social gains as it represents status, freedom and a sense of security (Helderman, 2007, p.11). Because of these private benefits owner occupancy is typically regarded as the most preferred form of tenure (Tähtinen, 2005, p. 19; Doling & Elsinga, 2006, p. 260).

From a societal point of view there must be a public interest of stimulating a particular tenure form that generates benefits to people other than the home owner (Coulson & Li. 2013, p. 57). The biggest advantage of home ownership for society is that it promotes economic growth (Voigtländer. 2019, p. 54). Schmidt (2016, p. 2) explains that home ownership increases consumption directly and indirectly through related goods and services and the creation of jobs, which leads to an increase in GDP. Furthermore, the cumulated private benefits of wealth accumulation that home ownership brings create a wealthier population (Schmidt, 2016, p. 15). Homeownership is both an important source of private and national wealth, that is used to justify government interference on behalf of (potential) home-owners (McKee. 2012; Schmidt, 2016).

The Startersloan is a demand-sided policy that does not aim to solve the underlying mismatch or inter-generational conflict on the housing market. It aims to relieve the symptoms of this problem by providing starters with extra financial means to obtain a home that otherwise could not have been purchased (Elsinga et al., 2014, p. 248). As discussed in paragraph 2.2 SVn acknowledges that the Startersloan is not the solution to the problem and that supply-sided policies are also needed (SVn, 2020).

2.3. The effectiveness of generic incentive policies

Governments in Europe have promoted a shift in tenure balance from the rented sector to the property sector through a range of incentive policies (Boelhouwer et al., 2005, p. 1). These incentive policies are an umbrella term for all policy measures that provide a financial incentive to make home ownership more accessible and affordable (Whitehead & Scanlon, 2002). The theoretical effectiveness of these policies is based on the neo-classical economic assumption that people are rational, utility maximising actors who can be extrinsically motivated through financial incentives to make a certain choice in line with the policy goal (Fall & Roussel, 2014; Bénabou & Tirole, 2009). However, financial encouragement comes on top of the natural preference of people for home ownership and therefore works as an extra nudge, especially for those with limited incomes (Doling & Elsinga, 2006, p. 260; Voigtländer, 2019, p. 58). According to Whitehead and Scanlon (2002, p. 13) most widely used incentive policies are generous mortgage regulations and fiscal benefits, like mortgage interest tax deductibles, exemption or reductions in transfer tax, property tax relief, high loan-to-value ratios for a mortgage or low mortgage interest rates (Whitehead & Scanlon, 2002).

Empirical findings on generic incentive policy

According to Atterhög (2006, p. 8) government policies have a significant influence on peoples' tenure choice. To measure the policy effect on home ownership rates, Atterhög (2006, p. 21) collected questionnaires from housing researchers in 13 OECD countries with questions regarding the generosity of policy support for home ownership, varying on a scale from no support (0) to very generous support (5). Data was collected for a period of 1970 to 2000. Atterhög (2006, p. 27-31) found a strong statistically significant and positive relationship between government support and home ownership rates. An increase of 0,1 government support on the scale from 0 to 5 increased the home ownership rates by 0,8% in non-Anglophone countries, including the Netherlands. Chen and Enström-Öst (2005) researched the effect of the Swedish housing allowance on the tenure choice of recipients in Swedish urban areas for the period of 1994 to 2002. A housing allowance is a monthly allowance for all tenure types provided to low-income households. Although the goal of this policy is aimed at aiding low-income households to increase their housing quality, it unintentionally encourages recipients to buy a house. The authors found that when the housing allowance increases, the propensity of average recipients to becoming home owners increases. According to Chen and Enström-Öst (2005, p. 622-624) the housing allowance works as a financial incentive that gives people the opportunity to save their monthly allowances for a deposit on a house.

2.4. The effectiveness of affordable homeownership products

The studies of Atterhög (2006) and Chen and Enström-Öst (2005) provide evidence that incentive policies are effective in increasing accessibility into homeownership. However, these studies provide no evidence of the effect of specifically targeted incentive policies, like first-time buyers for instance. A special branch of demand-side incentive policies that aim to increase accessibility of a specific group of people onto the property market, are labelled 'affordable homeownership products' by Elsinga et al. (2014, p. 239). McKee (2012, p. 853) also sets these targeted measures aside form generic policies like fiscal benefits that are available for the entire population. Elsinga et al. (2014, p. 238) state that 'there is a whole range of affordable homeownership products in which the home owner receives a 'subsidy' which needs to be paid back later on'. One type of these products are special loans for first-time buyers of which the Startersloan is the main example (Elsinga et al., 2014). Flatau (2003, p. 1) argues that while governments believe that targeted policies for young adults are effective, the potential increase in homeownership rates will only have be short-term effect and that the long-term effect of these policies is unclear.

2.4.1. Affordable homeownership products: Effectiveness of the Startersloan

Effectiveness of the Startersloan

Verwoerd, Schep and Mulder (2014) have researched the effect of the Startersloan for the years 2013 and 2014 by using the SVn database of 5.500 recipients and by holding a survey that 1.572 recipients filled in. The findings provide three important insights into the effectiveness of the Startersloan. The answers of recipients on the survey question what they would have done without the Startersloan, showed that 72% of the respondents would have postponed the purchase of their first home for at least a year. Another 22% answered that without the Startersloan they would not have bought a house at all. This means that the Startersloan not only offers starters an earlier entry onto the property market but for a portion of people the Startersloan provided them with enough incentive to become home owners while they had not considered this before (Verwoerd et al., 2014, p. 7-8). Furthermore, the Startersloan was effective in increasing home ownership rates which was measured through an increase in transactions or home purchases. Verwoerd et al. (2014) found that the total amount of 13.000 provided loans caused 21.900 extra transactions in 2013 and 2014, which means that these transactions are purely caused by the Startersloan. These extra transactions are 7% more than would have been the case without the Startersloan (Verwoerd et al., 2014, p. 22). These extra transactions also capture the snowball effect a home purchase has on other transactions on the housing market. The increase in transactions also increased the overall flow on the housing market as 80% of recipients bought an existing house and 20% a new-built house , which enabled other home purchases and home moves (Verwoerd et al., 2014, p.17).

The positive effect of the Startersloan also crosses municipal borders because one transaction sets others in motion that are outside municipal boundaries (Mulder et al., 2014, p. 35-36). Furthermore 47% of the respondents states that they moved from their parental home and 34% say they moved out of a rented home. In total the researchers state that the provision of 100 loans enable 51 to 53 homes to become available for purchase or renting. Verwoerd et al (2014, p. 7). To conclude, the Startersloan also influenced the moving behaviour of starters. The survey answers showed that 11% of the respondents answered that the availability of the Startersloan influenced their choice of municipality. These respondents indicated that they partly choose one municipality over the other based on the provision of the Startersloan (Verwoerd et al., 2014, p. 14).

The effect of the conditions of the Startersloan

The same researchers also researched the effect of the conditions that vary between municipalities on the effectiveness of the Startersloan. This study was conducted for the years 2012 to 2014 but only for the region of Amersfoort for the following municipalities: Amersfoort, Baarn, Barneveld, Bunschoten, Eemnes, Leusden, Nijkerk, Soest and Woudenberg (Mulder, Schep & Verwoerd. 2014). The researchers analysed the effect of a condition by comparing municipalities in the region of Amersfoort that have this condition to a similar region in the Netherlands that offers the Startersloan but then without that specific condition (Mulder et al., 2014, p. 7).

Mulder et al. (2014, p. 32-36) argue that the condition on the type of house restricts the use of the Startersloan and advise municipalities to cancel this condition. Furthermore, Mulder et al. (2014, p. 45) state that the origin condition, that only offers the loan to local residents, has a restrictive effect on the use of the Startersloan and advise municipalities to lift this condition. In municipalities where all first-time buyers can apply, whether insiders or outsiders, the Startersloan was used two to three times as much as in the region of Amersfoort where the origin condition is required of applicants (Verwoerd et al., 2014, p. 14). The authors conclude that the protection of the municipal housing market in favour of insiders in the end limits regional moving dynamics which results in an overall lower use of the loan (Mulder et al. 2014, pp. 35-36). Concerning the generosity of the Startersloan, Mulder et al. (2014, p. 52) argue that it is not necessarily the case that a lower loan discourages people from applying for the loan and buying a house all together. Because the incentive to buy is already there when people apply for the loan, a low or lower loan is not likely to discourage them. A higher loan will therefore not increase the use of the Startersloan (Mulder et al., 2014, p. 37). The researchers found a correlation between the height of the provided loan and the purchase price of the house, which shows that a higher maximum loan leads to a higher purchase price. A higher loan will merely encourage people to buy a house of higher quality, it does not increase the incentive to buy in the first place (Mulder et al., 2014, p. 52).

2.4.2. Affordable homeownership products: International perspective

Several European countries have implemented affordable homeownership products to give first-time buyers a leg-up onto the property market. Examples are, the German Bausparen program that enables first-time buyers to save for their deposit via house-savings contracts. In Greece first-time buyers are exempted from transfer tax and in Ireland the mortgage interest is deductible up to a certain amount for first-time buyers (Whitehead & Scanlon, 2002). However, research on the effectiveness of these targeted incentive policies is limited and these products can differ greatly between countries, which makes comparison difficult (Elsinga et al., 2014, p. 237). There are however two policy schemes that fall within the affordable homeownership product-category (Elsinga et al., 2014), for which the effectiveness was researched: the British Starter Home Initiative and the Australian First Home Owner Grant.

