The Relationship Between Homeownership and Financial Satisfaction in The Netherlands

Author and study number;	Martin Boxelaar
Educational institution	Universiteit Leiden
	Economics and Governance (E&G)
Supervisor	Dr. M. van Lent

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Introduction

Increasing the rate of homeownership is a desirable goal in many OECD countries (Havet & Penot, 2010). Because of this, homeownership is heavily subsidized by these governments to encourage the purchasing of homes (Coulson & Li, 2013, p1).

The stimulation of the homeownership is clearly visible in the Netherlands. Socio-economic effects are often seen as a reason for the stimulation policy for the housing market. In 1996, former CDA leader De Hoop Scheffer told the NRC that home ownership policy is “the most effective means of combating poverty” (Wind & Hochstenbach, 2019). It is also assumed that the liveability of an urban district will improve when an active search for buyers is made, because they would take better care of the living environment and could also serve as an example (Kromhout & Oving, 2008). One of the most important instruments for promoting the owner-occupied market is the mortgage interest deduction “*Hypotheekrenteaftrek*” which dates from 1893. Although the mortgage interest rate was never designed to actively stimulate the housing market (it emerged as a compromise to offset the negative impacts of a newly introduced tax policy), since the 1990s, the instrument has been seen by politicians as the instrument for stimulating homeownership (Kromhout & Oving, 2008). In the Netherlands, stimulating home ownership has contributed to the increasing ratio between owner-occupied and rental homes. In 1971 the percentage of owner-occupied homes was around 35 percent compared to rental homes, in 19997 there were more owner-occupied homes than rental homes on the Dutch housing market (Wind & Hochstenbach, 2019).

In the 2000s, Johan Remkes, then State Secretary for “public housing and urban policy”, stated in the “Home Ownership Promotion Act” that grants should help people with a smaller budget to buy a house. This was in order to have 65 percent owner-occupied homes in the Netherlands by 2010 (Kromhout & Oving, 2008). Although the government’s stimulation policy has contributed significantly to the share of owner-occupied homes in the Netherlands, it has never reached the proposed 65 percent (Wind & Hochstenbach, 2019).

The assumptions about the policy pursued are mainly based on a wide range of socio-economic effects. There is also a lot of interest from within academia about the effects of the housing situation on individuals / family. To name one, for instance, the increase of homeownership in the success of children and a variety of family outcomes (Aaronson, 2000, p1). Other authors are interested in the effects of homeownership on life satisfaction and self-esteem (Rossi & Weber 1996; Zumbro, 2011, p1).

Before the crisis, becoming a homeowner was also seen as an important way to gain wealth for most households (Zumbro, 2011, p1). After the fiscal crisis of 2008, the assumptions about aspects of homeownership were revaluated. Stimulating homeownership was not without risk, especially for those become homeowners without the financial means to do so (Coulson & Li, 2013, p1). The shock in the housing market was an interesting case study; namely research concerning the housing market and the (negative) consequences for homeowners looking at the financial satisfaction (Tharp et al., 2020).

The concept and the importance of the term financial satisfaction have been studied for multiple decades; evidence suggests that it is an important sub-component of overall well-being (Tharp et al., 2020). Various studies have also shown that there may be a positive relationship between homeownership and financial satisfaction, but because the term has many subs-components, understanding the phenomenon itself is more difficult (Elsinga and Hoekstra 2005). An interesting finding comes from Plagnol (2011), who states that the variations in individual financial satisfaction is not because of homeownership alone but is rather influenced by the value of the house (Plagnol, 2011). This finding is also partly supported by the study by Tharp et al. (2020), which found a positive association for homeownership, however, when the mortgage debt was also checked, the significance and direction of the coefficients differed from expected (Tharp et al., 2020). In all previous research, it is clear that the relationship between homeownership and financial satisfaction is difficult to approximate due to a persistent endogeneity problem with financial satisfaction (Aaronson, 2000). This causes a possible bias in the results.

Using econometric methods, the endogeneity problem can, in theory, be solved. In order to do this, a strong instrument must be found that can be used in an IV regression (Aaronson, 2000). In this paper, an attempt is made to obtain more insights into the relationship between financial satisfaction and homeownership in the Netherlands using longitudinal respondent data; an attempt will be made to run an IV regression in order to eliminate the bias present in other methodologies analyzing financial satisfaction. This makes it scientifically relevant because finding a suitable instrument that can solve the endogeneity problem, which has not yet been achieved between homeownership and financial satisfaction. Also, to my knowledge, no comparable studies have yet been carried out on the Dutch market, which link financial satisfaction with homeownership.

These findings may also be relevant for Dutch society, given that stimulating measures also play an important role in the owner-occupied housing market (Kromhout & Oving, 2008). The consequences of the financial crisis were clearly visible on the Dutch housing market and painfully showed how high the risk of homeownership (given the mortgage debt) was for homeowners in the Dutch market (NOS, 2017). This risk has been (partly) exacerbated by the government's regulation and stimulation policies on the owner-occupied housing market, and this has had major financial consequences for many households. The societal relevance of this research lies in gaining more insight into the trade between positive and negative effects homeowners can have in terms of financial satisfaction. Because financial satisfaction is strongly linked to well- being, this can become an important indicator when looking at the housing market.

The question that this research aims to answer is; *To what extent does financial satisfaction depend on homeownership in the Netherlands?* (in the period from 2008 to 2018)

To answer the main question, longitudinal data from the LISS Panel is used, which covers 10 years (2008-2018). This makes it possible for this research to examine the effects of a fluctuating market for homeowners and renters, and the relationships between homeownership and financial satisfaction. Before starting an analysis, the concepts used in the study will be introduced and elaborated upon in the theoretical framework. The next chapter will highlight the context within which the research question will be analysed, and it will apply key sections of the theoretical framework to the Dutch housing market. This will inform the subsequent hypotheses. In the literature study chapter, we will consider previous studies, which have encountered the endogeneity problem of homeownership and financial satisfaction, and better understand the reasons for the methods deployed by this study. In the chapter methodology the variables will be explained, and the choice of the research method will be justified. After justification, the chapter analysis begins in which the results are outlined. The study concludes with the findings and recommendations in the final chapter, entitled conclusion & discussion. Here a link is made between the results, the methodology and the theoretical framework, which highlights the main explorations of this paper; is financial satisfaction linked to homeownership in the Netherlands, and (the underlying question to this), how can we approach studies looking at the term financial satisfaction without introducing bias into our analysis?

Theoretical framework

What is Financial satisfaction?

In the 1970s, several scientists were interested in the relationship between happiness and income. The underlying assumption was that “satisfaction with income was synonymous with welfare or well-being” (Vera-Toscano et al., 2006 p213). This hypothesis is more in line with the term ‘financial satisfaction’ as we know it today (Vera-Toscano et al., 2006). In a recent study by Archuleta, Dale & Spann (2013), financial satisfaction was described as; “Perceived satisfaction of one’s income, ability to handle financial emergencies, ability to meet necessities, debt level, amount of savings, and money for future financial needs and life goals” (Archuleta et al., 2013, p.p 51). Financial satisfaction can be seen as a broad concept, which has received a lot of interest in recent decades, sparking debates across of a variety of different scientific disciplines (Hansen et al., 2009)

Traditional economic theories that only use “objective” indicators are unable to detect certain important elements driving socio-economic behaviour. These non-observable aspects can be indirectly included by using subjective indicators, making it possible to gain broader insights (Vera-Toscano et al., 2006 p213). The same can be said for financial satisfaction, where both objective and subjective indicators are needed to explain the term in its entirety (Archuleta et al., 2013, p.p 51). However, the complexity of the concept also poses problems for how exactly this indicator should be measured and which method should be applied. The scope of the concept is difficult to determine, as is apparent from a study by Joo and Grable (2004), quoting the work of Goodwin (1994) who summarises the then-available body of literature. Goodwin (1994) states that different researchers prefer different methodologies (some being more partial to a single-item measure, and others favouring multiple-item measure). These different methods, interestingly, all offer acceptable levels of validity and reliability when used appropriately. Hereby Godwin (1994) concludes that there is no consensus regarding the adequate measurement of financial satisfaction (Joo & Grable, 2004).

Joo and Grable (2004) extrapolate from Godwin’s conclusions in their article, where they discuss several studies that have surfaced over the last 20 years, aimed at unravelling the intricacies of the term financial satisfaction.

By using a path analysis method, they conclude that there are both direct and an indirect effects on financial satisfaction, whereby financial behaviours, financial stress levels, income, financial knowledge, financial solvency, risk tolerance, and education are all related factors of financial satisfaction (Joo & Grable, 2004, p.p 1).

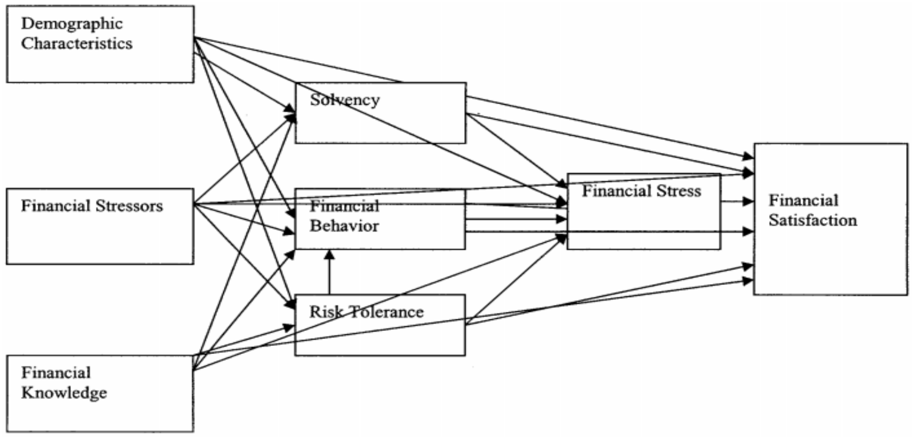

Figure 1; The Determinants of Financial Satisfaction (Joo & Grable, 2004, p.33)

Their graph, shown in Figure 1, illustrates the complex relationships between the above factors – showing how different elements influence/relate to each other – highlighting the difficulties of estimating and operationalizing the term financial satisfaction.

The framework established by Joo and Grable in 2004 is only one partial way of approaching financial satisfaction, and it does not elaborate on how exactly the term should be operationalized. The author states that the ultimate way to measure financial satisfaction has yet to be established, and because of the number of indirect effects, it remains difficult to determine this (Joo & Grable, 2004). In 2020 authors Tharp et al. apply the theory and framework to the housing market, concluding that there may still be variables missing from the framework (Tharp et al., 2020). The findings and conclusions of Tharp et al. are analysed in more detail in the literature review chapter.

