Netspar THESES

Heiline Adriaansen

Housing Wealth as a Supplement on Pension Savings
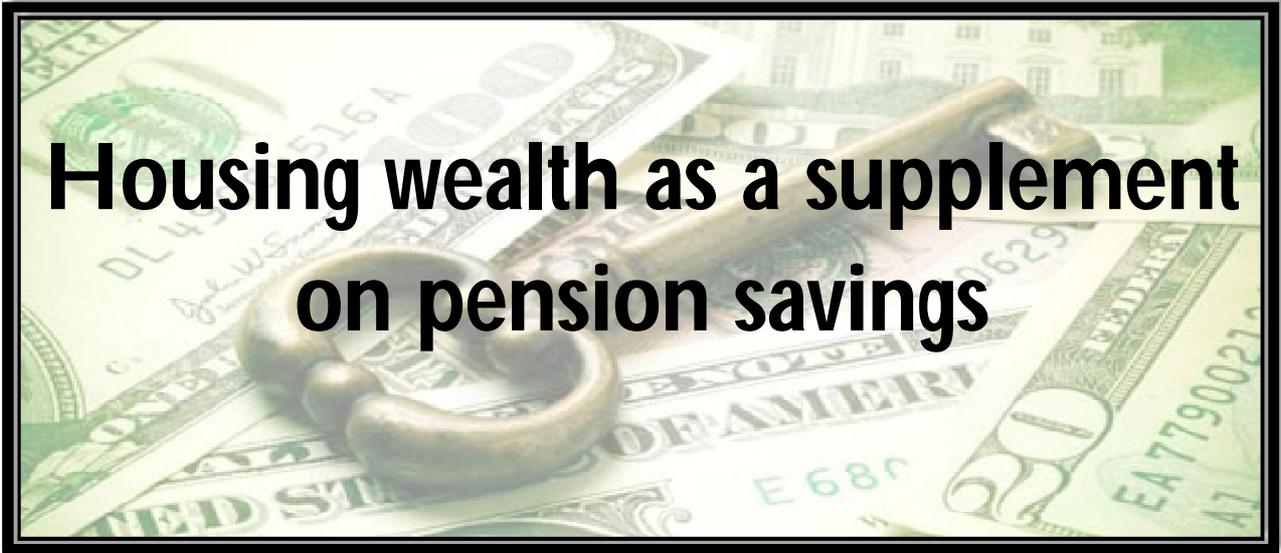
Housing wealth as a supplement on pension savings

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Abstract

Mortgage debt in the Netherlands is the highest among all countries in Europe. At the same time, our pension system has always been regarded as one of the best worldwide, mainly because of the high replacement rates. A high amount of pension assets in combination with a high amount of mortgage debt is reason to consider whether it would be a good idea to use pension savings for the housing market. This thesis investigates the financial consequences for Dutch households when the possibility is offered to use pension savings for a mortgage loan. Moreover, a survey at CentERdata is conducted to examine whether Dutch households actually wish to use pension savings for housing purposes.

One reason to make use of pension savings for housing purposes is to change the nature of savings. To change the nature of savings, a household effectively is provided a loan by the pension fund that can be used to lower its mortgage loan. The corresponding lower housing costs have to be repaid. If the after-tax mortgage interest rate is higher than the after-tax return on pension savings, there are no changes in consumption pattern before retirement but households will gain from higher retirement income. Another reason is to change the level of savings. In this way, pension savings are used to decrease a mortgage loan whereby households can benefit from a higher consumption pattern before retirement.

Majority of the participants from the survey conducted by CentERdata among Dutch households are not interested in using pension savings for housing purposes. The main reason given is the importance that they attach to a high level of retirement income. When individuals choose to substitute pension wealth for housing wealth, most participants mention the resulting lower housing costs as their reason.

Words of thanks

Without the help and support of all the people mentioned below, this master thesis would not have come about. Therefore, I want to start with a word of thanks to all those great people who provided me with information, computer and mathematical skills, behavioral knowledge, and mental support.

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I want to end my word of thanks by giving special attention to my partner and best friend Martijn Noteboom. You were always there to help me, during both the high and the low periods (where you had to survive new levels of grumpiness). Thank you, my love, for all your patience, mental support, and heartfelt sympathy.

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Introduction

Going Dutch: a well-known concept implying that the restaurant bill is split, with everyone paying his or her own share. It is the most famous example of our frugal reputation. *The Dutch Disease:* another concept related to our country, used for countries that are confronted with the negative consequences of a large increase in income. Recent developments unfortunately seem to make an end to our frugal reputation. Although we have recovered from our Dutch disease, it is not likely that this negative concept will lose its Dutch connotation. Quite the opposite, there is said to be a *new* Dutch Disease, namely Mortgage Debt (Mattich, 2013).

Mortgage debt in the Netherlands, with more than 110% of GDP, is the highest among all countries in Europe. Moreover, the overall national debt is 285% of disposable income (Mattich, 2013). At the same time an end has come to the seemingly permanent rise in Dutch housing prices. They have dropped most among all European countries, on average by 20% since the financial crisis started in 2008. A consequence of the combination of high mortgage debt and decreasing housing prices is the growing number of households with a mortgage loan that exceeds the value of their private home. In 2011, this was the case for more than one million households (CBS, 2013b).

One of the intervention goals of the Dutch government is to reduce the Loan to Value ratio (LTV, the mortgage loan amount relative to the value of the house) from 125% to 100% by 2018. Accordingly, the Wijffels Committee recently advised decreasing the LTV to 80% in order to protect Dutch households from high debt ratios (Commissie Structuur Nederlandse Banken, 2013).

A direct consequence of this government intervention is the decline in the number of first-time homebuyers: between 2005 and 2008 their number decreased by 20%, and by 2011 it further declined by a total of 40%. Potential buyers face uncertainty about the development of housing prices, insecure labor market, and tightened lending standards of banks as obstacles to enter the housing market (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012).

Fortunately, our economy also faces financial aspects that are well regulated. Our pension system has always been regarded as one of the best worldwide, mainly because of the high replacement rates. Klaas Knot, President of De Nederlandsche Bank, recently reported that the Netherlands possess collective pension assets equal to nearly 1,300 billion euros (Westen, M. 2013). By comparison, our total mortgage debt is equal to 670 billion euros (CBS 2012). In the latest Melbourne Global Pension Index by Mercer, which examines the adequacy of benefits, pension sustainability, and the integrity of pension systems, the Netherlands was ranked second worldwide (I Amsterdam, 2013).

A high amount of pension assets in combination with a high amount of mortgage debt is reason to consider whether it would be a good idea to use pension savings for the housing market. When we permit

individuals to withdraw part of their pension savings for mortgage repayments, household debt ratios will decline, monthly housing costs may decline, and mortgage loans will be paid off sooner. At the same time, retirement income will obviously decline.

Allowing pension withdrawals before the age of retirement in order to repay a mortgage loan is not uncommon. In developed countries like Canada, the United States, and Switzerland, the link between pension wealth and the housing market is well known. But we do not have to go that far to find constructions for the use of pension savings for mortgage repayments; even our neighboring countries Belgium and Germany offer this possibility.

This thesis will investigate the financial consequences for Dutch households when the possibility is offered to use pension savings for a mortgage loan. More specifically, it investigates the different connections between pension assets and housing assets, elaborating the various advantages, disadvantages, and related risks. It contributes to current literature by giving an *indication* of the financial consequences for individuals when using pension savings before their retirement age for housing purposes. Also, a survey is conducted of the interest among the Dutch population to make use of pension savings for a mortgage loan.

Chapter 1 presents an overview of the existing literature of the optimal path of consumption, with a distinction being made between homeowners and tenants. It also includes an introduction of the Dutch housing market and the Dutch pension system, looking at the financial position of individuals during different stages of life. *Chapter 2* explains what options might be developed to increase private property for retirement purposes by combining pension assets with homeownership. In *Chapter 3*, the financial arrangements are described of countries that offer the possibility of withdrawing money from the pension savings account before the age of retirement. It also investigates the financial consequences of this on retirement income. An overview of current Dutch tax policy is given in *Chapter 4*. The connection of pension savings with the housing market is modeled in *Chapter 5*. This chapter also elaborates on the financial consequences for households, and it presents policy recommendationes. Finally, *Chapter 6* presents the results of the survey that has been conducted among Dutch households to investigate whether individuals are prepared to use pension savings for mortgage loan reduction and other housing purposes.

1. The financial position of individuals during different stages of life

One of the most hotly debated items nowadays is how to create a sustainable pension system whereby people accumulate enough wealth to enable them to maintain a stable consumption level during retirement. In order to predict and analyze the consequences for individuals if they are offered the possibility to use pension savings for housing purposes, we first need to investigate how far removed we are in the Netherlands from the optimal path of consumption. Several questions then arise: What is the optimal path of consumption? What assets do we need when we reach retirement? Furthermore, why should government intervene? And what psychological biases and obstacles do we face during our working lives when we have to save for retirement by ourselves? This section presents scientific research to explain the optimal consumption path and the irrational behavior of human beings to savings. It goes on to describe the financial situation of individuals in the Netherlands during different stages of life .

1.1 Life Cycle Consumption

One of the first theories that explore the optimal level of consumption during an individual's lifetime is the 'ideal loan market' of Irving Fisher in the early twentieth century. Fisher (1930) assumed that consumers are forward-looking and choose consumption in such a way that lifetime utility is maximized. According to Fisher, every individual must have a uniform consumption path by compounding total lifetime resources, whereby the interest rate and the rate of time preferences are taken into account. By doing so, the *intertemporal budget constraint* is obtained; this shows the optimal consumption pattern during different stages of life, given the expected future income patterns. Accordingly, the household will engage in borrowing and lending whereby consumption remains more or less constant (Artle & Varaiya, 1978).

A quarter of a century later, Modigliani and Brumberg (1954) elaborated upon this subject and developed their famous *Life Cycle Hypothesis (LCH)* to explain the role of savings, and describe the optimal path of consumption. The model is based on two simplifying assumptions (Modigliani, 1985):

1) Opportunities: income is constant until retirement, there is no income for retirees, and the interest rate is equal to zero;
2) Preferences: consumption is constant over time, and there is no bequest motive.

The most powerful implication of the Life Cycle Hypothesis is to smooth consumption as much as possible, in order to maintain a stable lifestyle. The model assumes that people maximize utility over their lifetime and that utility is derived from current and future consumption. Therefore, consumption must be continuous in order to yield the highest utility, even if income is discontinuous; savings are primarily meant to finance consumption during retirement, which is completely independent of the level of income in a period (Baranzini, 2005).

Figure 1.1: Consumption & savings profile
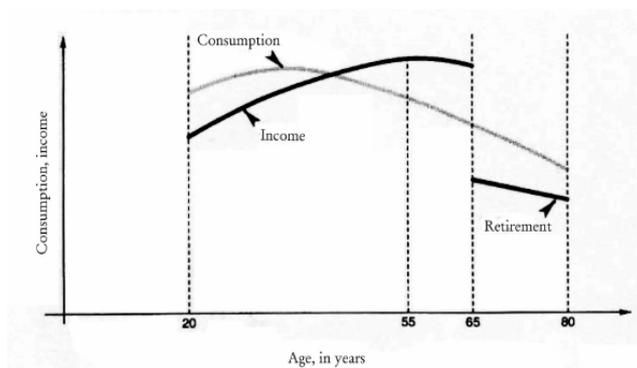
Source: Baranzini (2005)

According to Modigliani, people need to dissave when young (in other words, borrow) and start to save at middle age because of their gradually growing income (Figure 1.1). In other words, their consumption is higher while they are young compared to their income during that period, but this reverses from middle age. The dissaving period restarts when people retire and stops at death. The bold line in Figure 1.1 during retirement is the *actual* retirement income. However, since individuals were able to save part of their working income, their consumption during the retirement period will be higher.

If we assume non-negative saving rates, for example if young individuals are borrowing constrained, then according to Modigliani (1985) consumption smoothing will lead to a hump-shaped age path of wealth holding. It is based on the assumption that individuals know their time of death. If they are liquidity constrained, they need to save during their working period for their years of retirement. Their wealth thus increases in the working period. During retirement, wealth is decumulated proportionally until the time of death.

In 1957, Milton Friedman designed the optimal consumption path distinguishing permanent and temporary changes in income. Household consumption, he argued, responds only to permanent income shocks and is insensitive to transitory income shocks. In his paper *The Permanent Income Hypothesis*, individuals are expected to maintain a certain path of consumption based on predicted lifetime income. The transitory part of income may fluctuate; if it rises above the expected average lifetime income it is saved, and it is dissaved if it falls below that level (Friedman, 1957).

Finally, Tobin (1972) distinguishes between liquid and illiquid assets. He suggests the change in consumption pattern being dependent on the source of the change in lifetime wealth, distinguishing between wealth-constrained and liquidity-constrained households:

"Wealth-constrained households will, liquidity-constrained households will not, alter their current consumption in response to marginal changes in their illiquid resources such as increases in expected future labor incomes, improvements in prospective benefits, capital gains on houses and other imperfectly liquid assets. Wealth-constrained households will, liquidity-constrained households will not , respond to small changes in interest rates, either for lending or borrowing." (Tobin, 1972, *"Wealth, liquidity and the propensity to consume".)*

1.2 Life Cycle Consumption and Homeownership

In their paper *"Life Cycle Consumption and Homeownership"* Artle & Varaiya (1978) investigated the problem of liquidity constraints and other market imperfections violating the simplifying assumptions of the Life Cycle Hypothesis. This is because people are faced in 'real life' with borrowing and liquidity constraints and with taxes, all of which are ignored by most literature on the Life Cycle Theory. The main subject of their research is the change in consumption when a house is bought during the working period, often the largest investment a household makes during its life cycle. The authors try to analyze how the housing choice influences the optimal profile of life cycle consumption. Their results are summarized below.

1.2.1. Renting a house

According to Artle & Varaiya (1978), it is not unusual for people who are in the financial position to obtain a mortgage loan to choose instead for a rental home, even though the monthly cost of owning a house is less than the cost of renting. The cost depends on the subjective discount factor and the initial assets required. The explanation lies for the most part in the required down payment (although this is negligible nowadays in the Netherlands). The benefit of lower housing cost (which increases utility in the future) must be weighed against the lower consumption that is required today in order to save enough for the down payment (which lowers utility today). So, if the subjective discount factor is high and income and initial assets are low, a person is more likely to choose for a rental house instead of homeownership. An individual will maximize the following utility function:

$$maximize \int_{t1}^{t2} e^{-\delta t} \log\big(c(t)\big)\, dt$$

If the discount factor (represented by δ) is sufficiently high (higher than interest rate r), then the consumption pattern of an individual living in a rental home will look like the dashed line in Figure 1.2. The intuition behind the graph is: when liquidity constraints are introduced, individuals can consume only their income and initial assets. Because of the high discount factor, consumers face a downward sloping consumption pattern during their lifetime. If a bequest motive is introduced, a certain amount of assets will remain at the time of death.

1.2.2. Homeownership

For homeowners, the optimal consumption pattern looks somewhat different. This is because these individuals need to save in the early years as they have to meet the down payment. Therefore, during the initial period 0-T1, potential homeowners will rent a house in order to save for the required down payment. Their consumption is thus lower compared to the tenant profile. During the middle period T1 until T1+T2, this individual becomes a homeowner, leading to lower housing costs and higher consumption. During the final period, when the home is sold and the wealth is liquidated, total assets suddenly increase and so does consumption. Thereafter, consumption decreases relative to the individual's initial assets, and final assets at the time of death will again depend on the bequest motive. Consumption after the age of retirement decreases as a result of the hyperbolic discounting consumption

behavior of individuals, where a constant consumption pattern is not optimal. This pattern is shown as the solid line in Figure 1.2.

Figure 1.2: Optimal owner (solid line) and tenant (dashed line) consumption profiles
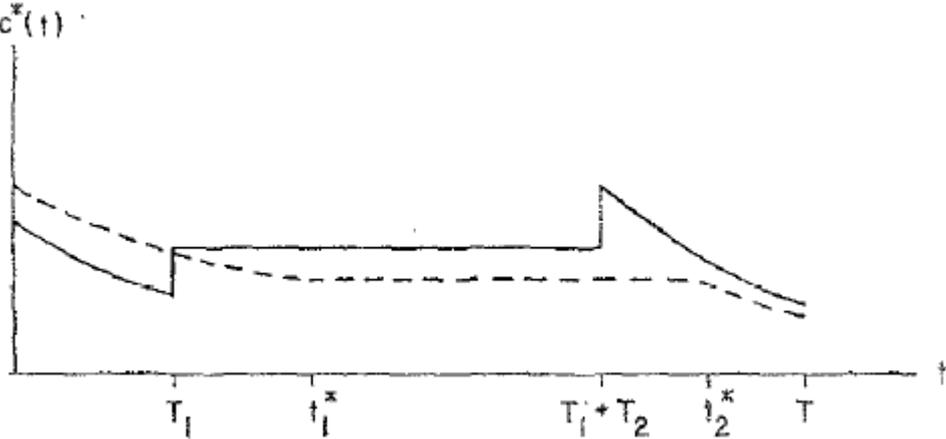
Source: Artle & Varaiya (1978)

1.3.Psychology of economic behavior

The economic theories on life cycle consumption described in the previous sections are all based on the optimal consumption choice of rational individuals with perfect information. Unfortunately, empirical evidence on savings behavior often contradicts the spending patterns described by life cycle saving and consumption theories. Even if consumers were to have perfect information, normative preferences (what individuals should do given personal preferences) would still not be in line with revealed preferences (what individuals actually do) (Kooreman & Prast, 2007). According to Thaler (1994), life cycle models of savings fail to describe consumption and saving patterns because the problem is too difficult to solve, and because impatient consumers lack the self-control to save enough for the optimal consumption pattern. This section will elaborate on the life cycle savings pattern of individuals from a *behavioral* economics point of view.

1.3.1. Working period

One of the major problems related to the intertemporal budget constraint (introduced by Fisher, 1930) is that it assumes that individuals are time-consistent. This assumption expects individuals to have the same preferences for today as for the future. However, intertemporal decision making involves pay-offs between consumption periods; if an individual saves today (thus consuming less), he/she will have higher consumption in the future. Here the problem arises: the presence of *immediate gratification* and *procrastination* whereby individuals face a *lack of self-control*. When a consumer faces the decision to delay consumption today in order to save for retirement, a large utility drop will be experienced since consumption yields immediate reward. However, if an individual chooses to decrease consumption ten years from now to save for retirement, this would moderate the drop in utility (Kooreman & Prast, 2007). People thus make short-term decisions that may harm their future welfare as they wish to save more for retirement but lack the willpower to act accordingly. This is referred to as *hyperbolic discounting*, the

tendency of individuals to prefer a smaller reward in the short term over a larger reward in the long term, as described with the consumption-saving decision above. It leads individuals to consume more than they would do if they were to act in accordance with a long-term perspective (Frederick, Loewenstein & O'Donoghue, 2002).

To summarize: individuals have *nonstandard time preferences*. Even when highly educated and well informed about the consequences of low pension savings in the future, people still exhibit delaying behavior and deviate from the neoclassical predictions (Graham & Isaac, 2002). Moreover, by the time the future comes closer, the saving decision remains as difficult as it is today. Therefore, government intervention is needed in order to make people behave in line with their own preferences and to protect people against their behavioral biases (Bodie & Prast, 2011).

A well-known program whereby workers are protected against their behavioral biases is the SMarT plan (Save More Tomorrow), developed by Thaler & Benartzi (2004). The basic idea of SMarT is to give workers the option to increase their savings rate as soon as they get an income raise. This helps employees who wish to save more but who lack self-control. The SMarT plan is based on four conditions:

I. The contribution rate goes up with the first paycheck after an income raise.
II. Employees are informed well in advance about the increase in contribution rate, thus before they enjoy a raise in income. Thus there is a lag between sign-up and start-up.
III. The contribution rate increases until the maximum is reached.
IV. The employee is allowed to opt out at any time.

The SMarT plan was introduced in 1998 at a manufacturing company that suffered from low retirement participation and savings rates. In an effort to increase those rates the company hired an investment consultant, who offered his services to every employee who was eligible for pension savings. Out of all employees who talked to the consultant, only 28% were willing to accept his advice even though the increase in saving rates was no more than 5%. For the participants who did not accept the advice of the consultant, a version of the SMarT plan was introduced. The SMarT had a more aggressive strategy for increasing saving rates, though it proved to be very popular: 78% of the participants who did not accept the consultant's advice did agree to join the SMarT plan. Only 2% dropped out when the savings rate increased (Thaler & Benartzi, 2004). Clearly, people are not unwilling to save for retirement; they only suffer from behavioral biases, which institutions can respond to.

Households are also reluctant to increase pension contributions because they do not want to experience a drop in current consumption. This is known as *loss aversion* (Thaler & Benartzi, 2004), the tendency of individuals to experience a much larger drop in utility when facing a loss than an increase in utility when facing a gain of equal amount. Loss aversion is one of the components of Prospect Theory, which suggests that investors will hold onto their investments longer when facing a loss than winners, even if the latter's

expected gain is lower. This also holds for the housing market. As Genesove and Mayer explained in their paper *'Loss Aversion and Seller Behavior: Evidence from the Housing Market'* (2001):

> *"In a boom, houses sell quickly at prices close to, and many times above, the sellers' asking prices. In a bust, however, homes tend to sit on the market for long periods of time with asking prices well above expected selling prices, and many sellers eventually withdraw their properties without sale."*

In this respect, the consequences of loss aversion in the housing market not only lead, in an economic downturn, to a higher asking price but also to higher costs because of the longer expected time horizon on the market. This is in line with behavioral economics, which states that irrational behavior is one of the fundamentals that should be taken into account when investigating the reluctance of sellers in an economic downturn to reduce the asking prices of their private-owned homes. This is in line with the findings of Engelhardt (2001); he found strong evidence for nominal loss aversion in housing mobility. This constraint turned out to be three times more important for households compared to the requirements to become eligible for a mortgage loan.

1.3.2. Retirement period

Next to the concern that people may not save adequately for retirement due to behavioral biases, there is another aspect where behavioral economics is relevant, namely the change in consumption upon retirement. Contrary to what the Life Cycle Hypothesis suggests, elderly people do not seem to dissave all of their wealth during the retirement period until death. Moreover, their marginal consumption decreases sharply upon retirement, even when retirement is expected. This is known as the *retirement consumption puzzle* (Haider & Stephens, 2005). An important reason for the relatively low spending by the elderly out of their private wealth and retirement income is the *precautionary savings motive*. Precautionary savings are held in order to have a sufficient reserve against unforeseen events. Older individuals usually face higher healthcare costs and mortality risks (the Netherlands being an exemption). The way people respond to these uncertainties depends on the degree of risk aversion: if people are highly risk-averse, they will reduce their consumption in order to build a nest egg. Alternatively, risk-averse retirees may reduce their consumption in order to protect themselves against the risk of running out of money as a result of longevity (Hurd, 1989). By contrast, some individuals consume more if protected by the government against being out of money through means-tested pension income.

Another reason to hold onto a certain amount of capital until death is the *bequest motive*. Parents seem to be altruistic because they want to leave some of their capital to their children when they die. This would explain part of the retirement puzzle, as individuals will consume less in order to leave part of their wealth to their children. The bequest motive actually lengthens the expected lifetime of an individual since it takes an extra period into account in the optimal lifetime consumption cycle (meaning a period after an individual has died). Evidence is mixed on the bequest motive. Kopczuk and Lupton (2007) found three-fourths of retirees to have bequest motives, whereby consumption expenditures decline by 25%. By contrast, Hurd (1987) found no evidence for a bequest motive. His results do show substantial transfers

from parents to their children; however, these transfers are made earlier in life, and the bequest motive does not play a role in the consumption pattern of retirees. This is in line with Dynan et al. (2002), who argue that the precautionary savings motive is intertwined with the bequest motive: individuals save for unexpected events, knowing that their savings will be transferred to their children if they do not need it themselves during life.

Finally, although an owner-occupied house is the major asset for most families, households may not realize that home equity constitutes disposable wealth (Hendriks, 2013). Literature shows that elderly people are unwilling to move so that home wealth does not serve as a supplement to their retirement income. Munnell et al. (2007) investigated this subject, surveying whether people plan to use housing wealth to finance their living expenses during retirement. Almost 75% of the respondents did not do so, and most of the rest were unsure. If this remains the case, so that most individuals do not see their home as a form of equity, then it explains why individuals leave wealth at the time of death.

1.4. The housing market in the Netherlands
1.4.1. The composition of Dutch households
In the Netherlands, almost 60% of the population is owner of the house lived in (Rijksoverheid, 2012). In Figure 1.3, the composition of households is related to the accommodation lived in. There is a strong relationship between the tenure choice of households and marital status; among all age groups, the majority of single people live in a rented house. Also, the presence of children seems to have a significant impact on the tenure choice. It may be that single people live in a rented home because they cannot meet the requirements for a mortgage loan as they have only one source of income. This idea is confirmed by Figure 1.4. The share of double-income households is much larger among homeowners compared to renters.

Figure 1.3 Accommodation among different households
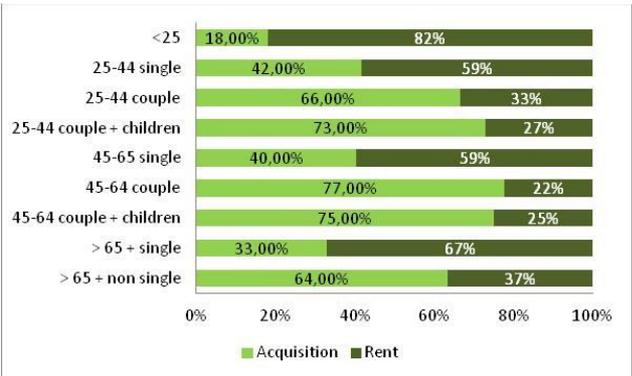
Data: WoON 2012

Figure 1.4: Age and share of two-earner households

Data: WoON 2012, own calculations

Another impact on the choice between homeownership and renting is the disposable income of households. As can be seen in Figure 1.5, the average disposable income of homeowners is higher among all age cohorts compared to the average disposable income of renters. Because benefits of mortgage interest deductibility are larger with a higher marginal tax rate, owner occupation is especially attractive

for higher income households (Rouwendal, 2007a). Today, households can make use of the mortgage interest deductibility only if the total mortgage is paid off within 30 years. Household earnings reach their peak at the age of 51 for owner-occupiers, with an average income of €52,570. The average disposable income for renters has a flatter line during the life cycle, with household earnings being the highest at the age of 48 corresponding to an income of €30,389.