The UK Starter Home Initiative

The Starter Home Initiative, implemented in 2001, enables first-time buyers to apply for a loan to buy property (Munro, 2007), which is similar to the Startersloan. However, this policy is only available for keyworkers like teachers and health workers and only for pressurised areas in England. While the goal was to aid 10.000 keyworkers before 2004, only 3300 starters were aided despite high government investments of around 300 million pounds (Munro, 2007). Munro (2007, p. 255) and Poon and Garrett (2012, p. 255) question the effectiveness of this policy, as it remained too small in scale to really attract enough recipients and to have an effect on home ownership rates among this group. This illustrates that targeting a very specific group might not be effective as the take-up of the policy can be small (Munro, 2007).

The Australian First Home Owner Grant

The First Home Owner Grant (FHOG) was introduced in 2000 by the Australian government and the territory governments and provide every first-time buyer with a cash grant of 7000 Australian dollars (Dungey, Wells & Thompson, 2011). Lee and Reed (2014, p. 1074-1075) found evidence of increased affordability of home ownership, measured with an index that indicates the affordability of a house, due to the FHOG scheme in Sydney for the years 2000 to 2010. However, there is no evidence that this increase in affordability is also visible in higher homeownership rates or accessibility. Furthermore, there is no guarantee that the cash grants are spend on the purchase of a house, which is the case with the UK Starter Home Initiative and the Startersloan. Randolph, Pinnegar and Tice (2013, p.71) also researched the effect of the FHOG scheme in Sydney, but found that increased housing affordability because of FHOG is only the case in times of economic downturn. While the results of Lee and Reed (2014) and Randolph et al. (2013) are contradictory, Bloxham, McGregor and Rankin (2010, p. 4) found a positive correlation between the level of first-home transactions and the value of FHOG grants. In 2008 and 2009 during the financial crisis the Australian government increased the value of grants, which was followed by a boost in first-home buyer activity on the housing market. In 2009 grant recipients were accountable for more than 40% of total housing turnover, while this previously was 25-30%. A reduction of the grant back to its original level of 7000 was followed by a decline in first-home buyer transactions (Bloxham et al., 2010). Even though these findings are based on correlation and not causation, it provides evidence that an affordable home ownership product like the FHOG can increase first home purchases.

Dungey et al. (2011, p. 7) argue that the difficulty of measuring the effectiveness of policy is often caused by insufficient temporal and spatial variation in this policy to isolate the policy effect. The authors lay the base for further research by arguing that there is enough spatial and temporal variance in the FHOG scheme and local tax benefits per territory, to capture the effect of these policies on the moving behaviour of first-time buyers. In Australia the generosity of support to first-time buyers can differ per territory, like the provision of the Startersloan differs per municipality. The authors predict that territories that have the highest level of benefits will see higher levels of relocated starters than territories with a lower level of benefits. This would indicate that monetary incentives are effective in increasing home ownership rates among first-time buyers which would be visible in the relocations of starters to generous locations, as the purchase of a house is followed by a relocation to this house (Dungey et al., 2011).

2.5. Determinants of relocations

Mulder et al. (2014, p. 35-36) state that the use and effectiveness of the Startersloan does not only depend on the loan and conditions itself but also on the overall appeal of a municipality Furthermore, the choice for a certain house and municipality is based on personal preferences that are determined by factors like household composition, income and social contacts (Doling & Elsinga, 2006; Kotler & Armstrong, 2008).

Local factors

The appeal of a municipality is based on specific local or locational factors (Karsten, 2007). The most important factors are the proximity or availability of infrastructure like motorways, green surroundings and the proximity to services like shops, healthcare, schools and public transport (Karsten, 2007; Wu, 2010). These factors are 'hard' or tangible characteristics of the location and are deemed more important by housing consumers than the 'soft' intangible characteristics like the aesthetics of the surroundings or neighbourhood connections (Kauko, 2006. p. 159 & 174). According to Frenkel, Bendit & Kaplan (2013, p. 39) classic locational factors are population density and the proximity to work. The first factor population density depends on the type of housing consumers; while some prefer the countryside other prefer more urban areas (Frenkel et al., 2013). Wu (2010, p. 184) argues however, that young housing consumers prefer higher populated areas because these areas provide them the convenience of living close to facilities and services. Regarding the proximity to work, Wu (2010, p. 188) found that the proximity to work is especially important for young adults. Furthermore, some households have a higher preference for areas with higher levels of job availability than other household groups (Zondag & Pieters, 2005).

According to Frenkel et al. (2013, p. 39) and Kauko (2006, p. 163) perhaps the most important factor for housing consumers is the overall housing affordability of an area. This is even more the case for young buyers because of their limited budget (Martens, 2009). To conclude, all household types are more inclined to relocate within the area, not too far away from their former location (Zondag & Pieters, 2005). Together these locational factors constitute the overall appeal of a municipality. According to Wu (2010, p. 175) locational factors can be viewed as more important to prospective buyers than the quality of the house itself, because the house can be adjusted to taste while the tangible characteristics of a location are likely to remain the same.

National factors

There are several main factors on the national level that can influence relocations; in particular relocations to owner-occupied homes. Favourable fiscal benefits and subsidies of owners relative to renters influence buyer activity on the housing market (Voigtländer, 2019; (Lauridsen, Nannerup & Skak, 2006). An example of this is the mortgage interest tax deductible or 'hypotheekrenteaftrek' that allows home owners to deduct interest payments on their mortgage from their taxable income. However, since 2013 the government reduces the percentage of these payments that is tax deductible every year, which also reduces the generosity of this fiscal benefit (Dol et al., 2012). Bloxham et al. (2010, p. 4) state that the interest rate is an important factor that influences first-time buyer transactions: a low interest rate is correlated with higher levels of first-time buyer purchases since mortgage rates are also lower in that case. Overall, activity of buyers on the housing market depends on the current situation on the housing market. In hot markets there are relatively more buyers than there are sellers, resulting in higher prices. While in cold markets there are more sellers than buyers, resulting in lower prices that make a home purchase more affordable (Case, Shiller & Thompson, 2012).

2.6. Conclusion and Hypotheses

The Startersloan is an affordable homeownership product that aims to increase home ownership rates among first-time buyers (SVn. 2018, 21 November). Homeownership comes with considerable private and public benefits that both first-time buyers and society as a whole are missing out on due to the inter-generational conflict on the housing market (McKee, 2012; Voigtländer, 2019). The empirical findings of Atterhög (2006) and Chen and Enström-Öst (2005) show that generic incentive policy is effective in increasing homeownership rates. Empirical findings that provide evidence of the effectiveness of targeted policies or affordable homeownership policies, in the Netherlands or abroad, are scarce or contradicting (Lee & Reed, 2014; Randolph et al., 2013). However, Verwoerd et al. (2014, p. 14 & 22) researched the effectiveness of the Startersloan and found that this policy enables first-time buyers to purchase a house earlier, is responsible for an increase in transactions of 7% and influences the location choice of recipients. In addition, Bloxham et al. (2010, p. 4) found a positive correlation between the level of first-home buyer transactions and the increased value of the FHOG grant, an Australian affordable homeownership policy. Based on existing literature on both generic and targeted incentive policy the prediction is that if the Startersloan is effective in increasing home ownership rates among first-time buyers, this will be visible in a higher level of relocations of this group in municipalities that offer the Startersloan, as in line with the prediction of Dungey et al. (2011). This results in the following main hypothesis:

Hypothesis 1: The Startersloan has a positive effect on the level of relocated first-time buyers, compared to a situation without the Startersloan.

The second hypothesis is additional and zooms in on the effect of the conditions of the Startersloan within the group of municipalities that provide the Startersloan. Mulder et al. (2014, p. 35-36) argued that the origin condition has a restrictive effect on the use of the Startersloan. In a comparable group of municipalities that did not have this condition the Startersloan was used two to three times as much than in the region of Amersfoort (Verwoerd et al., 2014, p. 14). Munro (2007, p. 255) argued that targeting a very specific group might not be effective as the take-up of the policy can disappoint. While Bloxham et al. (2010) found evidence in Australia that an increase in the value of FHOG grants led to an increase in home purchases, Mulder et al. (2014, p. 37) argue that a higher Startersloan will not result in higher levels of transactions. A higher loan does not give an extra incentive to buy, but provides the possibility of purchasing a more expensive house. This results in the following additional hypothesis:

Hypothesis 2: The condition on the origin of the buyer has a negative effect on the level of relocated first-time buyers, while the height of the maximum Startersloan has no effect on the level of relocated first-time buyers.

3. The Data

The dataset used in this research is a panel dataset that consists of existing and self-collected data for 355 municipalities for the period of 2010 up to and including 2020. During this period some municipalities have merged with other municipalities. Municipalities that existed at the start of this period but not at the end of this period were excluded from the dataset as to asses the same set of municipalities over time. In total the dataset consists of 3905 observations.

3.1. The independent variables

The main independent variable is the variable DummySL which indicates the presence (1) or absence (0) of the Startersloan in a municipality in a certain year. The treatment group, municipalities that offer the Startersloan, and the control group, municipalities that do not offer the Startersloan, can change each year as is visible in figure 1. Figure 1 shows that over a period of eleven years the level of municipalities that have implemented this policy has greatly increased. Whereas the Startersloan was only offered in 107 municipalities in 2010, this number increased to more than 250 municipalities in 2020. As was mentioned in the introduction, this shows that the popularity of the Startersloan as a policy instrument has increased (SVn, 2020).