Added value of financial satisfaction

It is difficult to determine how financial satisfaction is structured and what relationships it has with different objective and subjective indicators. However, the term has gained added value in recent decades because there is a growing interest among researchers in the relationship between financial situation and mental health, exploring the impact this has on cognitive, emotional, and relational well-being (Archuleta et al., 2013). In current literature, Financial satisfaction is often described as an important sub-component of an individual's overall well-being (Tharp et al., 2020, p.p 2). This relationship with well-being makes financial satisfaction an interesting indicator to explore, as it is able to offer more insights into existing economic theories and analyses (Archuleta et al., 2013, p. p 51).

Homeownership

Financial satisfaction is thus a concept that is difficult to quantify, but nonetheless academically relevant, as mentioned above. Before we can understand to what extent homeownership affects financial satisfaction, we must develop a good foundation concerning what type of research has already been done on the housing market, and individuals' behaviour regarding homeownership.

The benefits of homeownership

According to various literature studies, owning a house is preferable to renting a house. An example of this is the argument Saunders makes in "A nation of homeowners" (1990), in which he stated that human preference and instinct lie in having their territory marked and owned (Zumbro, 2014, p.p 322). He argues that this would provide higher stability and a sense of security and freedom, which would be present to a lesser extent in a rented house (Elsinga & Hoekstra, 2005). The stability of owning a house could therefore increase the stability of the family and could have a positive effect on the success of children and a variety of other family-related outcomes (Aaronson, 2000, p.p 1). Different studies also suggested that homeownership would have benefits for the liveability of a residential area, as homeowners take better care of the home and neighbourhood (Aaronson, 2000, p.p 4). The research by Zumbro (2014) states that homeowners do have a higher life satisfaction and this effect of owning a house is especially visible in relation to low-income households (Zumbro, 2014, p.p. 336). Others argue that renting a house is not inferior to the feeling of security homeowners experience, as the rental market has strict regulations benefiting tenants (Wüstenrot Stiftung et al., 2002). Although this may differ per country, there has been a trend recently that the costs for renters are increasing faster than for homeowners (Elsinga & Hoekstra, 2005). This certainly applies to low-income families for whom owning a home would provide more security when income decreases later in life, possibly making a decline towards the poverty line (AOW or pension) (Zumbro, 2014, 336).

Financial benefits of homeownership

Many authors state that people have a preference for owning a house over renting it, this also affects the regulations in a country. In most of the OECD countries, it can be seen that there is a political preference to owning a house, and many governments incentivize buying property in one way or another. The stimulation policy of this market is done using, among other things, tax relief; for example, a mortgage on the house can be deducted from other taxes, but also the assets in the house are often spared for wealth tax. There is also sometimes the possibility of receiving donations that can be used tax-free on a house (Havet & Penot, 2010). These are some examples of OECD countries financially stimulating homeownership. It is therefore not surprising that many studies show that owning a home is one of the most important ways to generate wealth (Zumbro, 2014). While this may be the case, it doesn't always have to be, Zumbro (2014) stated; "The economic returns of homeownership depend very much on timing, geography, and the time the property is held. Following from that, there are no guaranteed certainties for economic gains made by homeowners" (Zumbro, 2014, p. p 323). A good example of this was the fiscal crisis that started in 2007, in which confidence in the housing market declined sharply (Herbert et al., 2013). The decline in confidence in the homeowner's market caused an enormous drop in demand, but also resulting in a fall of the value of houses and foreclosures (Tharp et al., 2020).

This is interesting in the context of this research, as the relationship between homeownership and financial satisfaction may not be as easily discernable as it initially seems. The fiscal crisis has provided an interesting case for researching the housing market, where initially the dominant idea was that having a house is positively associated with wealth-building and life satisfaction. The fact that this is not always the case became painfully clear during the crisis; owning a home is not without risk. For people who had to sell their homes during that period, this risk translated to a substantial loss in wealth (Herbert et al., 2013). The uncertainty in the housing market has also had negative psychological consequences for homeowners, which have been associated with mortgage foreclosure. (Bowdler et al., 2010). Homeownership, and all its financial and security benefits may not in fact ensure a higher financial satisfaction. The positive financial associations could be outweighed by the inherent risks individuals undertake when buying a home. It may be argued that these effects have no consequences for tenants, however the research by Manturuk et al. (2012) shows that other factors play a role in the rental market, which have comparable effects when looking at financial hardship (Manturuk et al., 2012). The difference between homeowners and tenants will be elaborated later.

The return that can be gained by owning a house can be substantial. However, this is only one part of the story; buying a house is one of the biggest financial decisions anyone will make, this entails a great financial risk (Schneider & Tracy, 2001). In addition to the financial risk, mobility is also limited by the high transaction costs. A higher mobility can provide a greater flexibility in the labour market. This flexibility can ensure a better job and also a higher salary and thus contributes to higher wage (Havet & Penot, 2010). This can ensure that someone who does not own a house, because of his flexibility, fits better in the labour market, this can ultimately also lead to a higher capital.

Housing and Financial satisfaction

Owning a house has several advantages and is usually seen as a good investment for the future (Havet & Penot, 2010). The question that now arises is; to what extent does this also have consequences for financial satisfaction. In the previous part of the theoretical framework, the complexity in defining financial satisfaction has already been discussed. The research done by Joo & Grable, (2004) also looked specifically at the effect of homeownership on financial satisfaction. Two important indicators for determining financial satisfaction are financial stress and financial solvency, both of which are directly related to financial satisfaction (Joo & Grable, 2004).

As mentioned earlier, buying a home is an important, long-term financial decision, which is not without risk (Schneider & Tracy, 2001). The high debt many acquire in order to buy a home is reflected in financial satisfaction, which can be attributed to financial stress. The feeling of financial stress should therefore be higher on average among homeowners than among tenants. This could indicate that the financial satisfaction for tenants may be higher than for homeowners (Tharp et al., 2020). However, when looking at financial solvency, it can be seen that homeowners generally have more solvency (which can be partly attributed to the increase in the house's value) than tenants. This effect is therefore positive for homeowners concerning financial satisfaction. That financial solvency is higher among homeowners is not because they have a house, but because homeowners differ in many respects from tenants (Kaas et al., 2019). Homeowners differ from tenants in multiple ways as Kaas et al., (2019) indicate; "*They have higher income, are more likely to be self-employed, to be married, and to have children*." (Kaas et al., 2019, p.p 2). Controlling for this difference however is not enough, there are many unobserved and unknown variables that are substantially different in those two groups (Kaas et al., 2019).

This section introduced the term financial satisfaction, highlighting its academic and social importance, but also noting the difficulties associated with approximating and operationalizing the term. In order to better understand the possible effects of homeownership on financial satisfaction, the chapter then outlined the various intricacies of the housing market, pointing specifically to the risks and rewards of homeownership. The following section will explore the housing market in the Netherlands in more detail, in order to contextualize the theoretical concepts outlined in this chapter, so that these can be specifically applied to the main research question in this paper.

Context

As mentioned earlier in the theoretical framework, stimulating the housing market is an accepted idea that is applied in many OECD countries (Havet & Penot, 2010). In the Netherlands, stimulating the housing market is not much different. For a century, the government has encouraged homeownership. The active government policy was initially established as a social project, in which homeownership could provide wealth accumulation and security (Wind & Hochstenbach, 2019).

Stimulation of the housing market is also visible in parts of the renting sector, this is no coincidence; the promotion of sufficient housing is a task of the government, which is laid down in the constitution. This obligation is expressed in three values, namely, affordability, availability, and quality of the housing supply (Centraal Planbureau & Planbureau voor de Leefomgeving, 2016).

Homeownership in the Netherlands

An important aspect in acquiring a home is the financial resources required to finance it. In this section we will discuss which indicators are looked at and on which government policy is based

Regulation mortgage for homeowners

Substantial financial resources are needed to buy a house; this has already emerged from the theoretical framework (Schneider & Tracy, 2001). To facilitated this, a mortgage is usually needed to finance the house, and this is a long-run financial obligation with the bank. To reduce the financial risk of the market and the homeowner, there are government regulations on the mortgage market. The government is advised by the “National Institute for Budget Information” (Nibud), whereby the following core values apply for its advise to the government; affordability, manageability, and robustness (Bos et al., 2019). The policy ensures that when granting a mortgage, consideration must be given to the extent to which households can bear mortgage costs now and in the future, considering the income and expenditure patterns of the individual (Bos et al., 2019, p.p 11). Granting a mortgage is therefore examined at an individual level in order to determine whether the loan is suitable for the person; this also reduce the risks of the financial product. In order to advise the government, Nibud looks at the average spending pattern and the increase in purchasing power, so that a certain standardisation is possible in the advice on mortgage lending (Bos et al., 2019, p.p 13).

The amount of mortgage that an individual can get is determined by two main indicators; income and the appraisal value of the house (Bos et al., 2019). The influences of this regulation (maximum mortgage on the house) are clearly reflected in the market, where the requested mortgage is equal to the asking price of the house (CBS, 2019a). This regulation was introduced to minimize the financial risk on the housing market (Rijksoverhied, 2017, September 5). Another value of the Nibud is robust regulation, meaning new regulation can not introduce large shocks in the housing market. Advice for new regulation is based upon the average market development for the past four years; temporary shocks will therefore not introduce new regulations (Bos et al., 2019, p.p 14).

Housing value Dutch market

As mentioned in the theoretical framework, becoming a homeowner is seen as an important way to gain wealth (Zumbro, 2011, p1). Dutch policy concerning the housing market reinforces this effect through financing options and other tax benefits such as mortgage interest relief in the Netherlands, the general assumption is that a house is a stable and profitable investment in the long term (Wind & Hochstenbach, 2019). The development of the housing market in the Netherlands for the past couple decades confirms this. The figure below shows the sale price of existing homes in the period 1995 to 2019.