Figure 1.5: Disposable household income by age
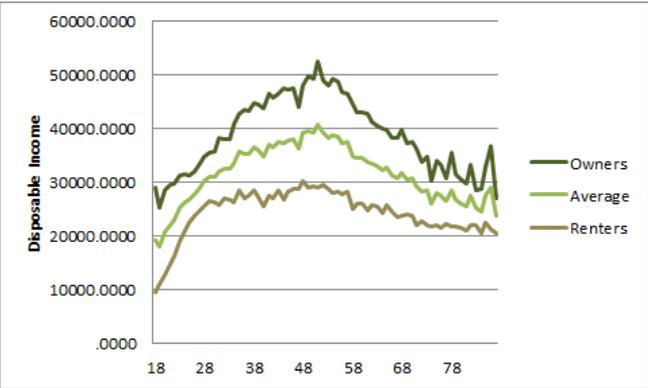
Data: WoON 2012, own calculations

Figure 1.6: Share of owner-occupiers and age of head of household

Data: WoON 2012

The share of owner-occupiers sharply increases between the age of 24-34 (Figure 1.6). The average age whereby individuals become a homeowner in the Netherlands is 28, which is higher compared to previous years due to the increasing requirements in order to become eligible for a mortgage loan (ING, 2012; Schilder & Conijn, 2013). The share of owner-occupiers peaks at the age of 42.

1.4.2. Housing costs

Housing costs in the Netherlands are quite high compared to other European countries: in 2012 Dutch households spent 29.1% of their disposable income on housing compared to an average of 22.6% in the EU. The after-tax amount spent on housing relative to disposable income is higher for households living in a rental home compared to homeowners (Rijksoverheid, 2012).

Figure 1.7: Monthly housing costs by age
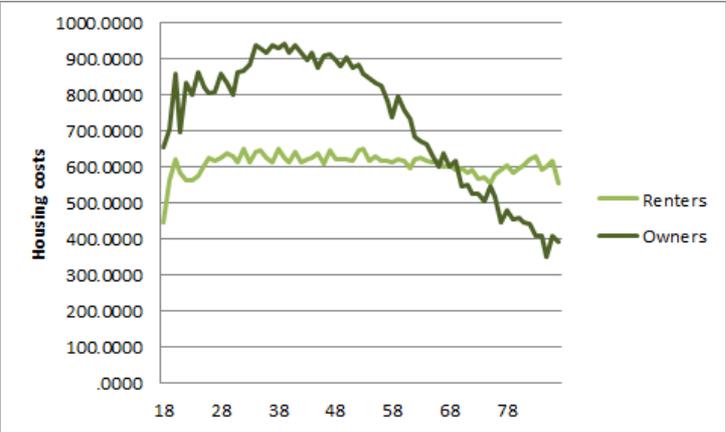
Data: WoON 2012, own calculations

In 2012, total after-tax average monthly expenses for homeownership were €792, corresponding to an average yearly household net income of €43,870. For renters, the after-tax average monthly housing costs were €597, with a yearly household net income of €23,017. These costs are after adjustment for mortgage interest deductibility and rental subsidies. In

relative terms, homeowners spent 25.30% of their disposable income on housing expenditures versus 36.40% for renters (Rijksoverheid, 2012).

Figure 1.7 shows that, although average housing costs over a lifetime are higher among homeowners, owner-occupiers benefit upon retirement from a decrease in mortgage payments, as these are then even lower compared to the cost of rental homes.

1.4.3. Housing prices & mortgage loans

Due to the financial crisis, housing prices have sharply decreased in recent years. In the Netherlands, they decreased more compared to other European countries. The drop in Dutch housing prices started in 2008, with a decline every year by 4%, whereas the housing prices in other European countries stabilized (CBS, 2013a). One of the consequences for individuals who bought a house just before the financial crisis is a sharp decline in the value of their recently bought private property. If such individuals need to sell their home (due to, for example, unemployment or divorce), they receive less money for their property compared to the outstanding mortgage loan, thus leaving the home owner with a residual debt. This problem is serious among young households as they have a relatively high amount of mortgage debt compared to the value of their property. Figure 1.8 shows the Loan to Value (LTV) at different ages and that it is below 1 among the older age groups. Remarkably, after 2008, a growing number of age groups face an LTV of about or even above 1.

Figure 1.8: LTV ratio and age of the head of household
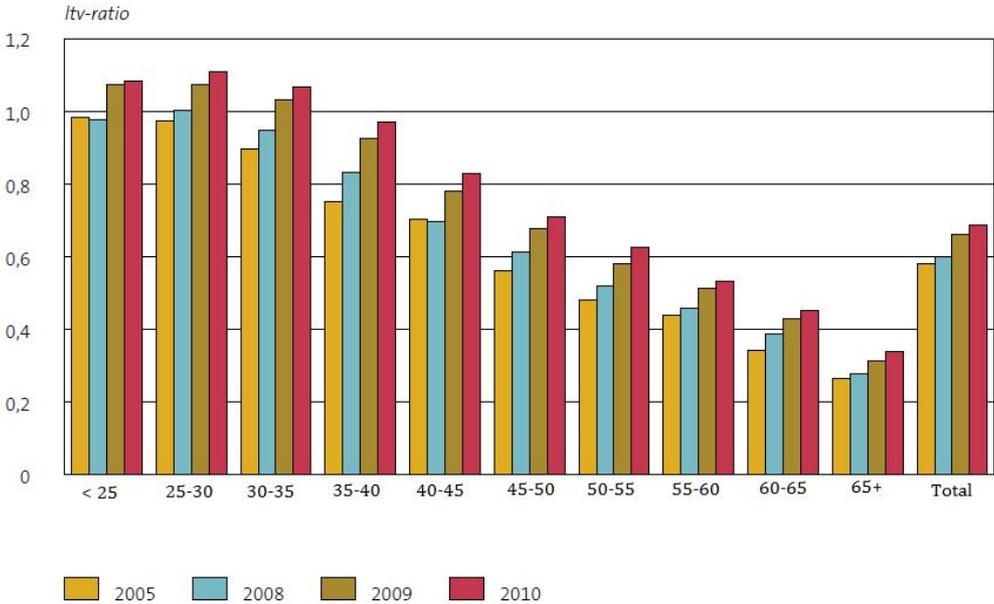
Source: CBS (2011)

Figure 1.9: Share of homeowners with a higher mortgage loan than house value
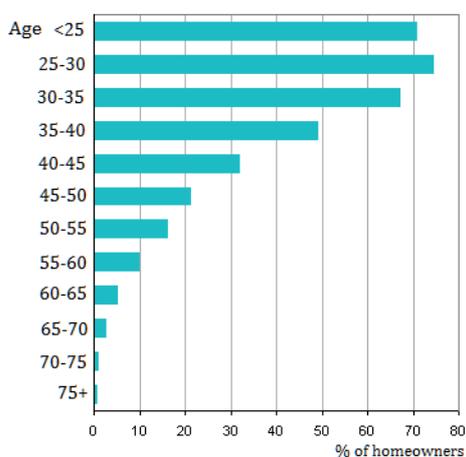
Source: CBS (2013b)

A consequence of the combination of high LTV ratios and the financial crisis is an increase in the number of households who own a property whose value is lower than their outstanding mortgage loan balance. In 2011, more than one million households in The Netherlands were in this position. Among these households, the head of the household is less than 40 years old in almost 6 out of 10 homes with a lower value than the mortgage loan balance (Figure 1.9). Furthermore, for 60% of all homeowners below the age of 40, the value of their home is below their mortgage debt (CBS, 2013b). Additionally, the difference between the mortgage debt and the property value is also the largest among these cohorts.

1.5 Pension accrued in different stages of life

The Dutch pension system consists of three pillars: the state old- age pension (Algemene Ouderdomswet, AOW), mandatory occupational pensions, and voluntary private pension products (Pensioenfederatie, 2013). This section elaborates on the first and second pillars. Voluntary pension savings are described in Section 1.6.

1.5.1. Pension savings in the first pillar

Every person who resides in the Netherlands is eligible for the first pillar, the state pension. The amount of pension income in this pillar does not depend on income but on the number of years that a person is resident in the Netherlands between the ages of 15 and 65, and the person's civil state when retired. In the first pillar, every individual accrues 2% state pension for each year in the Netherlands between the ages of 15 and 65. Upon retirement, couples each receive 50% of the minimum wage while single persons receive 70% of the minimum wage. The full minimum wage amount in 2008 was €17,552 per year (CBS, 2010).

1.5.2. Pension savings in the second pillar

The second pillar in the Netherlands is the occupational pension provision for all employees. It is financed by capital funding, i.e. from the contributions by employees and employers plus the returns on the investment of these contributions (Pensioenfederatie, 2013). A fixed percentage of the contributor's salary is accrued for each year of service. This salary percentage is dependent on the employer and industrial sector of the employee but independent of sex or income level (Ministerie van Sociale Zaken en Werkgelegenheid, 2013).

Table 1.1 presents the average yearly pension savings in the second pillar per age cohort. The middle column represents the average pension accrued per year from the contributions by both employees and employers per individual for a future yearly pension payout. The pension income from the second pillar is roughly 35% of the average income during the employee's working career, as shown by the right-hand column.

Table 1.1: Yearly pension savings in the second pillar, per age cohort in 2009

Age	Pension accrued per year (before tax)	Replacement rate of second pillar
20-25	€ 100	.
25-30	€ 700	39%
30-35	€ 1600	40%
35-40	€ 2500	39%
40-45	€ 3600	37%
45-50	€ 4900	35%
50-55	€ 6300	34%
55-60	€ 7400	33%
60-65	€ 7400	29%

Source: CBS Statline (2013c)

Table 1.2 shows the average yearly pension savings in the first and second pillars. Together these result in a replacement rate of 64% at retirement age of 65.

Table 1.2: Yearly pension savings in the first and second pillar, per age cohort in 2009

Age	Pension accrued per year (before tax)	Replacement rate
20-25	€ 1700	.
25-30	€ 3100	84%
30-35	€ 4800	74%
35-40	€ 6600	70%
40-45	€ 8600	66%
45-50	€ 10900	64%
50-55	€ 13300	63%
55-60	€ 15300	64%
60-65	€16300	64%

Data: CBS Statline (2013c)

1.6 Private wealth of individuals

The first pillar accounts for 50% of current pension payments in the Netherlands, the second pillar for 45%. The remaining 5% is saved in the third pillar (CBS, 2010). Unfortunately, the Statistics Netherlands is still looking for a way to report third pillar savings as it is unclear which part of an individual's savings is intended for retirement income. This section therefore elaborates upon the private wealth of individuals in different stages of life.

Figure 1.10 on the next page presents the financial wealth of individuals in the Netherlands in 2011 (excluding pension savings in first and second pillar as well as annuities of the third pillar). The amount of total savings reaches its peak at age 65 and decreases slightly thereafter. The profile looks somewhat similar to Figure 1.1: Dutch households save during their working career and accordingly dissave during their retirement period. Also, individuals take more risk when they become older, as the investments in shares increases among Dutch households until the age of 65.

Figure 1.10: The median of private wealth among Dutch households per age of the head of household, 2011
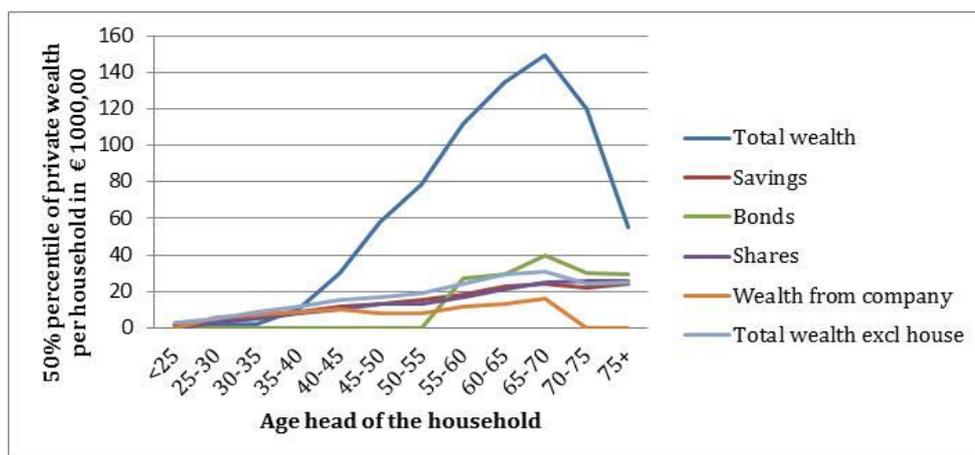
Data: CBS Statline, 2013c

When total wealth is compared against total wealth excluding the house, individuals younger than 30 have more wealth without the house because their mortgage debt is higher compared to the value of their house. The large difference at retirement age between total wealth and total wealth excluding the value of the house implies that a large part of total wealth at the age of 65 lies in the retiree's home.

The 50th percentile of private debt is shown in Figure 1.11. The amount of mortgage debt peaks in the 35-40 age group; the median amount is €210,000, the average is €252,000. Surprisingly, individuals aged over 75 still have a substantial amount of debt on average; the median outstanding debt is €50,000, with the average outstanding mortgage loan being €78,000. One reason for this may be the interest-only mortgages offered in the past by banks, which are held by 35% of the Dutch population (Rijksoverheid, 2012).

Figure 1.11: The median of private debt among Dutch households per age of the head of household, 2011
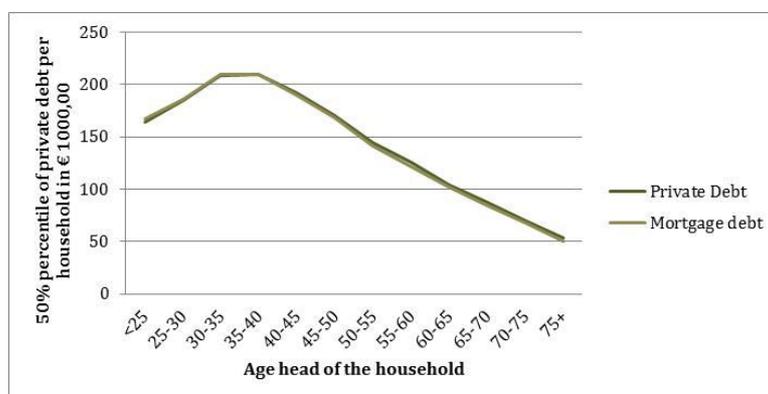
Data: CBS Statline, 2013c

1.7 Summary

In order to maintain a constant level of consumption, individuals must save during their working career for retirement income. The optimal savings rate not only depends on the level of income but also on behavioral aspects.

In the Netherlands, almost 60% of the population lives in a privately-owned house. Homeowners have on average a higher disposable income compared to renters. During their working years, homeowners face higher housing costs compared to renters. This situation reverses at the time of retirement as mortgage loans are almost paid off and housing costs decline. At the moment, more than one million households have a mortgage debt that is higher compared to the value of their house, with younger homeowners carrying most of this burden.

At the age of 65, the average replacement rate of the first and second pillars in the Netherlands is equal to 65%. Aside from the first and second pillar, individuals also have private pension savings (the third pillar). The private wealth of households increases until the age of 65. Thereafter, private savings substantially decrease, which is in line with the Life Cycle Hypothesis of Modigliani.

2. Possibilities for combining pension wealth with homeownership

Young people who have just entered the job market have a wider choice of affordable houses due to the lower housing prices caused by the financial crisis. In addition, the decision to buy a house is often postponed because of the insecure job market, the stricter financial requirements for mortgage loans, and the ever changing policies governing the housing market (Piljic & Stegeman, 2013). At the same time, elderly people suffer from lower income replacement rates upon retirement while some have a high amount of private wealth locked up in their privately owned house. Therefore, it may be wise to introduce constructions in the Netherlands whereby individuals have the opportunity to combine pension savings with the wealth in their house. This chapter will give an overview of the potential connections (Figure 2.1) with the corresponding risks, advantages, and disadvantages.

Figure 2.1: Combinations of pension assets with the housing market
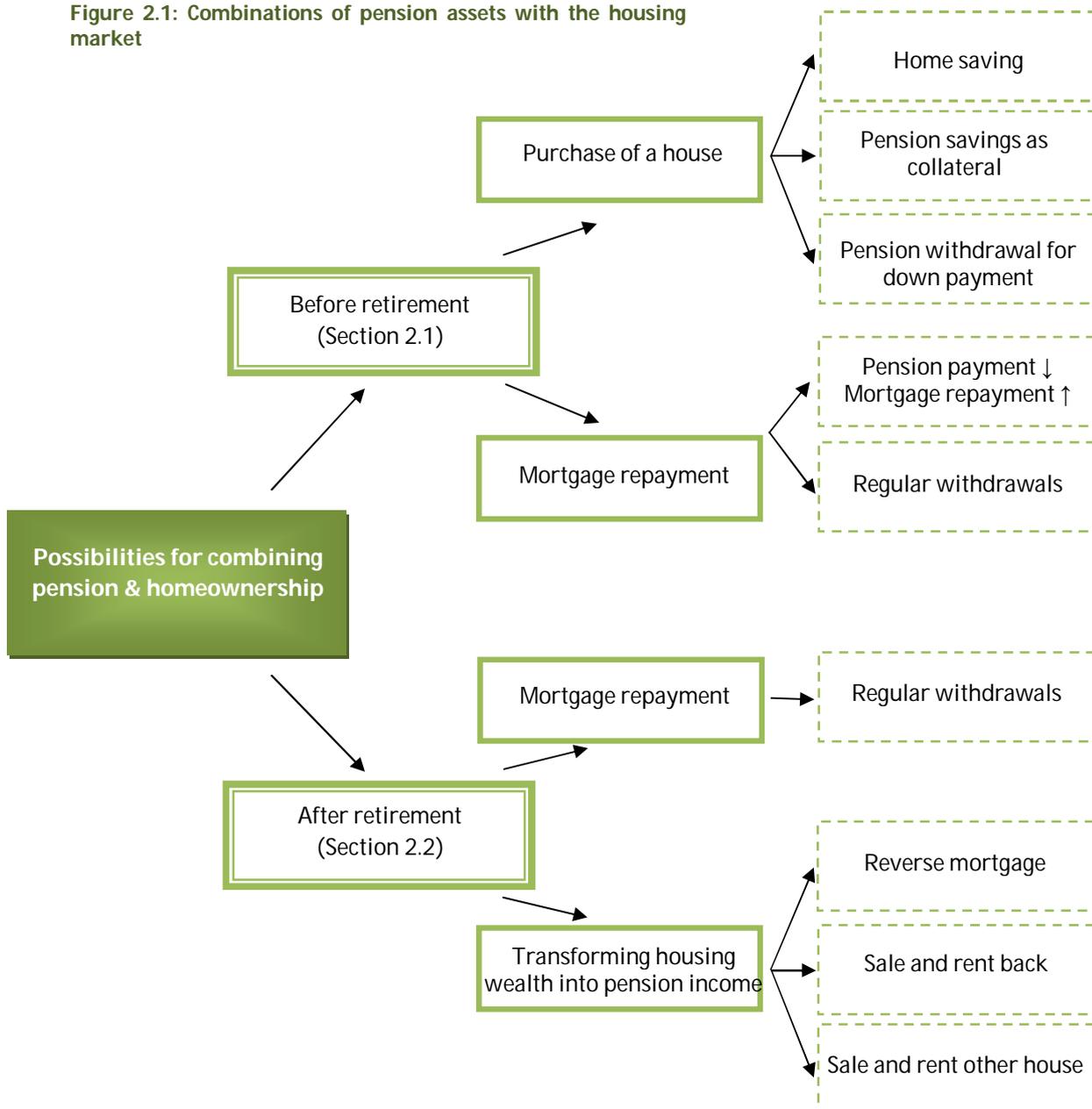
2.1 Possibilities before retirement

Constructions whereby pension savings are used for the housing market are permitted by law in the European Union. However, in the Netherlands it is prohibited to withdraw pension savings for other purposes than financing retirement consumption. It is therefore important to note that all the possibilities *before* retirement as described here can be implemented only if legal changes are enacted.

In theory there are two ways during the working years whereby individuals can substitute pension savings with the private wealth in their owner-occupied house: (1) using pension savings as a down payment in order to be eligible for a (lower) mortgage loan, and (2) for homeowners, pension savings can be used to repay all or part of the mortgage loan.

2.1.1. The purchase of a house

As a result of the financial crisis, mortgage lending standards have toughened significantly. Since 2013, banks may no longer offer mortgages which are more than 105% of the value of the underlying property. In addition to the purchase price of the property, this 105% includes the 2% property transfer tax plus additional costs such as advisory and administration costs. This maximum Loan to Value will decrease further to 100% in 2018 (Rijksoverheid, 2013). Currently, the Wijffels Committee has proposed that the government go even further. In fact, it has recommended a decrease of the Loan to Value to 80% in time, together with permission to use pension assets for down payment purposes (Commissie Structuur Nederlandse Banken, 2013).

At the same time, individuals must meet stricter income requirements to become eligible for a mortgage loan. These changes will have serious consequences for the housing market since first-time and other buyers can only afford homes with low values (ABN Amro, 2012). On top of that, how will young people be able to come up with the down payment when they want to buy their first house? They must pay monthly pension premiums, but this wealth is locked up in their pension fund (Bovenberg, 2012). By allowing individuals to use pension savings for down payment purposes and thus reduce the mortgage loan needed, it would be easier for potential homeowners at all income levels to access the housing market, plus it would decrease the risk taken by banks.

A possible solution for these young individuals could be **home saving.** Home saving is a method whereby a link is made between saving for a mortgage loan and saving for retirement income. This method is already a popular way of saving for homeownership in Germany (Section 3.4). One way to introduce this savings method is to introduce tax benefits that would encourage younger individuals who want to become first-time homebuyers ("starters") to save for that purpose. This would make it more attractive to save for a house by enabling them to come up with the down payment. By building wealth this way, a lower mortgage loan is required, which immediately results in lower corresponding mortgage interest and thus a decrease in monthly housing costs. One of the risks involved is that individuals could use their savings for other purposes by deciding not to become a homeowner but to stay on the rental market. The money saved that has not been used for the purchase of private property should thus be directly

transferred to a related pension account. In this way, individuals are free to choose how they will save for retirement: either via their pension fund or by accumulating wealth through investment in their home, thus decreasing their private debt (Bovenberg & Kortleve, 2012).

A combination with home saving is **withdrawal of pension savings** for a down payment, thus creating sufficient capital to decrease the mortgage. This could be done either by redirecting these savings to a home-saving account or by transferring them immediately to the bank account when the purchase of a house has been finalized. For example, in the United States first-time home buyers may withdraw $10,000 from their pension savings free of tax (Section 3.2).

Finally, pension savings could be used as **collateral**, thus reducing the risk taken by banks. As opposed to pension withdrawals for down payment purposes, pledging enables individuals to preserve their accumulated pension benefits. When pension savings are used as collateral, the Loan to Value (i.e. mortgage loan compared to the value of the house) will not decrease as the mortgage loan amount required remains unchanged. However, the risk taken by the bank is lower, which implies a lower interest rate. This method of using pension assets for the housing market is common in Switzerland (see section 3.3).

2.2.2. Mortgage repayment

Persons who already own their house can use their pension savings for mortgage repayment purposes. In this way, these households still accrue private savings, though retirement savings are substituted by housing wealth.

A first possibility is to allow individuals to pay **less to their pension** account and to apply the same amount towards an **increase in mortgage payments**. Implementing such arrangement in the Netherlands would require no change in the law. Only the pension fund policy on mandatory pension premiums would have to be restructured. Another option is make **regular withdrawals** prior to retirement to enable (higher) mortgage repayments during the working years because people lose their interest deductibility after 30 years. In this way the pension accrual will decrease, but at the same time wealth in the privately owned house increases. Regular withdrawals could also be used to pay off the remaining debt if a person wishes to sell his or her house when the mortgage loan balance is higher than the value of the home.

2.2 Possibilities during retirement

At the time of retirement, the majority of elderly people in the Netherlands have not fully repaid their mortgage loan. In 1986, more than two-thirds of all homeowners in the 65-74 age group had fully repaid their mortgage loans; this decreased to one-third by 2012 (Piljic & Stegeman, 2013). This trend can be explained by the interest-only mortgage loans offered in the past together with the mortgage interest deductibility. The high percentage among the elderly with an outstanding mortgage loan balance will probably change in the coming years since as from this year homeowners will have to repay their

mortgage loans completely within thirty years in order to make use of mortgage interest deductibility. Nevertheless, introducing the option to repay the remaining outstanding debt through extra pension payments may be interesting for retirees. If a household has completely repaid its outstanding debt, the reverse mortgage and the sale-and-rent-back construction offer the possibility to tap money out of the privately owned home. With these arrangements, an elderly person does not need to move to a rental house in order to access the private wealth locked in his or her home.

2.2.1. Mortgage repayment

Mortgage repayment in the retirement period involves the same construction as **regular withdrawals** during the working period. It actually yields higher pension benefits in the early stage of retirement and lower pension benefits when the retiree advances in age. In fact, such payment structure, known as the 'high-low construction', has already been introduced by some pension funds. Elderly persons are allowed to choose for higher pension payments at the beginning of their retirement period. The only difference with using this pension benefits structure is that the pension savings are partly used for mortgage redemption. Lump sum payments during retirement for housing expenditures are already in effect in Australia (Section 3.5).

2.2.2. Transforming home wealth into pension income

The most obvious way to capitalize the wealth of a privately owned home is to **sell one's home and rent another home.** The illiquid asset (the home) becomes available so that individuals are able to use the additional money to complement their retirement income. Transforming home wealth in this way requires that individuals move to another house. However, research shows most people choose to live in their own home as long as possible (Hendriks, 2013). An alternative would be to make use of the reverse mortgage and sale-and-rent back concepts.

The **reverse mortgage** is a combination of pension wealth with the housing market. The concept of the reverse mortgage (which is already applied in the Netherlands) is to create a new debt which will not be repaid; also the interest does not have to be paid so long as the individual does not sell the home he or she lives in. At the time the owner of the house no longer lives in the house (due to either death or moving), the total debt including interest must be repaid. By doing so, the illiquid amount which is invested in the house becomes available and pension income accordingly increases. It also partly hedges the risk of longevity because individuals have an extra source of income. The advantage is that people can continue to live in their house for a longer period, and that no interest payments need to be made as long as the owner continues to live in the house. However, a new debt is created while the mortgage loan just has been repaid. Another choice is a **sale and rent back** whereby the owner of the house sells his home to an investor and rents it back as a tenant (Advice guide, 2013).

Because this thesis focuses on the use of pension savings for the housing market prior to retirement, no further study is made of the combinations that are possible during retirement.

2.3. Reasons to use pension assets for housing purposes before retirement

With the possibility to use pension savings for housing purposes, households have a choice as to how to save for retirement: either via their pension fund or via their privately owned home. There are two reasons why people decide to substitute pension wealth by housing wealth:

1. *The nature of savings:* Individuals may prefer to save more via their owner-occupied home because they wish to save in a different way than the current pension system in the Netherlands. This may be due to the after-tax expected return on pension savings compared to the after-tax mortgage interest rate, and risk considerations.

2. *The level of savings:* The preference of individuals may also depend on their level of satisfaction about their savings level. Individuals who choose to save less for their personal pension income and instead consume more today are more likely to use pensions savings for repayment of their mortgage loan.

There is an important distinction between these two reasons. The first reason indicates that individuals are satisfied with their level of consumption and the level of yearly pension savings, but that they want to profit from arbitrage opportunities between different assets. The second reason includes intertemporal substitution of consumption: individuals choose to consume more today and less during retirement. Below, an elaboration is given of the considerations that play a role in the decision to make use of pension savings for housing purposes.