In the dataset the total size of the treatment group in percentages is 54,90% (1) and the size of the control group is 45,10% (0). Overall more municipalities have offered or still offer the Startersloan, than not offered the Startersloan. The data for DummySL originates from a requested dataset of SVn that contains information on the municipalities that have implemented the Startersloan at some point in time during the period of 2010 to October 2021.
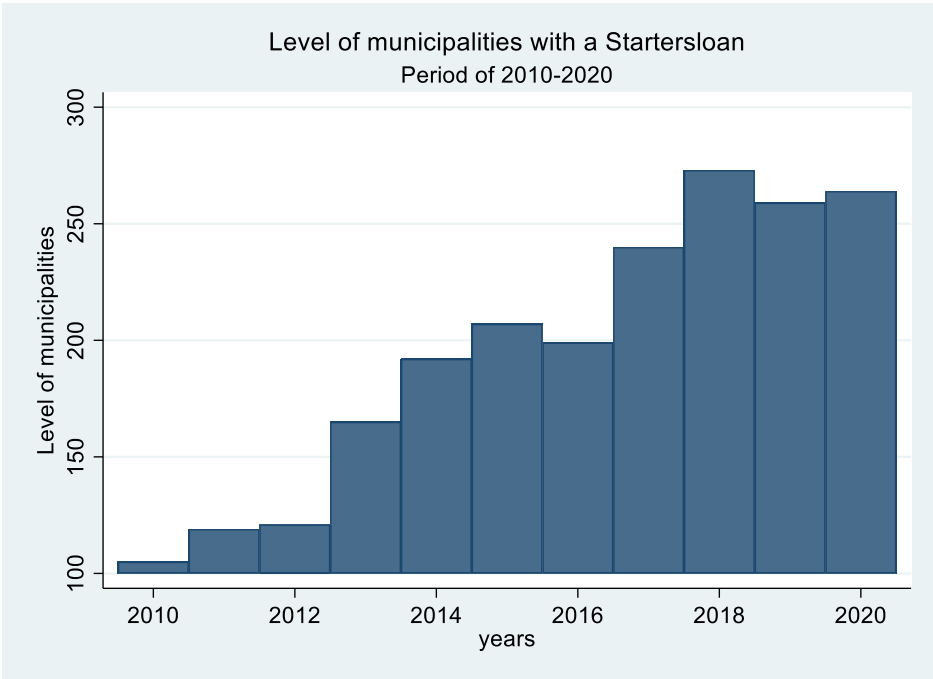

Figure 1: Level of municipalities with a Startersloan.

Figure 2 shows the distribution of the Startersloan over the provinces for the period of 2010 to 2020. The left-side shows the contribution of each province to not offering a Startersloan, while the right-side shows the contribution of each province to offering a Startersloan, in percentages. For the provinces Flevoland, Gelderland, Limburg, Noord-Brabant and especially Friesland the share of municipalities that has not offered the Startersloan in this period is higher, than the share of municipalities that have offered the Startersloan.
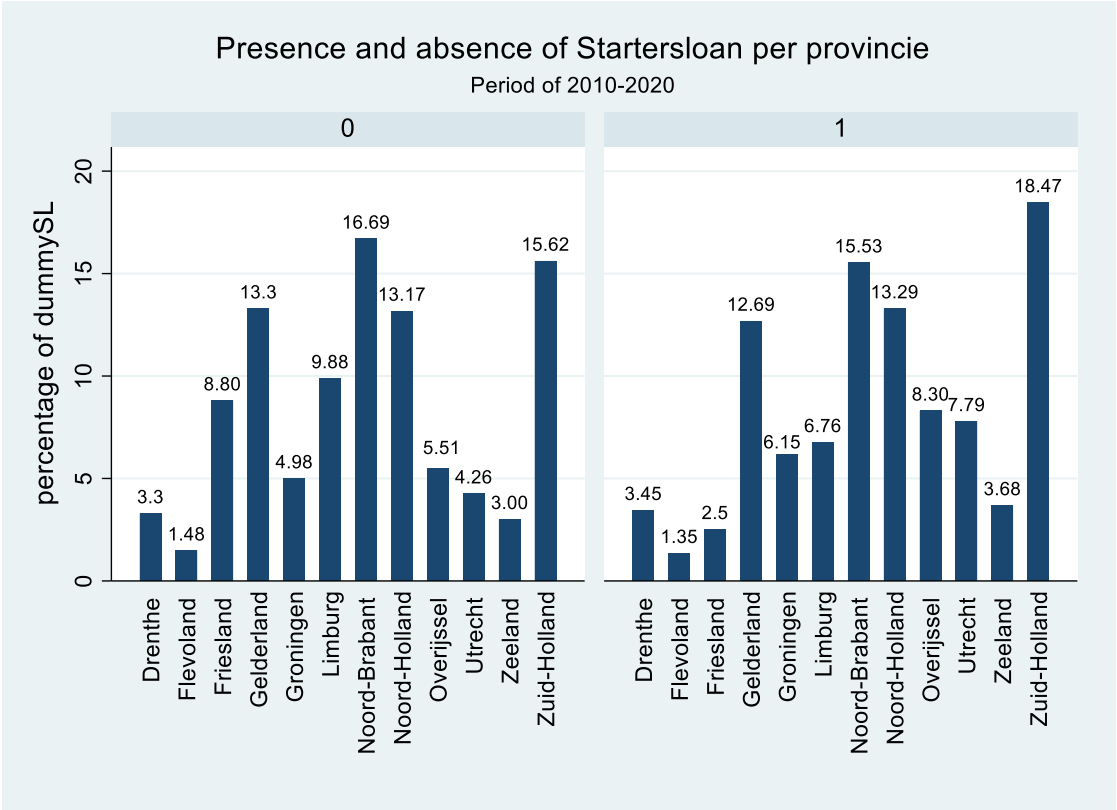

Figure 2: The presence and absence of the Startersloan per province.

Although DummySL is the variable of interest that will capture the policy effect needed to answer the research question, two main conditions of the Startersloan are also included in the dataset. These are the condition on the origin of the buyer and the maximum loan, discussed in paragraph 2.2. A variable on the type of house is not included since only 7% of all municipalities over the period of eleven years have this condition which makes it more suited for an analysis on a smaller scale. The variable DummyOriginBuyer indicates whether a municipality demands that applicants have an economic, social or historical connection to the municipality (1) or whether all first-time buyers can apply (0), for each municipality for each year. On average, for the entire period, the size of the treatment group was a little smaller with a percentage of 49.91% (1), than the control group with a percentage of 50.09 % (0).

Figure 3 shows the distribution of the condition on the origin of buyers over the provinces for the period of 2010 to 2020. The left-side shows the contribution of each province to not demanding this condition, while the right-side shows the contribution of each province to demanding this condition of starters, in percentages. For the provinces Noord-Holland, Overijssel, Utrecht and Zuid-Holland the share of municipalities that demand that starters are

connected to the municipality to be eligible for the Startersloan is higher, than the share of municipalities that do not demand this condition of starters.
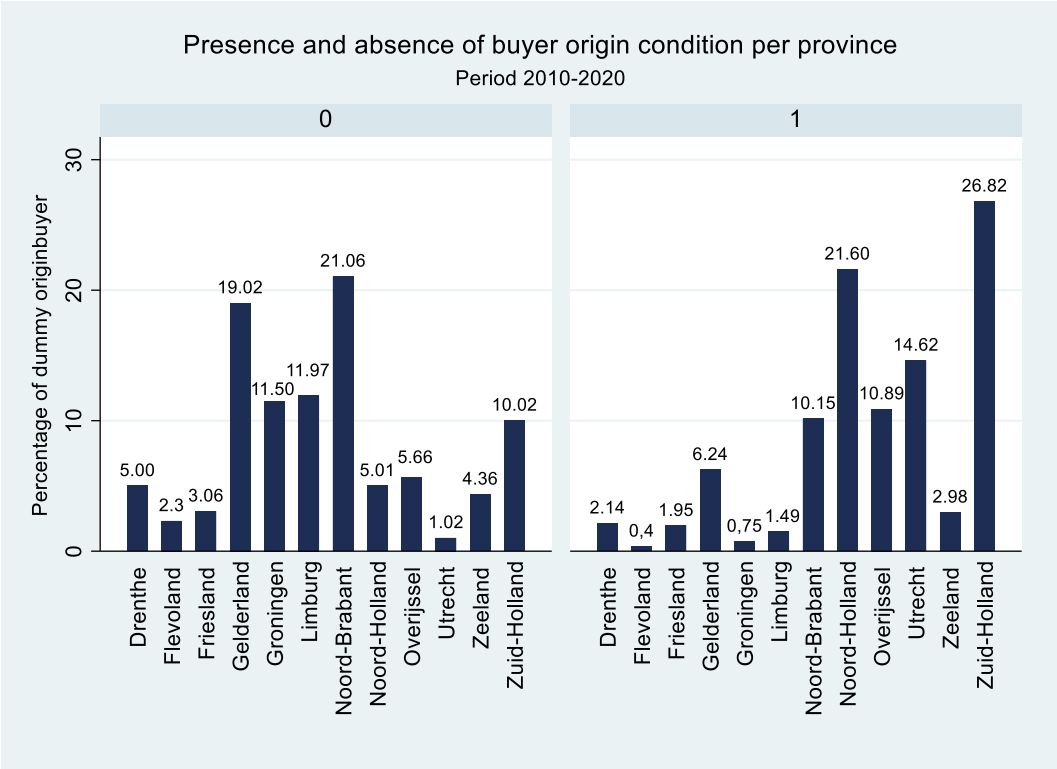
Figure 3: Presence and absence of the buyer origin condition per province.

The variable MaximumLoan indicates the maximum height of the Startersloan in a municipality in a certain year. Table 2 shows that the minimum loan that is provided in this dataset is 12.500 euro while the highest loan is 68,900 euro, while the average loan is 33320 euro. The variables DummyOriginBuyer and MaximumLoan capture the variance in the conditions of the Startersloan over time for all municipalities that offer the Startersloan, the treatment group with a size of 54,90%. Data on the variables DummyOriginBuyer and MaximumLoan was collected from the website lokaleregelgeving.overheid.nl, that has local regulations for every municipality. The Startersloan and its conditions are written down in local government regulations (verordeningen) and can be found of this website. Since 2011 municipalities have the legal obligation to store their regulations on this website. Every local regulation on the Startersloan has the same lay-out and under 'scope of application' the conditions for applicants are mentioned (Overheid.nl, 2021).