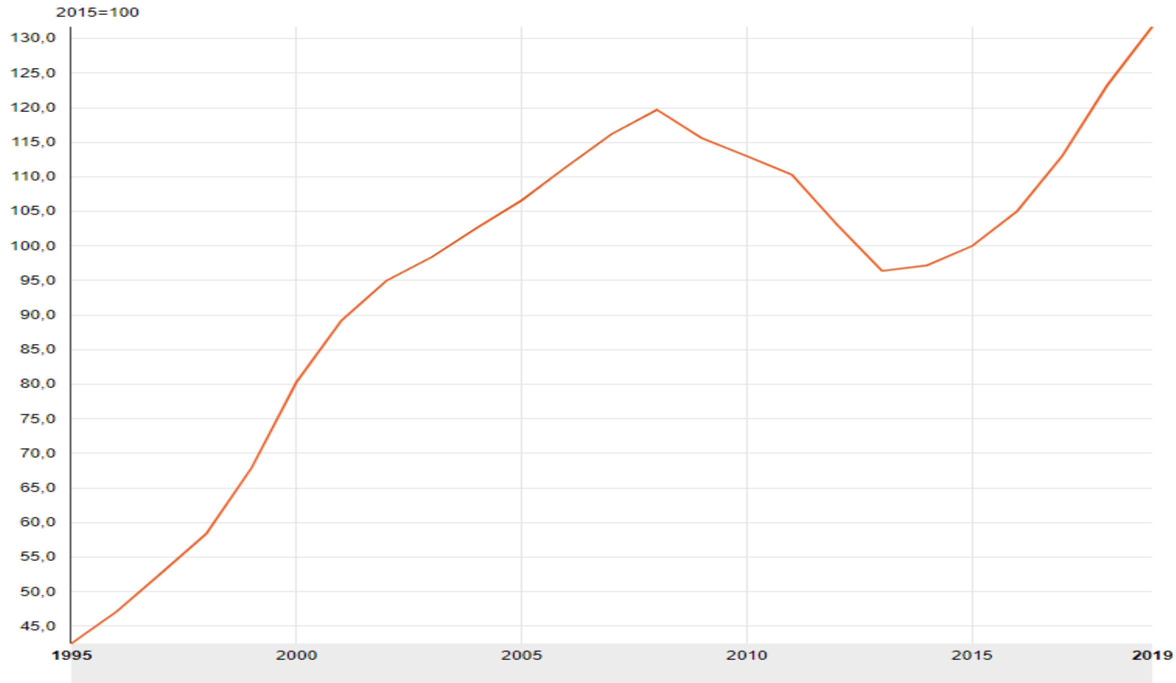

Figure 2; Existing homeowner's homes; selling prices price index 2015 = 100 of Statistics Netherlands (StatLine, 2020).

As seen in figure 2, there is a substantial drop from 2008 to 2012 due to the financial crisis, which had an impact on the housing market (NOS, 2017).This will be elaborated upon later in this chapter. Despite this mistrust in the market, when looking at a long-term investment, there is an upward trend. There are a couple of reasons for theses trends; the fact that the housing market is seen as a safe investment, which comes from the ideology that there is political and social support for the high house prices (Wind & Hochstenbach, 2019). Given that the majority of Dutch citizens own a house (57%) and have had to incur high financial debts to finance the house, a structural reduction in the value of houses is seen as a problem and explains social and political support to sustain the housing value. Another explanation for the increase in housing value can be given when looking at the demand and supply curve.

On the demand side, this is determined by both the number of households and the disposable income (CBS, 2011, pp 210). In the Netherlands, the population increased by 7.5 percent between the period 1995 and 2010, in which the number of households increased by 14.6 percent. When we look at the disposable income, which also affects the amount of the mortgage, it can be seen that in the same period the average income has increased by 4.0 percent per year. The latter has been made possible, among other things, by the increased labour participation (CBS, 2011, pp 211). Due to the market forces in the mortgage market, there were enough providers to make financing homes possible.

On the supply side, for decades now there has been shortage in building new houses due to regulation and scarce land (CBS, 2011, pp 212) The price increase that can be seen in recent decades can thus be explained.

Financial crisis housing market

The positive effects of homeownership were revaluated after the fiscal crisis, and it was made clear that homeownership was not without risk (Coulson & Li, 2013, p1). During the financial crisis the price increase due to scarcity was replaced by mistrust, this has led to a correction in the market. Homeowners were faced with falling house prices and sometimes the value of the house was lower than the given mortgage. In the first quarter of 2014, an estimated one million homes (35% of the market) were faced with this (Lemereis, 2015). Due to the rising house prices in recent times, this number has considerably dropped, in 2019 this was 4 percent of homeowners (Rijnbach, 2020)

This does not necessarily have to be a problem as long as there are no plans to move and the mortgage costs are still affordable. However, as stated earlier, this entails a great financial risk when the situation suddenly changes, and the owner is left with a residual debt (ING, 2020). This financial risk in the housing market has led to several policy changes, not only to ensure that the risks of the individual are reduced but also the risk of the financial sector. Since 2013, it is no longer possible to obtain an interest-only mortgage and mortgages may not exceed 100 percent of the home value (Kraniots, 2019). Despite these measures to reduce the risks in the housing market, the total mortgage debt in the Netherlands is still on the rise (Rijnbach, 2020). The explanation for this increase can be found when looking at the rise in house prices, but also in that people on average borrow more for their house in relation to their income. This is called the Loan To Income ratio and this increase can be attributed to the sharp rise in house prices compared to household income.

Rental Sector in The Netherlands

To make comparisons between homeowners and tenants possible, it is necessary to consider how the rental market is divided. The rental market is discussed in this part of the context chapter.

Social rental sector

In addition to the homeowner housing market, there is the possibility to rent. This market can be divided into a private and social rental sector. The distinction between the two sectors mainly arises when looking at the regulations.

In the social rental sector, there is government regulation to ensure that rental homes remain affordable for people with low income (Rijksoverhied, 2020b, December 1). To keep the price increase under control, a maximum of 4.1% has been agreed upon in 2020 when household income is less than 42,000 euros. If the household income is less or around minimum income, they also qualify for housing benefits. This rent allowance amounts to a maximum of 368 euros per month and is deducted from the rent (Rijksoverhied, 2020b, December 1). Keeping housing affordable for low-income groups is a priority for the Dutch government. To increase the feeling of security there is also a special commission in place in case there is a conflict between tenants and landlords (Rijksoverhied, 2020, March 2).

If there is a conflict between the tenant and the landlord, the tenancy committee can be engaged. The tenancy committee is a mediation party that can be engaged by both the tenant and the landlord and provides the opportunity to resolve the conflict. The tenancy committee ensures that the transaction costs are minimized in the event of a conflict, which can increase the feeling of security and improve quality in the social rental sector (Rijksoverhied, 2020b, December 1).

The goals of the government in the housing market are therefore clearly visible in the social rental sector, where both quality and price are regulated. The government's target group for this housing policy are mainly people with low incomes; which is reflected in the requirements for when someone can qualify for social housing (Rijksoverhied, 2020b, December 1)

Private rental sector

Social housing is often not available to people with higher incomes because of the above arrangements. For this group, an alternative is to buy a house, if this is not financially possible then they can turn to the private renting sector. The fundamental difference between the private rental sector and the social rental sector is the amount of government regulation. The private rental sector has no government policy concerning maximising the rent and/or subsidising housing. What also is missing in this sector is the protection and mediation that can be offered from the rent committee, this is only present for the first 6 months (Rijksoverhied, 2020a, March 2).

With high demand and no price regulation the increase in renting- price each year is substantially higher than in the social sector. Besides the high price, the quality of the houses sometimes also leaves something to be desired (Van der Laan, 2020). Where in the social rental sector there is always a committee for conflicts, this is not the case for the private sector. In case of conflicts between the tenant and the landlord, the transaction costs will be higher, and therefore not always an option for the tenant (Rijksoverhied, 2020a, March 2).

Consequences of policy for the housing market

In the Netherlands, the stimulation of homeownership was the government's focus for the housing market. The reasons for this can be found in the supposed positive socio-economic effects concerning homeownership. In 2000, Johan Remkes, then State Secretary for "public housing and urban policy" proposed implementing a policy that should ensure that at least 65% of the housing market will be homeowners within 10 years (Kromhout & Oving, 2008). This never happened; in the last decade it has been hovering at around 56%, with the rest being supplied by the renting sector. Although the ratio of the number of homeowners has hardly changed in recent years, this does not mean that the policy on the housing market for homeowners has not helped. In the 1970s, only 35 percent of the housing stock comprised homeowner's homes, so there has been a considerable shift in the housing market over the years (PBL, 2018) This shift however has led to a substantial decline in the supply side of the renting sector.

Affordability in both sectors

The change in the ratio between homeowners and rental properties is also reflected in the prices. When looking at the social rental market, the price is maximised at the indicated level set by the government, regardless of the demand for this type of home (PBL, 2018). However, moving to another house in this sector is almost not possible due to the high demand. The same is not visible in the private rental market, where short supply has led to a substantial rent increase over the years. The CBS stated in 2019 that the total housing costs for tenants increased by an average of 14 percent compared to 2012. The housing costs here mainly come from the higher rents in both the social and the private sector (CBS, 2019d). Although there is a maximisation in the price increase in social rent, this does not apply to tenants who have high income. When this is compared with the housing costs of homeowners, the average increase was only 2 percent in the same period. The relatively low increase was due to the lower interest rates, strict new mortgage regulations, and the declining mortgage debt among older homeowners (CBS, 2019d).

In conclusion

The context has given us more insight into the housing market in the Netherlands. Firstly, it has highlighted the impacts of government regulation regarding the provision of mortgages. On the one hand, this reduces the financial risk, but on the other it also creates a dichotomy in society; where one group can get a mortgage that makes buying a house possible and another group is forced to continue to rent. This chapter also echoes a discussion in the theoretical framework, which stated that having high debts has a negative effect on financial satisfaction; homeowners in the Dutch market incur large amounts of debt relative to other OECD countries, which might influence the association between homeownership and financial satisfaction for this research.

In the second part of the context, the development of the housing market was discussed. It emerged that due to, among other things, the government stimulus, considerable wealth increases have been possible in recent decades, attributable to the increase in house prices. According to Plagnol (2011), this is an important factor that contributes positively to financial satisfaction (Plagnol, 2011). It should be noted, however, that the financial crisis of 2008 has also exposed the risks of the Dutch housing market. The situation has led to high financial risks which can have a negative impact on financial satisfaction.

What is clear from the context section is that when the tenant and homeowners are compared, a distinction must be made between the social and private rental sector. The government regulates heavily in the social sector on both price and quality, but it does impose requirements on the tenants. Subsidized renting in the social sector is for people with low incomes (vulnerable groups in society), and they will likely experience a lower financial satisfaction to start with compared with the other groups.

Government policy in the free rental sector in limited, along with incentives to stimulate house purchase, prices have risen significantly. The uncertainty and increase in price can contribute negatively to financial satisfaction. Although this group is more comparable to homeowners, the choice to live in the private rental sector can have a number of reasons. As stated earlier, buying a home usually requires a long-term financial commitment. Moving to another region / house involves high transaction costs and this could be a reason to remain in the private rental sector. This could have a positive effect on financial satisfaction, as the mobility of the individual is higher, and they can therefore be more efficient and effective in the labour market. On the other hand, obtaining a mortgage is not possible for everyone. Buying a house may not be an option for this group and the expensive private rent remains. This group will then spend a considerable amount of their income on renting from the private sector, and they will not be able to profit from the investment in the housing market. This group may experience less financial stress which may be present if an individual has a mortgage, perhaps leading to a higher financial satisfaction; however, the high costs and the added value of the houses may lead to negative financial satisfaction.