2.3.1.   Arbitrage opportunities

Through use of arbitrage opportunities, the consumption pattern before retirement does not have to change. If an amount is withdrawn from the pension savings account for repayment of part of the mortgage loan, the consequently lower housing costs must then be saved for retirement. The consumption pattern of individuals does not change since the potential gain in consumption resulting from lower housing costs is offset by the collection of extra pension premium by pension funds.

The desire to change the nature of savings may be because of the (expected) return on pension savings versus the mortgage interest, or because of the perception of risk pertaining to an owner-occupied house and pension savings.

2.3.1.1. Relative rates of return

Firstly, there are financial considerations. In this way, gross and net returns are compared with and without the combination of pension wealth and housing wealth. Also tax implications have to be taken into account: for example, households face lower tax benefits from mortgage interest deductibility. At the same time, they profit from the lower tax on homeownership (*'Eigenwoningforfait'*) (tax implications are explained in Chapter 4). When considering the relative rates of return, households will be prepared to use pension savings for the mortgage loan if they expect to gain in terms of net relative rates of return. This is a reason to save *differently* from the current mandatory pension system.

2.3.1.2. Risk considerations

Aside from financial considerations, people will have different perceptions about the risk related to homeownership and pension savings. On the one hand, they may prefer to repay their mortgage loan instead of saving for retirement income since it is more obvious for what they are paying for. At the moment, 55% of employees do not have much trust, or have no trust, in their pension fund (CBS, 2012b). It may also be that the decrease in housing prices in the past five years caused a drop in the level of trust in the housing market.

Another concept related to risk considerations is that when more money is paid towards the house than towards the pension fund, there will be less insurance against the risk of longevity. On the other hand, if individuals do not live long time after their retirement age, the wealth in an owner-occupied house is available to bequeath, whereas money in the pension fund is lost. Thus, perceptions to risk may be reason for individuals to save *differently.*

2.3.2.   Intertemporal substitution of consumption

When a household makes use of pension assets for housing purposes in order to gain from intertemporal substitution of consumption, it does *not* have to repay the decrease in housing costs as a pension premium to its pension fund. Instead, it is allowed to use the lower housing costs to increase its consumption before retirement. The level of pension savings is thus adjusted (i.e. decreased).

2.3.2.1. Liquidity considerations

It is possible that individuals wish to use some of their pension savings before retirement in specific circumstances. In other words, they may be unhappy with the fact that they have such high pension savings being illiquid while they could use some income support at an earlier age. If they have high recurring expenses during their working life while knowing that these costs will disappear in later years, they may be interested in using pension savings before their retirement. For example, couples raising children incur education costs, housing costs, tax payments, eventually costs for day care, and mandatory pension contributions. Furthermore, circumstances such as unemployment or insufficient income for self-employed persons can be reason for them to wish to use pension savings before retirement. Lastly, if the value of an owner-occupied house has dropped during the financial crisis and this value is now below the amount of the mortgage loan, it is almost impossible to move to another house without being left with a large debt.

It may therefore be in the interest of households to make their pension assets liquid for only a few years as an income support for their 'expensive years' and thus decrease their monthly housing costs. This supports the idea of saving *less* for retirement.

2.3.2.2. Consumption considerations

Individuals with a high discount rate in their utility function prefer to consume now instead of later. Such persons will thus have a greater willingness to withdraw their pension savings compared to persons with

a lower discount rate. In different words, there are individuals who prefer to use pension savings for their mortgage loan simply because it increases their disposable consumption income before retirement. It may also be that some people are deeply attached to living in a large house and wish to use their pension savings to increase their standard of living. If individuals to consume more today, they will prefer to save *less* for retirement.

<u>2.3.2.3. The temptation to use pension savings</u>
A final consideration is that of the lack of self-control. Some people are aware of the fact that if they are given the opportunity to use their pension savings they will do so, even though they are aware that they will be worse off in the future. It then depends on the amount of pension savings that may be withdrawn; the amount permitted must be such that the financial consequences for the retirement years will be limited. It will be the task of the government to establish the right amount to protect individuals from withdrawing too much of their pension savings and to regulate this pattern.

Aside from the temptation to use pension savings, there is another behavioral aspect with the introduction of the use of pension savings for housing purposes. The Dutch population show low awareness and understanding with respect to pensions (Kortleve, Verbaal & Kuiper, 2013). At the same time, it is difficult to collect clearly understandable information with respect to mortgage loans (AFM, 2010). When households have the possibility to combine these two difficult concepts (i.e. mortgage loans and pension savings), it will become even more complicated to make proper decisions regarding personal financial planning.

2.4. Related risks, advantages, and disadvantages for other parties
2.4.1. Banks
The advantages of using pension savings for the purchase of a house are obvious: entering the housing market will be easier, and the costs of buying a home decrease. This is because a lower mortgage loan is required when a down payment is made, and/or the risk for banks decreases, which leads to a correspondingly lower interest rate. Also, when extra mortgage payments are made, the mortgage might be repaid at an earlier stage of life. Such early mortgage loan repayments result in banks having lower transaction costs.

2.4.2. The Government
A benefit to the government from the lower outstanding debt of households is the lower cost resulting from the deductibility of mortgage interest. Also, fewer households will need to make use of the National Mortgage Guarantee ('*Nationale Hypotheek Garantie', NHG*). The NHG is a government-regulated insurance that households can take in order to ensure that mortgage payments are made regardless of their financial position (explained in Chapter 4). At the same time, more regulation is required by the government. When individuals have more money to use for a down payment, they might have the intention of choosing an equal amount of monthly housing costs, but instead they may decide to buy a larger and/or more expensive house. In this case, their wealth is more vulnerable to the evolution of the value of their home

(Bovenberg & Kortleve, 2012). Also, when households decide to sell their private property, the wealth freed up may be used for something other than retirement income. Government intervention is highly recommended to oversee the consequences. It might be an alternative to introduce a law which states that, if pension capital is invested in the housing market and a home owner wants to sell his house, the principal withdrawn must be refunded into the pension account.

2.4.3. Pension funds

When pension funds offer households the option to withdraw pension savings for housing purposes, this will result in greater satisfaction on the part of pension fund members who wish to make use of such option.

A specific drawback for pension funds is the reduced guarantee that pension savings will pay off until the retirement age. Instead, pension savings could be withdrawn, so the investment portfolios of the pension funds should be changed. More precisely, pension funds must hold more liquid assets. That means more short-term investments, which will result in a lower return on pension savings. Pension funds can mitigate this effect by including these costs to individuals who withdraw pension savings.

2.5. Summary

A summary of all the risks, advantages and disadvantages related to the different pension savings arrangements and the housing market for households is given on the next two pages.

Table 2.1: Advantages and disadvantages for households when exploiting arbitrage opportunities

	Advantages	**Disadvantages**
Pension wealth for a down payment		
Households	❖ Easier to become eligible for mortgage loan/ homeownership ❖ Lower mortgage loan and/or lower interest rate ❖ More options for saving for retirement ❖ Easier to sell property with lower level of LTV ❖ A potentially higher return on pension savings when the mortgage interest rate is higher than the return on pension savings ❖ Lower taxes related to homeownership	❖ Individuals might buy a more expensive house ❖ When selling property, using the wealth for purposes other than retirement income ❖ House price risk if a more expensive house is bought ❖ Lower liquidity premium on pension savings ❖ Less deductible interest ❖ More difficult to make the right savings decision
Extra mortgage repayments		
Households	❖ Individuals are allowed to choose how to save for retirement ❖ Lower amount of outstanding debt ❖ Earlier protection against the risk of rising housing costs when the mortgage loan is sooner repaid ❖ Easier to sell property with lower level of LTV ❖ A potentially higher return on pension savings when the mortgage interest rate is higher than the return on pension savings ❖ Lower taxes related to homeownership	❖ When selling property, using the wealth for purposes other than retirement income ❖ Less deductible interest (fewer tax benefits) ❖ More difficult to make the right savings decision

Table 2.2: Advantages and disadvantages for households with intertemporal substitution of consumption

	Advantages	Disadvantages
Pension wealth for a down payment		
Households	❖ Easier to become eligible for mortgage loan/ homeownership ❖ Lower amount of outstanding debt and thus lower housing costs ❖ More options to save for retirement ❖ Easier to sell property with lower level of LTV ❖ Higher consumption during the working years ❖ Lower taxes related to homeownership ❖ More money to bequeath when dying at an early age	❖ Lower amount of pension ❖ Individuals might buy a more expensive house ❖ When selling property, using the wealth for purposes other than retirement income ❖ Less deductible interest ❖ House price risk if a more expensive house is bought ❖ Lower liquidity premium on pension savings ❖ Less insurance for the risk of longevity ❖ Temptation to use (too much) pension savings ❖ More difficult to make the right savings decision
Extra mortgage repayments		
Households	❖ Individuals are allowed to choose how to save for retirement ❖ Lower amount of outstanding debt and thus lower housing costs ❖ Higher consumption before retirement ❖ Earlier protection against the risk of increasing housing costs when the mortgage loan is sooner repaid ❖ Easier to sell property with lower level of LTV ❖ Lower taxes related to homeownership ❖ More money to bequeath when dying at an early age	❖ Lower amount of pension ❖ When selling property, using the wealth for purposes other than retirement income ❖ Less deductible interest ❖ Eventually more illiquid assets at retirement ❖ Less insurance for the risk of longevity ❖ Temptation to consume (too much) pension savings ❖ More difficult to make the right savings decision

3. Financial arrangements for pension systems in foreign countries

The Dutch pension system consists of three pillars which together determine the pension a person receives. Most schemes have a target total replacement rate of 70% of final pay (OECD, 2011a). The first pillar, the state old age pension is payable from the age of 65. Most occupational pension funds allow for early retirement. If an individual wishes to have the retirement pension paid from a younger age, the pension will be considerably lower (Pensioenfederatie, 2013). No other withdrawals are permitted prior to the age of retirement.

Some countries do offer individuals the possibility to use their accrued pension towards the financing of large expenses such as housing, healthcare, or educational costs. A presentation of these financial arrangements is given below.

3.1. Singapore

3.1.1. Pension system
The first (and only) pillar of the social security system in Singapore is the Central Provident Fund (CPF). Singapore runs a defined contribution (DC) scheme with individual accounts which are fully funded by workers and employers, and it provides three elements of financial security: retirement, homeownership, and healthcare. Participation is mandatory for all employed Singapore citizens; self-employed persons are required to contribute only to the healthcare account. For persons below the age of 50, contributions of monthly wages total 35.5%; this amount is divided between the employee (20%) and the employer (15.5%). After the age of 50, the contribution rate slightly decreases.

The contributions are split into three accounts, with the allocation in each of the accounts depending on the age of the person involved (OECD 2013):
- Ordinary Account

  Savings credited to the Ordinary Account can be used for housing, education, and other approved assets. The interest rate on these accounts is adjusted every three months, with the CPF setting a minimum guaranteed return of 2.5% per year.
- Special Account

  Contributions credited to the Special Account are set apart for retirement and can be used for investments in retirement-related financial products such as government bonds, insurance, and Exchange Traded Funds. Savings in the Special Account earn a return equal to the long-term government bond interest rate, which nowadays equals 4% per year. The first €36,064.20 saved in this account earns an extra 1% interest.
- Medisave Account

  Medisave Account savings are used to meet hospitalization and other healthcare expenses and for additional insurance packages. The return on savings is regulated in the same way as with the Special Account.

When a contributor reaches the age of 55, a fourth account is opened:

- Retirement Account

  As from the age of 55, members may withdraw a lump sum from their CPF savings in the three accounts described above. However, to get permission for this, members must first set aside the CPF Minimum Sum. Currently, participants have to deposit €93,650.11 into their Retirement Account and €26,267.71 into their Medisave Account.

It is also possible to withdrawn savings from the Ordinary Account *before* the age of 55 for expenditures such as investments, education, homeownership, and family protection. Such withdrawals have been made possible since the housing crisis of 1960 in order to improve the population's situation related to housing. In Singapore homeownership plays an important role: 90% of the population owns the home lived in (Pension Funds Online, 2013). To use money from the Ordinary Account to finance housing expenditures, CPF makes a distinction between Housing Development Board (HDB) flats and private property.

3.1.2. Financial Arrangements

In Singapore, a distinction is made as to homeownership between HDB flats, which are subsidized owner-occupation houses (Section 3.1.2.1), and private property (Section 3.1.2.2).

3.1.2.1. HDB Flats

The HDB flats are part of the program to offer affordable housing in Asia, to ensure that low-income citizens are not excluded from the housing system. The HDB, set up in 1960, has grown to become the major housing sector, with affordable flats that facilitate access to owner occupation in public housing for all income groups. According to the HDB Infoweb, 85% of the total Singapore population lived in HDB flats in 2012.

To be eligible for an HDB subsidized flat, citizens need to meet the following conditions:

- Singaporean citizenship
- A minimum age of 21
- Average gross monthly household income does not exceed a certain income ceiling. The level of income which may not be exceeded depends on the number of rooms that a specific house has. To give an indication: for buying a 2-room (non-mature towns/estates) the maximum gross monthly household income is set at €1,522.77; for a 3-room (mature towns/estates), 3-room (premium), 4-room or bigger flat this amount increases to €7,313.83.
- Form a family nucleus
- None of the property owners may own or have an interest in any other flat during the 30 months prior to the date of application
- Each eligible Singaporean household can buy a HDB housing unit only twice

  (HDB Infoweb, 2013)

The largest impact in the housing sector for homeowners is the possibility to withdraw part of their savings in the CPF Ordinary Account to buy a public housing unit. This is applied for the down payment, which equals 20% of the purchase price. The remaining 80% of the purchase price is transformed into an HDB-assisted mortgage loan, where the interest rate is set below the prime rate. According to HDB statistics, most first-time home buyers are able to pay their monthly housing loan (i.e. the down payment plus mortgage installments) entirely from their lump sum payments from their CPF Ordinary Account (Yuen, 2007).

Potential buyers of an HDB flat may withdraw their savings in order to:
I.   make direct payment to the HDB for the purchase of an HDB flat;
II.   pay installments on the mortgage loan (including interest) for the purchase of the HDB flat;
III.   pay legal fees and other costs related to the purchase.
        (CPF Board 2013a)

When a homeowner wishes to sell the HDB flat, the principal amount withdrawn for the purchase of the flat plus the accrued interest must be refunded to the CPF account. When an individual reaches the age of 55, only the Minimum Sum of the Retirement Account as well as the Medisave Account needs to be refunded. Excess refunds must be paid within five working days from the date of refund crediting (CPF Board 2013b).

3.1.2.2. Private Property
When an individual is able to afford a house in private property instead of an HDB flat, it is possible to withdraw all CPF savings in the Ordinary Account for the down payment on the associated mortgage loan payments. The withdrawals can be used for:
I.   direct payment to the seller for the purchase of a property;
II.   repayments of the mortgage loan (including interest) for the purchase of the property;
III.   repayment of a housing loan for the purchase of land;
IV.   payment of legal fees and other costs related to the purchase.
        (CPF Board 2013a)

When a homeowner wishes to sell the private occupied house, the procedure is the same as the above procedure for HDB flats.

3.1.3. The use of pension savings for housing purposes
The use of CPF withdrawals for housing purposes, either for HDB flats or private property, is subject to several limits. Firstly, it is recommended to take a mortgage loan that results in monthly housing costs less than 35% of gross yearly income. However, this is only an advice and not required by law. Secondly, a *valuation limit* and a *withdrawal limit* are set in order to make inhabitants cautious in their withdrawal behavior.

- The *Valuation Limit* (VL) is the lower of the purchase price of the property at the time of purchase and its market value. For example, if the purchase price of the property is €200,000 and its market value is €230,000, the VL is €200,000. Citizens may use their Ordinary Account savings up to the VL to buy the property or to pay the monthly mortgage loan installments, without having to meet any of the CPF conditions.
- The *Withdrawal Limit* (WL) is the maximum amount of CPF above the VL that can be used for property, such as mortgage loan repayments. Once the Withdrawal Limit is reached, no other withdrawals are allowed. If any housing loan balance is still outstanding then, the owner must service it fully with cash. Currently, the Withdrawal Limit is 120% of the Valuation Limit. If an individual wishes to use the WL, then the Minimum Sum cash component must first be set apart. (Standard Chartered Singapore, 2013).

As contribution rates decline after the age of 55, the CPF advises to repay withdrawals before reaching this age. However, once the VL is reached or if the mortgage loan is still not paid off at age 55, it is still allowed to continue to use CPF savings. The amount that may be used is called the Available Housing Withdrawal Limit.

- The *Available Housing Withdrawal Limit* (AHWL) is the accessible amount of the Ordinary Account balance to withdraw, after setting apart the CPF Minimum Sum cash component. The Minimum Sum, implemented to ensure some regular pension income, was set at €94,732.02 in 2010. The AHWL increases with new CPF contributions and decreases when savings from the Ordinary Account are used. It is established in order to provide every member of the CPF with enough resources at the age of retirement (Welcome to Retirement Ready CPF, 2012).

When the Available Housing Withdrawal Limit is reached, no further withdrawals are allowed, and all housing (or other) expenses have to be paid out of pocket.

The question remains whether people actually make use of the possibility to withdraw pension savings. Figure 3.1 shows the withdrawal trend of the last half century before retirement, which is that over time individuals increasingly withdraw savings from their pension account. Over time, two important process changes have been introduced for the housing market in the CPF. As from 1968, it was permitted to use CPF contributions to finance homeownership of HDB flats, and in 1981 this was extended to private housing (Lim, 2001). Figure 3.1 shows a rising trend in the CPF Withdrawals-to-Contributions Ratio; these sharply increased from 1981, which could be an indicator for the impact of the extension to private housing. However, in most years the contributions exceed withdrawals (the dark blue line represents the CPF Withdrawals-to-Contributions Ratio). Today, about 50% of distributions are used for housing investments.

Figure 3.1: Annual CPF Contributions and Withdrawals, 1955-2006
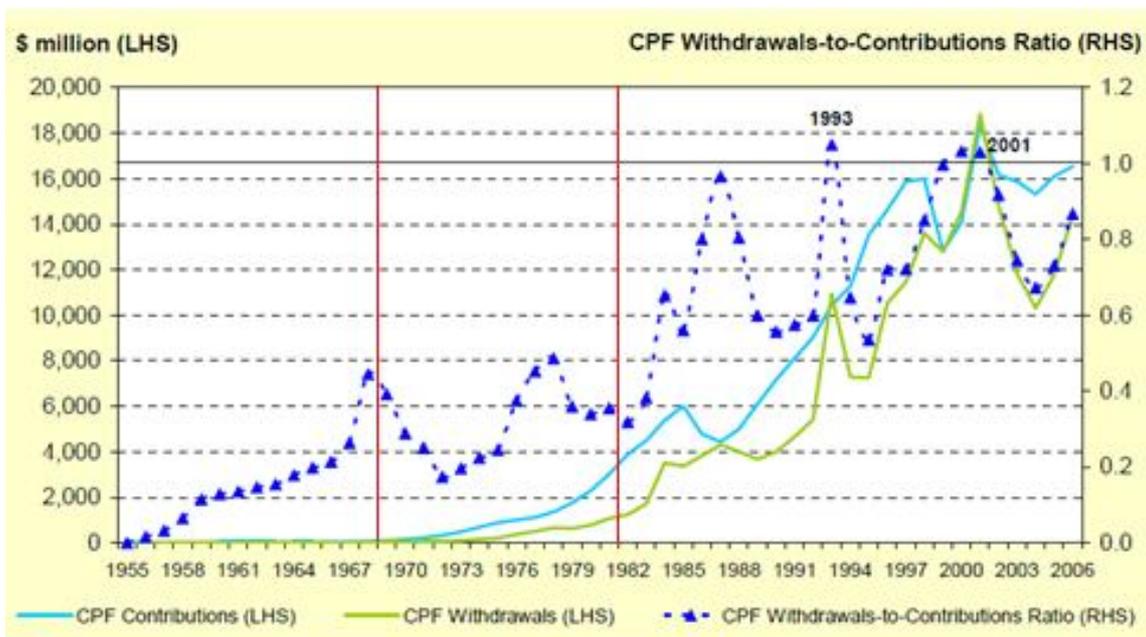
3.1.4. Financial situation of retirees in Singapore

Figure 3.2: Net and Gross replacement rates
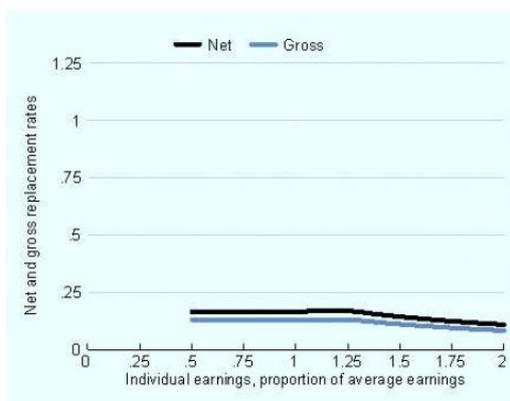
Source: OECD (2011a)

Although Singapore has a wide range of options whereby the elderly can make use of their retirement assets, the results from the study by the OECD (2011a) of pension funds in Singapore are not that positive. As shown in Figure 3.2, Net and Gross Replacement are always below 20% in relation to individual earnings. This might be a consequence of the flexible restrictions to prevent irrational behavior regarding withdrawals from CPF savings. It may also indicate that the Minimum Sum income level at retirement is too low. The replacement rate calculated by the OECD includes all mandatory pension schemes for private-sector workers (OECD 2011a). According to Choon & Tsui (2012), the calculations of the OECD were not adjusted for the institutional arrangements in Singapore whereby housing assets can be unlocked to supplement retirement income. The OECD has built a model where net income replacement rates are simulated that include HDB housing ownership. Their results suggest a replacement rate for median income workers of 70% for males and 64% for females if housing assets are included. As such, evidence regarding the financial position of retirees is mixed in Singapore, so that no clear conclusions can be drawn.

3.2. United States

3.2.1. Pension system

The largest program in the United States for income maintenance is the OASDI program, also known as the Social Security Act, which covers 96% of the population. OASDI stands for Old Age Survivors and Disability Insurance, which is financed by payroll taxes. It is an important source of retirement income as three out of five beneficiaries aged 65 or older rely on it for at least half of their income. Retirement income from the OASDI is, however, not guaranteed as payouts are dependent on annual earnings. Also, payouts are permanently reduced if they are claimed before the age of 65, which is possible from the age of 62 (Social Security; Research, Statistics & Policy Analysis, 2013).

Aside from the Social Security Act, additional retirement income for individuals in the United States can be obtained through employer-sponsored retirement plans and IRAs (see Section 3.2.1.1). Employers are encouraged by the U.S. government to sponsor specific pension plans as it offers tax breaks when they establish and contribute to employee pensions (About Economics, 2013). Employers are free in choosing which pension to provide, whereby they can choose out of numerous mechanisms; the most common forms of private pension funds are defined benefit and defined contribution plans. Employer-sponsored pension plans do not offer the possibility of withdrawing pension savings before the age of retirement. This is an important difference from the traditional IRAs.

3.2.2. Financial Arrangements

3.2.2.1. Traditional Individual Retirement Accounts (IRAs)

At the end of 2011, IRAs held more than one-fourth of total U.S. retirement assets and constituted 9.7% of the total financial assets of U.S. households. IRAs are held by individual persons, thus the investment decisions of households play an important role in the returns and variation of returns that they experience (Holden and Bass, 2012). Participants are allowed to access their savings from the age of 59.5 and are required to start withdrawing benefits by the age of 70.5. Contributors are permitted to withdraw savings before the age of 59.5, but such withdrawals are subject to income tax as well as a 10% penalty, depending on the reason for withdrawal (OECD Private Pensions Outlook, 2008).

One of the situations where individuals are exempted from the 10% penalty is a withdrawal of up to €7,701.79 when such amount is used for the purchase of a first home. If the individual and his/her spouse are first-time home-buyers, each of them can withdraw up to € 7,701.79 without having to pay the additional tax. However, the amount taken up constitutes taxable income. The definition of a first-time home buyer is as follows:

"Generally, you are a first-time homebuyer if you had no present interest in a main home during the 2-year period ending on the date of acquisition of the home which the distribution is being used to buy, build, or rebuild. If you are married, your spouse must also meet this no-ownership requirement" (Department of the Treasury, Internal Revenue Service, 2012).

To avoid the tax penalty, the distribution must meet all of the following criteria:

I.   It must be used to pay qualified acquisition costs (which include costs of buying, building, or rebuilding a home, and any customary settlement, financing, or other closing costs) before the close of the 120th day after the day the distribution is received.

II. It must be used to pay qualified acquisition costs for the main home of a first-time homebuyer (defined as above).

III. Total qualifying distributions, plus all prior qualified first-time homebuyer distributions, if any, may not exceed €7,613.83.

(Department of the Treasury, Internal Revenue Service, 2012)

3.2.3. The use of pension savings for the housing market

In 1997, an exemption from tax penalties for first-time homebuyers (and for higher education) was introduced by the Taxpayer Relief Act. As shown in Figure 3.3, the Taxpayer Relief Act led to a substantial increase of withdrawals from the IRA: total IRA distributions almost doubled. Apparently, withdrawals become substantially more interesting for households when the tax penalty is removed. However, homeownership rates in the US have been increasing since 1994, without any impact on marginal growth in 1997 (Figure 3.4).

Table 3.1 shows the withdrawal activity of traditional IRA investors by age. This again confirms the idea that tax penalties are good instruments to protect individuals against 'wrong' intertemporal choice with immediate gratification. On average, 18.1% of traditional IRA investors took distributions from their traditional IRAs in 2008. However, this varied considerably by age: 73.8% of total withdrawals were made by individuals aged 60 and over, and 78.3% of investors aged 70 and older took distributions in 2008. That contrasts with the distribution rate between 6% and 7% in the age cohort 25-39 (Holden and Bass, 2012). In the US, 64% of the population is owner of the house they live in. If we look at private homeownership, the distribution among the ages of house owners looks somewhat the same as in the Netherlands until the age of 45 (Figure 3.5). However, above the age of 45, the US shows even higher numbers in the relative share of households that own the house they occupy. This reaches its peak in the 70-74 age category, as 82.4% of population in this age cohort is owner of the home they live in.