3.2. The dependent variables

Preferred data vs actual data

The main goal of the Startersloan is to increase home ownership rates among first-time buyers (SVn. 2018, 21 November). Measuring the home ownership rate for a specific target group is however difficult since most national databanks do not provide this specific data (Atterhög. 2006, p. 20). Although Statistics Netherlands has data on the percentage of owned homes per municipality per year, this data does not provide information on the characteristics of the owners (CBS. 2021, 5 November). Verwoerd et al. (2014) and Bloxham et al. (2010) measured the effectiveness of policy on transactions. But as the purchase of a house is followed by a relocation to this house, the level of relocations is the operalization used in this research. Relocations can indirectly give information about the homeownership rate. This is line with Dungey et al. (2011) that if a policy measure that differs over time and location is effective, this will be visible in increased levels of relocations to the area in which this policy is offered. Statistics Netherlands has data on the actual number of people that move from municipality A to B in the dataset 'Tussen gemeenten verhuisde personen' (CBS. 2021, 13 September). A variable that captures the number of relocations for each combination of origin and destination municipality would control for both municipal characteristics and characteristics and preferences of the relocated individual (Doling & Elsinga, 2006; Kotler & Armstrong, 2008). However, this data cannot be broken down into age groups which makes it less suitable for this research.

The Startersloan is a specifically targeted policy only available for young adults aged 20 to 40 years (Mulder et al., 2014, p. 33). This corresponds with the youth segment, aged 18 to 35, in which typically first-home purchases take place (Kotler & Armstrong, 2008) and the upper limit of this category is increasing (McKee, 2012). Therefore it is important that the dependent variable only captures relocations of people aged 20 to 40, as all other relocations are irrelevant for this research and would probably lead to an underestimation of the effect of the Startersloan. In addition, the Startersloan is a local policy measure that is responsible for only a small share of home purchases (SVn, 2020). To illustrate this, in 2020 a total of 2340 Startersloans was provided (SVn, 2020), while the Dutch association of real estate agents (NVM) states that in this year a total of 154.000 homes were sold. If, for simplicity's sake, the loans provided in 2020 led to the purchase of 2340 homes in that same year than this means that the Startersloan was only responsible for 1,5% of home purchases (NVM, 2020)

The dependent variables

The two dependent variables that capture relocations of first-time buyers are the variables SettledStarters and WithinStarters which measure the actual number of people in the age category of 20 to 40 that have relocated from elsewhere to a municipality (SettledStarters) and those that have relocated within their own municipality (WithinStarters). The first variable shows the level of relocations from outsiders while the second indicates this for insiders. In this research the age category of 20 to 40 will be labelled as first-time buyers or starters.

The dependent variables capture relocations among first-time buyers to both rented and owner-occupied property, while the interest in this research lies solely in relocations to owner-occupied homes. The data of SettledStarters and WithinStarters was originated from the dataset 'Verhuisde personen; binnen gemeenten, tussen gemeenten, regio' from Statistics Netherlands (CBS. 2021, 3 September). The average level of within municipality moved starters in the dataset is 1064 starters, while the average of settled starters is lower, at 884 starters, as shown in table 2. Figure 4 shows the level of moved starters per province for the period of 2010 to 2020. The level of moved starters, for both categories, is highest in the provinces of Noord-Holland and Zuid-Holland. Figure 4 also shows that the average level of settled starters is lower in almost every province, than the average level of within municipality moved starters. Only in Groningen and Utrecht the average level of settled starters is higher than the average level of starters that move within their own municipality. This is in line with findings that all household types prefer to relocate not too far from their former location (Zondag & Pieters, 2005).
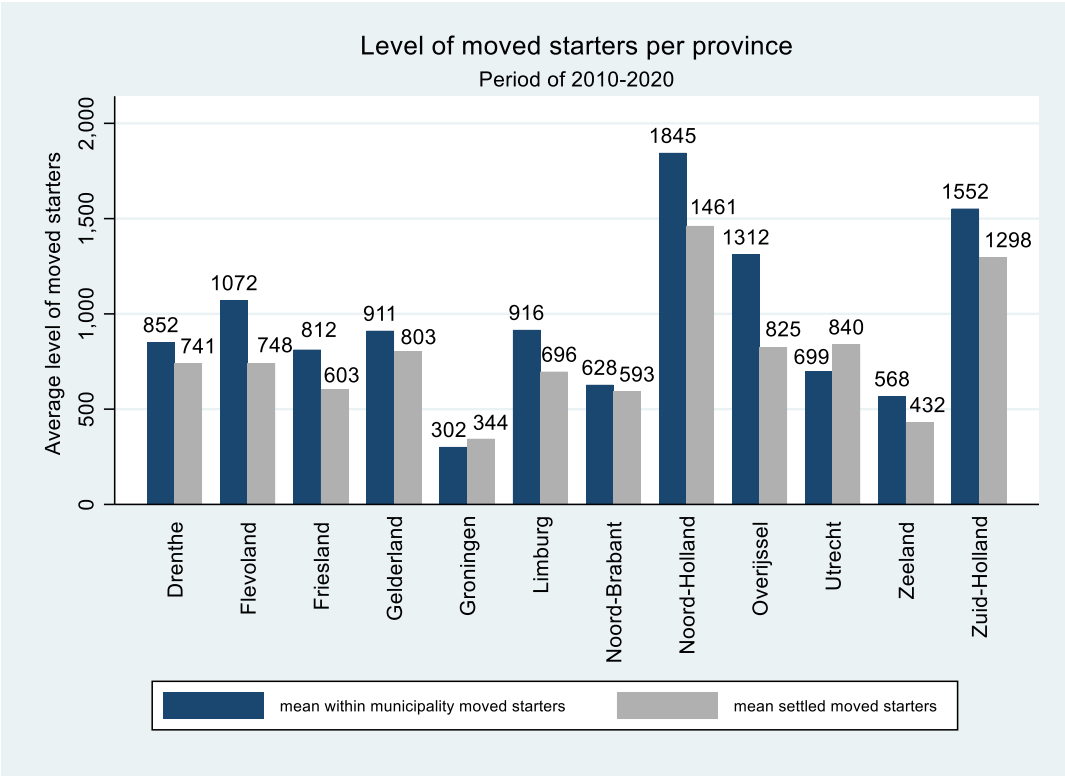

Figure 4: The level of relocated starters per province.

Table 1: Correlations

VARIABLES	SettledStarters	WithinStarters
DummySL	0,0341	0,0196
DummyOriginBuyer	-0,0677	-0,1001
MaximumLoan	0,0955	0,0799

Table 1 shows the correlations between the two dependent variables and the three independent variables. As 1 indicates full correlation and 0 indicates no correlation, the table shows that DummySL and SettledStarters are slightly correlated and that the correlation is even smaller for WithinStarters. The direction of the correlation is positive which is in line with the hypothesis. The variable DummyOriginBuyer is slightly and negatively correlated with SettledStarters and WithinStarters; the direction of the correlation is in line with the hypothesis The variable MaximumLoan is slightly and positively correlated with both SettledStarters and WithinStarters, as is in line with the hypothesis.

3.3. Control variables

Time- and entity-varying variables

To control for factors that change both over time and entity, four control variables are included in the model. The variable AverageSellingprice is the average selling price of owner-occupied homes in a municipality and originates from Statistics Netherlands (CBS, 2021, 22 February). Housing affordability remains one of the most important factors that influences the purchase and location of a house, according to Frenkel et al. (2013, p. 39) and Kauko (2006, p. 163). Especially for first-time buyers housing affordability of a region can be considered important as their income is often limited (Martens, 2009; Mulder & Wagner, 2001). Table 2 shows that the average selling price is 259409 euro, but that this can differ per municipality which indicates the relevance of controlling for AverageSellingprice.

The variable AverageInhabitants indicates the average number of people that live in a municipality and originates from Statistics Netherlands (CBS. 2021, 9 June). This variable captures the effect of the size of a municipality on the level of relocations. As the dataset includes data for cities like Amsterdam, Rotterdam and The Hague but also small municipalities, it is important to control for the municipal size as this is not a fixed factor. It can be expected that larger municipalities will also have a larger share of potential first-time buyers aged 20 to 40. Table 2 shows that the average level of inhabitants is 41654 inhabitants, but that the minimum is 922 and the maximum is 873047 inhabitants. In addition, population density can influence the decision-making process of housing consumers (Frenkel et al. 2013), as Wu (2010, p.184) argues that young housing consumers are associated with areas with more inhabitants, as bigger towns provide them with the convenience of living close to facilities.

The variable JobAvailability captures the total level of jobs x1000 in a municipality and originates from Statistics Netherlands (CBS. 2021, 19 October). Zondag and Pieters (2005) found that some households have a higher preference for areas with higher levels of job availability than other household groups. Especially for young adults the proximity to work is important (Wu, 2010). Table 2 shows that the average level of available jobs is 19.067,57 jobs, and that this can differ greatly between municipalities.

To conclude, the variable %OwnedHomes captures the percentage of owner-occupied homes relative to the total level of homes per municipality and originates from Statistics Netherlands (CBS. 2021, 5 November). SettledStarters and WithinStarters show the level of relocated starters to both rented and owned property, while the interest in this research lays in relocations to owner-occupied homes. It can be expected that the effect of the Startersloan will be more visible in municipalities that have a high(er) owner-occupied sector, and therefore %OwnedHomes is included in the model. Overall it can be questioned whether young adults move to areas with a high(er) share of owned homes, as this might not be financially possible for this age group (McKee, 2012; Martens, 2009). Table 2 shows that the average percentage of owned homes is 64%, which indicates that on average the ratio of owned property is higher than rented property. This varies considerably between municipalities as the minimum is 23% and the maximum is 88%.