Hypotheses

The following concerns the null and alternative hypotheses of the posed main question: *To what extent does financial satisfaction depend on homeownership in the Netherlands?* (in the period from 2008 to 2018)

Hypothesis main question

Nulhypothese; There is no relationship between owning a house in the Netherlands and financial satisfaction.

Alternative hypothesis*;* There is a *positive* relationship between owning a house in the Netherlands and financial satisfaction.

The above research question stems from the relationship between financial satisfaction and homeownership already discussed. If the null hypothesis were to be assumed, this would mean that owning a house does not have enough effect to make a significant difference in financial satisfaction. Perhaps having a home does not contribute to financial satisfaction, and this could be due to the high financial risks. If the null hypothesis is rejected, having a home in the Netherlands appears to affect financial satisfaction. As discussed in the previous sections, the effect should be positive given the theory.

Hypotheses Sub-questions

To analyse the main question better, several sub-questions have been formulated. The sub-questions be an extension of the context section, in which a specific distinction was made between the social and the private-rental sector, and the influence of the volatility of the housing market on financial satisfaction.

1. When the homeowner’s market is compared to the social rental sector (with benefits), is there a significant difference in financial satisfaction?

2. When the homeowner’s market is compared to the rental sector (without benefits), is there a significant difference in financial satisfaction?

3. Does homeowners' financial satisfaction change when the avarage housing value in the Netherlands fluctuate?

H1: When a respondent is in the social rental sector with benefits, the financial satisfaction compared to the homeowner is significantly lower.

H2: When a respondent is in the rental sector without benefits, financial satisfaction with the homeowner is significantly lower.

H3: When the average house price in the Netherlands rises, it has a positive effect on the financial satisfaction of the homeowner.

H4: When the average house price in the Netherlands falls, it has a negative effect on the financial satisfaction of the homeowner.

Literature study

The relationship between financial satisfaction and the housing market is not new; previous studies have already shown that we can expect a positive association between the two (Tharp et al., 2020), confirming the hypotheses that arising from the theoretical framework and the context sections.

In the theoretical framework, the framework of Joo and Grable (2004) is briefly explained, which should provide more insights on how to approach financial satisfaction (Joo & Grable, 2004). The framework has been used in several studies, including that of Garrett & James III (2013), entitled "Financial Ratios and Perceived Household Financial Satisfaction", in which financial health was defined by using solvency, liquidity, and investment asset ratio (Tharp et al., 2020). A more recent approach to this research has been written by Tharp et. Al (2020) which uses Joo and Grabel's framework to find a relationship between homeownership and financial satisfaction. Guided in the research of Joo and Grable (2004), the authors formulate five hypotheses based on the effects homeownership has on financial satisfaction (Tharp et al., 2020, p.p 5),through using different subcomponents of the framework. Tharp et al. suggests that having a mortgage should have a negative impact on financial satisfaction due to the increase in the subcomponent financial stress. The measurement of this subcomponent was done through using an indication that determined if a respondent was late with a mortgage payment. Tharp et al assume that late mortgage payments indicate more financial stress which will have a negative impact on financial satisfaction (Tharp et al., 2020, p.p 4). In the results he couldn't reject the null hypothesis and concluded that "the findings do not undermine the factors predicted to influence financial satisfaction within Joo and Grable's (2004) framework, but rather, suggest different strength or direction of associations than anticipated." (Tharp et al., 2020, p.p 17). This is an important finding, namely that the framework can indeed provide insights, but is not yet comprehensive in order to fully explain financial satisfaction.

This is not very strange in that respect, since financial satisfaction is a subjective indicator that is difficult to approximate. Therefore, making a distinction between homeowners and tenants in the housing market can not entirely encompass this difference. Although these can certainly affect an individual's financial satisfaction, the effect is different for tenants and homeowners. This is also endorsed in the research by Havet and Penot (2010), in which "it was shown that homeowners were different from renters in terms of portfolio choices, risk management, job mobility, environment, segregation, child outcomes, etc." (Havet & Penot, 2010, p.p 2). This makes it notably difficult to control for everything when researching the differences between homeownership and renting. Aaronson (2000) endorsed this in his research "A Note on the Benefits of Homeownership" in which the complexity of homeowners and renters emerges. He highlights that when these two are compared by an OLS regression there may be a bias for homeownership effects (Aaronson, 2000, p.p 2). The author is also critical of the use of frameworks which may try to make connections with homeownership, because the assumptions required for this are by definition difficult to defend (Aaronson, 2000). In the study by Tharp et. Al. (2020), a large number of the hypotheses were answered by means of the framework as could be expected from the theory, but the authors also state that during the research there is a risk of omitted variable biases due to the endogeneity of homeownership in relation to financial satisfaction.

A possible solution to rectify this bias is through finding proper instrumental variables and running an IV regression (Angrist & Pischke, 2014). This is outlined by multiple authors (Aaronson 2000; Tharp et al., 2020), and attempted by Tharp et al (2020), but no robust instruments have been found for homeownership in relation to financial satisfaction. This research hopes to further this attempt and aims to determine the effects of homeownership on financial satisfaction using IV regressions, in an effort to eliminate the previously found omitted variable bias and answer the main research question. This will be further elaborated upon in the methodology chapter.

Methodology

This chapter describes the research method. The first section discusses which data is used. The next section outlines the variables that will be used in the regressions, and lastly this chapter discusses which analysis strategy is used to answer the hypotheses.

Data

This paper is based upon data from the LISS Panel and is a representative sample of Dutch individuals who take part in a monthly internet survey. The respondents of the LISS Panel are based on a true probability sample of households drawn from the population register. To ensure a true probability sample, respondents who could otherwise not take part in the survey were provided with a computer and internet connection. The data comprise longitudinal panel data, covering a large variety of domains. Merging different years and domains can be done by using a key variable that will be unique for a respondent (Das et al., 2018, p.p 1). The LISS panel has been active since October 2007 and consist of 5000 households, comprising around 75000 individuals (CentERdata, 2020). The questions posed in the LISS survey regarding financial satisfaction and homeownership closely mirror the questions used by other research studying this topic, therefore we can assume an acceptable internal validity.

Data used in this paper were collected in June 2008 through August 2008 and every year thereafter until 2018. This study is interested in respondents that are homeowners or renters in the Netherlands, which included around 3,500 respondents per year (CentERdata, 2020). The database for the period 2008-2018 consists in total of 38,051 respondents and will be used in this study.

For the development of housing prices in the Netherlands an additional variable is used; the source of the data for the average housing value per year in the Netherlands for the period 2008-2018 is obtained from Statistics Netherlands (StatLine, 2020).

Variables

It has been established in the theoretical framework that there are several factors that influence financial satisfaction, in this section these variables will be elaborated on.

Dependent variable

The dependent variable in this paper is financial satisfaction and is measured by the question "How satisfied are you with your financial situation?". Responses were measured on a Likert scale from 0 to 10, where value "0" means the respondent is not at all satisfied with his/her financial satisfaction, and "10" means the respondent is entirely satisfied (CentERdata, 2020). The level of measurement for this variable is on an ordinal level.

Independent variables

For this paper there are three independent variables used based on the current housing situation. Based on the literature, there should be a positive relationship between homeownership and financial satisfaction (Elsinga and Hoekstra 2005). The independent variable "homeowner" is obtained from the question "Are you a tenant, subtenant, or (co-)owner of your current dwelling?", if the response is (co-)owner (option 3), the respondent will be selected as "homeowner". If the respondent selects tenant (option 1) or subtenant (option 2), the variable "homeowner" will be set to 0. There was also an option "other", if this was the case the value of this variable is set to a missing value and will not be included in the regression (CentERdata, 2020). The sample size of homeowners was N=35370 in the period 2008-2018, and around N=3500 per year.

As was discussed in the context section, there is an important distinction that should be made regarding the renting market in the Netherlands. A tenant can rent with benefits in the social sector and rent without benefits. This distinction will create the variables "Housing benefits" and "Private renting". This distinction is important to include, because of the potential differences in renters with benefits and without, as this could have a substantial effect on financial satisfaction (Kaas et al., 2019).

The question that makes this distinction between renters possible is; "Do you receive (through the Tax Administration) any rent benefit?". If both Option 1, "yes, I receive rent benefit" and the variable "homeowner" is coded 0, the respondent will be placed in the category "Housing benefits" and set to a value of 1. If the respondent selects "no, I don't receive rent benefit" and the variable "homeowner" is 0, the variable "private renting" will be set to a value of 1. The variables "Housing benefits" and "private renting" will be coded 1, if the variable homeowner is also coded 1. In the questionary the option "I prefer not to say" or "I don't know", was an option, if the respondent selected one of these options, the variables "Housing benefit" and "private renting" were set to a missing value (CentERdata, 2020). These independent variables reduced the sample size, for the variable housing benefits the sample size is reduced N=26156 and for the variable private renting this was around 30659 in the selected period.

The fourth independent variable is "Increase Price", this variable is obtained from Statistics Netherlands and includes data from 2008 until 2018 (StatLine, 2020). As Plagnol (2011) describes, housing value could be a more important indicator for financial satisfaction than homeownership (Plagnol, 2011). The variable shows the change in average housing price in The Netherlands compared to the year before. This variable only applies for those respondents that have indicated to be a homeowner. If the variable value homeowner is set to 1, the respondent will be given the variable "Increase Price" for that specific year. When the variable homeowner is set to 0, the variable "Increase Price" will set to a missing value. The sample size for this variable will be reduced to only homeowners; N= 23032 in the period (2008-2018).

Demographic variables

To control for demographic characteristics, the variables age, cohabitation, education, gender, and income were included as control variables. Controlling these variables was also used in previous studies of financial satisfaction (Hira & Mugenda, 1998; Joo & Grable, 2004). The variable age was coded in the same manner as Statistics Netherlands, with 7 different categorical groups: (1) "14 years and younger", (2) "15 - 24 years" , (3) "25 - 34 years" , (4) "35 - 44 years" , (5) "45 - 54 years" , (6) "55 - 64 years" , and (7) "65 years and older". The variable cohabitation was obtained in the question: "The household head lives together with a partner (wedded or unwedded)", coded (0) if the respondent was not living together with a partner and (1) if he/she was living with a partner. For the level of education, this study uses the same categorization as Statistics Netherlands,with 6 different categories; (1)" primary school", (2)" intermediate secondary education", (3)" higher secondary education", (4)" higher secondary education", (5)" higher vocational education", and (6)" university". The variable gender; male respondents where given the value 1, female respondents set as 0 (CentERdata, 2020).

For the income variable the use of an open income question is preferred, as it is a better predictor of financial satisfaction; both personal or household income can be used (Hsieh, 2003). However self-reports of income could suffer from low reliability and high non-response (Headey et al., 2005). However because of the importance of this variable it is included in this study. If the respondent indicated the option "I don't know" or "Unknown" the personal income variable will be coded as missing value (CentERdata, 2020).