Figure 3.3: Aggregate IRA distributions
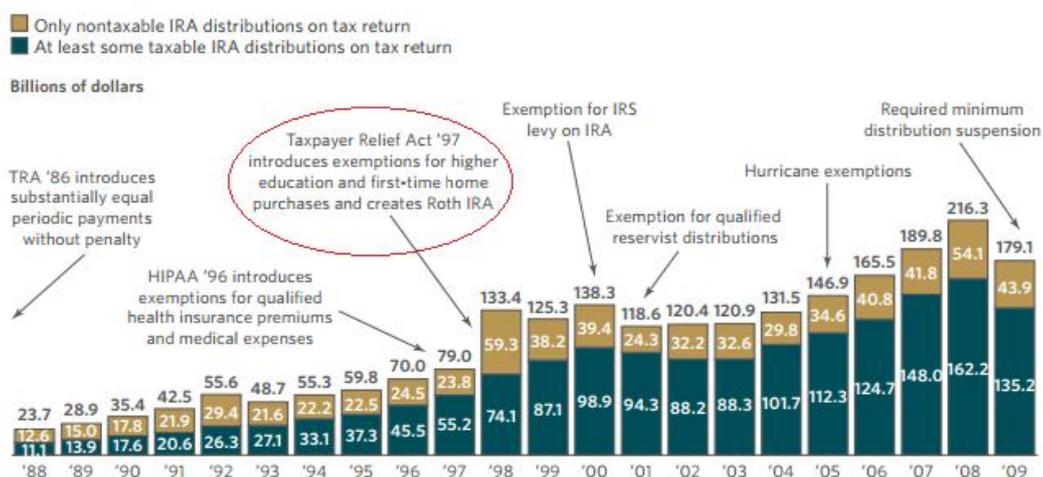
Source: Holden and Bass (2012)

Table 3.1: Withdrawal Activity of Traditional IRA Investors by Age, 2008

Withdrawal Activity of Traditional IRA Investors by Age, 2008
Number of traditional IRA investors and traditional IRA investors with withdrawals[1] by age

Age	Traditional IRA investors		Traditional IRA investors with withdrawals[1]		Memo: percentage of traditional IRA investors who had withdrawals[1]
	Number *Thousands*	Share[2] *Percent*	Number *Thousands*	Share[2] *Percent*	
25 to 29	213.6	2.7%	13.0	0.9%	6.1%
30 to 34	416.7	5.4	27.3	1.9	6.5
35 to 39	638.1	8.2	43.0	3.0	6.7
40 to 44	798.9	10.3	56.3	4.0	7.0
45 to 49	1,002.9	12.9	72.7	5.2	7.2
50 to 54	1,078.5	13.9	79.5	5.6	7.4
55 to 59	1,026.8	13.2	77.3	5.5	7.5
60 to 64	944.3	12.1	151.2	10.7	16.0
65 to 69	704.9	9.1	144.4	10.2	20.5
70 or older	953.7	12.3	746.7	52.9	78.3
All	7,778.3	100.0	1,411.2	100.0	18.1

[1]Traditional IRA investors with withdrawals are traditional IRA investors (aged 25 or older) who had withdrawals from their traditional IRAs in 2008.
[2]Share is the percentage of the total.
Note: Figure A.9 in the appendix provides additional detail by gender.
Source: The IRA Investor Database™

Source: Holden and Bass (2012)

Figure 3.4: U.S. Homeownership Rate 1975-2011
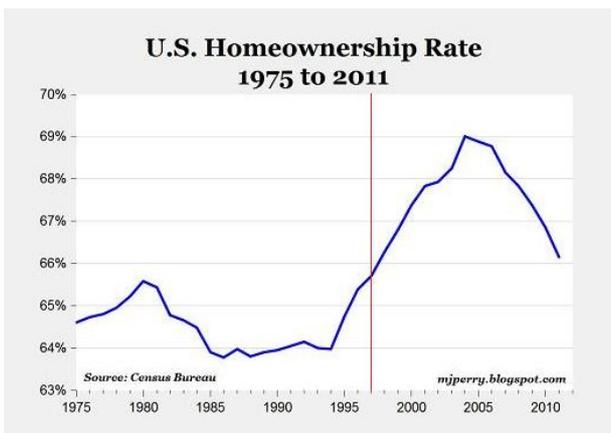
Source: All Star Charts (2013)

Figure 3.5: Homeownership rates in the US, 2010
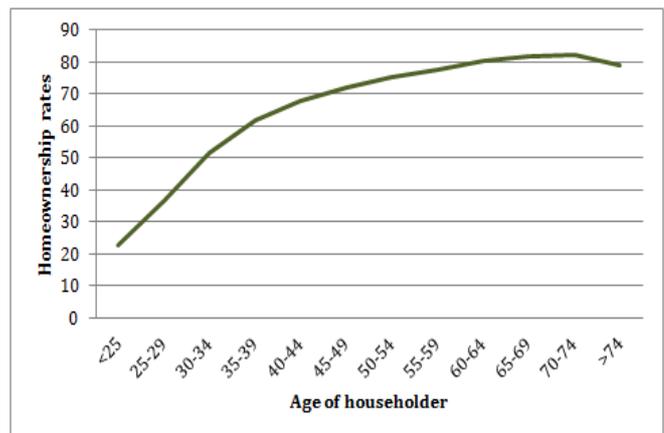
Data obtained from United States Census Bureau (2013)

3.2.4. Financial position of retirees in the US

Figure 3.6: Net and gross replacement
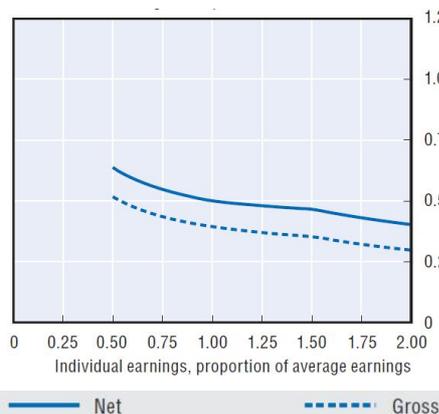
Source: OECD (2011b)

The income replacement rates are higher for lower income levels than for higher income levels in the United States. This may be because lower income groups are provided with a higher amount of social security out of the OASDI because their benefits are earnings-related with a progressive benefit formula. The replacement rates are much higher compared to Singapore even though it is possible in both countries to extract income from pension savings.

The most important difference between the pension systems of those two countries is the tax penalty, which prevents households from withdrawing much of their pension savings. Another difference is that in the US the only current retirement scheme where it is permitted to distribute pension savings for housing expenditures is the IRA.

A pattern commonly seen in the US is that young individuals after graduation from college either live with their parents or rent for a period before entering the housing market (Edwards, 2011). This is in line with the consumption pattern of home buyers explained in Section 1.2. To conclude, if withdrawals are regulated very strictly and only allowed for specific purposes, together with the correlated tax expenditures among the distributions, withdrawal activity is substantially lower compared to a country such as Singapore.

3.3. Switzerland

3.3.1. Pension system

The pension system in Switzerland consists of three pillars:

- First Pillar: The first pillar in Switzerland –the Alters- und Hinterlassenenversicherung (AHV) – is mandatory for all employees, self-employed, and unemployed persons above the age of 20. It is structured so as to ensure a minimum standard of living for the elderly. The amount someone receives from the first pillar is dependent on the number of contribution years, income, and credits for child-rearing plus care. It is mainly financed on a pay-as-you-go basis and partly subsidized through VAT revenues.

- Second pillar: The second pillar is an occupational benefit plan that is obligatory for all employees whose annual income exceeds a minimum level, intended to secure a sufficient standard of living. Self-employed and unemployed persons are not required to participate in the second pillar. Trustee boards are free in the way they organize their pension system: whether to provide DB or DC, and how to divide the contribution rate between employee and employer. The only requirement is that the contribution by the employer is at least equal to that of their employees. The ambition for the second pillar in combination with the first pillar is to cover 60-70% of the salary of workers with average earnings.

- Third pillar: The third pillar is an individual occupational pension plan based on voluntary savings and consists of two parts: the tied pension provision (pillar 3a) and the flexible pension provision (pillar 3b). Pillar 3a is subsidized as it benefits from tax incentives, which implies that contributions are taxed only at the time of payment and thus deductible from taxable income. Pension savings in the flexible pension provision do not enjoy any tax privileges.

  (Queisser and Vittas, 2000)

Pension contributions are tax deductible, and pension benefits are taxed in the same way as other income. The age for full eligibility for retirement payouts is 65 for men and 64 for women. Early retirement is possible, but this leads to a reduced pension throughout retirement. The only accepted reason to

withdraw or pledge pension savings in the second pillar and pillar 3a before the age of retirement is for financing owner-occupied property (Swiss Life Network, 2012).

3.3.2. Financial arrangements

3.3.2.1. Withdrawing pension assets

Individuals in Switzerland are allowed to withdraw pension savings before their retirement for homeownership purposes provided that they are still more than three years from retirement. The funds in the second pillar and pillar 3a may be used *"for the purchase of housing, investment in homes, participation in housing cooperatives and for repayment of the mortgage principal but not for the financing of home maintenance or mortgage interest payment"* (Queisser and Vittas, 2000).

Withdrawal of capital for down payment purposes leads to a lower mortgage principal, which results in lower interest expenses. However, this also means a lower amount of interest that is tax-deductible; the amount withdrawn is fully taxable, however at a rate lower than the normal income tax rate. The tax rate depends on the canton of residence. The advanced withdrawal is limited to the vested benefits of the individual. It reduces pension benefits, but if there is any reduction in coverage for the risk of disability or death, this reduction may be compensated by savings out of the third pillar (Pension fund and residential property, 2013).

There are some regulations governing withdrawal of occupational pension assets:

  I.   The minimum withdrawal amount is €16,302.58.
 II.   Withdrawals may only be made once every five years.
III.   From the age of 50, the maximum permitted withdrawal amount is the vested benefit at age 50 or half of the vested benefit at the time of withdrawal.
 IV.   People less than three years from retirement are not permitted to withdraw pension savings for homeownership purposes.
       (BCV, *"A step-by-step guide to homeownership in Switzerland, 2013)*

An individual is obliged to repay the distribution if and when the property is sold. The amount to be repaid consists of the sales price, *excluding* the amount of interest (Baloise Insurance, 2013), less any mortgage-secured debt and taxes. Other voluntary repayments whereby occupational benefits increase must be at least €16,223.24. This is possible until three years prior to pension entitlement (Pension fund and residential property, 2013).

3.3.2.2. Pledge of pension assets

It is also possible to use pension savings out of the second and third pillar as collateral for the purchase of private property in order to get a higher mortgage loan. As opposed to pension withdrawals, pledging enables individuals to preserve the benefits accumulated, and the amount pledged is not taxed. Monthly mortgage interest payments are not reduced with this type of property financing; instead, a higher mortgage loan or a lower interest rate can be obtained from the pledgeholder. Up to the age of 50, the

maximum amount that may be pledged is the sum of the vested benefits. As from the age of 50, the maximum amount that may be pledged is the vested benefits at age 50 or half of the vested benefits currently available, whichever is greater. If the pledge must be enforced, the same conditions will apply as for pension withdrawals, as explained in Section 3.2.2.1, (BCV, 2013).

3.3.3. The use of pension savings for the housing market

With 31%, Switzerland has the lowest rate of owner-occupation in the developed world. This is because economic incentives push individuals towards rental homes rather than homeownership, as the system does not give preferential tax treatment to owner-occupied housing: owner-occupied homes are heavily taxed (Queisser and Whitehouse, 2003). For example, the net rent of housing expenses as well as housing wealth plus some capital gains are taxed, contrary to rental housing, which has various subsidy programs. Furthermore, mortgage loans are hard to get: banks do not finance more than 80% of the value of a property, and the annual cost of owning a house may not exceed 33% of gross household income. (Bourassa, Hoesli and Scognamiglio, 2012).

According to Bourassa et al. (2006), half of the households with occupied-housing in Switzerland use their pension savings out of the first and second pillar as *collateral*, and approximately 26,000 households *withdrew* part of their savings.

3.3.4. Financial situation of retirees in Switzerland

Figure 3.7: Net and Gross Replacement Rates in Switzerland
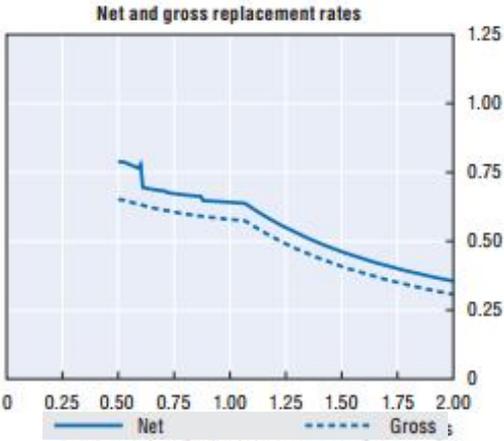
Source: OECD 2011b

Although the percentage of occupant ownership is so low, the financial situation of the elderly in Switzerland is very good. 96% of working men and 83% of working women are covered by the first and second pillar (Butler and Staubli, 2013). As shown in Figure 3.7, average earners reach a net replacement rate of 67.5%. Switzerland is one of the richest countries in Europe, thus the low homeownership rate does not signal an economically poor performing country. It may well be that tax policy has such influence in Switzerland that it distorts the tenure choice of households. Bourassa et al. (2006) argue that 83% of respondents in a Swiss survey would prefer homeownership if there were no financial or other constraints. Furthermore, 90% of the participants in their survey aged 30-49 preferred owning to renting.

3.4. Germany

3.4.1. Pension system

The public pension system – the Gesetzliche Rentenversicherung - in Germany is in Bismarckian style, whereby pension provision is seen as an insurance product instead of an instrument to combat poverty at old age. It was established in order to maintain a sufficient standard of living, whereby public pensions are proportional to average income earned during working life. The system only has a few redistributive properties. Approximately 70% is paid by payroll tax contributions on a PAYG basis. The German social security contribution rate was set at 19.5% of gross income in 2003, which is equally shared between employee and employer. Retirement benefits are dependent on four variables: (1) 'earning points' that reflect the relative earnings position, (2) active years on the labor market, (3) adjustment for pension type and retirement age, and (4) the current pension value (Börsch-Supan and Wilke, 2003). The old-age pension is payable from the age of 65; for individuals born in 1964 or later this increases to the age of 67 (OECD 2011c). The statutory pension insurance is an important source of income for the German elderly; 96% of persons above the age of 65 get at least some benefits from this pension plan, and 69% of the retirement income of formerly employed persons is fully dependent on the benefits from this mandatory first-pillar pension provision (Berner, 2006).

As in the Netherlands and Switzerland, also Germany has a second and a third pillar next to its mandatory public pension plan (first pillar). The second pillar is an occupational pension plan, the third is a private old age provision. The majority of occupational pension plans are provided by banks, insurance companies, or investment funds. Most of them are on a defined-contribution basis with a corresponding 4% contribution rate. Approximately 41% of companies provide supplementary pension coverage for their employees (OECD, 2011a).

In 2001, the German Retirement Savings Act introduced the 'Riester Pensions" to stabilize contribution and replacement rates, as Germany faces an aging society with a declining replacement rate in the public PAYG system. The Riester Pension provides tax advantages on pension savings plus additional subsidies for low-income households and households with children to encourage people to save. More modest advantages are applied to all other households. Another main difference between the Riester Pensions and other private occupational pension plans is that for these pension accounts the law permits withdrawals for owner-occupied housing (Börsch-Supan et al., 2012)

3.4.2. Financial arrangements

3.4.2.1. Riester Pensions: subsidies and tax benefits

Riester subsidies are provided to encourage households to save for retirement. Low-income households benefit from the system because they receive additional subsidies.

The subsidies contain three elements: (1) a flat-rate benefit for low and middle income households, (2) additional subsidies for each child raised, and (3) tax deductions. The following rules apply to participants in the Rieser Pension as from 2008:

I.   The maximum contribution rate is set at 4% of gross income. If households contribute less, the subsidies are reduced proportionally.

II. The flat rate benefit for eligible low and middle income households (means-tested) is €154 per year. This is credited to the pension account if an application form has been completed.

III. The additional subsidy per child raised is €185; for children born after 2008 it is €300.

IV. Contributions are tax deductible up to €2,100. They are constructed such that the tax deduction is more favorable for high(er) income.

(Börsch-Supan et al., 2008).

A household is entitled to the Riester Pension plan if one of the partners is actively insured under the public pension schemes. Uninsured self-employed persons, students, and households with an income below €400 per month are ineligible (Pfarr and Schneider 2011).

3.4.2.2. Bauspar system

The Bauspar (= home saving) system in Germany serves as a supplement to private pension savings in the third pillar, intended to make mortgage loans more accessible for households. It works as follows:

Example: Ten individuals want to buy a house; they all need to save during 10 years in order to become eligible for a mortgage loan. The individuals pool their savings, so that one individual is immediately allowed to withdraw the deposited savings and thus obtains a mortgage loan. One individual thus uses his/her personal savings plus those of the others. Next year, another individual is allowed to withdraw savings, using the savings of all individuals plus the repayment of the individual who did the first withdrawal, etc.

Today, Germany has 30 million Bauspar contracts. A Bauspar contract is divided into four phases:

I.   The contract conclusion phase: The Bauspar sum and the remaining contract conditions are agreed. Usually, the interest rate of the loan lies between 1.5% and 4.5%.

II. The savings phase: Individuals need to save 40% to 50% of the Bauspar sum in the form of regular payments

III. The allocation phase: The valuation index, which expresses the individual's saving performance, determines the order of allocations to customers.

IV. The loan phase: The Bauspar sum is disbursed to the customer, with the interest on the loan being one percentage point higher than the interest rate set in the contract conclusion phase. (European Office, 2013)

3.4.3. The use of pension savings for the housing market

High-income households are advantaged under the Riester Pension as they benefit additionally from the tax deductions on pension savings. In Germany it is not allowed to withdraw pension savings before the age at retirement; thereafter savings are disbursed in annuities. However, there is an exception for owner-occupied housing: households gain from the Riester Pension as it allows withdrawal of the accumulated

capital for homeownership. According to Börsch-Supan et al. (2012), it was permitted between 2001-2008 to withdraw between €10,000 and €50,000 to make a down payment, which had to be repaid in monthly payments before retirement. Since 2008, it is allowed to withdraw savings up to the accumulated capital for homeownership, also known as the Wohn-Riester. The amount withdrawn does not have to be repaid. Instead, payments to loan agreements and building society saving contracts (Bausparen) are certified as Riester contributions, and households still receive the associated subsidies.

Figure 3.8: Development of Riester Pensions (million contracts)
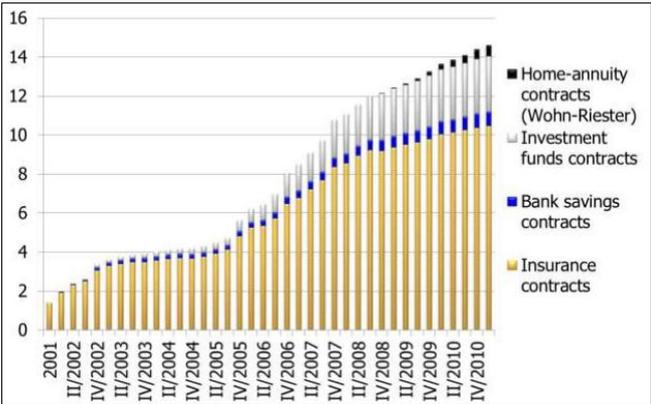
Source: Börsch-Supan, Coppola, Reil-Held, (2012)

Although individuals are allowed to use the Riester Pension for home-annuity payments, it is not used very frequently, as can be seen in Figure 3.8. The change in law in 2008, whereby individuals can use all of their accrued pension savings, slightly increased the use of home-annuity contracts, but such Riester products are still not popular among the German population (Börsch-Supan et al., 2012).

The extent to which low and high income households benefit from the products from the Riester Pension is shown in Figure 3.9.

Figure 3.9: Subsidy as percentage of total contributions
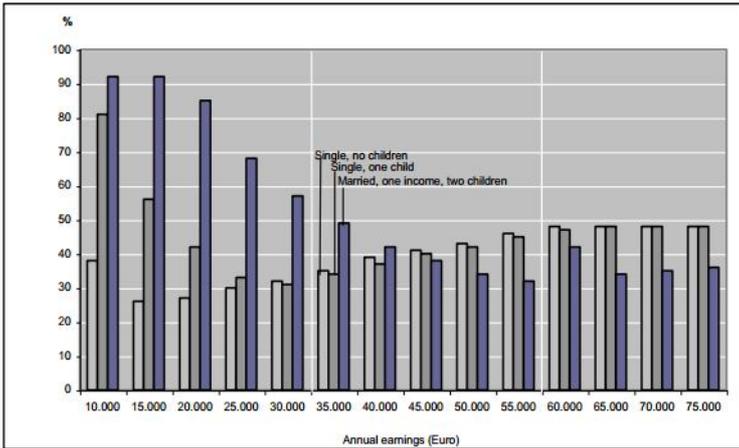
Source: Börsch-Supan, Coppola and Reil-Held, (2012)

Low-income households get relatively high subsidies, while high income households gain from the tax deductions on a progressive basis. Therefore, the rate of subsidies to contributions show a U-shaped graph. At the mean earnings level (€42,000) the subsidy rate is 39% (Börsch-Supan et al., 2012).

Figure 3.10: Net and Gross Replacement Rates in
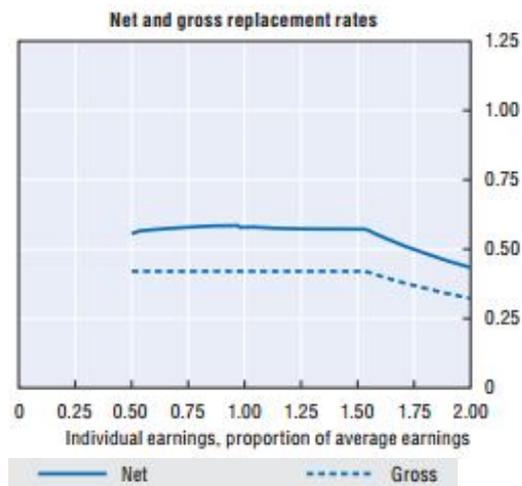
Source: OECD 2011b

Replacement rates in Germany are stable over different levels of income (Figure 3.10), as a consequence of the Bismarckian pension system. With an average replacement rate of more than 60%, Germany succeeds in maintaining a sufficient standard of living at retirement as costs decline likewise. The low replacement rate among individuals with high incomes is due to the upper limit for social security contributions (Börsch-Supan et al., 2008).

The majority in all age groups in Germany are not homeowners but live in rental homes because the country has a relatively small owner-occupied sector. In Germany, home occupation decisions among individuals contrast with the Netherlands: 40% live in owner-occupied houses, a percentage that has been stable since the 1940s (Helbrecht and Geilenkeuser, 2010). This is mainly a consequence of the subsidized rental sector and the restrictive mortgage system with large down payments, long-term fixed interest rates, and high transaction costs. As a consequence, homeownership rates remain low, and owner-occupied housing remains a privilege for higher-income individuals (Häußermann and Siebel, 1996). This is also probably the reason why the Wohn-Riester has not been a great success. Although pension accruals are allowed to be used to reduce housing costs, the subsidized rental sector in combination with the restricted housing market makes for low homeownership rates among the German population. As with Switzerland, it enhances the idea that a low homeownership rate is not necessarily an indicator of a poorly performing economy.

3.5. Australia

3.5.1. Pension system

The pension system in Australia consists of three pillars. The first pillar is the government's Age Pension Program. This is a means-tested benefit that provides a safety net at the age of retirement for persons who are unable to save enough during their working life. The Age Pension is funded out of general revenues, and individuals are eligible at the age of 65, which will be raised over the coming decade to the age of 67. To be fully or partly eligible for the Age Pension, an individual must satisfy both the Age Pension Income Test and the Pension Asset test, which are effective from July 2013.

- The *Pension Income Test*: The thresholds for full eligibility for the Age Pension are set at annual amounts of €2,720.23 for individuals and €4,812.72 for couples. For partial eligibility for the Age pension, the annual income thresholds are €30,913.11 for individuals and €47,318.33 for couples (Power, 2013a).

- The *Pension Asset Test*: For the Pension Asset Test, a distinction is made between homeowners and non-homeowners. The threshold for a full Age Pension entitlement for homeowners is set at € 131,953.99 for individuals and €187,116.46 for couples. The threshold for households without an owner-occupied house lies much higher: €227,524.23 for individuals and €282,686.70 for couples (Power, 2013b). Owner-occupied housing is exempted from the test.

A fully eligible single person receives an annual Age Pension Income of €14,097.45, while couples receive €21,260.19 (Power, 2013c). These benefits are reduced when income or assets are above the thresholds.

The second pillar is an occupational, mandatory "Superannuation Guarantee" (SG) pension program. In 2013 employers must contribute 9% of total earnings; this will rise to 12% by 2020. The employee contributes 3%, which co-contribution would lead to a 40% replacement rate at the retirement age of 65. The employer is required to establish a default Superannuation Fund. This Fund is responsible for the investment options and the investment default. Individuals are allowed to opt out if they prefer a different investment strategy (Agnew, 2013). Self-employed individuals are not required to save additionally for their pension income via Superannuation Guarantee contributions. However, they are encouraged to save voluntarily for retirement through the availability of tax deductions (CPA Australia, 2012). Normally the Super contributions are taxed at 15% (Superstrategy, 2011). The tax treatment of pension benefits depends on the age of the individual and the form of payout (Section 3.5.2.).

Over and above the contribution set by the government in the second pillar, voluntary contributions to the SG are possible in the third pillar. The third pillar also includes non-superannuation savings such as individual savings accounts, shares, and real estate as Australia also offers such products as the reverse mortgage (Australia's future tax system, 2013). The voluntary contributions do not benefit from the lower tax rate on Super contributions. However, they still benefit from a lower tax rate than the income tax rates (Retirement and Income modeling, 2013).

The preservation age, which is the age at which individuals get access to their super benefits (Australian Government, 2013), lies at 60 for individuals born after July 1964. For individuals born before 1960, the preservation age is 55. For individuals born between 1960 and 1964 it depends proportionally on the year of birth and leads to a corresponding preservation age between 55 and 60. Generally, it is not possible to withdraw any pension assets before the preservation age. A large difference with the Netherlands is that at the time of retirement, individuals are allowed to withdraw pension assets for other purposes than financing the retirement period, such as vacation or mortgage repayments (Section 3.5.2.1). Also, an exemption is made for individuals who face severe financial hardship (Section 3.5.2.2).

3.5.2. Financial arrangements

3.5.2.1. Withdrawal of pension assets

To be allowed to withdraw pension assets from the Superannuation account, a person must have reached the preservation age described above (for exemptions, see Section 3.5.2.2). From the age of 60, all sorts of

pension payments (pension income as well as lump sum withdrawals) are free of tax. Between the ages of 55 and 59, the following tax rules apply:

- Pension payments: These are divided between taxable payments and non-taxable payments:
  - *Tax-free amount*: This is the total of after-tax contributions, government co-contribution, pre-July 1983 benefits, the capital gains tax-exempt component, and certain amounts of disability benefits.
  - *Taxable amount*: The taxable portion is 85% of the rest of the pension savings (total pension savings minus the tax-free amount). This is because of a 15% tax offset. For individuals aged 55-59, the pension income tax is equal to the income tax.
- Lump sum pension withdrawals: Withdrawals are tax-free up to €118,207.30. The amount of pension withdrawn exceeding this threshold is taxed at a rate of 21.5%.