Table 2: Descriptive statistics for all variables

	All municipalities			Only treatment municipalities		
VARIABLES	Mean	Min	Max	Mean	Min	Max
DummySL	0,5490	0: 45,10%	1: 54,90%	-	-	-
DummyOriginBuyer	0,4991	0: 50,09%	1: 49,91%	0,4991	0: 50,09%	1:49,91%
MaximumLoan	33320.82	12500	68900	33320.82	12500	68900
WithinStarters	1064.13	0	64613	969.1264	19	56174
SettledStarters	884.7877	15	29714	866.271	77	28570
AverageSellingprice	259409.4	119488	902214	265505.7	123452	902214
AverageInhabitants	41654.47	922.5	873047.5	40490.74	4848.5	858506
%OwnedHomes	64.21%	23.1%	88.2%	64.35%	28.8%	81.7%
JobAvailability x1000	19.06757	0.4	651.7	18.95783	1.4	634.1

Time-invariant variables

Locational factors that are assumed to be constant over time are included in the model through fixed effects and municipal dummies that capture the unique characteristics of a municipality, as the next chapter will discuss. By including the municipal effects into the model not only observed but also unobserved factors are controlled for. These locational or municipal factors are tangible factors like the proximity or availability of infrastructure, green surroundings and the proximity to services like shops, healthcare, schools and public transport, but also the geographical location (Karsten, 2007; Wu, 2010; Kauko, 2006). It is unlikely that these characteristics will change much over time as surroundings and exact locations are mostly stationary (Wu, 2010).

Time-varying variables

Year dummies will be included to control for factors that vary over time but are constant across entities, like factors on the national level discussed in the paragraph 2.6. This includes the situation on the housing market, as the level of relocations can be influenced by the presence of a hot or cold market (Case et al., 2012). Furthermore, government interference on behalf of the rental or owner-occupied sector can affect the choices of housing consumers and therefore also relocations (Voigtländer, 2019; Lauridsen, 2006). Bloxham et al. (2010) argue that interest rates can spur or discourage home purchases as they not only influence the demand for homes (expenditure in general) they also determine the mortgage interest rates. Year dummies will control for both these observed effects and unobserved effects not discussed in the literature.

4. The Methodology

4.1. Identification strategy

Choice of research method

The hypotheses in paragraph 2.6 will be tested through a Fixed Effect (FE) model. A FE model controls for the entity specific fixed characteristics through the process of demeaning the data. For every variable in the model the mean is determined over the time period and then subtracted from every observation of that variable. Through this process the FE model controls for both the entity specific observable and unobservable fixed effects and removes these effects prior to estimation. The FE regression estimates the within-group effect, which is the effect of the treatment variable on the outcome variable within the average municipality over the time period (Wooldridge, 2012).

A FE model is considered the golden standard when panel data is used, however theoretical argumentation is required to legitimise this choice over an OLS model (Bell, Fairbrother & Jones. 2018, p. 1052). The same set of 355 municipalities is observed over a period of eleven years. A pooled OLS regression is the preferred method when a different sample is used over time, as OLS draws random samples from the population to estimate the effect of X on Y. When the same sample is used over time OLS ignores the unique characteristics of each municipality, while these unobserved factors might influence both the dependent and independent variable (Woolridge. 2012, p. 344). OLS does not take full advantage of the possibilities of panel data, as panel data enables the researcher to control for unobserved factors of entities and factors that change over time but not across entities (Torres-Reyna, 2007; Woolridge. 2012, p. 484-485).

The main benefit of a FE model is that it reduces the sources of bias to time-varying variables, because the time-invariant fixed variables that might bias the relationship between X and Y are controlled for (Collischon & Eberl, 2020, p. 292). Each municipality has unique characteristics that are constant over time but might be a source of unobserved heterogeneity that will lead to biased results. OLS controls for the observable factors when they are included in the model, while a FE model does the same and more by also controlling for unobservable factors on the cross-sectional level (Collischon & Eberl, 2020)

The goal of this research is to measure the change in relocations caused by the change, from absence to presence, of the Startersloan. When the research goal is to capture the change in variables over time a FE model is better suited as it removes time-invariant observed and unobserved effects (Torres-Reyna, 2007). According to Bell et al. (2018, p. 1058) this is a drawback, as important information about the relation between the predictors and the dependent variables is thrown away. However, variables that remain more or less constant over time are not that interesting to research as they cannot have an effect on other variables (Wooldridge, 2012). Another reason why a FE model is the preferred choice is that it relies on enough within-group variation (Woolridge, 2012, p. 485), which is the case in the dataset

in this research. The descriptive statistics in chapter 3 showed that overall the share of municipalities that have offered the Startersloan is only a little higher, 54,90%, than the share of municipalities that have not offered the Startersloan, 45,10%. Furthermore, figure 1 showed that there is enough change in the Startersloan over time, while figure 2 showed that there is enough variation in the Startersloan over location.

Assumptions of the FE model

The first assumption of the FE model is that the fixed characteristics of entities should not be correlated with the characteristics of other entities. Meaning that the entity error term and the constant that captures entity fixed effects are not correlated to those of other entities. Thus, every entity is completely unique. A second connected assumption is that the error terms of the entities and the explanatory variables in the model are allowed to correlate. Because when it is confirmed that the first assumption holds, it does not matter whether the error terms of the entities might correlate with the explanatory variables (Torres-Reyna, 2007). In this research both assumptions hold as the time-invariant characteristics of the 355 municipalities are considered unique and unconnected to each other. As discussed in paragraph 3.3 each municipality has unique geographical location (Kauko, 2006) and unique characteristics like the level and proximity to services like schools, hospitals and infrastructure (Karsten, 2007; Wu, 2010). These locational factors hardly change over time (Wu, 2010, p. 175) and are assumed to be different for every municipality. If this would not have been the case, a Random Effects (RE) model should be used that treats the municipalities as connected to each other and random effect are random draws out of the population (Bell et al., 2018, p. 1060).

Threats in estimating the treatment effect

According to Wooldridge (2012, pp. 12) the FE model is considered a more convincing method when panel data is used than OLS, for estimating the ceteris paribus effect. The ceteris paribus effect is the effect of the independent variable on the dependent variable while all other relevant factors remain fixed, thus isolating the causal effect of X on Y. The regression links the treatment variable to the dependent variable while holding control variables fixed by including them in the model (Angrist & Pischke. 2015, p. 58). Controlling however for all possible observed and unobserved factors that might cause omitted variable bias, a major form of endogeneity, is impossible (Wooldridge, 2012). In a FE model bias can still originate from observed and unobserved time-varying variables (Collischon & Eberl, 2020). To address this problem the variable YearDummies will control for observed and unobserved factors that vary over the years but are constant across entities, as discussed in paragraph 3.3. To control for factors that vary both over time and across entities the following control variables are included: AverageSellingprice, %OwnedHomes, AverageInhabitants and JobAvailability. Only controlling for time-invariant factors would lead to an overestimation of the treatment effect and biased results: controlling for both time-invariant and time-varying variables greatly reduces the risk of omitted variable (Angrist & Pischke. 2015, p. 69).

Another threat to the validity of the model is that the exogeneity assumption might be violated. The independent variables should not be dependent on the dependent variable. The dependent variable depends on the error term, which means that under a strict exogeneity assumption the error term should not be correlated to the explanatory variables (Wooldridge, 2012). However, a FE model allows for a relaxation of the strict exogeneity assumption in OLS. The error term of the entities is allowed to correlate with the explanatory variables, as discussed in paragraph 4.1.2 (Wooldridge. 2012; Torres-Reyna, 2007). The relaxation of the exogeneity assumption is possible in a FE model because the demeaning process removes the 'idiosyncratic means from both sides of the equation'; both for the dependent and independent variables (Collischon & Eberl, 2020, p. 292). To conclude, a Least-Squares Dummy Variables model (LSDV) will function as benchmark to check the robustness of the results of the FE model (Collischon & Eberl. 2020, p. 290).

4.2. The main hypothesis

This model tests the main hypothesis. Even though the model below only mentions SettledStarters as the dependent variable, the exact same regression is performed with WithinStarters as the dependent variables. In total four regressions will be run based on this model. Two regressions that capture the effect of all predictors on the two outcome variables and two regressions that capture the effect of the variable of interest DummySL on the two dependent variables.

$$SettledStarters_{it}$$
$$= \beta 1 DummySL_{it} + \beta 2 AverageSellingprice_{it} + \beta 3 \%OwnedHomes_{it}$$
$$+ \beta 4 AverageInhabitants_{it} + \beta 5 JobAvailability_{it} + \beta 6 YearDummies_{t}$$
$$+ \alpha_i + \varepsilon_{it}$$

In the model the letter i indicates the entity and t indicates time and indicate that variables changed both across entity and over time. The variables with these letters as subscript capture all combinations of the 355 municipalities and the eleven years. The unknown intercept α_i captures the collected unique fixed effects of each entity, and is located at the end of the equation because the fixed effects were removed prior to estimation. Along with α_i time-invariant predictors are also removed during the demeaning process. The parameter ε_{it} indicates the error terms of each combination of municipality and year. In a FE model the effect, coefficient, of each predicator shows the average within-group effect of that predictor on the dependent variable (Woolridge, 2012, p. 484).

The outcome variables SettledStarters and WithinStarters measure the actual number of people in the age category of 20 to 40, labelled as first-time buyers, that relocated from elsewhere to a municipality (SettledStarters) and those that have relocated within their own municipality (WithinStarters). The value of these variables will increase by 1 for every moved person.

The variable of interest is DummySL were β captures the treatment effect in an average municipality when this variable changes from 0 to 1, so when the treatment Startersloan is turned on.