Analytic Strategy

The data collected is numerical and can be analysed through statistical techniques, making this a quantitative research exploration (Verhoeven, 2018). The research will be done with the statistical software package “Stata”, which will run the analyses used to answer the research question.

In the chapter results, descriptive statistics is used to give more insight in the demographic variables of the LISS panel data and are compared with the data of Statistics Netherlands. Comparing both demographic values will give a representativeness of the sample used in this research, if comparable the results measured in the study are generalizable for the population in The Netherlands (CentERdata, 2020).

OLS model

To predict financial satisfaction with the described variables, the method ordinary least squares (OLS) will be used. Using multiple regression in the model could introduce a problem, if these independent variables correlate with each other the problem of multicollinearity will occur. This will reduce the precision of the coefficients in the OLS regression (Chen, 2012).

For using the method OLS-regression there are multiple underlining assumptions, one assumption is that all independent variables are uncorrelated with the error term. This problem occurs when there is omitted variable bias or simultaneity between dependent and independent variables (Angrist & Pischke, 2014). Omitted variable biased is probably introduced by using longitudinal panel data from multiple points in time for the same respondent, for solving this problem another method will be used.

Fixed effect model

In the second part of the analysis the method OLS with fixed effects will predict financial satisfaction in order to account for the omitted variable bias introduced by using the OLS method. The bias in the OLS method is included in the error term and predictor variable, since the OLS model by itself does not account for time-invariant characteristics that are unique to a respondent. The model with fixed effects removes these time-invariant characteristics and will output the net effect of a coefficient (Stock & Watson, 2008).

IV-regression

The third part of the analysis will introduce IV-regression, this method will produce a consistent result if there is a correlation between the independent variable and the error term (Angrist & Pischke, 2014). As mentioned in the literature study, the relationship between homeownership and financial satisfaction introduces an endogeneity problem and will therefore introduce a omitted variable bias in the results (Tharp et al., 2020). This will be tested with Hausman specification test, whereby the instrument variable estimates will be compared with the OLS estimates (Angrist & Pischke, 2014). If the test is significant there is the problem of endogeneity and the IV-regression is necessary.

For an unbiased result in the IV-regression it is crucial to identify a strong instrument. The instrument needs to be highly correlated with homeownership and not correlated with financial satisfaction, however the instrument needs to have a effect on financials satisfaction through homeownership. To test if the instrument is strong enough, we will look at the F-statistic in first state regression, the F-statistic should be greater than 10 (Angrist & Pischke, 2014).

The instruments and theory will be introduced and tested in the next chapter, and if the tests are strong enough, the IV-regression should provide us with an unbiased output regarding the relationship between homeownership and financial satisfaction.

Analysis

This chapter attempts to answer the hypotheses through statistical analysis of the data. Based on regressions, it will be determined to what extent owning a house influences financial satisfaction, and how changes in house value can affect financial satisfaction. The following (demographic) control variables derived from the theoretical framework will be used in all the regressions.

1. Age
2. Gender
3. Cohabitation
4. Education
5. Income

This paper will make use of longitudinal observation data concerning the same respondents over a period of 10 years (2008-2018). A fixed effects model is hereby necessary to control for the effects of year-invariant variables with year invariant effects (Angrist & Pischke, 2014). This will be done in the second part of the analysis, where 4 different regressions (introduced bellow) will be analysed, incorporating fixed effects. While these control variables are important to include in the regression's models, as already mentioned in the theoretical framework and literature study, this would most likely still introduce a omitted variable biased due to a endogeneity problem between financial satisfaction and homeownership. To overcome this problem this paper attempts to determine if a strong instrumental variable is available for an IV regression. This will be done in the third part in the analysis.

To answer the main question of this paper, the following four regression models will be analysed; What is the influence of owning a house in the Netherlands on financial satisfaction compared to renting?

- What is the influence of owning a house in the Netherlands on financial satisfaction compared to renting in the social sector with state-subsidized rent?
- What is the influence of owning a house in the Netherlands on financial satisfaction compared to renting without rent-subsidies (this can be in both the private and social rental sector)?
- What is the influence of price fluctuations for homeowners in the housing market in the Netherlands on financial satisfaction?

Descriptive statistics

As described earlier in the methodology, this data is provided by the LISS panel, administered by CentERdata for the period 2008-2018. This is a longitudinal survey based on a true probability sample of households provided from the population register (CentERdata, 2020). The database contains around 130 thousand observations in the period 2008 until 2018. Around 3500 respondents per year filled the housing survey and combining those in the given period gives this research around 35 thousand respondents who are active in the housing market: either owning or renting a house.

In the descriptive statistics the year 2018 of the LISS panel data will be compared with the data from Statistics Netherlands for the corresponding year. In the sample, the ratio between men and women in 2018 is 47% to 53%, this roughly corresponds with the data from Statistics Netherlands, where the national average between men and women is 48% to 52% (CBS , 2018a). Approximately 60% of the respondents also indicate that they live together, which gives a good representation of the Dutch population (CBS, 2018b).

Age	Frequency	Valid Percent
15-24	1,048	2.76
25-34	4,460	11.73
35-44	6,464	17.01
45-54	7,414	19.51
55-65	8,366	22.01
65-99	10,256	26.98

Age	Valid Percent
0-20	22,2
20-40	24,8
40-65	34,2
65-99	18,8

Table 1: Age of respondents (left), Age of the Dutch population in 2018(right) (CBS, 2018)

The age categories of the respondents are visible in table 1 (left). When this is compared with the data from Statistics Netherlands (table 1, right), we can see it that the key population figures from Statistics Netherlands are higher for the population groups ages 40 years and younger (CBS, 2018c). This is also not surprising since the percentage of the respondents especially for the age categories 15-24 and 25-34 could still live with their parents and are therefore not shown in this data. This ensures that the results in the frequency table above are skewed compared to the key population figures of Statistics Netherlands.

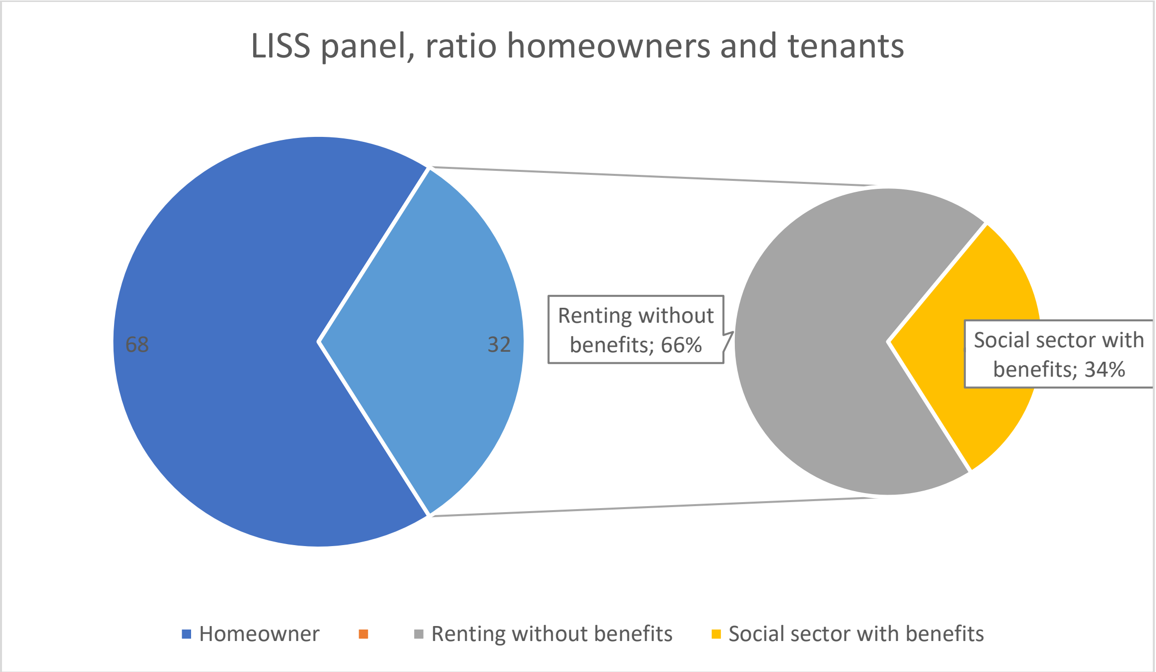

Figure 3; Respondents ratio between homeowners and tenants

Another interesting value to look at is the percentage of homeowners versus tenants**.** In the LISS panel data 68% of the respondents showed that they are homeowners in 2018, while only 32% are renting. Of the 32%, about 34% of the respondents also indicate they receive housing benefit, the rest either rents in the private or social rental sector (See figure 3). The context section describes the ratio of rent and owner-occupied market using data from Statistics Netherlands, which shows that approximately 57% of the properties in 2018 belong to homeowners, while the other 43% are renters. When the null values are also considered with the rental market (when the respondent has chosen the option "other"), the ratio in the LISS panel data remains relatively high, at 66% homeownership vs. 34% rent. The reason for this is not clear and could be a problem for generalising the results (PBL, 2018).

Another interesting finding is that the "social rental sector" in the LISS panel data is quite small, at only 34% compared to 64% in the data from Statistics Netherlands in year 2018. An explanation could be found by the formulation of the question asked by the LISS panel; the questionnaire taken by the respondents only asked, "do you receive a housing benefit through the tax authorities?", this means that many of the respondents who are living in a social rental home but receive no housing benefit would answer no. If this is taken into account, the ratio in the Netherlands with housing benefits is around 32% compared to 34% in our data (PBL, 2018).

Another important indicator is net disposable income. The average disposable income of a respondent in 2018 is approximately 2000 euros per month. This amount is substantially lower than the income distribution seen in Statistics Netherlands. The data from Statistics Netherlands show that the average disposable income is around 2,400 euros per month (CBS, 2019b). Several factors may have contributed to this difference; a substantial number (5%) of respondents have given the indication that they receive 0-euro income per month in year 2018. Another explanation for the low average income can be found in the questionnaire, some (5%) respondents noted the option “I don’t know” and are therefore not included in the average disposable income. This was a potential problem what also been described in the methodology, where self reported income could suffer from low reliability and high non-response (Headey et al., 2005).

The distribution in the level of education is representative of the education level in the Netherlands (CBS, 2018c). Table 2 shows the frequency and valid percentage of education level for the LISS panel data.