(Australian Super Retirement Division, 2013)

With this form of tax policy, it is possible to fully repay an outstanding mortgage loan after the age of 60 without any tax liability. According to the Super strategy, it is optimal for a person who is 5 to 10 years away from retirement to switch to Interest Only repayments for all or part of the loan. Individuals who do so are advised to put the money that is saved because of the lower repayments into their Superaccount. This is because Australians are allowed to put pre-tax dollars into the Superaccount by salary sacrificing, while mortgage repayments are made out of after-tax dollars. They thus pay a much lower tax amount since they benefit from the lower taxes on pension contributions (15%) versus the income tax applying to mortgage repayments (38.5%). Finally, when the individual decides to retire after the age of 60, a lump sum is withdrawn from the pension account; this fully repays the outstanding mortgage (Superstrategy, 2011). This system is roughly the same as the capital insurance (*kapitaalverzekering*) in the Netherlands whereby individuals save money by making use of the deductibility of mortgage interest.

3.5.2.2. Pension withdrawals before the preservation age

Normally, a person has to reach the preservation age before being allowed to make use of his or her pension savings. However, Australia makes exceptions for certain circumstances, whereby individuals are permitted to withdraw some of the money saved in their Superannuation account in order to help them manage their outstanding debts. Individuals are only allowed to sign up for early access to their Superannuation account after they have considered all other debt management options. Thereafter, financial experts will look at the short-term benefits of using the Superannuation account, weighing them against the long-term disadvantages. Early release of Superannuation assets is finally at the discretion of the Superannuation fund (MoneyHelp, 2013).

To have access on the ground of financial hardship, an individual has to meet the following requirements:

- Having been on Commonwealth income support for an extended continuous period, and
- Being able to demonstrate financial hardship, or
- Be over the age of 55 and having received Commonwealth income support benefits for 39 weeks in total.

If a person cannot prove financial hardship according to the above requirements, it is possible to ask the Department of Human Services (DHS) for approval to release Superannuation benefits based on specified grounds. Specified grounds are:

- Medical expenses
- Credit card debt and other loans
- Regular bills
- Motor vehicle purchases and repairs if the individual lives in a remote area and relies privately on the vehicle for transport
- Renovations of the owner-occupied house due to severe disability
- Mortgage repayments in financial troubles.
  (Australian Super, 2013)

Release of money from the Superannuation account for mortgage repayments is only applicable if:

- The individual has difficulties meeting mortgage repayment requirements, and
- The lender wants to sell the home because the individual is in arrears, and
- The name of the individual is on the mortgage documents, and
- The mortgage is for a property which is the individual's first place of residence.
  (Breez Finance, 2013)

The maximum amount which can be released is €6,724.27 gross for every 12-months period. Early benefits are taxed at a rate of 21.5% (MoneySmart, 2013).

3.5.3. The use of pension savings for the housing market

Since 1960, the level of homeownership in Australia has been relatively stable at 70%. However, the value of mortgages and outstanding mortgage debt has increased substantially. In 1992, the Superannuation account was introduced, which led to a considerable increase in the percentage of homeowners with an outstanding mortgage loan. The increased competition between banks and other lenders during the 1990s led to easier access to finances. This, combined with the introduction of the compulsory Superannuation account, raised the percentage of households with a mortgage from 40% in 1992 up to 53% in 2010. More importantly, the percentage of homeowners close to retirement with an outstanding mortgage loan more than doubled between 2002 and 2010. Not only the number of mortgages has grown, there has also been an increase in the borrowing amount of home mortgages. The average mortgage loan between 2002 and 2010 grew from €31,859.10 to €57,601.80, an increase of more than 80%. Also in this case, the largest difference was for households close to retirement, where the borrowing amount of mortgage loans increased by 130% (CPA Australia, 2012).

What caused this rapid increase in private debt? There is anecdotal evidence that individuals who are close to retirement, who know that a large amount of money will be available soon, increase their standard of living accordingly. As the Superannuation account can be withdrawn as a fully tax-free lump

sum amount, individuals purchase items that they normally could not afford, support their children, go on holiday, and increase their credit card payments. This spending pattern does not only hold for homeowners; also renters appear to act in this way as their debts are equal to three-fourth of their superannuation savings. Seeing that the cost of living after retirement is higher compared to that of homeowners while average income is lower, this is a worrisome development (CPA Australia, 2012).

3.5.4. Financial situation of retirees in Australia

Figure 3.11: Net and Gross Replacement Rates in
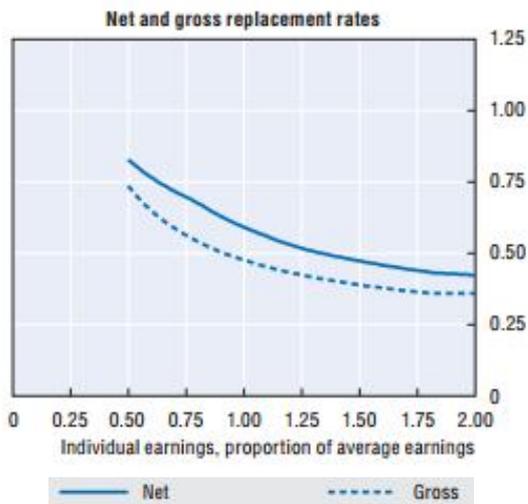
Source: OECD 2011b

Compared to countries such as the Netherlands, Switzerland and Germany, Australia has relatively low replacement rates (Figure 3.11). The reason for this is the policy set by the government, which considered a pre-retirement income replacement rate of 40% to be sufficient. Moreover, this 40% is reached under the Australian pension system if an individual has worked 40 years full-time, which is not a realistic assumption (CPA Australia, 2012). Also, as the Pension Asset Test does not include the value of the privately owned house, Cho & Sane (2011) argue that households will invest more money in their house, resulting in an increase in social benefits. If this holds, then also mortgage values will increase, leading to a corresponding increase in the amount of debt. The current consensus of the Australian government is to set the replacement rate at 60%-65% of pre-retirement income, which would provide retirees with 70%-80% of pre-retirement expenditures (CPA Australia, 2012).

Australia again confirms the idea that individuals discount the future with a discount factor that is too high. Individuals close to retirement increase their expenditures and standard of living as they have their Superannuation savings account in mind, which can be fully accessed at the date of retirement. A new interesting fact that can be learned from Australia is that strict regulation during the working period only is not enough to restrain people from hyperbolic discounting. Therefore, regulations are also needed for the period of retirement, in order to smooth consumption during the last 20 years of a person's life.

3.6 Canada

3.6.1. Pension system

A large part of retirement income in Canada is based on the Canada Pension Plan (CPP), a public pension provision. Together with the Old Age Security (OAS) it provides the base upon which Canadians save for retirement. An exception applies for the province of Quebec, where the Quebec Pension Plan (QPP) is in place, replacing the CPP provision. The CPP and QPP work closely together to ensure that all contributors are protected in the same way. Because the QPP provides similar pensions and benefits as the CPP, only the CPP will be described in this chapter.

The retirement age in Canada is 65. Spouses and common-law partners of OAS pensioners are entitled to reduced retirement income from the age of 60. Individuals also have the option to delay their retirement until the age of 70, whereby pension benefits increase (Government of Canada, 2013a). To be eligible for the OAS, individuals must have made at least one valid contribution before the age of retirement. The amount of OAS that an individual gets is dependent on the number of years the individual has lived in Canada after the age of 18. In 2013, the full pension amount was €404.29 per month (Government of Canada, 2013b). For recipients who have a low retirement income, the Guaranteed Income Supplement (GIS) provides extra monthly pension income amounting to a maximum of €548.19 in 2013 (Government of Canada, 2013c).

Aside from the OAS, every person over the age of 18 who works in Canada and earns more than €2,590.87 per year must contribute to the CPP. Employees and employers each pay half of the required contributions; self-employed individuals must make the full contribution themselves. Pensionable earnings are maximized at €37,826.63 per year in 2013; the contribution rate on pensionable earnings is 9.9%. The benefit that a retiree receives is dependent on the number of contribution years and the level of contributions. The benefits are dependent on the CPP contributions and the earnings on which the contributions are based. Moreover, if an individual has had low earnings for a number of years because of he/she fulfilled the role of primary caregiver in raising children, extra credits are given (Government of Canada, 2013d). A full benefit requires 40 years of contribution, whereby the pension calculation excludes the 15% of years with the lowest earnings. Finally, the earnings-related pension of the CPP is uprated annually in line with the cost of living (OECD 2011b).

Aside from the public pension provisions, there are voluntary pension savings. These are provided in the form of company-sponsored pension plans such as the Registered Pension Plan (RPP), as well as private pension savings such as the Registered Retirement Savings Plan (RRSP). The contribution rate of voluntary pension savings is assumed to be 8.5% (OECD, 2011b). Voluntary pension savings in the RRP and RRSP are tax deductible to encourage the occupational retirement savings: the pensioner pays tax at the time the pension benefit is received. In 2008, 38% of paid workers had a company-sponsored pension plan (Woodger, 2009).

3.6.2. Financial Arrangements

The mandatory public pension schemes in Canada do not provide the option of using pension savings before the age of retirement. However, under the RRSP the individual has the opportunity to withdraw pension savings to buy or build a qualified home.

3.6.2.1. Home Buyers' Plan

The Home Buyers' Plan (HBP) allows individuals to withdraw pension savings from the RRSP to buy or build a privately owned house or a house for a disabled relative. Individuals may withdraw up to

€18,534.99 in a calendar year. The withdrawals are exempted from taxable income, and the RRSP insurer does not withhold taxes on the amount withdrawn.

A number of requirements must be met for participation in the HBP:

1) A written agreement must first be concluded to buy or build a home.
2) The funds withdrawn from the RRSP must be used for the qualifying home as principal place of residence within one year.
3) Individuals must meet the first-time home buyers' requirement. An exception to this for buyers who withdraw for a disabled person.
4) The repayable HBP balance on January 1 must be zero. This means that the total repayments to the HBP should equal the withdrawals that made from the RRSP.
5) The final withdrawal must be made no later than 30 days after the closing date.
6) Individuals must be residents of Canada.
7) All withdrawals must be received in the same calendar year.
8) The qualifying home should be bought or built before October 1 of the year after the withdrawal.

If both the individual and his/her spouse fulfill the requirements, both may create an HBP. When total withdrawals per spouse exceed €18,534.99, the excess is subject to income tax (Canada Revenue Agency, 2013).

3.6.2.2. Repaying withdrawals

The amounts withdrawn from the RRSP under the HBP have to be repaid over a period of 15 years. During each of these 15 years, 1/15 of the total amount withdrawn must be repaid. Only the amount withdrawn has to be repaid, i.e. *without* interest (Ratehub, 2013). Individuals must start repaying in the second year following the year the withdrawals were made. Although the repayment could be regarded as an extra contribution to the pension fund, this amount is *not* tax deductible (contrary to regular pension contributions). If an individual repays an amount less than the required repayment amount, the difference is added to taxable income (Canada Revenue Agency, 2013). This requirement was implemented to encourage individuals to repay their amount withdrawn.

3.6.2.3. Special repayment situations

o *The HBP participant dies*: In this case, the legal representative must include the participant's outstanding debt in the participant's taxable income for the year of death. If the surviving spouse is also an HBP participant, the HBP balance must be repaid in the same period that the spouse is required to repay his/her own withdrawals. Finally, if the surviving spouse does not participate in the HBP, the repayment schedule remains the same as it was before the HBP participant died. Thus the spouse must repay these amounts.

o *The HBP participant becomes a non-resident*: The remaining balance must be repaid to the RRSP within 60 days after the participant becomes a non-resident.

o *The withdrawals are not repaid by the age of 71*: Retirees who have not fully repaid their withdrawal when reaching the age of 71 may choose one of the following options: (1) the remaining repayable amount is paid at once, (2) the retiree makes a partial repayment, and the

remaining outstanding amount is divided by the number of remaining repayable periods and added to taxable income, (3) the retiree makes no repayment and the repayable balance is divided by the number of remaining repayable periods and added to taxable income (Canada Revenue Agency, 2013).

3.6.3. The use of pension savings for the housing market

Figure 3.12: Percentage of households who are homeowners in Canada
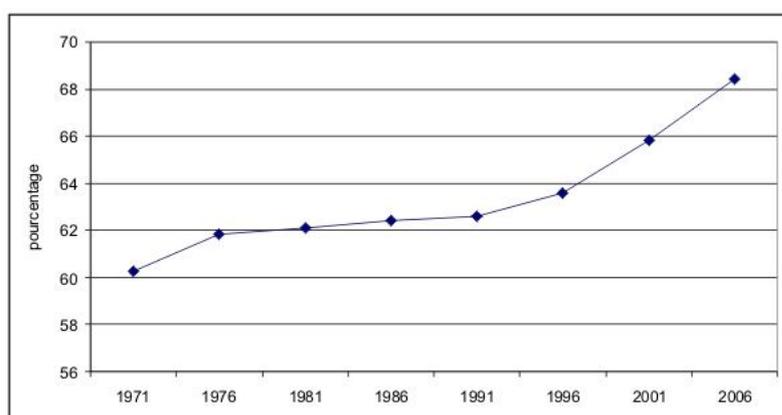
Source: Canada's Housing Bubble (2013)

The Home Buyers' Plan was implemented in February 1992 with the intention of stimulating the housing market. As shown in Figure 3.12, homeownership has greatly increased since 1992 so that presently over 70% of households in Canada own their own home (Allentuck, 2013). In line with this, the HBP is becoming increasingly popular among the Canadians. HBP assets have grown steadily over time, from € 1.1 billion in 1992 to €7.4 billion in 2003. The amount withdrawn per household was less than €7,410.78 for every income group, which is far below the limit allowed (Steele, 2007). Today, almost 1.8 million Canadians participate in the HBP (McLister, 2013).

While the Home Buyers' Plan increased homeownership in Canada, it also has a negative side. In principle, participants are punished for shortfalls on repayments through the inclusion of the full repayment amount due in taxable income. The number of tax filers holding an HBP rose from 370,000 in 1995 to 1.3 million in 2003 (Steele, 2007). Table 3.2 presents the percentage that was repaid in 2003 of the HBP balance in 2001.

Table 3.2: HBP repayments in 2003 as percentage of balance in 2001

	Repayments in 2003 as a % of the HBP balance in 2001	
	Age < 45	Age 45-64
< $ 10,000	4.1%	4.4%
$ 10,000-20,000	2.9%	4.4%
$ 20,000-30,000	3.6%	5.6%
$ 30,000-40,000	4.1%	7.7%
$ 40,000-50,000	4.6%	6.4%
$ 50,000-60,000	6.0%	8.1%
$ 60,000-80,000	6.9%	9.5%
$ 80,000-100,000	8.5%	12.4%
> $ 100,000	11.0%	13.3%

Source: Steele, 2007

Normally, individuals must repay each year 1/15 of the total amounts withdrawn, which is equal to 6.67%. Table 3.2 shows that low income households repay much less to their RRSP compared to the required repayments, and younger persons often choose to repay less compared to older persons.

In 1995, one third of HBP participants who were obliged to make install payments paid insufficient amounts (Frenken, 1998). In 2011, almost half of HDP participants (47%) made fewer repayments than the full requirement (McLister, 2013).

3.6.4. Financial situation of retirees in Canada

Figure 3.13: Net and gross replacement rates in
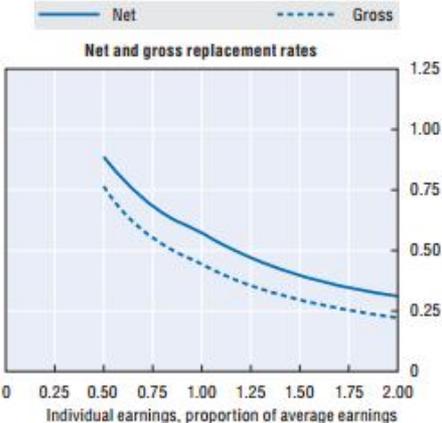
Source: OECD 2011b

The replacement rates in Canada for individuals with an average wage are merely 53%. Although CPP benefits are earnings-related, replacement rates are lower among higher income levels (Figure 3.13). Canada has one of the lowest poverty levels relative to average earnings, which results from the high old-age income safety nets and the Guaranteed Income Security.

The financial position of retirees worsened enormously during the financial crisis; private pension funds had real losses of 21.4% in 2008. This was mainly caused by the large share of wealth investments in the portfolios of pension funds (OECD, 2009).

3.7 Summary

A country with a high level of homeownership is not necessarily one where individuals enjoy high wealth levels. And vice versa, a country may perform very well in terms of private wealth even though it has a low level of homeownership.

Singapore heavily subsidizes the housing market by giving individuals at all income levels the opportunity to buy a house. This is possible through the use of pension savings. Because the amounts allowed to be withdrawn from the pension savings account are quite high, individuals invest much of their pension wealth in their privately owned house. Individuals need to have clear allocations which calls for strict regulations to prevent them from overspending their pension savings. This is done in the United States, where individuals are only allowed to use pension savings for housing purposes when they buy their first house. Also, a strict limit is set, with individuals having to pay a tax penalty if this amount is exceeded. Both in the United States and Singapore, homeownership rates are one of the highest in the world,

Germany has a *Bausparen* program that makes mortgage loans more accessible for households. This is done by pooling the money of individuals who want to obtain a mortgage loan; this is repeatedly handed out in order to give everybody the opportunity to make a down payment. Also, Germany allows individuals to withdraw their accumulated pension savings in the third pillar for homeownership purposes. Switzerland offers, aside from the option to withdraw pension savings for the down payment,

the possibility to use pension savings as collateral for the purchase of private property. This is done in order to obtain a higher mortgage loan to buy a larger house or to get a lower interest rate for a mortgage loan of the same amount. Another interesting policy in Switzerland is the structure of the level of permitted withdrawals (or pledged amounts); this is dependent on the age of the individual. Below the age of 50, it is allowed to pledge the sum of the vested benefits. From the age of 50, the maximum amount allowed to be pledged is the greater of vested benefits at age 50 or half of the vested benefits currently available. In contrast to the US and Singapore, Germany and Switzerland have among the lowest rates of privately owned houses in the developed world (with 40% and 31% respectively), mainly due to the subsidized rental sector. For example, in Switzerland owner-occupied homes are heavily taxed, and banks are allowed to provide mortgage loans when the LTV is below 80%. At the same time, retirees in both Switzerland and Germany have high levels of pension income relative to their income during their working period.

In Australia, individuals may withdraw their pension savings from the age of 60 free of tax. Between the ages of 55 and 59, withdrawals are tax-free up to €118,207.30. The amount of pension withdrawn exceeding this threshold is subject to a tax of 21.5%. Individuals below the age of 55 cannot withdraw pension assets. However, Australia makes exceptions for certain conditions in order to help individuals to manage their outstanding debts. This seems a well-organized pension and housing system, but debt rates are very high in Australia. There is anecdotal evidence which suggests a pattern whereby individuals consume more when approaching retirement. As their pension savings account can be withdrawn as tax-free lump sum payments, individuals close to retirement purchase more expensive items, go on holiday, and increase their credit card purchases.

Finally, Canada gives individuals the opportunity to borrow pension funds from their pension savings account in order to buy their first house, or to finance a house for a disabled relative. The amount withdrawn must be repaid in 15 years, with individuals paying 1/15th of the borrowed amount per year. The amount withdrawn is not taxed; however, when an individual makes pension repayments this amount constitutes taxable income. If an individual is not able to repay the required amount to the pension fund, then 1/15th of the borrowed amount still has to be added to taxable income.

4. Tax regulations in the Netherlands

One of the key issues that should be considered in considering the introduction of the option to use pension wealth to lower housing costs is whether individuals would gain from such implementation. And if they would gain from it, then what legal changes need to be introduced in the Netherlands to make such arrangement possible. This chapter describes Dutch income tax policy and the financial arrangements that affect the housing market.

4.1. The Dutch income tax system

In the Netherlands, the tax rates payable on income depend on the source of these earnings. For income tax purposes, earnings are divided into three categories:

- Box 1: Income from employment and homeownership
- Box 2: Income from a substantial interest
- Box 3: Income from savings and investments

The information in the following subsections is based on the tax rules for 2013 of the Dutch Tax and Customs Administration (Belastingdienst 2013a).

4.1.1. Tax rates in box 1

In box 1, income from employment and homeownership is taxed. Income in box 1 includes, among others: business income, wages, periodic payments, foreign income, tips and 0.6% of the value of an owner-occupied house. Taxable income in box 1 is offset by deductible mortgage interest (Section 4.3.2) and pension contributions. The applicable marginal tax rates on income in box 1 are shown in Table 4.1.

Table 4.1: Tax rate in box 1 before retirement

Taxable income	Tax rate
< € 19,646	37%
€ 19,646 - € 33,364	42%
€ 33,364 - € 55,992	42%
> € 55,992	52%

Source: Belastingdienst (2013a)

4.1.2. Tax rates in box 2

In box 2, income from a substantial interest is taxed. Two kinds of income are taxed in box 2:

1) dividends from regular profit
2) the disposal of shares

Profit from dividends or the disposal of shares is taxed if an individual and/or the partner own 5% or more of the shares of a Dutch or foreign company. The tax rate in box 2 is 25%. However, if the profit

earned is from a limited liability company (*besloten vennootschap*) or a joint-stock company, the tax rates of box 1 apply.

4.1.3. Tax rates in box 3

Box 3 taxes income from savings and investments, with an exemption of €21,139. Examples of income classified in box 3 are private savings, shares, and real estate that is not owner-occupied. If an individual has outstanding private debt, this may be deducted from the assets reported in box 3. The remaining wealth is taxed. This is the amount *above* the threshold of €21,139 minus the outstanding debt. An assumed 4% income from this remaining amount is taxed at a rate of 30%.

4.2. Tax policy on retirement income

Pension savings in the Netherlands are taxed via an EET schedule. With an EET schedule, pension contributions are tax deductible, and also the growth of pension savings via the pension fund's investment performance remains untaxed. At the time of retirement, pension savings are taxed at the marginal rate (Pensioenfederatie, 2013). The marginal tax rates applied to retirement income in the first two brackets are lower compared to the tax rates applicable to employment income (Table 4.2).

Table 4.2: Income tax rates in the Netherlands

Taxable income	Income tax before retirement	Income tax after retirement
< € 19,646	37%	19.1%
€ 19,646 - € 33,364	42%	24.1%
€ 33,364 - € 55,992	42%	42%
> € 55,992	52%	52%

Source: Belastingdienst (2013a)

4.3. Financial arrangements of the Dutch housing market

In the Netherlands, both tenants and homeowners may gain from governmental interventions in the Dutch housing market. If homeowners meet specific criteria, they may subtract part of the interest paid on their mortgage loan from taxable income (Section 4.3.2); tenants may benefit from subsidies in the rental sector (Section 4.3.4). This section elaborates upon the policies in the Dutch housing market.

4.3.1. Mortgages

4.3.1.1. Loan to Value

The maximum value of a mortgage loan that an individual can obtain depends on household income, private debt, private wealth, and the mortgage interest rate. Since 2011, the maximum Loan to Value is

equal to 106%, but this will go down to 100% in 2018 (see Section 2.1). Because this 106% includes 2% property transfer tax plus additional transaction costs, banks may not offer mortgage loans in excess of 104% of the value of the underlying property. However, an exemption is made if a homeowner moves from one owner-occupied house to another and is left with a private debt due to a decrease in value of the private property. In such case, the Loan to Value is allowed to increase in proportion to the remaining debt up to 110% of the value of the new house (Nederlandse Vereniging voor Banken, 2013).

4.3.1.2. Mortgage interest rates

As to mortgage interest, individuals can choose between a fixed or a variable rate. The variable interest rate is pegged to the market interest rate. The corresponding risk faced by individuals is that of an increase in the market interest rate, which would lead to higher housing costs. Moreover, the variable rate offered by banks may be somewhat higher compared to the market interest rate to cover their own costs.

The fixed interest rate is set for a fixed number of years (1, 5, 10, 20, or 30 years). The fixed interest rate depends on the number of years chosen (AFM, 2013). A somewhat lower interest rate compared to the usual mortgage interest rate can be realized when a National Mortgage Guarantee (*Nationale Hypotheek Garantie, NHG*) is obtained. A home buyer can obtain such a guarantee when certain income requirements are met, and the mortgage loan may not exceed €290,000 (NHG, 2013). To receive an NHG, households need to pay a single premium equal to 0.85% of the total real estate value. Because banks evaluate home buyers with an NHG to have a lower risk profile, the mortgage interest rates offered will be lower. The advantage of a fixed interest rate is that it provides certainty about future housing costs. However, also this certainty has a price, as this is incorporated into the fixed interest rate offered by the bank (AFM, 2013). Table 4.3 shows the fixed mortgage interest rates applying on August 12, 2013.

Table 4.3: Mortgage loan fixed interest rates

Fixed time	NHG, 100% LTV	75% LTV	125% LTV
1 year	2.60%	2.55%	3.10%
5 years	3.20%	3.15%	3.70%
10 years	4.10%	4.00%	4.35%
15 years	4.50%	4.40%	5.00%
20 years	4.65%	4.70%	5.10%

Source: Actuelerentestanden.nl (09-09-2013)

<u>4.3.1.3. Mortgage products</u>

A wide variety of mortgage products is available in the Netherlands. The most popular mortgages are:

- Endowment mortgage (*levenhypotheek*): The endowment mortgage is a combination of a life insurance policy and a mortgage loan that does not have to be repaid until the final date. The life insurance policy is used as a bank account to save for the outstanding mortgage loan, with a fixed amount being deposited each month. Until the household's bank account balance is equal to the value of the mortgage loan (the date is being set in the contract), only interest is paid to the lender. At the end of the contract, the full amount mortgage is repaid. In this way, households are able to make maximum use of the mortgage interest deductibility (Hypotheekvormen.info, 2013).

- Savings-based mortgage (*spaarhypotheek*): The savings-based mortgage is an improved version of the endowment mortgage. The difference between the endowment mortgage and the savings-based mortgage lies in the compensation over the monthly installments. The savings-based mortgage involves no profit sharing; however, individuals receive a compensation that is equal to the mortgage interest rate. So, if the mortgage interest rate rises, also the savings account will have a higher payoff. In this way, gross monthly housing costs are more stable compared to the endowment mortgage (Hypotheekkantoor, 2013).

- Investment mortgage (*beleggingshypotheek*): Contrary to the endowment mortgage and the savings-based mortgage, the investment mortgage does not involve payments to a life insurance savings account. Instead, the periodic payments are used to invest in assets that are intended to accumulate sufficient capital to repay the mortgage loan at the end of the contract. This may result in a higher average return, but such higher payoff is not guaranteed. In fact, if the return turns out to be very low, a new arrangement will have to be made in order to ensure that the repayment can be made (Rouwendal, 2007b).

- Interest-only mortgage (*aflossingsvrije hypotheek*): With the interest-only mortgage, households are completely free in the terms under which they wish to repay their mortgage loan. In this way, homeowners are only required to pay monthly interest. However, especially first-time homeowners are usually not accepted by banks for an interest-only mortgage, but they may combine multiple types of mortgages. This means that part of the mortgage has to be repaid whereas the remainder is interest-only (Rouwendal, 2007b).