AverageSellingprice measures the average selling price of owner-occupied homes and the value of this variable will increase with 1 when the average price increases with 1 euro. The variable %OwnedHomes measures the percentage of owner-occupied homes relative to the total level of homes per municipality. The value of this variable increases with 1 for an increase of 1 percent. AverageInhabitants measures the average number of people that live in a municipality and its value increases by 1 for every new inhabitant. JobAvailability measures the total level of jobs in a municipality x1000, so when the value of this variable increases by 1 this is an increase of 1000 jobs. These four control variables change both over time and across entity, as the subscripts i and t indicate. The last variable YearDummies measures the influence of factors that change over time but not across entity for the years 2011 to 2020, as 2010 is the base year.

For the four FE regressions a LSDV counterpart was performed. The model of this benchmark includes the same variables as the FE model but to control for municipal fixed effects the variable MunicipalityDummies is added.

$$
\begin{aligned}
SettledStarters_{it} \\
= \alpha + \beta1 DummySL_{it} + \beta2 AverageSellingprice_{it} \\
+ \beta3 \%OwnedHomes_{it} + \beta4 AverageInhabitants_{it} \\
+ \beta5 JobAvailability_{it} + \beta6 YearDummies_t \\
+ \beta7 MunicipalityDummies_i + \varepsilon_{it}
\end{aligned}
$$

4.3. Additional hypothesis

This model tests the additional hypothesis. In total two regressions will be run based on this model; one that captures the effect of the predictors on SettledStarters and one that captures the effect of the predictors on WithinStarters. Mulder et al. (2014, p. 7) compared two groups of municipalities to estimate the additional effect of the conditions of the Startersloan. Both groups offered the Startersloan, but one group had no condition on the origin of the buyers while the other group did have this condition. Furthermore, the authors also researched the effect of the maximum loan (Mulder et al., 2014). In this research the size of the treatment group is 54,9%, within the treatment group the effect of origin condition, DummyOriginBuyer, and the effect of the maximum Startersloan, MaximumLoan, will be tested.

$$SettledStarters_{it}$$
$$= \beta1 MaximumLoan_{it} + \beta2 DummyOriginBuyer_{it}$$
$$+ \beta3 AverageSellingprice_{it} + \beta4 AverageInhabitants_{it}$$
$$+ \beta5\%OwnedHomes_{it} + \beta6 JobAvailability_{it} + \beta7 YearDummies_{t} + \alpha_i$$
$$+ \varepsilon_{it}$$

The only new variables included are DummyOriginBuyer and MaximumLoan, instead of DummySL. The β of the variable MaximumLoan measures the effect of the MaximumLoan on first-time buyer relocations when the maximum loan increases by 1 unit which is an increase of 1 euro. Within the treatment group of 54,9% (100%) a new treatment and control group have originated, based on the absence 50,9% (0) or presence 49,1% (1) of the condition on the origin of the buyer. This is what the β of the first variable DummyOriginBuyer measures: the treatment effect (49,1%) on first-time buyer relocations for an average municipality that offers the Startersloan policy.

For the two FE regressions a LSDV counterpart was performed. The model of this benchmark includes the same variables as the FE model but to control for municipal fixed effects the variable MunicipalityDummies is added.

$$SettledStarters_{it}$$
$$= \alpha + \beta1 MaximumLoan_{it} + \beta2 DummyOriginBuyer_{it}$$
$$+ \beta2 AverageSellingprice_{it} + \beta3 AverageInhabitants_{it}$$
$$+ \beta4\%OwnedHomes_{it} + \beta5 JobAvailability_{it} + \beta6 YearDummies_{t}$$
$$+ \beta7 MunicipalityDummies_{i} + \varepsilon_{it}$$

5.The Results

5.1. Results main hypothesis

Table 3: SettledStarters as dependent variable

VARIABLES	(FE 1) SettledStarters	(FE 2) SettledStarters	(LSDV 1) SettledStarters	(LSDV 2) SettledStarters
DummySL	72.89*** (9.077)	4.386 (6.917)	72.89*** (9.077)	4.386 (6.917)
AverageSellingprice		-0.000168 (0.000139)		-0.000168 (0.000139)
%OwnedHomes		-2.467 (2.097)		-2.467 (2.097)
AverageInhabitants		0.0484*** (0.00152)		0.0484*** (0.00152)
JobAvailability		-0.292 (1.343)		-0.292 (1.343)
2011		-8.812 (10.31)		-8.812 (10.31)
2012		17.74 (10.88)		17.74 (10.88)
2013		15.13 (11.69)		15.13 (11.69)
2014		56.47*** (11.41)		56.47*** (11.41)
2015		107.5*** (11.17)		107.5*** (11.17)
2016		177.3*** (10.83)		177.3*** (10.83)
2017		173.0*** (11.00)		173.0*** (11.00)
2018		120.2*** (12.26)		120.2*** (12.26)
2019		128.9*** (14.13)		128.9*** (14.13)
2020		123.7 (143.3)		123.7 (143.3)
Constant	844.5*** (6.110)	-984.6*** (139.0)	550.*** (65.2)	-662.8*** (136.0)
Observations	3,877	3,421	3,877	3,421
R-squared	0.018	0.559	0.988	0.995

Standard errors in parentheses   *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3 shows the results of four regressions that estimate the effect of the predictors on the level of settled starters. The first and second column show the results of the FE regressions in which the first regression only measures the effect of DummySL, while the second FE regression includes all predictors. The same is measured with the LSDV regressions in the third and fourth column, that does not include the municipal dummies for practical reasons. The exact same four regressions are performed with WithinStarters as the dependent variable, shown in table 4.

The first FE regression estimates the within-group effect of DummySL on the level of settled starters and shows that when an average municipality changes from not offering the Startersloan (0) to offering the Startersloan (1) this causes the level of settled starters to significantly increase with 72,89 starters. As is visible in table 2 the average level of settled starters is 884,7877, which means that compared to this average level the Startersloan is responsible for an increase of 8,24%. However, the FE model controls for time-invariant fixed variables but does not control for time- varying and time-and entity-varying variables. It is therefore likely that the result in the first column is biased and the effect of DummySL overestimated. The second FE regression shows that by control variables the threat to omitted variable bias is reduced, but at the expense of the treatment effect of DummySL. The second regression shows that when an average municipality changes from not offering the Startersloan (0) to offering the Startersloan (1) this causes the level of settled starters to increase with only 4.386 starters, or 0,5% compared to the average level. This coefficient is not significant as is also visible in the high standard error.

The coefficient of AverageSellingprice is negative although not significant. When the average selling price of owner-occupied homes increases with 1 euro, this leads to a decrease of 0.000168 starters or put differently, when the average selling price increases with 5952 euro, the level of settled starters decreases with 1. The coefficient of %OwnedHomes indicates that there is a negative, insignificant correlation between the percentage of owner-occupied homes and the level of settled starters. An increase of %OwnedHomes with 1 percentage point leads to a decrease of 2,467 starters or 0,28% compared to the average level of starters. AverageInhabitants shows that there is a positive and significant correlation between the average level of inhabitants and the level of settled starters, as expected and discussed in paragraph 3.3. When the level of inhabitants increases with 1, this leads to an increase of 0,0484 starters in the average municipality. This means that the number of relocated settled starters increases by 1 for an increase of 20,66 inhabitants. The coefficient of JobAvailability is insignificant and negative, which was not expected based on existing literature (Zondag & Pieters, 2005; Wu, 2010). When JobAvailability increases with 1000 jobs, the level of settled starters decreases with 0.292 starters or 0,033%.

The inclusion of YearDummies shows that there is no significant effect of the years 2011, 2012, 2013 and 2020 on the level of settled starters. However, this is not the case for the years 2014 to 2019. The coefficients are quite high compared to other coefficients in the model, and indicate that there is a positive significant correlation between each specific year and SettledStarters. The year 2016 has the highest coefficient of 177,3 settled starters, which is an

increase of 20%. In view of the high coefficients and significance of the majority of years, it is likely that the inclusion of YearDummies greatly influenced the treatment effect of DummySL.

That the results in the FE models are robust is confirmed, as the LSDV regressions give the exact same results. There are two problems with interpreting the R-squared. Firstly, the R-squared in FE models is often low as it only measures the within-group effect so the R-squared of the OLS model gives more information on the goodness-of-fit of the model (Wooldridge, 2012; Torres-Reyna, 2007, p. 22). However, as the LSDV regression includes 355 dummy variables the R-squared is likely to be rather high (Wooldridge. 2012, p. 487-489). These problems are also visible in table 3. The first LSDV model has an R-squared of 0,988 and the second LSDV model with all predictors has an R-squared of 0,995, which is not much higher than the previous model. This is however not the case for the FE models; the FE model goes from an explanatory power of 0,018 to 0,559, which means that the second FE model explains 56% of the variation in SettledStarters. In the FE model the time-varying and time-and entity varying variables add much to the explanatory power of the model, which is not the case for the LSDV model that is prone to overestimating the R-squared. The safest conclusion is that the final models with all predictors have an explanatory power of 56% to 99,5% which means that most of the variation in SettledStarters can be explained by the explanatory variables.