Education	***Frequency***	***Valid Percent***
Primary education	217	5.86
Prevocational secondary education	733	19.78
Senior general secondary education	319	8.61
Senior secondary vocational education	912	24.61
Higher vocational education	1,017	27.4
University education	508	13.71

Table 2; Education level respondents

Almost all independent variables described above are generally in line with the data from Statistics Netherlands. However, the data is a bit skewed when looking the variable income and the proportion renters and homeowners. This must be taken into account when the results of regressions are generalised.

Regressions

In the survey, the respondents were asked to indicate how financial satisfied they are on a scale from 0 to 10, and what their housing situation was in that particular year. A respondent can indicate whether he/she owns or rents their house, this information is used for the first model, where all homeowners and renters are included. Model 2 includes to what extent a respondent receives housing benefits and compares the corresponding levels of financial satisfaction with those of respondents who indicate that they own a house. Model 3 looks at the same comparison, but only includes renters who do not receive housing benefits. Model 4 only includes homeowners and the extent to which a price fluctuation on the housing market affects financial satisfaction. The four regressions are performed by the OLS method and are also tested with the control variables as given above.

Correlation matrix

For a (multiple) OLS regression analysis and fixed effects, the assumption is that the independent variables do not correlate much with each other, otherwise there would be multicollinearity. To check whether this is not the case, a correlation matrix is created. A value of 0.8 or higher means that the independent variables correlate too strongly with each other and therefore cannot be included in the same equation (Angrist & Pischke, 2014).

	Homeowner	Age	Gender	Cohabitation	Education	Income
Homeowner	1					
Age	0.0586	1				
Gender	-0.0523	-0.0935	1			
Cohabitation	0.3496	-0.0003	-0.0809	1		
Education	0.1790	-0.2497	-0.0844	0.0494	1	
Income	0.2025	0.0935	-0.4049	-0.0282	0.3561	1

Table 3; Correlation matrix of independent variables

As seen in table 3, no independent variable has a score above 0.8, so all independent variables can be included in the regressions

OLS-Regression model

	(1)	(1a)	(2)	(2a)	(3)	(3a)	(4)	(4a)
Homeowner	0.908 ***	0.772 ***						
	(0.021)	(0.0218)						
Housing benefit			-1.776 ***	-1.589 ***				
			(0.0335)	(0.0339)				
Private renting					-0.608 ***	-0.504 ***		
					(0.0222)	(0.0224)		
Increase Price							0.00359	0.000278
							(0.00198)	(0.00198)
Age	0.215 ***	0.173 ***	0.221 ***	0.193 ***	0.218 ***	0.181 ***	0.226 ***	0.204 ***
	(0.006)	(0.00668)	(0.00751)	(0.00757)	(0.00660)	(0.00666)	(0.00767)	(0.00768)
Gender	-0.020	0.274^{***}	0.0342	0.323^{***}	0.0219	0.309^{***}	0.0517^{*}	0.362^{***}
	(0.018)	(0.0203)	(0.0203)	(0.0225)	(0.0184)	(0.0202)	(0.0202)	(0.0225)
Cohabitation	0.219 ***	0.333^{***}	0.176^{***}	0.286^{***}	0.156^{***}	0.266^{***}	0.159^{***}	0.269^{***}
	(0.020)	(0.0204)	(0.0226)	(0.0229)	(0.0200)	(0.0202)	(0.0225)	(0.0228)
Education	0.175 ***	0.0815^{***}	0.149^{***}	0.0656^{***}	0.173^{***}	0.0815^{***}	0.167^{***}	0.0782^{***}
	(0.006)	(0.00691)	(0.00714)	(0.00763)	(0.00639)	(0.00686)	(0.00710)	(0.00761)
Income (X1000)		0.409^{***}		0.350^{***}		0.378^{***}		0.346^{***}
		(0.01)		(0.01)		(0.01)		(0.01)
Intercept	4.221 ***	3.982^{***}	5.199^{***}	4.822^{***}	5.146^{***}	4.797^{***}	5.108^{***}	4.716^{***}
	(0.051)	(0.0516)	(0.0613)	(0.0628)	(0.0542)	(0.0551)	(0.0615)	(0.0628)
N	35370	33783	27293	26156	32189	30659	24112	23032
adj. R^2	0.120	0.159	0.163	0.197	0.083	0.121	0.048	0.089

Standard errors in parentheses
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 4; Regression analysis with independent variables; Homeowner (1), Housing benefit (2), Private renting (3) and increase price (4)

In table 4 the results are given of the 4 different OLS regressions, which provide more insight into the hypothesis. The results of all the models have a significant F value (0.0), this means that all the significant independent variables may be interpreted in the following subsections.

Control variables

The control variable income in these four OLS regression was also added later to gain more insight into the influence of a strong coefficient on the equation. When the variable income is added to the equation, it can be seen that the size of other coefficients become smaller, but they retain their significance and have not changed direction. This does not apply to Gender in the first model, it can be seen that both direction and significance level change when income is included. Cohabitation is the only variable that increases in strengt when the income variable is included.

If all variables are included in the OLS regressions, it can be seen that all independent control variables have a significance of p <0.001, which means that all variables listed above contribute significantly to financial satisfaction. The control variables “Age”, “Gender”, “Education”, “Cohabitation” and “Income” have a positive relationship to financial satisfaction and may be considered by the significance level.

According to the findings in the OLS-models; if a respondent is older, they have a higher financial satisfaction. For the variable gender there is also a positive relationship with financial satisfaction. Gender is a binary variable, which means that if the respondent is male, financial satisfaction is higher compared to female. These results are in line with Brown et al. (2014), where men did experience lower financial satisfaction if they where still renting later in life (Brown et al., 2014).

The variable cohabitation is also binary, if the respondent is married or living with a partner the variable will be 1. The results show that there is a positive and significant relationship between cohabitation and financial satisfaction if the respondent is cohabiting. This is also in line with previous research done by (Brown et al., 2014)), where non-retirees who are not cohabitating had a negative and significant impact on financial satisfaction. (Hira & Mugenda, 1998, p.p 80)

Both income and education show a positive and significant result, which is in line with recent research (Tharp et al., 2020). The coefficient for income is depicted in multiples of 1000, so for every 1000 Euros, the financial satisfaction will increase with the given coefficient in the table above. For education, an increase in “level of education” for the respondent also increases the financial satisfaction by the coefficient strength given in the table above.

Independent variables

The first model uses the independent variable “Homeowner” to compare financial satisfaction with respondents that are homeowners versus responders that are renters. This model gives us more insight into the effects of homeownership on financial satisfaction and may answer the first hypothesis. “Homeowner” has a coefficient of 0.772 and is a positive and relatively strong relationship. Because of the significant value of p <0.001, this may be interpreted in the conclusion of this subsection. Based on this analysis, it can be stated that owning a home has a significant and positive effect on financial satisfaction. This is also consistent with the research results of Tharp et. Al (2020), whereby homeownership was positively associated with financial satisfaction (Tharp et al., 2020).

As described in the context, the renting market can be split between the social sector with benefits and the private sector without any benefits. To get more insight in these markets model 2 (a) will consider both homeowners, and only renters in the social sector with housing benefits. The independent variable "housing benefit" has a significance of p <0.001 and can thus be interpreted. When the housing market is divided between homeowners and subsidized renters, the difference in financial satisfaction has a strong negative relationship. A respondent who is renting with housing benefits has a financial satisfaction of -1,589 lower than a homeowner. As mentioned in the context and literature study, comparing those two groups is difficult. The difference in these groups is more than only homeownership, and therefore a lower financial satisfaction can be linked to other factors. While this result shows that there is a substantial difference in these two groups, due to the lack of other independent variables there is a strong omitted variable biased in this model. The inclusion of this model however nonetheless gives us more insight in the different groups, isolating them from other renters in the first model.

In model 3, the groups are more similar; the comparison is between homeowners and renters without housing benefits. This gives a better indication of what owning a house does for financial satisfaction compared to model 1 & 2. For this we use the independent variable "Private Rental"; the variable has a significance of p <0.001 and can therefore be interpreted. The relationship with financial satisfaction is negative with a coefficient of 0.504. When a respondent indicates that he/she is renting on the housing market but does not receive housing benefits from the government, the financial satisfaction is -0.504 lower compared to a respondent who owns a house. The coefficient is substantially lower than the first two regressions, this is due to the separation of respondents with housing benefits. The coefficient is weaker, however remains significant and in the same direction as hypothesised.

The fourth OLS regression differs from the previous three models and will be discussed in a later section in more detail.

Explanatory power and the conclusion

The adjusted R value are given for all the regressions in table 4, the explanatory power off all the models can be described as weak. The highest R-Squared value can be seen in model 2a with a value of 0.197, which means that model 2a can determine 19,7 percent of the explained variance of the dependent variable. The weak explanatory power however is not uncommon in the social or behavioural sciences due to the fact that we can't include all relevant predictors to explain the dependent variable (Rapoport, 1972).

This is visible when the variable "income" is introduced by OLS models, the explanatory power of the OLS models increases and the coefficients from almost all other variables decreases in power (Angrist & Pischke, 2014). To achieve a higher adjusted R value, we could include more variables as described in the framework by Joo and Gabe, however due to a lack of specific data and the potential for omitted variable biased, this should be avoided.

The strength of the coefficients of all independent variables can substantially differ by including more variables, this of course is not uncommon in the social science and cannot therefore be the only reason for not answering the hypothesis based on the first results that are significant. As mentioned, the OLS regression uses panel data of specific respondents spanning multiple years. The OLS regressions however do not account for the specific effect of an individual respondent over the years and could therefore introduce a bias in coefficient strength, direction, and significance level. To overcome this particular issue the second part of this analysis will use an OLS regression with fixed effects. A fixed effects model can be used to remove the omitted variable bias, as outlined in the methodology section, through introducing a fixed mean for each respondent (Kohler & Kreuter, 2005).