- Annuity mortgage (*annuïteitenhypotheek*): An annuity mortgage calls for fixed equal gross payments on a yearly basis over the entire term of the loan. However, the split of costs differs as the relative amounts of interest expense and mortgage repayment change over time. In the early years of the mortgage, the major part of gross housing costs represents interest and a relatively low part consists of mortgage repayments. Over time, more mortgage repayments are made on an increasing nonlinear basis while the interest component decreases.

- Straight-line mortgage (*lineaire hypotheek*): Households with a straight-line mortgage repay an equal mortgage installment each month, plus interest over the outstanding loan balance. In this way, the balance of the outstanding loan decreases on a straight-line basis over time, as does the interest. As a consequence, gross monthly housing costs are highest in the early years of the mortgage term and decrease over time.

Figure 4.1 shows the relative percentages of different mortgage products in the Netherlands in 2012. Most homeowners have a combination of different mortgage types; the most popular one at this moment is the interest-only mortgage. That is because it allows households to make maximum use of the mortgage interest deductibility. However, requirements pertaining to the deductibility of mortgage interest have been changed by the government. The popularity of this type of product is thus expected to decrease over time. This will be explained further in Section 4.3.2.

Figure 4.1: The use of different types of mortgages in the Netherlands
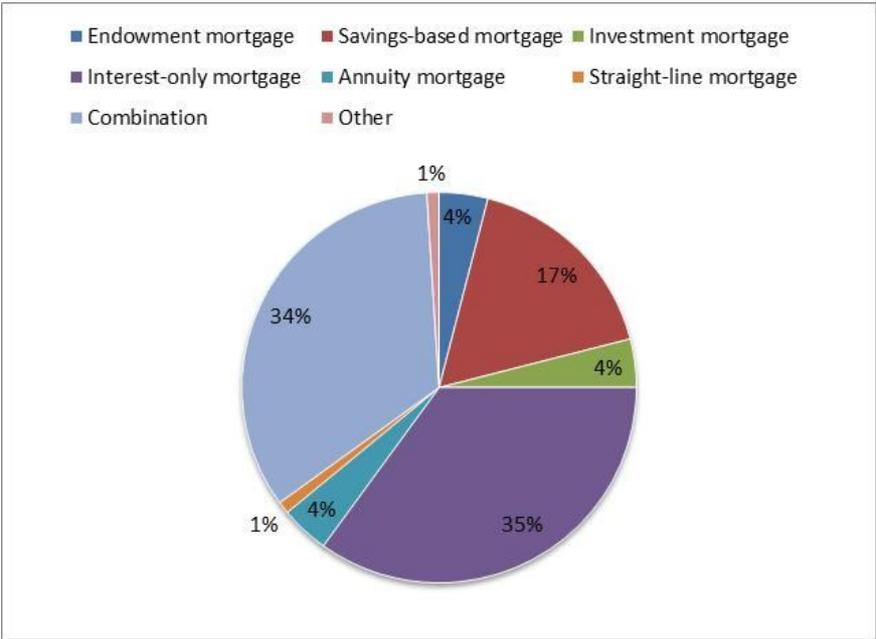
Source: WoON (2012)

4.3.2. Mortgage interest deductibility

The interest that a homeowner pays on the mortgage loan is deductible from taxable income. The interest expense can be deducted from taxable income if the loan is used for the purchase of a home or for renovation/overhaul of an owner-occupied house (Rijksoverheid, 2013b).

4.3.2.1. New cases

In the past, households were allowed to choose any type of mortgage loan, thus fully benefiting from the deductibility of mortgage interest. However, this policy has been changed. Individuals who buy a new house from 2013 onwards are only entitled to mortgage interest deductibility if they repay their total outstanding loan within 30 years with a corresponding annuity or straight-line mortgage. Moreover, the government will decrease the maximum deductibility rate in the fourth bracket (currently 52%, see Table 4.2) on a step-by-step basis to 38%. This will start in 2014 in steps of 0.5% on a yearly basis (Rijksoverheid, 2013c).

This policy has already had a large impact on the Dutch mortgage market. Of all individuals who bought a home in the second quarter of 2013, 70% chose an annuity mortgage loan. This is a big difference from the mortgage loan breakdown in 2012 shown in Figure 4.1. The choice for an annuity mortgage instead of a straight-line mortgage probably reflects the fact that households are discouraged by the high monthly housing costs in the early years of a linear mortgage (Algemeen Dagblad, 2013).

4.3.2.2. Old cases

Individuals who bought their owner-occupied house before 2013 are not required to have a straight-line or annuity mortgage loan. However, also for these homeowners, their mortgage interest payments are only deductible for 30 years since 2001 (eigenhuis.nl, 2013).

4.3.3. Taxation of owner-occupied houses

Homeowners may deduct some expenses from their taxable income, but at the same time some additional tax payments are due. Firstly, the interest on a mortgage loan is deductible from taxable income as described above. In addition to the interest, other expenses may be deducted from taxable income when a house is bought. These include all one-time costs related to the conclusion of a mortgage loan such as civil-law notary costs, payments to obtain the National Mortgage Guarantee (see Section 4.3.1.2.), and appraisal costs. Also, if a person lives in a house where the owner of the house does not own the land that the home has built on, then the payments to the owner of the land are deductible. Finally, owners of historic buildings may deduct replacement or repair costs of components of the historic building from their taxable income. At the same time, homeowners must add the notional rental value of the home that they live in to their taxable income (*'eigenwoningforfait'*). The related percentages are shown in Table 4.4 (Rijksoverheid, 2013d).

Table 4.4: Notional rental value of owner-occupied house

Value of the house		Tax percentage
More than	Less than	Tax percentage
€0	€12,500	0.00%
€12,500	€25,000	0.20%
€25,000	€50,000	0.35%
€50,000	€75,000	0.45%
€75,000	€1,040,000	0.60%
€1,040,000	-	€ 6,360 + 1.55% of the value of the home above €1,040,000

Source: Rijksoverheid (2013d)

The Hillen Act (*'Wet Hillen'*) was introduced in 2005 to encourage households by means of tax incentives to pay off their outstanding mortgage loan. Under the Hillen Act, individuals may deduct all or part of their homeownership tax when the outstanding loan is very small. More specifically, if the homeownership tax is higher than or equal to the deductible mortgage interest, the individual may deduct the difference from their taxable income (Vereniging Eigen Huis, 2013).

4.3.4. The rental sector

Individuals who live in a rental home in the Netherlands may be able to benefit from rental subsidies. The requirements for receipt of rental subsidies for individuals are:

- The house has a living room and a private kitchen and toilet.
- Both partners are registered in the town they live in at the rental home address.
- Both partners have Dutch citizenship or have a valid residence permit.
- The monthly rent must be at least €222.18 and at most €681.02.
- Gross household income may not exceed €28,550 on a yearly basis. For single households, the threshold is €21,025. The amounts for retirees are slightly higher: €28,725 for a multiple household and €21,100 for singles.
- The household's private wealth may not exceed €21,139. The related amount for single parents is €42,278.

(Belastingdienst, 2013b)

When a household meets all of the above requirements, it may be entitled to a rental subsidy. The level of the subsidy depends on various factors. These include, for example, the age of the various members of the household, the number of individuals constituting the household, and the presence of adjustments for disabled persons in the house. As an indication, these are the rental subsidies for multiple compositions of families in 2013:

- A household consisting of 2 individuals below retirement age, no children, and gross household yearly income of € 20,000 receives € 242 per month.
- A household consisting of 2 individuals below retirement age, with 2 children, and gross household yearly income of € 20,000 receives € 267 per month.
- A single parent with children and a gross yearly income of € 15,000 receives € 282 per month.
- A household consisting of 2 retirees with a gross household yearly income of € 20,000 receives €306.
- A single retiree with a gross yearly income of € 15,000 receives €304 per month.

(Belastingdienst, 2013c)

4.4 Summary

The Netherlands has an EET fiscal pension system whereby employees only pay taxes over their pension savings when these are actually received. The tax system provides for a progressive income tax rate, which is higher for income during the working period compared to the tax rate on retirement income.

Because of the financial crisis and stricter lending standards, the permitted LTV has decreased over time. Moreover, to become eligible for mortgage interest deductibility, starters must repay their mortgage loan within 30 years, and the deductibility entitlement only applies to annuity and straight-line mortgage loans. However, this does not apply for households who had already a mortgage loan before 2013. But, for them the mortgage interest is also only deductible for 30 years.

Currently, most homeowners have a mortgage loan that combines various of the above types or an interest-only mortgage loan. However, this pattern is expected to change over time as annuity mortgage loans become more popular as a result of the stricter rules for deductibility of mortgage interest.

5. Substituting pension savings by housing wealth: a model

As explained in Chapter 2, there are two reasons why people would wish to substitute pension wealth for housing wealth: (1) the *nature* of savings and (2) the *level* of savings. When individuals wish to change the nature of their savings, that involves the substitution of pension wealth for housing wealth, with the reduction in housing costs having to be repaid later to the pension fund. In this way, individuals make use of *arbitrage opportunities.* If pension assets are used for housing purposes in order to change the level of savings, individuals are allowed to profit from lower housing costs before retirement. This constitutes *intertemporal substitution of consumption.* This chapter examines the financial consequences for households who make use of pension savings for their mortgage loan in order to benefit either from arbitrage opportunities or from intertemporal substitution of consumption.

This model for investigating the financial consequences for individuals does *not* include the risk of longevity. Furthermore, the model is built on the assumption that individuals save for retirement income through an individual DC pension account. In that way we eliminate the problem of backloading of benefits that arises in a DB pension system. Finally, individuals do not buy a larger house at a later stage in life.

The key outcome variable that we will examine is the change in non-housing disposable consumption before and after the introduction of one of the links between pension wealth and housing wealth at all ages:

$$\Delta C_t = C_t^N - C_t^O \tag{1}$$

where ΔC_t represents the change in disposable non-housing consumption in the new situation (C_t^N) compared to the old situation (C_t^O) at age t of the individual.

Also, the change in private wealth will be examined:

$$\Delta W_t = W_t^N - W_t^O \tag{2}$$

where ΔW_t represents the difference in total assets for a household at a particular age t. W_t^N represents total assets in the new situation and W_t^O total assets in the old situation.

At first, a situation is examined where individuals make use of arbitrage opportunities (Section 5.2). This is followed by an investigation of intertemporal substitution of consumption (Section 5.3). Thereafter, the income and consumption pattern of households is simulated, with a calculation of the financial consequences for three different households (low, middle, and high income). At the end of the section, we address the question: What are the financial consequences for households in different stages of life for net non-housing disposable consumption if they combine pension wealth with housing wealth?

5.1. The old situation

This section describes the 'old situation', which does *not* allow the use of pension assets for housing purposes.

5.1.1. Non-housing disposable consumption

Non-housing disposable consumption is defined as the remaining disposable income after payment of pension contributions and housing costs. This section assumes absence of government intervention. So, non-housing disposable consumption per year is:

$$C_t^O = (1 - \rho)Y_t - H_t, \tag{3}$$

where C_t^O is non-housing disposable consumption in the old situation, ρ represents the portion of income Y_t that has to be saved for retirement, and H_t are the housing costs at age t.

Individuals become active in the job market and consequently start to save for retirement income at age *t=S*. Housing costs depend on the housing status, i.e. whether the individual is a homeowner or a renter. Individuals buy a house at age *t=B* (where *B>S*) and take out a mortgage loan with a duration of *n*. The mortgage is thus paid off at age *B+n*. If the individual is a homeowner with an outstanding annuity mortgage loan, i.e. at ages *B ≤ t ≤ B+n*, the housing costs will consist of mortgage loan repayments and interest payments. When the mortgage loan has been paid off, i.e. at age *t>B+n*, housing costs disappear. Before purchasing a house (i.e. at age *t < B*), individuals rent.

5.1.2. Private assets

In this model, homeowners accumulate private wealth in two ways: by pension contributions and mortgage repayments. The mortgage loan at the age time the loan is taken up is assumed to be equal to the value of the house

$$M_B = V_B, \tag{4}$$

where M_B is the mortgage loan at the time of the purchase of the house (*t = B)* and V_B is the value of the house at age *t = B*. We thus assume that the individual does not make any down payment when the house is bought (i.e. LTV=100%).

Private assets consist of pension wealth plus housing wealth

$$W_t^O = W_{p,t}^O + W_{h,t}^O, \tag{5}$$

where W_t^O are total private assets, $W_{p,t}^O$ are total pension savings, and $W_{h,t}^O$ represents housing wealth at age *t.* We thus assume that the individual saves only through the pension fund and the home.

Private assets accumulate through the flow of savings in period *t*

$$W_{t+1}^O = W_t^O \left(1 + r_{W,t}\right) + X_t, \tag{6}$$

where W_t are assets at the beginning of period *t*, $r_{W,t}$ represents the return on the assets at age *t*, and X_t is the flow of saving during period *t.*

Applying (6) recursively, we derive (for *t>S*)

$$W_t^O = W_s(1 + r_{W,t})^{t-S} + \sum_{i=S}^{t-1} X_i(1 + r_{W,t})^{t-1-i}. \tag{7}$$

Accordingly, if we start without any wealth at age S (i.e. W_s=0), we have

$$W_t^O = \sum_{i-S}^{t-1} X_i(1 + r_{W,t})^{t-1-i}. \tag{8}$$

Mortgage debt at age $t+1$ is

$$M_{t+1} = M_t(1 + r_{M,t}) - A_t, \tag{9}$$

where M_t is the mortgage debt at the beginning of period t, $r_{m,t}$ is the interest rate on a mortgage loan at age t, and A_t is the payment to the bank at age t (consisting of interest payments $M_t r_{M,t}$and loan redemptions).

5.1.2.1. Pension wealth
Individuals need to set part of their income aside for retirement

$$s_{p,t} = \rho Y_t, \tag{10}$$

where $s_{p,t}$ are the yearly pension savings. Income at age t is shown by

$$Y_i = Y_S(1 + \pi_y)^{i-S}, \tag{11}$$

where Y_i is income in year i, which is equal to the income at the age when the individual started in the job market (age t = S), increased by wage inflation π_y during the years the individual is active in the job market. .

Total pension wealth at age t is (compare to (7)):

$$W_{p,t}^O = \sum_{i=S}^{t-1} \rho Y_i(1 + r_p)^{t-1-i}. \tag{12}$$

In equation (12), pension savings grow every year with a fixed fraction ρ on the yearly income Y_i plus the (constant) return on pension saving (r_p) over the pension savings earned in previous years. We can substitute (11) into equation (12) to eliminate Y_i:

$$W_{p,t}^O = \sum_{i=S}^{t-1} \rho Y_s(1 + \pi_y)^{i-S}(1 + r_p)^{t-1-i}$$
$$W_{p,t}^O = \rho Y_s(1 + \pi_y)^{t-S-1} \sum_{i=S}^{t-1}(1 + \hat{r}_p)^{t-1-i}, \tag{13}$$

where $\hat{r}_p$ is the real return on pension savings, which is given by

$$1 + \hat{r}_p \equiv \frac{1+r_p}{1+\pi_y}. \tag{14}$$

5.1.2.2. Housing wealth
Housing wealth at age t is equal to the value of the house (which grows with inflation π_h), minus the outstanding mortgage debt at age t

$$W_{h,t}^O = V_B(1 + \pi_h)^{t-B} - M_t. \tag{15}$$

Applying equation (9) recursively, we find (assuming interest rate r_M to be constant)

$$M_t = M_B(1 + r_M)^{t-B} - \sum_{i=B}^{t-1} A_i(1 + r_M)^{t-1-i}, \tag{16}$$

so that for age $t=B+n$:

$$M_{B+n} = M_B(1 + r_M)^n - \sum_{i=B}^{B+n-1} A_i(1 + r_M)^{B+n-1-i} \tag{17}$$

With M_{B+n}=0 (since the mortgage loan is will be fully repaid after n years), we can write (17) as follows:

$$M_B = \sum_{i=B}^{B+n-1} A_i(1 + r_M)^{B-1-i}$$

If $A_i = A$ is constant (as in an annuity mortgage), we have

$$M_B = A \sum_{i=B}^{B+n-1} \left(\frac{1}{1+r_M}\right)^{i+1-B} = A \sum_{j=1}^{n} \left(\frac{1}{1+r_M}\right)^{j} \tag{18}$$

$$M_B = A \left(\frac{1-(1+r_M)^{-n}}{r_M}\right),$$

where the third equality follows from the crucial expression for arbitrary $x<1$, m and n:

$$\sum_{j=m}^{n} x^j = \frac{x^m - x^{n+1}}{1-x}. \tag{19}$$

Equation (18) can be used to express A in terms of M_B

$$A = \frac{M_B * r_M}{1-(1+r_M)^{-n}}. \tag{20}$$

Equation (20) is substituted in equation (16) to eliminate A:

$$M_t = M_B(1+r_M)^{t-B} - \sum_{i=B}^{t-1} \frac{M_B r_M}{1-(1+r_M)^{-n}} (1+r_M)^{t-1-i}$$

$$= M_B \left[(1+r_M)^{t-B} - \frac{r_M(1+r_M)^{t-1}}{1-(1+r_M)^{-n}} \sum_{i=B}^{t-1} \left(\frac{1}{(1+r_M)}\right)^{i}\right]. \tag{21}$$

Equation (19) is applied to get

$$M_t = M_B \left[(1+r_M)^{t-B} - \frac{r_M(1+r_M)^{t-1}}{1-(1+r_M)^{-n}} \frac{\left[\left(\frac{1}{(1+r_M)}\right)^{B} - \left(\frac{1}{(1+r_M)}\right)^{t}\right]}{1-\frac{1}{1+r_M}}\right]. \tag{22}$$

We know that

$$1 - \left(\frac{1}{1+r_m}\right) = \frac{1+r_m-1}{1+r_m} = \frac{r_m}{1+r_m}, \tag{23}$$

so that we can rewrite (22)

$$M_t = M_B \left[(1+r_M)^{t-B} - \frac{r_M(1+r_M)^{t-1}}{1-(1+r_M)^{-n}} \frac{\left(\frac{1}{(1+r_M)}\right)^{B} - \left(\frac{1}{(1+r_M)}\right)^{t}}{\frac{r_m}{1+r_m}}\right]$$

$$= M_B \left[(1+r_M)^{t-B} - \frac{(1+r_M)^t}{1-(1+r_M)^{-n}} \left((1+r_M)^{-B} - (1+r_M)^{-t}\right)\right]$$

$$= M_B \left[(1+r_M)^{t-B} - \left[\frac{(1+r_M)^{t-B}-1}{1-(1+r_M)^{-n}}\right]\right]$$

$$= M_B \left[\frac{(1+r_M)^{t-B}-(1+r_M)^{t-B-n}}{1-(1+r_M)^{-n}} - \left[\frac{(1+r_M)^{t-B}-1}{1-(1+r_M)^{-n}}\right]\right]. \tag{24}$$

Hence, the outstanding mortgage loan balance at the time period $B \le t \le B+n$ is expressed as

$$M_t = M_B \left(\frac{1-(1+r_M)^{-(B+n-t)}}{1-(1+r_M)^{-n}}\right). \tag{25}$$

If equation (25) is substituted in equation (15) to eliminate M_t, housing wealth at age t is expressed as

$$W_{h,t}^O = V_B(1+\pi_h)^{t-B} - M_B \left(\frac{1-(1+r_M)^{-(B+n)-t)}}{1-(1+r_M)^{-n}}\right). \tag{26}$$

By substituting into equation (5) to eliminate $W_{p,t}^O$ and $W_{h,t}^O$ respectively, we find (using (12) and (26)):

$$W_t^O = \sum_{i=S}^{t-1} \rho Y_i(1+r_p)^{t-1-i} + V_B(1+\pi_h)^{t-B} - M_B \left(\frac{1-(1+r_M)^{-(B+n-t)}}{1-(1+r_M)^{-n}}\right). \tag{27}$$

Equation (27) shows that total wealth in the 'old situation' consist of pension contributions, plus the return on these contributions, plus the value of the house that grows with inflation, minus the outstanding mortgage loan.

5.2. Arbitrage opportunities

As explained in Chapter 2, by making use of arbitrage opportunities individuals profit from the potentially higher interest rate on a mortgage loan compared to the expected return on pension savings. This is because part of the pension savings are transferred from the pension account for repayment of the mortgage loan. This might be regarded as a loan offered by pension funds to individuals that has to be repaid when individuals receive the benefits of the loan (i.e. the lower housing costs) (Bovenberg & Jacobs, 2013).

5.2.1. Arbitrage opportunities with a single withdrawal

In this section, individuals are allowed to withdraw a specific amount 'μ' from their accrued pension in order to lower their mortgage loan. The single withdrawal μ is made at age $t=w$. It could be used as a down payment when individuals buy a new house, so that $w = B$. Alternatively, it can be used to lower an existing mortgage loan when the individual is already a homeowner. In this case, we have $w > B$. The withdrawal is transferred from the pension savings account to the mortgage bank. In this way, the pension savings account decreases at the time when pension savings are withdrawn (age $t=w$):

$$W_{p,w}^N = \left\{ \sum_{i=S}^{w-1} \rho Y_i (1 + r_p)^{w-1-i} \right\} - \mu, \tag{28}$$

where $W_{p,w}^N$ are the total pension savings at age $t=w$, and μ is the amount withdrawn from the pension savings account in order to lower the mortgage loan. At the same time, the outstanding mortgage loan decreases:

$$\overline{M_w} = M_w - \mu, \tag{29}$$

where $\overline{M_w}$ is the new mortgage loan balance after the withdrawal. At the age of withdrawal (t=w), there are no changes in total private wealth:

$$W_w^N = \left[\sum_{i=S}^{w-1} \rho Y_i (1 + r_p)^{w-1-i} \right] - \mu + V_B (1 + \pi_h)^{w-1-B} - (M_w - \mu) = W_w^O \tag{30}$$

$$\Delta W_w = 0.$$

As described above, the decrease in yearly housing costs in the coming years is collected by the pension fund. If we combine (20) and (25) to eliminate M_B, we find for the change in the annuity payments:

$$\Delta A = \frac{\overline{M_w} r_m}{1 - (1 + r_m)^{-(n+B)+w}} - \frac{M_w r_m}{1 - (1 + r_m)^{-(n+B)+w}} . \tag{31}$$

The difference between $\overline{M_w}$ and M_w is the amount withdrawn from the pension savings account, which is accordingly used as a down payment. The change in yearly housing costs is equal to the change in the annuity payments:

$$\Delta H_t = \Delta A = -\frac{r_m * \mu}{1 - (1 + r_m)^{-(n+B)+w}}. \tag{32}$$

The decrease in annuity payments (32) is found by assuming that the amortization is used to reduce the annuity payment and that the duration of the loan remains fixed. The reduction in annuity payments is collected by the pension fund. Consumption before the age of retirement will not change:

$$
C_{nh,t}^N = \begin{cases} (1-\rho)Y_t - H_t & \text{if } B \le t \le w \\[2mm] \left((1-\rho)Y_t - \frac{r_m * \mu}{1-(1+r_m)^{-(n+B)+w}}\right) - \left(\left(H_t - \frac{r_m * \mu}{1-(1+r_m)^{-(n+B)+w}}\right)\right) = C_{nh,t}^O & \text{if } w < t < B+n \\[2mm] (1-\rho)Y_t & \text{if } B+n \le t < R \end{cases}
$$

Disposable non-housing consumption does not change in the new situation. The decrease in housing costs is collected by the pension fund during the term of the outstanding mortgage loan (age $w < t \le B+n$).

Pension savings in the new situation are:

$$
W_{p,t}^N = \begin{cases} \sum_{i=S}^{t-1} \rho Y_i (1+r_p)^{t-1-i} & \text{if } t \le w \\[3mm] \sum_{i=S}^{t-1} \rho Y_i (1+r_p)^{t-1-i} + \left[\frac{r_m * \mu}{1-(1+r_m)^{-(n+B)+w}}\sum_{i=w}^{t-1}(1+r_p)^{t-1-i}\right] - \mu(1+r_p)^{(t-1-w)} & \text{if } w < t < B+n \\[3mm] \sum_{i=S}^{t-1} \rho Y_i (1+r_p)^{t-1-i} + \sum_{i=w}^{B+n-1}\left(\frac{r_m * \mu}{(1-(1+r_m)^{-(n+B)+w})}\right)(1+r_p)^{t-1-i} - \mu(1+r_p)^{t-1-w} & \text{if } B+n \le t < R \end{cases}
$$

Before the time of withdrawal, there are no changes in pension wealth. After the individual reduces the outstanding mortgage loan balance by applying pension wealth, pension wealth decreases by the amount withdrawn and the corresponding missed return on savings. At the same time, pension wealth increases every year by the difference in housing costs plus the return on these savings.

Compared to the pension savings in the old situation (equation 12), the difference in pension wealth at age $t > w$ is:

$$
\Delta W_{p,t} = \sum_{i=w}^{t-1}\left(\frac{r_m * \mu}{(1-(1+r_m)^{-(n+B)+w})}\right)(1+r_p)^{t-1-i} - \mu(1+r_p)^{t-1-w}
$$

$$
= \left(\frac{r_m * \mu}{(1-(1+r_m)^{-(n+B)+w})}\right)\sum_{i=w}^{t-1}(1+r_p)^{t-1-i} - \mu(1+r_p)^{t-1-w}
$$

$$
= \frac{r_m * \mu}{(1-(1+r_m)^{-(n+B)+w})}\left[\frac{(1+r_p)^{-(t-1)+w}-1}{r_p}\right] - \mu(1+r_p)^{t-1-w}
$$

$$
= \frac{r_m}{(1-(1+r_m)^{-(n+B)+w})}\left[\frac{1-(1+r_p)^{-(t-1)+w}}{r_p}\right]\mu(1+r_p)^{t-1-w} - \mu(1+r_p)^{t-1-w}. \tag{33}
$$

Thus:

$$
\Delta W_{p,t} = -\mu(1+r_p)^{t-1-w}\left[1 - \left[\frac{1-(1+r_p)^{-(t-1)+w}}{r_p}\right]\left[\frac{r_m}{(1-(1+r_m)^{-(n+B)+w})}\right]\right]. \tag{34}
$$

When the mortgage loan has been repaid (at age $t \ge B+n$), ΔH_t and H_t are 0. The change in pension assets when the mortgage loan is repaid, i.e. at age $t = B+n+1$, is:

$$
\Delta W_{p,B+n+1} = -\mu(1+r_p)^{n+B-w}\left[1 - \left[\frac{1-(1+r_p)^{-(n+B)+w}}{r_p}\right]\left[\frac{r_m}{(1-(1+r_m)^{-(n+B)+w})}\right]\right]. \tag{35}
$$

The question remains whether individuals would benefit from the withdrawal. Arbitrage opportunities are present only when the change in total wealth at the time of the final mortgage repayment is positive.

We know that $\frac{r}{1-(1+r)^{-(n+B)+w}}$ increases in r, so that:

$$\frac{\frac{r_m}{(1-(1+r_m)^{-(n+B)+w}}}{\frac{r_p}{(1-(1+r_p)^{-(n+B)+w}}} > 1 \quad if\ and\ only\ if \quad r_m > r_p. \tag{36}$$

Thus:

$$\Delta W_{p,n} > 0\ iff\ \boldsymbol{r_m} > \boldsymbol{r_p}. \tag{37}$$

This equation confirms the intuition that individuals gain from arbitrage only if the interest rate on mortgage loans exceeds the return on pension savings.