Table 4: WithinStarters as dependent variable

VARIABLES	(FE 3) WithinStarters	(FE 4) WithinStarters	(LSDV 3) WithinStarters	(LSDV 4) WithinStarters
DummySL	39.22**	32.64***	39.22**	32.64***
	(16.44)	(10.98)	(16.44)	(10.98)
AverageSellingprice		-0.000335		-0.000335
		(0.000220)		(0.000220)
%OwnedHomes		-3.125		-3.125
		(3.329)		(3.329)
AverageInhabitants		0.0389***		0.0389***
		(0.00242)		(0.00242)
JobAvailability		63.76***		63.76***
		(2.131)		(2.131)
2011		-38.49**		-38.49**
		(16.37)		(16.37)
2012		4.707		4.707
		(17.26)		(17.26)
2013		-2.825		-2.825
		(18.56)		(18.56)
2014		30.79*		30.79*
		(18.11)		(18.11)
2015		71.74***		71.74***
		(17.73)		(17.73)
2016		75.98***		75.98***
		(17.20)		(17.20)
2017		60.36***		60.36***
		(17.46)		(17.46)
2018		-43.82**		-43.82**
		(19.46)		(19.46)
2019		-79.26***		-79.26***
		(22.43)		(22.43)
2020		90.49		90.49
		(227.5)		(227.5)
Constant	1,042***	-1,492***	336.3***	-1,044***
	(11.07)	(220.7)	(119.4)	(215.9)
Observations	3,876	3,421	3,876	3,421
R-squared	0,002	0.595	0.988	0.997

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The first column in table 4 shows the within-municipality effect of DummySL on the level of within municipality moved starters, WithinStarters. When an average municipality changes from not offering the Startersloan (0) to offering the Startersloan (1) this causes the level of within moved starters to significantly increase, at the alpha-level of 0,05, with 39,22 starters. Compared to the average level of within municipality moved starters of 1064.13 starters, this is an increase of 3,69%. The fourth FE regression in column two shows that when time-varying and time-and entity-varying controls are included the effect of DummySL remains positive and significant. In this model the introduction of the Startersloan in an average municipality significantly increases the level of within moved starters with 32,64 starters or 3,07%, now significant at an alpha-level of 0,01. The third FE model in table 4 only overestimated the sole effect of DummySL a little compared with the coefficient of DummySL in the fourth model with all predictors.

The coefficients of the variables AverageSellingprice and %OwnedHomes are negative and insignificant, which was also the case for SettledStarters in table 3. The coefficient of AverageInhabitants shows that there is a positive significant correlation between the average level of inhabitants in the average municipality and the level of within moved starters. When the average level of inhabitants increases with 1 this causes an increase of 0,0389 within moved starters or put differently the number of relocated starters increases by 1 for an increase of 25,7 inhabitants. Whereas in table 3 there was no significant effect of JobAvailability on the level of settled starters, the coefficient of this variable has a positive and significant effect on the level of within municipality moved starters. When JobAvailability increases with 1000 jobs, the level of within municipality moved starters increases with 63,76 starters, a 6% increase compared to the average level of 1064.13 starters. This is in line with the literature on the attraction of higher job availability in an area on especially young housing consumers, that was not found for SettledStarters (Zondag & Pieters, 2005; Wu, 2010).

The year 2011 and the years 2014 to 2019 all have a significant effect on the level of within municipality moved starters. The years 2014 to 2017 have positive coefficients which indicate that time-varying factors increased the level of moved starters. In the discussion of table 3 extra attention was given to the year 2016 because of its high coefficient. In table 4 the coefficient for the year 2016 is positive and significant and also rather high, with an increase of 75.98 starters or 7,14 %.

The reliability of the FE models is confirmed by the LSDV regressions that give the exact same results. Although the interpretation of the R-squared is questionable, both the FE and LSDV model have a rather high R-squared. The final FE model with all predictors has an explanatory power of 0.595 and the final LSDV model has an R-squared of 0.997. Overall, the biggest part of the variation in WithinStarters can be explained by the explanatory variables in these models.

5.2. Results additional hypothesis

Table 5: Both SettledStarters and WithinStarters included

VARIABLES	(FE 1) SettledStarters	(LSDV 1) SettledStarters	(FE 2) WithinStarters	(LSDV 2) WithinStarters
MaximumLoan	-0.00359**	-0.00359**	0.00219	0.00219
	(0.00143)	(0.00143)	(0.00166)	(0.00166)
DummyOriginBuyer	-59.98***	-59.98***	-101.5***	-101.5***
	(18.21)	(18.21)	(21.08)	(21.08)
AverageSellingprice	3.82e-05	3.82e-05	-0.000578***	-0.000578***
	(0.000191)	(0.000191)	(0.000221)	(0.000221)
AverageInhabitants	0.0363***	0.0363***	0.0444***	0.0444***
	(0.00234)	(0.00234)	(0.00271)	(0.00271)
%OwnedHomes	-3.778	-3.778	-9.040**	-9.040**
	(3.214)	(3.214)	(3.720)	(3.720)
JobAvailability	-18.54***	-18.54***	25.03***	25.03***
	(2.084)	(2.084)	(2.412)	(2.412)
2011	2.008	2.008	-25.78	-25.78
	(16.77)	(16.77)	(19.41)	(19.41)
2012	32.28*	32.28*	11.41	11.41
	(17.34)	(17.34)	(20.06)	(20.06)
2013	24.94	24.94	-22.35	-22.35
	(17.53)	(17.53)	(20.28)	(20.28)
2014	71.54***	71.54***	6.471	6.471
	(17.02)	(17.02)	(19.69)	(19.69)
2015	134.3***	134.3***	64.30***	64.30***
	(16.61)	(16.61)	(19.22)	(19.22)
2016	217.2***	217.2***	89.42***	89.42***
	(16.59)	(16.59)	(19.20)	(19.20)
2017	206.1***	206.1***	93.48***	93.48***
	(16.38)	(16.38)	(18.96)	(18.96)
2018	160.1***	160.1***	29.36	29.36
	(17.73)	(17.73)	(20.52)	(20.52)
2019	170.1***	170.1***	-1.217	-1.217
	(20.47)	(20.47)	(23.68)	(23.68)
2020	177.7	177.7	111.8	111.8
	(175.9)	(175.9)	(203.6)	(203.6)
Constant	37.95	62.11	-582.5**	-450.9*
	(214.5)	(212.3)	(248.3)	(245.7)
Observations	1,793	1,793	1793	1,793
R-squared	0.417	0.996	0.435	0.998

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5 shows the results of four regressions that measure the additional effect of the conditions of the Startersloan, DummyOriginBuyer and MaximumLoan. Two FE regressions and two LSDV regressions were performed, one with SettledStarters as the dependent variable and one with WithinStarters as the dependent variable. The number of observations is 1,793 and not 3905 as only observations that belong to the treatment group of municipalities that offer a Startersloan are included.

The first column shows the results of the FE regression with SettledStarters as the dependent variable. MaximumLoan has a negative but significant coefficient, when a municipality that offers the Startersloan increases the maximum loan with 1 euro, this leads to a decrease of 0,00359 starters. When the Startersloan increases with 278 euro, the level of relocated starters will drop with 1. This not in line with the prediction that the height of the loan has no effect on the level of relocated first-time buyers. The coefficient of DummyOriginBuyer is negative and significant which is in line with the prediction; when a municipality that offers the Startersloan changes its policy from open to all applicants (0) to limited for insiders (1) this leads to a decrease of 59,90 settled starters or 6,9% compared to the average level of settled starters of 866, 271 starters as is visible in table 2.

The coefficients of the variables AverageSellingprice and %OwnedHomes are insignificant. The coefficient of AverageInhabitants is significant and positive and indicates that when the average level of inhabitants increases with 27,55 this leads to an increase of 1 starter. The coefficient of JobAvailability in table 3 was negative but very small. In table 5 however JobAvailability has a negative significant coefficient of 18.54 starters which means that when JobAvailability increases by 1000 jobs the level of settled starters decreases with 18,42 starters or 2,13% compared to the average. This finding is not in line with existing literature (Zondag & Pieters, 2005; Wu, 2010). The coefficients of the years 2012 and 2014 to 2019 all have a significant positive effect on settled starters. As was also the case in table 3, the year 2016 shows the highest coefficient of 217 settled starters, which is an increase of 25% compared to the average level of settled starters. For the years 2012, 2014 to 2019 there were time-varying factors that significantly increased the level of settled starters.

The third column shows the results for the second FE regression with WithinStarters as the dependent variable. The coefficient of MaximumLoan is positive but insignificant which is in line with the additional hypothesis in paragraph 2.6. When an average municipality that offers the Startersloan increases the maximum loan with 1 euro, this leads to an increase in the level of starters with 0,00219 starters or when Startersloan increases with 456 euro this leads to an increase of 1 within the municipality moved starter. The coefficient of DummyOriginBuyer is negative and significant and shows that when a municipality that offers the Startersloan changes its policy from open to all applicants (0) to only open to insiders (1) this leads to a decrease of 101,5 within municipality moved starters or a decrease of 10,47% compared to the average of 969.1264 within moved starters.

The coefficients of the four time- and entity varying variables are all significant. The coefficient of AverageSellingprice is significant and negative, as is in line with the prediction in the literature (Martens, 2009). The coefficient of AverageInhabitants is positive and significant, as was the case in all models. While the coefficient of the %OwnedHomes was negative but insignificant in all regressions discussed in this chapter, this is not the case for this FE regression. The coefficient of %OwnedHomes indicates that when the ratio of owner-occupied homes increases by 1 percentage point this leads to a significant decrease of 9,040 starters or a decrease of 0,9%. This might indicate that young adults are less likely to move to areas with a higher ratio of owner-occupied homes. In table 4 the coefficient of JobAvailability was positive and significant, as is also the case in table 5. When JobAvailability increases with 1000 jobs, the level of within moved starters increases with 25,03 starters or 2,58% . While in the other models, for both SettledStarters and WithinStarters, the majority of the eleven years has a significant effect on the level of relocated starters this is not the case for the second FE model in table 5. Only the years 2015, 2016 and 2017 have significant and positive coefficients; in each of year time-varying factors increased the level of within moved starters.

To conclude, the reliability of both models is strengthened by the LSDV models that show the exact same results. The first FE model only explains 41,7% of the within-variation in SettledStarters, while the second FE model explains 43,5% of the within-variation in WithinStarters.

6. Discussion

6.1. Reflection on the hypotheses

Hypothesis 1: The Startersloan has a positive effect on the level of relocated first-time buyers, compared to a situation without the Startersloan.