OLS-Regression model with Fixed effects

	(1)	(1a)	(2)	(2a)	(3)	(3a)	(4)	(4a)
Homeowner	0.0557	0.0209						
	(0.047)	(0.0480)						
Housing benefit			-0.229*	-0.179				
			(0.112)	(0.112)				
Private renting					-0.0454	-0.0116		
					(0.0478)	(0.0482)		
Increase Price							0.00431**	0.00345*
							(0.00157)	(0.00159)
Age	0.161***	0.113***	0.150***	0.118***	0.129***	0.0854***	0.0801***	0.0573**
	(0.017)	(0.0183)	(0.0193)	(0.0197)	(0.0179)	(0.0183)	(0.0210)	(0.0214)
Cohabitation	0.221***	0.257***	0.132**	0.146**	0.170***	0.193***	0.122*	0.128**
	(0.039)	(0.0401)	(0.0473)	(0.0478)	(0.0411)	(0.0415)	(0.0485)	(0.0490)
Education	0.0802***	0.0419	0.0893***	0.0692**	0.0803***	0.0377	0.0798**	0.0597*
	(0.021)	(0.0216)	(0.0265)	(0.0268)	(0.0223)	(0.0226)	(0.0281)	(0.0285)
Income (X1000)		0.330***		0.262***		0.320***		0.248***
		(0.0176)		(0.0186)		(0.0178)		(0.0188)
Intercept	5.426***	5.277***	5.672***	5.456***	5.825***	5.651***	6.274***	6.034***
	(0.121)	(0.123)	(0.144)	(0.147)	(0.125)	(0.128)	(0.157)	(0.161)
N	35370	33783	27293	26156	32189	30659	24112	23032
R^2 within	0.005	0.019	0.004	0.014	0.004	0.017	0.003	0.013
R^2 between	0.098	0.141	0.147	0.168	0.087	0.118	0.061	0.082
R^2 overall	0.078	0.119	0.113	0.137	0.065	0.093	0.044	0.068

Standard errors in parentheses
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 5; Regression analysis including fixed effects and with independent variables; Homeowner (1), Housing benefit (2), Private renting (3) and increase price (4)

In table 5 we included the same independent variables as the previous OLS method; however the variable "gender" is omitted because on individual level there is no change in the given period. In table 5 the results are given for the 4 different OLS regression with fixed effects, all the results have a significant F value (0.0) and may therefore be interpreted.

Control variables

Almost all controle variables have a significance of $p<0.05$, only the variable education in model 1 & 2 when income is included is not significant. Compaird to the first OLS model in figure 4, the direction is the same and the strength of the coefficient is in the ballpark of the previous results. The variable income is still a strong and significant indicator, and when including this variable in the equestion, almost all other coefficients of the indipendent variables are weakend. The variable cohabitation coefficient is getting stonger, however the change is small. Because the direction and strength of the coefficients are almost the same values, the conclusions for the controle variables will be quite similair and will therfore not be discussed in this section.

Indipendent variables

In model 1 with fixed effects, the coefficient for "Homeowners" is positive with a coefficient of 0.0209. If the respondent is a homeowner, the increase in financials satisfaction is 0.029. Compared to the coefficients of othere variables in the equestion this is a weak associastion with financial satisfaction. More important is the lack of significance ($p> 0.05$) of the variable "Homeowners". This could however be coincidental and therefore it is impossible to draw a conclusion about the hypothesis concerning this varaible.

When looking at the variable "housing benefits", the same direction is visible, as seen in the previous method. When the income variable is introduced in the model, the coefficient strength is weakend and the significance of the variable is greater than $p>0.05$. Model 2a can't be interpetated because of the lack of signifiance ($p>0.05$). When the income variable is not included in the fixed effects model, there is a negative and significant relationship with financial satisfaction if the respondent is living in the rental sector with housing benefits. As mentiond in the previous section and the theortical framework, this can probably be attributed to more than just the housing market. The direction is as predicted in the hypothesis, however due to the importance (in coefficient strenght and significance) of the income variable in this question the results for model 2 can't be included in answering the hypothesis.

The variable "Private renting" in model 3 with fixed effects is substantially lower than the regression without fixed effects, however the direction of the coefficient is the same as hypthesized. When the respondent is renting whithout housing benefits, the finacial satisfaction is -0.0166 lower than a homeowner. The results however aren't significant and can't be used to awnser the hypothesis.

Model 4

The fourth regression model differs from the previous three models, as the independent variable in this model is market variance, and not homeownership. Here, the financial satisfatction of homeowners are analyzed with changes in the value of their home. While this does not explicitly answer the main research question in this paper, it does give us a far greater understanding of financial satisfaction and the housing market.

OLS regression

The 4th OLS regression only compares homeowners' financials satisfaction, analysing the difference in average increase or decrease of housing market in percentage compared to the previous year in the Netherlands. The independent variable is called "Increase Price" and as seen in table 4, has a positive but small relationship with financial satisfaction. The direction is in line with the hypothesis, however, is not significant and can't thus be interpreted. This finding however is nonetheless interesting as mentioned in the theoretical framework having a house is one of the most important ways to gain financial capital and could therefore be a crucial factor for financial satisfaction. We suspected a positive and significant outcome, however, as has also been discussed in the theoretical framework and context, if the housing price increases and the respondent is willing to sell the house, the price for a new house will be also more expensive. The same argument can be made for when the housing market is in decline and the homeowner can still pay the mortgage (and has no intention to move), the impact on financial satisfaction could therefore be minimal.

Fixed effects

In table 5, the 4th regression coefficient is postive and significant ($p<0.05$). This means if the avarage house price in the Netherlands increased with 10 percent (compaired with the previous year), the increase in financial satisfaction on a respondent is 0.04. This could also be argued the other way around, when there is a crisis on the housing market with a decrease of 10 percent in housing value there will be a decrease in financial satisfaction of 0.04 for homeowners. There is thus a weak but postive relationship with financial satisfaction when the house prices are increasing as predicted in the theoretical framework. While the result is statistically significant, the power of the coefficient is weak. The change in financial satisfaction due to increase/decrease in housing value is too small for a significant change and thus not strong enough to accept the hypothesis. But, again, the value is nonetheless interesting. While the main research question focuses on homeownership and financial satisfaction, this paper has also noted the difficulty in defining and measuring the term financial satisfaction without introducing bias. While the previous three models in tabel 4 show a significant relationship between homeownership and financial satisfaction, model 4 in table 5 highlights that, while small, changes in the housing market also have a significant effect on the financial satisfaction of homeowners. The mere act of owning a home is therefore not the only contributing factor to the financial satisfaction of homeowners, and as thus, it is extremely difficult to recognize possible ommited variables or biases. If market fluctuations have a strong impact on the financial satisfaction of homeowners, then it may be possible that the results for some of the years measured in the first three regression are not reflective of homeownership, so much as they might be influenced by housing market crashes or booms. As discussed in the following section, this exemplifies the need for a methodology that is able to respond to the possible omitted variable bias (due to endogenity) in the first three models.

Explanatory power and conclusion

The R values are given for all the models in Table 5, the explanatory power off all the models can be described as weak. The highest R-Squared between value can be seen in model 2a with a value of 0.168, which means that model 2a can determine 16,8 percent of the explained variance of the dependent variable between respondents.

The explanatory power of the regression is weak and the significance of almost all independent variables are statistically insignificant ($p<0.05$) or too weak to be interpreted. While it is thus not possible to answer the hypothesis with the given results, the regression with fixed effects has shown that there is a potential bias in the previous OLS regression. The bias is not only in the coefficient strength, but also in the significance level. To see if there is indeed a bias in the OLS regression, the Hausman test is used. The results of the Hausman test are statistically significant ($p> 0.05$) and the use of a fixed effect model is preferable.

The results are different than we had expected. In the study by Tarp et al (2020) the results of homeownership had a positive and significant association with financial satisfaction. The method and variables used in the study were based on the framework by Joo and Grable (2004), which differs from the variables used for this analysis and could therefore explain the difference. As already mentioned in the literature study, including more variables is not always possible, nor is it always the preferred solution. To overcome this problem, IV-regression can be used.

IV regression

The results gathered from the OLS regression were almost all significant ($p < 0.001$) and the direction corresponds with the predictions in the hypothesis. In the second part of the analysis the results of all independent variables were (statistically) insignificant and indicated that the first OLS results are biased. As has already been described in the literature study, the explanatory variable is not exogenous, but endogenous and can therefore indicate an endogeneity problem. In other words, the variable homeownership is a variable that changes in strength and/or direction determined by its relationship with other independent variables inside the regression. This refers to a potential problem where explanatory variables are not included and causes omitted variable bias. In the relationship between homeownership and financial satisfaction Tarp et al (2020) concluded that there is omitted variable bias when using the framework by Joo and Grable, this could be solved by using an IV-regression (Tharp et al., 2020).

In the third part of the analysis, an attempt is made to find strong instruments to address the endogeneity problem in the previous models.

Instrument theory

In the methodology, the operation of an IV regression and its necessity has been extensively discussed. Finding a good and strong instrument is necessary to carry out the 2SLS and interpret the results without bias (Angrist & Pischke, 2014). It is important here that the instrument only works on financial satisfaction through the independent variable X; it should not directly correlate with financial satisfaction, but directly correlate with the independent variable, homeownership.

There is no method to indicate what a good instrument is within an existing dataset. The foundation of finding a good instrument is based on theory (and thus meets the above criteria) how the instrument is working within the model (Angrist & Pischke, 2014). Finding valid instrument is difficult and may not be exist et all. In the existing literature finding a good instrument for homeownership is hard, as already discussed in the literature study. For this research, the theory for the instrument will focus on difference between homeownership and renting and will therefore not include model 4.

Instrument 1

The first instrument that will be used is the respondent's relationship with the neighbourhood, which was included in the questionnaire. The theory behind this instrument is that homeowners are more willing to invest in neighbourhood relationships, because a good and stable neighbourhood would increase the value of their house. Therefore, homeowners would have more incentive to participate, which ultimately leads to growth in neighbourhood capital (Aaronson, 2000 p 3). Another reason for a good relationship is the high transaction cost for moving to another house, therefore investing time in the neighbourhood for a good relationship with the neighbours is an understandable investment for homeowners. The variable "relationship with the neighbourhood" has no significant relationship with financial satisfaction, but it could be influenced by homeownership.

Instrument 2

The second instrument is a combination between two questions; the age of the children and if they are living independently. All children between 5- and 16-years old living in the Netherlands are in the category of compulsory school age (Rijksoverheid, 2017), combining this with the variable if a child is living at least 4 days per week in the respondent's house, could give us a good instrument variable. The theory behind this instrument is that is if the respondent indicated that he/she has a child between age 5 to 16 years old living within the respondent's household, the mobility of the respondent (moving to another city) is more restricted due to potential impact of the child's school progress (Aaronson, 1999 p 11). This type of instrument has already been used by Aaronson (1999) for the endogenous variable homeownership, however it was a weak instrument and could therefore not be used. The instrument variable however could still be interesting to test for this study; the dataset used by Aaronson is more than two decades old and uses respondents from United States. However, it is important to note that in the research done by Tarp et al. (2020), the control variable "dependent children" had a positive and significant relationship with financial satisfaction and could therefore violate the rules for a "good" instrument (Tarp et al, 2020, p.23).

Instrument 3

The fourth instrument that will be tested is "distance to work", in which someone who owns a house might be content driving further on average than someone who rents. Buying a house is a long-term financial constraint and therefore the mobility of homeowners is lower than their renting counterparts (Havet & Penot, 2010). With this instrument, the relationship between "distance from work" and financial satisfaction is not significant but could have an impact when the instrument goes through homeowners.