5.2.2. Arbitrage opportunities by regular withdrawals

Contrary to Section 5.2.1, it is also possible to make regular withdrawals. When regular withdrawals are applied, individuals are allowed to regularly use pension savings for extra mortgage repayments. The use of pension savings for extra mortgage repayments is permitted for *x* years between ages *t=c* and *t=d*, where *B<c<d<B+n*. More specifically, the period wherein it is allowed to substitute pension wealth by housing wealth is shorter than the term of the mortgage loan. The maturity date of the mortgage loan is not adjusted, and the higher mortgage payments in the period *c ≤ t ≤ d* are followed by lower mortgage payments in the period *c ≤ t < B+n*. As individuals in this section make use of arbitrage opportunities, they must repay the reduction in mortgage payments at ages *c ≤ t < B+n* to their pension fund.

Individuals are allowed to reduce pension savings with proportion θ relative to income Y_t. The reduction in pension savings of θY_t is consequently used for extra mortgage repayment.

For the period between *c ≤ t< d*, the outstanding mortgage loan becomes (compare to equation (16)):

$$\overline{M_t} = M_B(1 + r_M)^{t-B} - \sum_{i=B}^{t-1} A_i(1 + r_M)^{t-1-i} - \sum_{i=c}^{t-1} \theta Y_s(1 + \pi_y)^{t-1-S}(1 + \hat{r}_m)^{t-1-i}, \tag{38}$$

where $\hat{r}_m$ is the real mortgage interest rate. This means

$$1 + \hat{r}_m \equiv \frac{1+r_m}{1+\pi_y}. \tag{39}$$

The new outstanding mortgage loan for the period *c ≤ t< d* (equation (38)) decreases compared to the old situation through the extra mortgage repayments, which are a fraction of income.

At age *t=c+1*, i.e. at the time when the individual made the first extra mortgage repayment, housing costs decrease as the mortgage loan is lower compared to the old situation. Therefore, this is the starting age at which individuals must make repayments to their pension fund. By the extra mortgage repayment equal to θY_c, the annuity payment decreases at age *t=c* by (combine (20) and (25) to eliminate M_t):

$$\Delta A_c = \frac{\overline{M_c} r_m}{1-(1+r_m)^{-(n+B)+c}} - \frac{M_c r_m}{1-(1+r_m)^{-(n+B)+c}}.$$

$$\Delta A_c = -\frac{r_m \theta Y_c}{1-(1+r_m)^{-(n+B)+c}}. \tag{40}$$

The mortgage loan will decrease between ages $c < t \le d$ every year additionally by the fraction θ on income. Therefore, the decrease in annual annuity payments between ages $c < t \le d$ is equal to the sum of the extra mortgage payments from age $t=c$:

$$\Delta A_t = -\sum_{i=c}^{t} \frac{r_m \theta Y_i}{1-(1+r_m)^{-(n+B)+i}}. \tag{41}$$

Accordingly, the decrease in pension wealth is equal to the pension savings that are used to make the extra mortgage repayments (including the missed return on these pension savings). The increases in pension savings for $t \ge d$ are the repayments to the pension fund, which equals the change in yearly housing costs (plus the return on these repayments):

$$\Delta W_{p,t}^N = \sum_{i=c}^{t} \left[\Delta A_i (1+r_p)^{t-i-1} - \theta Y_i (1+r_p)^{t-i-1} \right]. \tag{42}$$

Because individuals have to repay the lower housing costs to their pension fund, the consumption pattern before the age of retirement will not change:

$$C_{nh,t}^N = \begin{cases} (1-\rho)Y_t - H_t & \text{if } B \le t \le c \\ [(1-\rho)Y_t - \Delta A_t] - [H_t - \Delta A_t] = C_{nh,t}^O & \text{if } c < t < B+n \\ (1-\rho)Y_t & \text{if } B+n \le t < R. \end{cases}$$

Since we assumed the return on pension savings to be constant, we are able to calculate the mortgage interest rate from which individuals gain from the substitution of pension savings and mortgage repayments. If we substitute (41) into (42) to eliminate ΔA_t, we obtain for $c < t \le B+n$:

$$\Delta W_{p,t}^N = \sum_{i=c}^{d} \left(\sum_{j=i}^{t-1} \frac{r_m \theta Y_i}{1-(1+r_m)^{-(n+B)+i}} (1+r_p)^{t-j-1} - \theta Y_i (1+r_p)^{t-i-1} \right), \tag{43}$$

where we use (19) to obtain

$$\Delta W_{p,t}^N = \sum_{i=c}^{d} -\theta Y_i (1+r_p)^{t-i-1} \left(1 - \left(\frac{1-(1+r_p)^{-(t-1)+i}}{r_p} \right) \left(\frac{r_m}{1-(1+r_m)^{-n+(i-B)}} \right) \right). \tag{44}$$

At age $t=B+n+1$, the mortgage loan is paid off and all repayments to the pension fund are made. The difference in pension wealth at age $t=B+n+1$ is

$$\Delta W_{p,B+n+1}^N = \sum_{i=c}^{d} -\theta Y_i (1+r_p)^{B+n-i} \left(1 - \left(\frac{1-(1+r_p)^{-(B+n)+i}}{r_p} \right) \left(\frac{r_m}{1-(1+r_m)^{-(n+B)+i}} \right) \right). \tag{45}$$

We know that $\frac{r}{1-(1+r)^{-(n+B)+w}}$ is increasing in r. Then

$$\frac{\frac{r_m}{(1-(1+r_m)^{-(n+B)+i}}}{\frac{r_p}{(1-(1+r_p)^{-(n+B)+i}}} > 1 \qquad \text{if and only if} \quad r_m > r_p, \tag{46}$$

thus:

$$\Delta \boldsymbol{W}_{\boldsymbol{p,n}} > 0 \; iff \; \boldsymbol{r_m} > \boldsymbol{r_p}. \tag{47}$$

The difference in pension wealth for *each* year will be positive if, and only if, $r_m > r_p$. So also with regular withdrawals, individuals only gain from arbitrage opportunities if the mortgage interest rate is higher compared to the return on pension savings.

5.3. Intertemporal substitution of consumption

This section describes the financial consequences when individuals are allowed to consume more today and save less for retirement by using pension assets in order to reduce their mortgage loan. The crucial difference with Section 5.2 is that individuals do *not* have to repay the decrease in housing costs as a pension premium to their pension fund. Instead, they are allowed to use the lower housing costs to increase their consumption before the age of retirement.

5.3.1. Single withdrawal for intertemporal substitution of consumption

As in Section 5.2, individuals withdraw a single amount μ from their pension savings account in order to decrease their mortgage loan. The amount could be used as down payment for a new mortgage loan or to lower the existing mortgage loan. The amount is withdrawn at age $t=w$. As a result, the pension savings account decreases (see equation (28)) and the outstanding mortgage loan also decreases (see equation (29)). If the amount withdrawn is directly transferred to the bank, then at the age of withdrawal ($t=w$) there are no changes in total private wealth. As in Section 5.2., the change in yearly housing costs is equal to the decrease in the annuity payment (see equation (32)).

Until now, there are no changes compared to Section 5.2. However, this changes in the years after the time the amount is withdrawn, i.e. at age $t>w$. This is because individuals will benefit from a higher consumption pattern before their retirement so long as they have an outstanding mortgage loan:

$$C_{nh,t}^{N} = \begin{cases} (1-\rho)Y_t - H_t & \text{if } t < w \\ \left((1-\rho)Y_t\right) - \left(\left(H_t - \frac{r_m*\mu}{1-(1+r_m)^{-(n+B)+w}}\right)\right) & \text{if } w \le t \le B+n \\ (1-\rho)Y_t & \text{if } B+n < t < R \end{cases}$$

So the change in consumption resulting from the lower housing costs between age w and age $B+n$ is

$$\Delta C_t = \frac{r_m*\mu}{1-(1+r_m)^{-(n+B)+w}}. \tag{48}$$

When the mortgage loan is paid off (at age $t=B+n$), housing costs disappear so that the former borrowers no longer benefit from a higher consumption pattern. This increase in consumption has also a negative side as the pension savings for retirement income will decrease:

$$W_{p,t}^{N} = \left\{\sum_{i=S}^{t-1} \rho Y_i (1+r_p)^{t-1-i}\right\} - \mu(1+r_p)^{t-1-w}. \tag{49}$$

Equation (49) can be interpreted to state that the pension savings at age t in the new situation ($W_{p,t}^{N}$) are equal to the total pension savings plus the return on these pension savings. The withdrawn amount and the missed return on this withdrawal lessen the pension savings account balance.

At the age of retirement ($t=R$), with the assumption that individuals have repaid their mortgage before their retirement (i.e., $R>n$), the difference in pension assets is equal to (equation (12) and (49) are used):

$$W_{p,R}^{N} = \left\{\sum_{i=S}^{t-1} \rho Y_i (1+r_p)^{t-1-i}\right\} - \mu(1+r_p)^{R-1-w}$$

$$\Delta W_{p,R} = -\mu(1+r_p)^{R-1-w} \tag{50}$$

Equation (50) shows that the (negative) difference in pension wealth at the age of retirement is equal to the amount that is withdrawn at age $t=w$, plus the missed return on this withdrawal.

Do people want to substitute retirement income by income support before their retirement? This depends on the rate at which consumers discount future consumption. If they discount future consumption at a high rate, then they are more likely to gain from the substitution of consumption since they are more impatient compared to consumers with a lower discount rate. The difference in the discounted consumption function when pension wealth is substituted by housing wealth is:

$$\Delta C^D = \sum_{i=w}^{T} \frac{\Delta C_t}{(1+\delta)^{i-w}}, \tag{51}$$

where ΔC^D is the change in the discounted consumption from age $t=w$ (i.e. the time of the withdrawal) until death ($t=T$), ΔC_t represents the change in consumption at age t and δ is the consumer's discount rate. Since we know the difference in consumption for every age, we can calculate from which discount rate δ consumers will gain from the intertemporal substitution of consumption.

We assume all interest rates to be the same, so $r_m = r_p = r$. The change in consumption during the working period is the lower housing costs, given by equation (48). The difference in pension wealth, which will be converted into an annuity at the age of retirement is given by equation (50). If we substitute the lower housing costs and the change in retirement income in equation (51), we get:

$$\Delta C^D = \left(\sum_{i=w}^{B+n-1} \frac{r*\mu}{1-(1+r)^{-(n+B)+w}} \left(\frac{1}{(1+\delta)^{i-w}} \right) \right) - \mu(1+r)^{R-w} \left(\frac{1}{(1+\delta)^{R-w}} \right), \tag{52}$$

which we can simplify to

$$= \left(\frac{r*\mu}{1-(1+r)^{-(n+B)+w}} * (1+\delta)^{w-1} * \frac{(1+\delta)^{-w}-(1+\delta)^{-(B+n)}}{1-1/(1+\delta)} \right) - \mu(1+r)^{R-w} \left(\frac{1}{(1+\delta)^{R-w}} \right)$$

$$= \left(\frac{r*\mu}{1-(1+r)^{-(n+B)+w}} * \frac{(1+\delta)^{-1}-(1+\delta)^{-(B+n)+w-1}}{\delta/(1+\delta)} \right) - \mu \left(\frac{(1+r)^{R-w}}{(1+\delta)^{R-w}} \right)$$

$$= \left(\frac{r*\mu}{1-(1+r)^{-(n+B)+w}} * \frac{1-(1+\delta)^{-(B+n)+w}}{\delta} \right) - \mu \left(\frac{(1+r)}{(1+\delta)} \right)^{R-w}$$

$$= \mu \left(\frac{r}{1-(1+r)^{-(n+B)+w}} * \frac{1-(1+\delta)^{-(B+n)+w}}{\delta} - \left(\frac{(1+r)}{(1+\delta)} \right)^{R-w} \right)$$

$$= \mu \left(\frac{r}{1-(1+r)^{-(n+B)+w}} \Big/ \frac{\delta}{1-(1+\delta)^{-(B+n)+w}} - \left(\frac{(1+r)}{(1+\delta)} \right)^{R-w} \right) \tag{53}$$

We can write the last term as

$$\Delta C^D = \frac{r}{[1-(1+r)^{-(B+n)+w}](1+\delta)^{R-w}} \left\{ \frac{(1+\delta)^{R-w}}{\delta} \left[1-(1+\delta)^{-(B+n)+w} \right] - \frac{(1+r)^{R-w}}{r} \left[1-(1+r)^{-(B+n)+w} \right] \right\} \tag{54}$$

We know that the term between accolades is zero if $r=\delta$. Moreover the term

$$\frac{(1+\delta)^{R-w}}{\delta} \left[1-(1+\delta)^{-(B+n)+w} \right] = \frac{(1+\delta)^{R-w}-(1+\delta)^{R-(B+n)}}{\delta} \tag{55}$$

is increasing in δ.

To show this, take the first derivative with respect to δ to arrive at

$$\frac{1}{\delta^2} \{ [\delta a + (1-\delta)](1+\delta)^{a-1} - [\delta b + (1-\delta)](1+\delta)^{b-1} \}, \tag{56}$$

where $a=R-w$ and $b=R-(B+n)$ so that $a>b$ (since $w<B+n$). Then we use that $[\delta a + (1-\delta)](1+\delta)^{a-1}$ is increasing in a (if $\delta>0$) so that

$$[\delta a + (1-\delta)](1+\delta)^{a-1} > [\delta b + (1-\delta)](1+\delta)^{b-1} \tag{57}$$

if a>b and $\delta > 0$.

The conclusion is that (54) is zero for $r = \delta$ and larger than zero if and only if $\boldsymbol{\delta} > r$. Intuitively, people can gain from consuming more today and less during retirement if they are sufficiently impatient.

5.3.2. Regular withdrawals for intertemporal substitution of consumption

Also regular withdrawals can be used for intertemporal substitution of consumption. Just as in Section 5.2.2, individuals are permitted to use pension savings for extra mortgage repayments between the age $c \leq t < d$. Also, the maturity of the mortgage loan is not adjusted. Contrary to Section 5.2.2, individuals are allowed to consume the lower housing costs that result from the extra mortgage repayments before the age of retirement.

The pension savings are reduced by proportion θ relative to income Y_t in the period $c \leq t < d$. This decline in pension savings is used for extra mortgage repayments. Although consumers now enjoy a higher consumption pattern before the age of retirement, the outstanding mortgage loan is given by the same expressions as described in Section 5.2.2. This is because individuals make the same additional mortgage repayments as with arbitrage opportunities. Therefore, the outstanding mortgage loan in the period $c \leq t < d$ is still given by equation (38). Also, the decline in mortgage payments per year is the same as in Section 5.2.2, see equation (41).

With the use of pension savings for intertemporal substitution of consumption, consumers are enabled to profit from the lower housing costs that result from the extra mortgage repayments. In this case, the consumption function becomes:

$$
C_{nh,t}^{N} = \begin{cases}
(1-\rho)Y_t - H_t & \text{if } B \leq t \leq c \\
[(1-\rho)Y_t] - \left[H_t - \sum_{i=c}^{t} \frac{r_m \theta Y_i}{1-(1+r_m)^{-(n+B)+i}} \right] & \text{if } c < t \leq d \quad (58) \\
\\
[(1-\rho)Y_t] - \left[H_t - \sum_{i=c}^{d} \frac{r_m \theta Y_i}{1-(1+r_m)^{-(n+B)+i}} \right] & \text{if } d < t < B+n \quad (59) \\
(1-\rho)Y_t & \text{if } B+n \leq t < R
\end{cases}
$$

Because consumers save less in the period $c \leq t < d$ (as pension savings decrease by θY_t), their pension wealth will decrease. This decrease in pension wealth results in lower retirement income. This is the effect of the intertemporal substitution of consumption: consumption during retirement decreases in order to enable more consumption during the working period. The total decrease at the age of retirement is equal to:

$$
\Delta W_{p,t}^{N} = -\sum_{i=c}^{d} \theta Y_i (1 + r_p)^{t-i}. \quad (60)
$$

Equation (60) shows the difference in pension wealth, which is equal to the sum of the amounts withdrawn between the period $c < t \leq d$, including the missed returns of these pension savings until the age of retirement.

As in Section 5.3.1., consumers gain from this intertemporal substitution of consumption if they have a high preference for consuming today instead of saving for consumption in the future. The more impatient consumers are, the higher the gain from the intertemporal substitution of consumption.

If we assume constantly equal interest rates (thus, the return on pension savings = mortgage interest), the change in the discounted consumption with the substitution of pension wealth is given by (use (51))

$$\Delta C^D = \sum_{t=c}^{B+n-1} \Delta C_t \left(\frac{1}{(1+\delta)^{t-c}}\right) + \Delta W_{p,R}\left(\frac{1}{(1+\delta)^{R-c}}\right)$$

$$= \sum_{t=c}^{d} \Delta C_t \left(\frac{1}{(1+\delta)^{t-c}}\right) + \sum_{i=d+1}^{B+n-1} \Delta C_t \left(\frac{1}{(1+\delta)^{t-c}}\right) + \Delta W_{p,R}\left(\frac{1}{(1+\delta)^{R-c}}\right). \tag{61}$$

Now we substitute (58), (59), and (60) into (61), whereby we get

$$\Delta C^D = \sum_{t=c}^{d} \sum_{i=c}^{t} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-c}} + \sum_{t=d+1}^{B+n-1} \sum_{i=c}^{d} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-c}} - \sum_{i=c}^{d} \theta Y_i (1+r_p)^{R-i} \frac{1}{(1+\delta)^{R-c}}, \tag{62}$$

where we use

$$\sum_{t=c}^{d} \sum_{i=c}^{t} = \sum_{i=c}^{d} \sum_{t=i}^{d} \tag{63}$$

to get

$$\Delta C^D = \sum_{i=c}^{d} \left(\sum_{t=i}^{d} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-c}} + \sum_{t=d+1}^{B+n-1} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-c}} - \theta Y_i (1+r_p)^{R-i} \frac{1}{(1+\delta)^{R-c}} \right)$$

$$= \sum_{i=c}^{d} \left(\sum_{t=i}^{B+n-1} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-c}} - \theta Y_i (1+r_p)^{R-i} \frac{1}{(1+\delta)^{R-c}} \right)$$

$$= \sum_{i=c}^{d} \frac{1}{(1+\delta)^{i-c}} \left[\sum_{t=i}^{B+n-1} \frac{r\theta Y_i}{1-(1+r)^{-(n+B)+i}} \frac{1}{(1+\delta)^{t-i}} - \theta Y_i \frac{(1+r)^{R-i}}{(1+\delta)^{R-i}} \right]. \tag{64}$$

Equation (64) shows that with regular withdrawals, the same conditions will hold compared to a single withdrawal as (64) has exactly the same profile compared to (52). This means that consumers will gain from a regular withdrawal each year if, and only if, $\delta > r$. If we assume a constant return on pension savings equal to a constant mortgage interest rate (i.e. $r_p = r_m = r$), then the sum of all regular withdrawals will also be positive if, and only if, $\boldsymbol{\delta > r}$.

5.4. The introduction of taxes

An important question for the state is which tax rate to apply for withdrawals. The Dutch pension system follows an EET scheme whereby taxes on pension savings are paid when pension benefits are collected. The related tax payments for homeowners have been described in Chapter 4. If we give taxpayers the opportunity to use pension savings before retirement, this tax payment needs to be paid at an earlier stage of life. We calculate below which tax rate the government should apply on a single withdrawal from the pension savings, to keep the impact on public finances neutral.

From equation (25) for $B+n > t > w > B$, we find

$$M_B = M_w \left(\frac{1-(1+r_M)^{-n}}{1-(1+r_M)^{-(B+n-w)}} \right). \tag{65}$$

Now we eliminate M_B in equation (25) by substituting equation (65)

$$M_t = M_w \left(\frac{1-(1+r_M)^{-n}}{1-(1+r_M)^{-(B+n-w)}}\right)\left(\frac{1-(1+r_M)^{-(B+n-t)}}{1-(1+r_M)^{-n}}\right) \tag{66}$$

$$M_t = M_w \left(\frac{1-(1+r_M)^{-(B+n-t)}}{1-(1+r_M)^{-(B+n-w)}}\right). \tag{67}$$

If we want to introduce taxes in the model, we first need to know the present value of the interest payments. With equation (67) we can write the interest payments at age t (where $B+n > t > w$), where we discount the interest payments at age $t > w$ to age w. The discounted interest payments for age $t{\geq}w$ are given by $\frac{r_M M_t}{(1+r_m)^{t-w}}$, where we can eliminate M_t by using equation (67)

$$\frac{r_M M_t}{(1+r_m)^{t-w}} = r_m M_w (1+r_M)^{w-t}\left(\frac{1-(1+r_M)^{-(B+n-t)}}{1-(1+r_M)^{-(B+n-w)}}\right) = r_m M_w \left(\frac{(1+r_m)^{-t}-(1+r_m)^{-(B+n)}}{(1+r_m)^{-w}-(1+r_m)^{-(B+n)}}\right). \tag{68}$$

The discounted value of all interest payments made between $t=w$ and $t=B+n$ is given by

$$Y^{rA}_{w,B+n} \equiv \sum_{i=w}^{B+n-1}\frac{r_M M_i}{(1+r_m)^{i-w}} \tag{69}$$

where $(Y^{rA}_{w,B+n})$ denotes the discounted value of all interest payments between $t=w$ and $t=B+n$. We substitute (68) to eliminate M_i in equation (69)

$$Y^{rA}_{w,B+n} = r_M M_w \sum_{i=w}^{B+n-1}\frac{(1+r_m)^{-i}-(1+r_m)^{-(B+n)}}{(1+r_m)^{-w}-(1+r_m)^{-(B+n)}}, \tag{70}$$

so that:

$$Y^{rA}_{w,B+n} = \frac{r_m}{(1+r_m)^{-w}-(1+r_m)^{-(B+n)}} M_w \left(-(B+n-w)(1+r_m)^{-(B+n)} + \sum_{i=w}^{B+n-1}(1+r_m)^{-i}\right). \tag{71}$$

Equation (19) is used to get

$$Y^{rA}_{w,B+n} = \left(\frac{r_m}{(1+r_m)^{-w}-(1+r_m)^{-(B+n)}}\right) M_w \left(-(B+n-w)(1+r_m)^{-(B+n)} + \frac{(1+r_m)^{-w}-(1+r_m)^{-(B+n)}}{r_m}\right)$$

$$Y^{rA}_{w,B+n} = M_w \left(1 - \frac{(B+n-w)r_m}{(1+r_m)^{B+n-w}-1}\right). \tag{72}$$

5.4.1. Intertemporal substitution of consumption

Having calculated the present value of all interest payments, we are now able to determine the tax rate on a single withdrawal that is neutral in terms of public finances. The tax rate is determined on a single withdrawal that is intended for intertemporal substitution of consumption. This means that individuals are allowed to consume the lower housing costs before retirement.

As in Section 5.3.1, individuals are allowed to use μ of their pension savings to reduce their mortgage loan. If we assume all returns to be equal (i.e., the mortgage interest rate, the return on pension savings, and the interest rate used by the government, thus $r_p = r_m = r$), the introduction of pension withdrawals will have the following impact on public finances (measured by the impact on discounted tax revenues at age $t=w$)

$$\Delta T_w = t_u \mu - t_r \mu + t_l \mu (1-C)(1-t_u), \tag{73}$$

where ΔT_w denotes the change in discounted tax revenues, t_μ is the (marginal) tax rate at which the government taxes the withdrawal of the pension saving at age w, t_r is the marginal tax rate at which

pension income is taxed during retirement, and t_l is the marginal tax rate for mortgage interest payment deductions. $\mu(1 - C)$ is the decrease in mortgage interest payments, see (72)

$$1 - C = 1 - \frac{(B+n-w)r_m}{(1+r_m)^{B+n-w}-1}.$$

(74)

Thus, the change in discounted tax payments is equal to the tax to be paid on the withdrawal, minus the tax payments that are avoided in retirement when pension savings are paid out before retirement, plus the lost tax benefit due to the deductibility of mortgage interest (since interest payments will be lower).

Because the decrease in the mortgage loan is equal to the amount that is withdrawn ($\Delta M_t = -\mu$) (we ignore the Hillen Act), we have from (69)

$$\Delta Y_{w,B+n}^r = -\mu(1 - C).$$

(75)

If the tax rate is determined such that the public finances are not affected (i.e. ΔT_w=0), we find from (73)

$$1 - t_u = \frac{1-t_r}{1-t_l(1-C)}.$$

(76)

We get a tax advantage (compared to regular tax rate t_r that is applied to pension income) because the taxpayer no longer benefits from tax arbitrage between, on the one hand, untaxed interest in the savings scheme and, on the other hand, deductible interest expense.

We can write (76) as

$$t_u = \frac{t_r-t_l(1-C)}{1-t_l(1-C)}.$$

(77)

Note that

$$\boldsymbol{t_u} > 0 \; iff \; \boldsymbol{t_r} > \boldsymbol{t_l(1 - C)}.$$

5.4.2. Arbitrage opportunities

If we want to keep consumption between *w* and *B+n-1* constant with the introduction of taxes, we need to save the following at age $w < t < B + n - 1$

$$\Delta S_t = \frac{-(1-t_u)\Delta A+t_l r_m \Delta M_t(1-t_u)}{1+t_l}$$

(78)

where

$$\Delta A = -\frac{\mu * r_m}{1-(1+r_m)^{-(B+n-w)}}.$$

(79)

Equation (78) shows the savings needed to keep consumption constant, with the savings being divided by $1 + t_l$ since pension savings are tax deductible. It is equal to the change in the annuity payment (79), corrected for the tax that should be paid over the pension withdrawal, plus the difference in the mortgage interest deductibility.

The tax impact of this additional saving, ΔT_w^S, is (assuming $r_m = r_p$)

$$\Delta T_w^S = \frac{(t_r-t_l)}{1+t_l}\left(\left(\sum_{i=w}^{B+n-1}\frac{(1-t_u)\Delta A}{(1+r_m)^{i-w}}\right) + \left(t_l\sum_{i=w}^{B+n-1}\frac{r_m\Delta M_i}{(1+r_m)^{i-w}}\right)\right),$$

(80)

so that (use (79) to eliminate ΔA and (75))

$$\Delta T_w^S = \frac{(t_r - t_l)}{1 + t_l} \mu ((1 - t_u) - t_l (1 - C)(1 - t_u)) \tag{81}$$

If we set t_u such that $\Delta T_w + \Delta T_w^S = 0$, we find from (73) and (81)

$$t_u \left[(1 - t_l(1 - C)) \left(1 + \frac{t_l - t_r}{1 + t_l} \right) \right] = t_r - t_l(1 - C) + \frac{(t_r - t_l)}{1 + t_l}(1 - t_l(1 - C)) \tag{82}$$

If $t_l = t_r$, we get the same result as with intertemporal substitution. If $t_r < t_l$, we find that the tax rate t_u needs to be higher if the individual saves the lower mortgage payments and benefits from tax arbitrage between the rate at which the premium can be deducted and the tax rate at which the benefits are taxed.