The prediction was that the effectiveness of the Startersloan would be visible in a higher level of relocated first-time buyers in municipalities that offer this policy as opposed to municipalities that do not. This prediction was based on findings in existing literature that proved the effectiveness of both generic and targeted incentive policies (Atterhög, 2006; Chen and Enström-Öst, 2005; Bloxham et al. 2010; Dungey et al., 2011; Verwoerd et al., 2014).

As the treatment effect was measured on two types of relocated starters, SettledStarters and WithinStarters, the hypothesis can only be confirmed for the last type. In the average municipality that provides the Startersloan the level of within municipality moved starters is significantly higher, with 32 starters or 3,07%, than in the average municipality that does not provide the Startersloan. This is in line with the existing literature and confirms the hypothesis. The treatment effect is positive and significant both before and after the inclusion of time-varying and time- and entity varying controls, which indicates the strength of the correlation between the Startersloan and the level of within municipality relocated first-time buyers. This was not the case for the level of settled starters, as the treatment effect of the Startersloan was positive and significant before the inclusion of controls but no longer significant after the inclusion of controls. These findings indicate that the Startersloan is effective in increasing accessibility into homeownership, but that this is only the case for starters that move within their own municipality and not for those that move to a municipality from elsewhere. That the Startersloan would have different effects on different types of relocated first-time buyers was not predicted in the hypothesis. An explanation for the insignificance of the Startersloan on settled starters and significance on within municipality moved starters can be, that overall people are more inclined to relocate within their own municipality (Zondag & Pieters, 2005). The average level of relocated starters is higher for WithinStarters than SettledStarters, as is visible in table 2 and that this is also the case for almost every province is visible in figure 2.

A possible explanation why the coefficients are not very high compared to the coefficients of the year dummies for instance, is twofold. Firstly, the Startersloan is only responsible for a small share of home purchases which can explain low coefficients (SVn, 2020). Secondly, a period of eleven years was researched in this study while the studies of Verwoerd et al. (2014) and Mulder et al.(2014) focused on the years 2013 and 2014. It is to be expected that in a longer time period there are more time-varying factors that can potentially influence the effect of the Startersloan on relocations, as the results showed. Furthermore, the years 2013 and 2014 are perhaps more prone to a positive effect of the Startersloan as the national government invested in the Startersloan policy in 2013 (SVn. 2018, 21 November)[2].

This enabled municipalities to provide twice as many loans to starters and encouraged more municipalities to implement the Startersloan policy. The possible effect of this investment is visible in figure 1 that shows that from 2012 to 2013 the level of municipalities that offered the Startersloan more than doubled.

Hypothesis 2: The condition on the origin of the buyer has a negative effect on the level of relocated first-time buyers, while the height of the maximum Startersloan has no effect on the level of relocated first-time buyers.

The additional hypothesis zooms in on the effect of the conditions of the Startersloan within the group of municipalities that provide the Startersloan. Based on the existing literature the prediction was that the condition on the origin of buyers reduces the level of relocated starters, compared to the group of municipalities that offer the Startersloan without this condition (Mulder et al. 2014; Verwoerd et al. 2014; Munro, 2007). The results in table 5 show that the DummyOriginBuyer has a negative significant effect on both the levels of settled and within municipality moved starters. Based on the findings of Mulder et al. (2014, p. 35-36) and Verwoerd et al. (2014, p. 14) the origin condition limits the use of the Startersloan as starters from outside the municipality cannot apply. It is therefore surprising that the origin condition also has a negative significant effect on WithinStarters and that the coefficient is even bigger than for SettledStarters. When a municipality that offers the Startersloan changes its policy from open to all applicants (0) to only open to insiders (1) this leads to a decrease of 101,5 within moved starters or a decrease of 10,47%.

There are two possible but conflicting explanations for this. The first is that the reason why municipalities only offer the Startersloan to insiders is that the municipal budget only allows for a small amount of loans to be supplied (Dol et al., 2020, p. 21). In this case only a limited amount of people can be helped while the level of applications might be much higher, resulting in the negative relationship. Another reason is that the protection of the municipal housing market in favour of insiders, limits regional moving dynamics which results in an overall lower use of the loan (Mulder et al. 2014, p. 35-36). In this case the take-up is simply too low which is visible in the negative effect of the condition on within municipality moved starters.

Based on the existing literature the prediction was that the height of the maximum Startersloan has no additional effect on the level of relocated starters; it does not give an extra incentive to buy as this incentive is already present (Mulder et al. 2014, p. 37-38). Table 5 shows that the effect of an increase in the maximum loan is negative and significant for the level of settled starters. This is not in line with the hypothesis. That the Startersloan has no significant effect on the level of settled starters, might explain why the coefficient of MaximumLoan is negative. The effect of an increase in the maximum loan on the level of within municipality moved starters is insignificant and slightly positive which is in line with the hypothesis that states that the height of the loan has no additional effect on the level of relocated starters.

6.2. Reflection on the model

The robustness of the results in the FE models is confirmed by the fact that an alternative method, the LSDV models, yields exactly the same results. As was discussed in paragraph 4.1 the choice for a FE model instead of OLS was based on theoretical arguments. To empirically check the validity of the chosen method a Hausman test was performed on all FE regressions (Bell et al. 2018, p. 1070). The Hausman test measures whether the error terms of the entities are correlated with the individual characteristics of the entities. If the error terms are correlated than FE is not a suitable model to estimate the treatment effect and a RE model should be used. The null hypothesis is that the preferred model is a RE model and only a p-value smaller than 0,05 can ensure the rejection of the null hypothesis (Torres-Reyna, 2007). For all FE regressions the p-value was smaller than 0,05, which means that both theoretically and empirically the FE model is the preferred model to measure the treatment effect of DummySL on the level of relocated first-time buyers.

The robustness of the FE model was enhanced by controlling for both time-varying and time- and entity-varying factors that reduced the threat of omitted variable bias , as the FE model only controls for time-invariant fixed effects (Collischon & Eberl. 2020, p. 292). A limitation of the results is that there are some missing values for the control variables which is visible in the lower level of observations in tables 3 and 4. Despite this, the dataset is still strongly balanced.

7. Conclusion

The goal of this research is to answer the research question: *Is the Startersloan effective in increasing the accessibility into homeownership for first-time buyers, compared to a situation without the Startersloan?*

The Startersloan is an affordable homeownership product that aims to increase home ownership rates among first-time buyers by providing them with a second mortgage (SVn. 2018, 21 November). This policy aims to repair the symptoms of the inter-generational conflict on the housing market (SVn, 2020), not the conflict itself, as home ownership comes with considerable private and public benefits both first-time buyers and society are missing out on (McKee, 2012; Schmidt, 2016). Existing literature provides evidence that both generic and targeted incentive policies are effective in increasing homeownership rates (Atterhög, 2006; Chen and Enström-Öst, 2005; Bloxham et al. 2010; Dungey et al., 2011). Especially the study of Verwoerd et al. (2014) showed positive results; the Startersloan increases transactions, enables recipients to buy a house earlier and also influences the choice of some recipients for a particular municipality.

Based on existing literature the prediction is that since home purchases are followed by relocations, the effectiveness of the Startersloan will be visible in higher levels of relocated starters in municipalities with the Startersloan compared to municipalities without the Startersloan. By making use of the variation in the Startersloan over eleven years and 355 municipalities, the policy effect on the level of relocated first-time buyers was captured. The effectiveness of the Startersloan can depend on many factors, that vary over time and per municipality. This research has tried to control for both municipal fixed effects and time-varying factors to diminish the threat of omitted variable bias and enhance the reliability of the results.

To answer the main question the Startersloan, measured with DummySL, has a positive and significant effect on the level of within municipality moved starters but not on the level of settled starters although the coefficient remains positive. When comparing a situation with the Startersloan to a situation without the Startersloan, the Startersloan is responsible for a significant increase of 32 within municipality moved starters. By controlling for time-varying and time-and entity varying effects, the difference between the control and treatment group is the presence (1) or absence (0) of the treatment. The answer to the research question is that the Startersloan is effective in increasing accessibility into homeownership for first-time buyers, but that this is only the case for first-time buyers that move within their own municipality.

The strength of this research is that it uses panel data with a cross-sectional and longitudinal dimension. While the presence of enough variation over time and location is often lacking in policy evaluations, which weakens the robustness of the results, this is not the case in this study (Dungey et al., 2011). A limitation of this research is that the data on the dependent variable relocations did not capture the exact relocations from location A to location B. As discussed in paragraph 2.3, if this data could have been used it would have controlled for the influence of personal characteristics and preferences of relocated starters which would have further reduced the threat of omitted variable bias. A second limitation is that the Startersloan was captured

with a dummy variable that does not give further information on the policy, for instance the level of provided loans. This has been partly corrected by using a separate model that measures the effect of the two main conditions of the Startersloan on the level of relocated starters. This is however a limitation that is likely to occur in empirical studies, as policies are often not measurable which results in the use of a dummy or categorical variable (Atterhög, 2009).

As the results only provide evidence for the effectiveness of the Startersloan in increasing the level of relocated starters that move within their own municipality, it is difficult to fully recommend the implementation of this policy. It can however be recommended that municipalities remove the condition on the origin of the buyers, as this condition has a restrictive effect on both the level of settled and within municipality moved starters. This is in line with the advise of Mulder et al. (2014, p. 35-36). The Startersloan is a costly product and not without risk for both municipalities and recipients (SVn, 2020). Furthermore, it has the potential to increase housing prices (Lee & Reed, 2014; Van Kooten. 2021, 8 August). These possible drawbacks can be viewed as societal costs and are an important topic for further research. It is recommended that the positive effect of the Startersloan is measured in comparison to the drawbacks, to perform a policy evaluation that establishes whether the societal benefits really outweigh the societal costs (Baarsma et al. 2010, p. 77).

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