Endogenous & Instrument test

Before the IV-regression can be interpreted, the instrument must first be tested (Angrist & Pischke, 2014). The questions that are crucial here; to what extent is the assumption of endogeneity correct and how robust is the instrument that will be used in the IV regression? The first question can be answered by controlling the Dublin and Wu-Hausman significance value, as described in the methodology section. In these tests, the F value must be higher than the critical value in order to determine that the instrument is indeed a strong indicator (Kohler & Kreuter, 2005). The results of these test are shown in table 6 for all three models and the different instruments.

		Model 1	Model 2	Model 3
Test endogenous - Wu-Hausman (p-value)	Instrument 1	0.00	0.00	0.00
	Instrument 2	0.00	0.00	0.00
	Instrument 3	-	-	-
Instrument test - F value	Instrument 1	15.26	0.04	17.61
	Instrument 2	387	41.48	405
	Instrument 3	-	-	-

Table 6; Results endogenous test and instrument test for model 1,2,3

The instrument "the relationship with the neighbourhood" indicates that there is indeed a problem of endogeneity. The variable homeownership is thus endogenous, and the use of IV-regression is necessary to remove the omitted variable bias. The second test determines the strength of the instrument, an F value less than 10 indicates that the instrument is weak. Model 1 and model 3 passes the instrument test and can therefore be used. For model 2 however the F-value is not significant, this indicates that the instrument can't be used. As mentioned in the instrument theory, the instrument measures the respondent's relationship with the neighbourhood and its based on the theory that if the respondent is renting, he/she could move more easily due to the low transaction cost. This theory however does not fit with respondents in the renting sector and housing benefits. Moving to another place is not only relatively costly for this group, but also not always an option. As described in the context, there is high demand for the social renting sector and finding a new place in this sector is hard. This could be an explanation for failing the instrument test for model 2. This instrument will be used only for model 1 & 3.

The instrument dependable children in age categories 5 to 16 years old, passes both the endogenous and the instrument test. And can therefore be used in all three models.

Unfortunately, the "distance to work" instrument does not pass the endogenous test, all p values are not significant, so theoretically no IV regression would be necessary. With further analysis of the instrument, there may be another explanation. Of the 35,000 respondents, only 2,500 respondents completed this "instrument" question. As a result, the IV regression would show different results compared to the previous OLS regression, because only a small part of the database is used. Because of this selection in the data, it is unfortunately not possible to use this instrument.

IV-regression results

The results of the IV-regressions are shown in table 7. Instrument 1 and 3 are used with the independent variable homeownership (model 1). Included in the results of the IV-regression are the results with and without fixed effects for both instruments. As already mentioned in the second part of this chapter, including fixed effects is mandatory to eliminate the selection bias that is introduced by using longitudinal panel data.

	Instrument 1	Instrument 1 & fe	Instrument 3	Instrument 3 & fe
Homeowner	7.425^{***}	0.0902	-2.863^{***}	-0.431
	(1.985)	(1.990)	(0.276)	(1.092)
Age	0.0347	0.109^{**}	0.255^{***}	0.120^{***}
	(0.0425)	(0.0341)	(0.0110)	(0.0241)
Gender	-0.168	0	0.518^{***}	0
	(0.139)	(.)	(0.0330)	(.)
Cohabitation	-1.917^{**}	0.232	1.574^{***}	0.317^{*}
	(0.673)	(0.261)	(0.0978)	(0.151)
Education	-0.162^{*}	0.0525	0.213^{***}	0.0500
	(0.0727)	(0.0408)	(0.0136)	(0.0292)
Income (X1000)	-0.152	0.309^{***}	0.720^{***}	0.339^{***}
	(0.168)	(0.0391)	(0.0275)	(0.0282)
Intercept	3.633^{***}	5.281^{***}	4.126^{***}	5.468^{***}
	(0.158)	(0.878)	(0.0705)	(0.477)
N	31534	31534	33783	33783

Standard errors in parentheses
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 7; IV-Regression analysis including fixed effects with independent variable; Homeowner (1), Instruments: neighbourhood relationship & dependable children age 5 to 16 years old

The IV-regression for model 2 and 3 showed comparable results, whereby the direction and significance indicate that the results where biased and are therefore not included in this figure. The significance of the independent variable in the IV-regression without fixed effects, is due to the omitted variable biased and will not be will not be further on elaborated. The results of the IV-regression, therefore, are unfortunately biased and can not be used to answer the hypothesis of the research.

For the first instrument the “relationship with the neighbourhood”, the results show that the direction of all independent variables are as hypothesised. The second instrument in figure 7, however, shows that the direction of the independent variable “homeowner” is different than hypothesised. Both IV-regression indicate a large standard error and statistically insignificant p-value, interpretation of this model for answering the hypothesis is therefore not possible. The reason for this could be found in the first stage, wherein both instruments show a low Partial R-squared value (less than 2%). Partial R-squared measures the correlation between the instrument and the endogenous variable, when this variable is too low the results will be biased.

The two instruments that have been tested are invalid due to the low Partial R-squared, as a result, the assumptions about the instruments are incorrect and the instruments are not valid. While this impedes the theoretical and statistical assumptions made by this paper, because an IV regression is necessary for this analysis in order to omit bias, it does confirm the conclusions made by many authors discussed in the theoretical framework and the literature review. As previous authors have shown, financial satisfaction is a complicated term with many inter-dependent variables that are difficult to isolate. Previous research shows that it is prone to endogeneity problems and omitted variable bias, however solving this by using an IV regression has proven remarkably tricky, as it is very difficult to find instrumental variables that relate to the independent variable, but not to financial satisfaction. So many choices we make in our lives relate directly to our financial satisfaction, and isolating choices which may serve as instruments, may be too far removed to provide any strong variable to use in the IV regression.

Conclusion

The concept 'financial satisfaction' is as complex as it is useful. The term itself has been linked to overall wellbeing, and as such the relationship between homeownership and financial satisfaction could be an important point of reference for policy makers, regulators, and researchers. In this study, longitudinal observation data from LISS panel was used, and based on different regressions methods it tried to answer the question; To what extent does financial satisfaction depend on homeownership in the Netherlands? (in the period from 2008 to 2018). Various factors have emerged from the theoretical framework and context section that have been argued to influence the housing market and financial satisfaction; using this, we had formulated four hypotheses.

The four hypotheses where analysed in four different models; in the first model all homeowners and renters where included in the variable "homeowners". In model 2 the interest was in the comparison of homeowners and respondents who received housing benefits. Third model; included renters who did not receive housing benefits, comparing these to homeowners; and the last model only included homeowners and the extend to which a price fluctuation on the housing market affects financial satisfaction. Analysing these four models was done using three different analysing methods, wherein social demographic control variables where included.

The first method used in this research was the OLS method. The first three models had a significant outcome in the direction what was predicted. If a respondent indicated that he/she was a homeowner, it had a positive effect on financial satisfaction. When comparing homeowners with subsidized renters (model 2), the strength of the coefficient increased and had an acceptable significant level. The independent variable in the third model was also significant, however the strength of heaving an owner-occupied house indicated a weaker relation with financial satisfaction compared with the first two models. As mentioned in the methodology, the use of longitudinal data resulted in omitted variable biased. Due to the omitted variable biased, the results could not be used to answer the hypothesis.

To overcome the omitted variable biased introduced by using longitudinal panel data, this study ran OLS regressions with fixed effects. This time the results where different. All the independent variables compared to the previous results indicated an insignificant result and therefore it is not possible answer the hypothesis of model 1, 2 and 3. The regression with fixed effects has shown that the previous results from the OLS-regression are biased and can therefore not be used. The only significant independent variable with the OLS regression was for model

4, the relationship was as predicted in the hypothesis; there is a weak but positive relationship with financial satisfaction if the average house price is increasing, and a negative relationship if the average price is decreasing. While the result is statistically significant, the strength of the coefficient is too weak to answer the hypothesis.

As indicated in the theoretical framework; defining and measuring the term financial satisfaction is difficult without introducing bias in the results. By only including homeownership and socio demographic control variables there is an omitted variable biased when the relationship between homeownership and financial satisfaction is measured. As pointed out in the literature study the variable homeownership is endogenous, and therefore violates the assumptions for the OLS method. The endogeneity problem thus introduces a biased in the given results, to overcome this, the method IV-regression was introduced.

In the IV-regression, three different instruments where introduced by this paper. In order to indicate whether the instrument was strong enough, we looked at the F-value, for both instrument 1 "relationship with the neighbourhood" and instrument 2 "dependable children between ages 5 and 16" the value indicated that it was a strong instrument. However due to the low Partial R-squared value of both instruments, the results of the IV-regressions were biased and could not therefore be used. The third instrument "distance to work" however, when testing WU-Hausman test, indicated that there was no endogeneity problem, and the IV-regression should not be necessary. Upon analysing the instrument, we found that only 250 respondents per year completed this question, meaning there was a selection biased introduced and therefore it was not possible to use this instrument.

The paper introduced 3 different methods for analysing the relationship between homeownership and financials satisfaction. Some of the methods showed a strong and significant result as predicted in the hypothesis, however in all the results there are (as mentioned above) biases and it is therefore too premature to answer the main research question.

Discussion

The importance of the concept financial satisfaction is due to the strong link with overall well-being, as has been described in the theoretical framework. As a Result, financial satisfaction has added value in terms of social and scientific relevance. In different studies, financial satisfaction had a positive association with homeownership, however these results could have a potential biased due to the endogeneity problem (Tharp et al., 2020).

The importance of the IV-regression methods can therefore not be overstated, however finding a good instrument is hereby necessary (Aaronson, 2000). The use of a framework could pose a partial solution to this problem (Tharp et al., 2020), however due to the indirect link between different subcomponents of financial satisfaction, it is not the preferred solution because it could result in a biased outcome.

This paper tried different instruments for the IV-regression, however these instruments could not solve the endogeneity problem. Although no robust empirical conclusions can therefore be made from this study, it remains scientifically relevant. Science advances when new theories are tested, naming which instruments have been used with which theories can certainly contribute to subsequent research. On top of this, it is worth outlining the immense challenges associated with tackling the endogeneity problem related to financial satisfaction. The fact that this paper was unable to find strong instruments, and hereby unable to rectify the biases, further solidifies the need to proceed cautiously when using financial satisfaction as an indicator in policy research and advice. It may be an important and promising concept, worthy of further analysis, but until the bias can be eliminated it remains a risky basis for researchers, policy makers and consultants. This paper would suggest further exploring IV regressions as a possible solution to the endogeneity problem, perhaps using a more expansive and detailed dataset and experimenting with different possible instrumental variables.

Due to the importance of financial satisfaction on well-being and the possible link with the housing market, this remains an interesting avenue of study (Tharp et al., 2020). Although the ever-present endogeneity problem allows for few concrete conclusions within this specific research paper, the availability of a good instrument could become an important indicator for further research, especially as it relates to consultancy and policy advice.

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