5.5. Financial position of individuals in the current situation

In this section some simplifying assumptions are removed so that more practical conclusions can be drawn about the financial consequences for households in the Netherlands. Also, the algebraic symbols are substituted by numbers, and this then forms the input for an Excel model that will calculate directly an exact number for ΔC_t and $\Delta W(t)$.

### 5.5.1. The introduction of three fictional households

The financial consequences for households will depend on their income level and the value of their house. Therefore, three different households are looked at: high, middle, and low income households. As working income is not constant during the active period in the labor market but instead increases when individuals work for a longer period of time, the 'career inflation' variable is introduced. This is the career pattern for males and females as calculated by the actuarial department of PGGM. The average change in salary per age is taken for both genders in the PFZW pension fund. This is not a perfect representation of all Dutch workers; however, it provides an approximation of the career patterns of individuals. The career inflation chosen per age is shown in Table 1 in the Appendix. Also, the average wage that individuals receive when they start in the labor market is calculated by the actuarial department of PGGM. The following wages are used:

- *Low income households*: The income of low income households is set at the gross minimum income level in the Netherlands, which is €19,043 at age 25. Moreover, because the career pattern of low-income individuals is generally not as favorable as that of high-income individuals, they follow a career path equal to half of the average career inflation at PFZW.
- *Middle income households*: The gross average income of individuals belonging to the middle income group who work fulltime is €28,095 at age 25 for PFZW participants.
- *High income households*: High income households are assumed to earn twice as much compared to the modal household in the Netherlands; it is set at €33,000 at age 25.

Because low income households generally have a lower level of education, they start in the labor market at an earlier age. Low income households start to work at age 20, middle income households at age 22 and high income households at age 24.

The mortgage loan amounts that banks offer depend on household income (current and expected). Therefore, households in the model consist of the combined working income of a male and female.

Figure 5.1
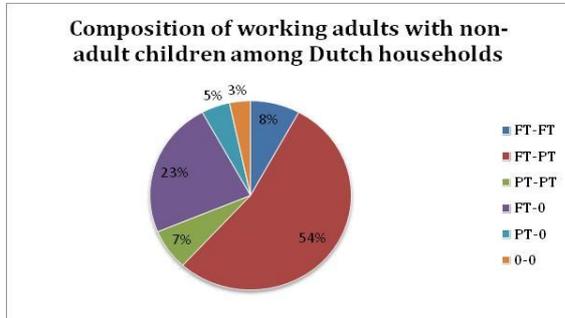
Source: CBS (2012a)

Among most households in the Netherlands with non-adult children, the working composition among the partners consists of a fulltime (FT) worker and a part-time worker (PT). This is shown in Figure 5.1. A fulltime worker is a partner who works more than 35 hours per week. A part time worker is defined as a partner who works 12-20 hours per week.

Figure 5.2
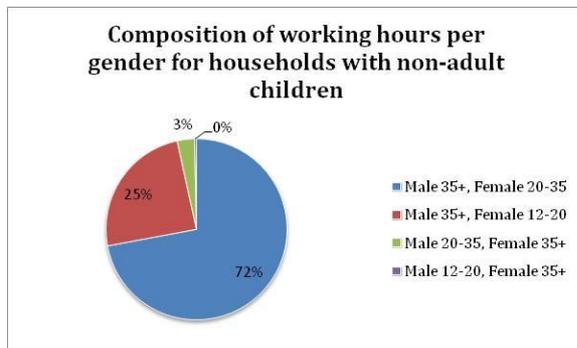
Source: CBS (2012a)

Of households consisting of a FT worker and a PT worker, the majority is composed of a male (M) who works fulltime and a female (FM) who works 20-35 hours (Figure 5.2). Therefore, the three simulated households consist of a male who works fulltime and a female who works part-time (20h).

5.5.2. The current income pattern of individuals

In the old situation, pension wealth is not used for housing purposes. Furthermore, gross income of households in taxed according to Dutch tax law as it is in effect in 2013.

Gross income of the simulated households is equal to the gross income of the individual in the year before adjustment for career inflation and general wage inflation at a particular age (see Table 1 in the Appendix):

$$Y_{gm,t} = Y_{gm,t-1} * (1 + \pi_{cm,t}) * (1 + \pi_{l,t})$$
$$Y_{gf,t} = Y_{gf,t-1} * (1 + \pi_{cf,t}) * (1 + \pi_{l,t})$$

$Y_{gm,t}$	=	Gross income of male at age t
$Y_{gf,t}$	=	Gross income of female at age t
$\pi_{cm,t}$	=	Male career inflation at age t
$\pi_{cf,t}$	=	Female career inflation at age t
$\pi_{l,t}$	=	Wage inflation at age t

Mortgage interest payments and pension savings are deductible from taxable income. Moreover, individuals have a franchise of €10,000; on this first part of income no pension contributions are paid because of the state pension provision. The mortgage interest deductible amount is equal to the interest rate times the outstanding mortgage loan. Homeowners must add part of the value of their house to taxable income as this is also seen as rental income (*'eigenwoningforfait'*). This homeownership tax only applies when earned income is higher than the amount of interest that individuals must pay. This is covered by the *Hillen Act* (see Chapter 4). Therefore, taxable income equals gross income minus mandatory occupational pension contributions, minus the mortgage interest that is paid, plus a fraction of the value of the house:

$$Y_{tm,t} = Y_{gm,t} - (\rho * (Y_{gm,t} - €\,10{,}000)) - \alpha(r_h * M_t) + \alpha(V_t * T_h) \qquad \text{If } Y_{gm,t} > 10{,}000;\ V_t * T_h > r_h * M_t$$

$$Y_{tm,t} = Y_{gm,t} - (\rho * (Y_{gm,t} - €\,10{,}000)) - \alpha(r_h * M_t) \qquad \text{If } Y_{gm,t} > 10{,}000;\ V_t * T_h \le r_h * M_t$$

$$Y_{tm,t} = Y_{gm,t} - \alpha(r_h * M_t) + \alpha(V_t * T_h) \qquad \text{If } Y_{gm,t} \le 10{,}000;\ V_t * T_h > r_h * M_t$$

$$Y_{tm,t} = Y_{gm,t} - \alpha(r_h * M_t) \qquad \text{If } Y_{gm,t} \le 10{,}000;\ V_t * T_h < r_h * M_t$$

$$Y_{tf,t} = Y_{gf,t} - (\rho * (Y_{gf,t} - €\,10{,}000)) \qquad \text{If } Y_{gf,t} > 10{,}000$$

$$Y_{tf,t} = Y_{gf,t} \qquad \text{If } Y_{gf,t} \le 10{,}000$$

$Y_{tm,t}$	=	Male taxable income at age t
$Y_{tf,t}$	=	Female taxable income at age t
ρ	=	Pension premium = 15%
α	=	Homeownership (1=homeowner with outstanding mortgage loan, 0 =otherwise)
r_h	=	Mortgage interest rate
M_t	=	Outstanding mortgage loan
V_t	=	Value of the house at age t
T_h	=	Portion of the value of the house to be added to taxable income as imputed rent

As the household consists of a fulltime worker (male) and a part-time worker (female), the mortgage interest paid is deducted from the gross income of the fulltime worker because this leads to a higher tax benefit.

As explained in Section 4.1.1, the Netherlands has a progressive income tax system, meaning that the marginal tax rate increases as income goes up. Different tax levels apply for working income and pension income. Net income is taxable income minus the income tax:

$$Y_{nm,t} = Y_{tm,t} - T_{l,t}$$
$$Y_{nf,t} = Y_{tf,t} - T_{l,t}$$

$Y_{nm,t}$	=	Male net income at age t
$Y_{nf,t}$	=	Female net income at age t
$T_{l,t}$	=	Tax payments at age t

$$
\begin{array}{llll}
T_{l,t} & = & Y_{tm,t} * 0.37 & \text{If } Y_{tm,t} \leq \text{€ } 19645 \\
T_{l,t} & = & \text{€ } 7268.65 + (Y_{tm,t} - \text{€ } 19646.00) * 0.42 & \text{If €}19645 < Y_{tm,t} \leq \text{€}33363 \\
T_{l,t} & = & \text{€ } 7268.65 + \text{€ } 5761.14 + (Y_{tm,t} - \text{€ } 33364.00) * 0.42 & \text{If €}33363 < Y_{tm,t} \leq \text{€}55991 \\
T_{l,t} & = & \text{€ } 7268.65 + \text{€ } 5761.14 + \text{€}9503.34 + (Y_{tm,t} - \text{€ } 55992.00) * 0.52 & \text{If } Y_{tm,t} > \text{€}55991
\end{array}
$$

The above tax amounts are equal to the income tax applying in 2013, as shown in Section 4.4.1. Net income in the retirement period is defined as:

$$
P_{nm,t} = P_{tm,t} - T_{r,t}
$$
$$
P_{nf,t} = P_{tf,t} - T_{r,t}
$$

$P_{nm,t}$ = Male net pension income at age t

$P_{nf,t}$ = Female net pension income at age t

$P_{tm,t}$ = Male taxable pension income at age t

$P_{tf,t}$ = Female taxable pension income at age t

$T_{r,t}$ = Tax payments in the retirement period at age t

$$
\begin{array}{llll}
T_{r,t} & = & P_{tm,t} * 0.191 & \text{If } P_{tm,t} \leq \text{€ } 19645 \\
T_{r,t} & = & \text{€ } 3752.19 + (P_{tm,t} - \text{€}19646.00) * 0.241 & \text{If €}19645 < P_{tm,t} \leq \text{€}33555 \\
T_{r,t} & = & \text{€ } 3752.19 + \text{€ } 3352.06 + (P_{tm,t} - \text{€ } 33556.00) * 0.42 & \text{If €}33363 < P_{tm,t} \leq \text{€}55991 \\
T_{r,t} & = & \text{€ } 3752.19 + \text{€ } 3352.06 + \text{€ } 9422.70 + (P_{tm,t} - \text{€ } 55992.00) * 0.52 & \text{If } P_{tm,t} > \text{€}55991
\end{array}
$$

These tax payments are in accordance with tax rates applying in 2013, as described in Section 4.4.2.

Pension wealth before retirement increases with the yearly pension contributions and the return on pension savings from previous years. After retirement, pension wealth equals pension savings in the previous year, plus the return on pension savings, minus retirement income.

$$
\begin{array}{lll}
W_{pm,t} = W_{pm,t-1}(1 + r_p)(1 + \pi_p) + \rho\,(Y_{gm,t-1} - \text{€ }10{,}000) & \text{If } t \leq 65 \\
W_{pm,t} = W_{pm,t-1}(1 + r_p)(1 + \pi_p) - P_{gm,t-1} & \text{If } t > 65 \\
W_{pf,t} = W_{pf,t-1}(1 + r_p)(1 + \pi_p) + \rho\,(Y_{fm,t-1} - \text{€ }10{,}000) & \text{If } t \leq 65 \\
W_{pf,t} = W_{pf,t-1}(1 + r_p)(1 + \pi_p) - P_{gf,t-1} & \text{If } t > 65
\end{array}
$$

$W_{pm,t}$ = Male pension accrued at age t

$W_{pf,t}$ = Female pension accrued at age t

r_p = Yearly return on pension savings

π_p = Yearly price inflation

$P_{gm,t-1}$ = Male retirement gross income from pension savings at age t

$P_{gf,t-1}$ = Female retirement gross income from pension savings at age t

As explained in the beginning of this chapter, longevity risk has not been incorporated in the model. Pension savings are paid out as an annuity whereby total pension wealth will be equal to 0 when a person dies ($t = T = 85$). This means that at age 66 (t = R), an annuity is introduced whereby individuals receive the same pension income amount every year, corrected for price inflation:

$$P_{gm,t} = \frac{A_{m,66}*\hat{r}_p}{1-(1+\hat{r}_p)^{-(T-R)}}$$

$$P_{gw,t} = \frac{A_{f,66}*\hat{r}_p}{1-(1+\hat{r}_p)^{-(T-R)}}$$

$P_{gm,t}$	=	Male retirement gross income at age t
$P_{gw,t}$	=	Female retirement gross income at age t
$\hat{r}_p$	=	Real return on pension savings

Housing costs depend on the mortgage loan. Since 2013, households in the Netherlands benefit from the interest deductibility only if they have an annuity mortgage or a straight-line mortgage loan. Furthermore, the mortgage must be repaid within 30 years. The mortgage loan equals the value of the house bought at age $t=B$ (i.e. LTV=100%):

$$M_B = V_B$$

M_B	=	Value of the mortgage loan at age $t=B$
V_B	=	Value of the house at age $t=B$

In this model, it is assumed that an individual buys a house at the age of 28. This is the average age at which a person buys a house in the Netherlands (Schilder & Conijn, 2013). Furthermore, the mortgage loan amount M is equal to 4.5 times gross household income at age 28. This is the mortgage amount that banks may offer (Eigen huis kopen, 2013). It is assumed that individuals do not buy a more expensive house in a later stage of life. Thus, the mortgage loan at time $t=B=28$ is 4.5 times gross household income:

$$M_B = 4.5 * (Y_{gm,B} + Y_{gf,B}).$$

Yearly housing costs for an annuity mortgage (A) are the same as described in Section 5.1.2.2:

$$A = \frac{M_B*r_M}{1-(1+r_M)^{-n}}.$$

A	=	Yearly annuity payment
r_M	=	Mortgage interest rate
n	=	Duration of the mortgage loan = 30 years

As the mortgage interest payments are already subtracted from gross income, only the mortgage repayments have to be deducted from net income:

$$H_t = A - (r_m * M_t)$$

H_t	=	Mortgage repayment at age t

As stated in Section 5.1, net disposable non-housing consumption will be the outcome variable in the model together with the change in total wealth. Because people buy a house at a later stage than the age at which they start in the labor market, they pay rent during the initial years of their working career. For low income households the rental costs are set at €5,400 per year (average after-subsidy rental costs for regulated rental homes), for middle income households at €7,800 per year, and for high income households at €10,200 per year (average after-subsidy costs for rental homes in the private sector, CBS 2013c). The consumption function in the old situation for households is:

$$C_t = Y_{nm,t} + Y_{nf,t} - \propto H_t - \beta h_t - \alpha(V_t * T_h) \qquad \text{If } t \leq 65, V_t * T_h > r_h * M_t$$

$$C_t = Y_{nm,t} + Y_{nf,t} - \propto H_t - \beta h_t \qquad \text{If } t \leq 65, V_t * T_h < r_h * M_t$$

$$C_t = P_{nm,t} + P_{nf,t} + \eta_t - \propto H_t - \beta h_t - \alpha(V_t * T_h) \qquad \text{If } 65 < t \leq 85, V_t * T_h > r_h * M_t$$

$$C_t = P_{nm,t} + P_{nf,t} + \eta_t - \propto H_t - \beta h_t \qquad \text{If } 65 < t \leq 85, V_t * T_h < r_h * M_t$$

$$C_t = 0 \qquad \text{If } t > 85$$

C_t	=	Household yearly net disposable non-housing consumption
β	=	Home occupation (1 = renter; 0 = homeowner)
h_t	=	Yearly rental costs
$\propto$	=	Homeownership (1=homeowner with outstanding mortgage loan, 0 =otherwise)
H_t	=	Mortgage repayment at age t
η_t	=	Public pension

Total wealth is defined as:

$$W_t = W_{pm,t} + W_{pf,t} + V_t(1 + \pi_p)^t - M_t$$

W_t	=	Total wealth at age t
V_t	=	Value of the house at age t
M_t	=	Outstanding mortgage loan at age t
π_p	=	Price inflation

Thus, total wealth at age t is defined as the sum of the pension wealth of the male and the female, plus the value of the home after adjustment for price inflation, minus the outstanding mortgage loan.

With the parameters chosen as described above, and assuming the real expected return on pension savings to be equal to the real mortgage interest rate ($\hat{r}_p = \hat{r}_h = 3.5\%$), price inflation of 2% and wage inflation of 3%, households will have the consumption and wealth profile as shown in Figure 5.3 and 5.4.

At age 28, individuals buy a house involving annuity payments that are higher than the yearly rental costs. Therefore, non-housing disposable income declines at the age of 28. The sharp rise in consumption at age 57 is due to the mortgage loan having been fully repaid after 30 years, so that housing costs disappear. Another shock occurs at the age of 66 because of retirement (in this model, individuals retire at age 66). Total wealth is not fully consumed at the time of death since in this model individuals bequeath their housing wealth.

Figure 5.3 — Non-housing disposable income per age

Figure 5.4 — Total wealth per age
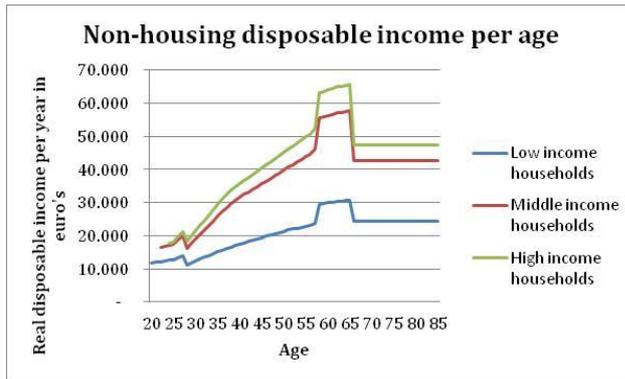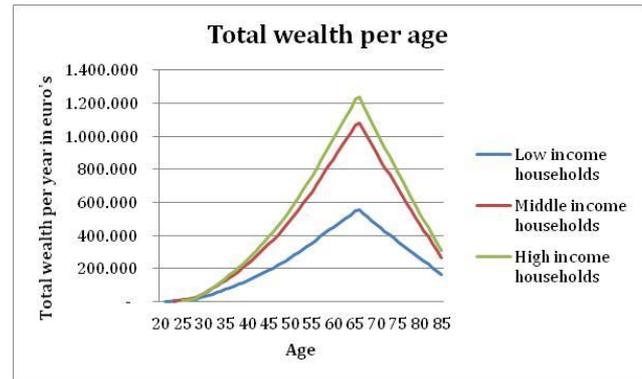
5.6. Financial position of individuals with a single pension withdrawal

In the new situation, individuals are allowed to make a single pension withdrawal for the down payment of a house. As before, the financial consequences of a single withdrawal will be checked both for (1) arbitrage opportunities and (2) intertemporal substitution of consumption. The financial consequences are shown for middle income households, except in the case of large differences compared to other income groups.

The financial consequences for households for both arbitrage opportunities and intertemporal substitution of consumption are calculated for the following cases:

1. $r_p = r = r_m = 3.5\%$, without taxes. This is done in order to see which variables cause changes to the consumption and wealth patterns of individuals without the impact of taxes.

2. $r_p = r = r_m = 3.5\%$, including taxes. Taxes are introduced for the case, with the nominal pension return assumed to be equal to the nominal mortgage interest rate.

3. $r_p = r = 2.54\% < r_m = 4.7\%$, without taxes. The nominal mortgage interest rate is set at 4.7%, which is the average of 10-year fixed mortgage interest rates in the Netherlands (author's own calculation based on mortgage interest rates at Hypotheekrente.nl on October 2, 2013). Because money borrowed from a bank can be regarded as a 'safe loan', this is compared to the return on pension savings with the same risk profile and duration, thus a Dutch government bond. On September 30, 2013, the nominal return on a Dutch government bond with a duration of 11.09 years amounted to 2.54% (Agentschap van de Generale Thesaurie, 2013). In this situation, individuals can make use of arbitrage opportunities since the nominal mortgage interest rate is higher than the nominal return on pension savings.

4. $r_p = r = 2.54\% < r_m = 4.7\%$, including taxes. The closing examination shows the financial consequences including taxes and arbitrage opportunities.

Price inflation in all cases is set at 2% and wage inflation at 3%.

5.6.1. Single withdrawal for arbitrage opportunities

When individuals withdraw pension savings in order to lower their mortgage loan, this will decrease their pension savings account Individuals buy a house at age 28 and are allowed to withdraw $\mu\%$ from their pension savings account relative to the value of the house that they intend to buy. Because the male works

fulltime and the female works part-time, a larger part will be withdrawn from the pension account of the male (80%) compared to the pension account of the female (20%):

$$W_{pm,28} = W_{pm,27}(1 + r_p)(1 + \pi_p) + \rho\,(Y_{gm,27} - €\,10{,}000) - (0.80 * \mu * V_{h,28})$$

$$W_{pf,28} = W_{pf,27}(1 + r_p)(1 + \pi_p) + \rho\,(Y_{fm,27} - €\,10{,}000) - (0.20 * \mu * V_{h,28})$$

|		
$W_{pm,28}$	=	Male pension accrued at age 28
$W_{pf,28}$	=	Female pension accrued at age 28
r_p	=	Yearly return on pension savings
π_p	=	Yearly price inflation
ρ	=	Mandatory percentage of pension savings in relation to income
μ	=	Allowed percentage of the value of the house to be withdrawn from the pension account
$V_{h,28}$	=	Value of the house bought at age 28

1. No taxes and $r_p = r_m = r = 3.5\%$

The first consideration is which percentage to allow in relation to the value of the house since pension wealth depends on income level. If a woman has a low-income profile (she starts to work at age 20), she will have a negligible pension wealth at age 28 because her earnings are unlikely to exceed the franchise on which individuals do not have to save for retirement. Instead, a male with a middle-income profile will have substantial pension savings (he starts to work at age 22).

For the time being, we set the withdrawal at 10% of the mortgage loan. In this model, a male with a middle income profile has a pension wealth of €20,544 at age 28. The pension wealth of a female with a middle income profile at age 28 is €5,311. The mortgage loan at age 28 is 4.5 times yearly household income, thus €256,885. This results in a down payment of €25,688. When the nominal mortgage interest rate is equal to the nominal return on pension savings and there are no taxes, there is *no* change in consumption or total wealth among all ages (Figure 5.5). This confirms the result of Section 2.2.1 and equation (37) in particular.
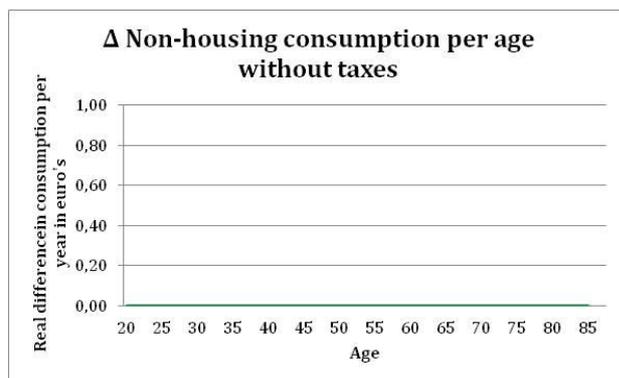
Figure 5.5

For implementation of this in The Netherlands, the advice would be to set the permitted withdrawal as a percentage of pension wealth. This percentage should be lowered when individuals are older, to prevent them from suffering from low replacement rates during retirement.

2. Taxes and $r_p = r_m = r = 3.5$

With the introduction of taxes, several variables change. Firstly, income taxes lead to lower disposable income (before and during retirement) compared to disposable income without taxes. Mortgage interest

is deductible from taxable income, mandatory pension savings are exempted from tax, and homeowners pay tax over their privately owned house (*'Eigenwoningforfait'*). This homeownership tax is fully or partly offset when it is higher than the yearly mortgage interest payments. Finally, the largest difference is the introduction of tax on the pension withdrawal. This will create a gap between the amount withdrawn from the pension savings account and the amount that is used to reduce the mortgage loan. The tax rate introduced on the pension withdrawal is given by equation (82).

Middle-income households fall in the marginal tax rate of 42% during the working period at age 28 and 24% during the retirement period. The tax on a pension withdrawal therefore is

$$t_u \left[(1 - 0.42(1 - C)) \left(1 + \frac{0.42 - 0.24}{1 + 0.42} \right) \right] = 0.24 - 0.42(1 - C) + \frac{(0.24 - 0.42)}{1 + 0.42}(1 - 0.42(1 - C))$$

$$1 - C = 1 - \frac{(28 + 30 - 28)0.035}{(1 + 0.035)^{28+30-28} - 1}$$

$$C = 0.58111$$

$$t_u = -4.35\%$$

This means that individuals are given a subsidy instead of having to pay a tax over the amount withdrawn from their pension savings account, thus compensating for the lost tax benefit of mortgage interest deductibility. Because the new mortgage loan is lower as a result of the down payment made with the pension savings withdrawn, also the interest payments will be lower, leading to reduction of the tax benefit of the deductibility of mortgage interest. Figure 5.6 represents the change in consumption per age with the introduction of taxes.

Figure 5.6
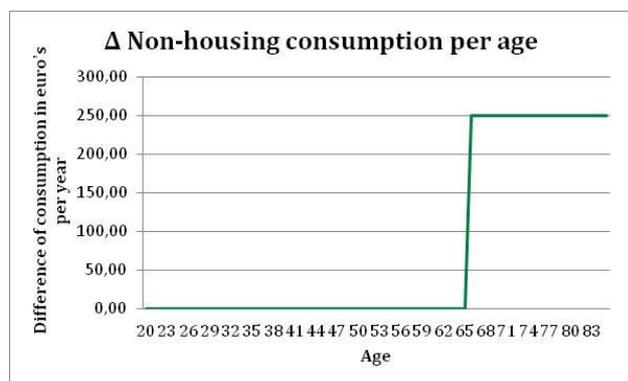
The consumption pattern will not change during the working years of the household since the reduction in housing costs will have to be repaid to the pension fund. In the retirement period, consumption goes up as a subsidy is given on the pension withdrawal. More specifically, the down payment that individuals make (thus the decrease in the mortgage loan) is higher than the amount withdrawn from the pension savings account. If households consequently make repayments to their pension fund, the total reduction in housing costs will be higher than the amount borrowed from the pension fund so that pension wealth goes up. This results in an increase in the annuity installments that individuals receive during retirement. Moreover, with the introduction of the *Hillen Act*, the tax for homeownership will sooner remove. Individuals also have to repay this increase in consumption to their pension fund, therefore retirement savings increase. Finally, individuals now make higher pension savings since they make usual pension contributions plus the lower housing costs. These are all tax deductible whereby taxable income decreases. The Dutch tax system has different marginal tax rates among different levels of income, therefore the average tax rate will differ compared to the ´old´ situation (i.e. decrease).

The subsidy calculated above is based on the assumption of equal marginal tax rates. Individuals also repay the decrease in tax payments to their pension fund, so more pension will be accrued than the old situation whereby retirement income increases.

3. No taxes and $r_p = r = 2.54 < r_m = 4.7$

As explained in Section 5.2, whether people benefit from the use of pension savings depends on the relationship between r_p and r_m. In this section, the financial consequences will be investigated for the situation when the mortgage interest rate is higher than the return on pension savings. In this situation, individuals can make use of arbitrage opportunities as the mortgage interest rate is higher compared to the expected return on pension savings. The change in the non-housing disposable consumption and total
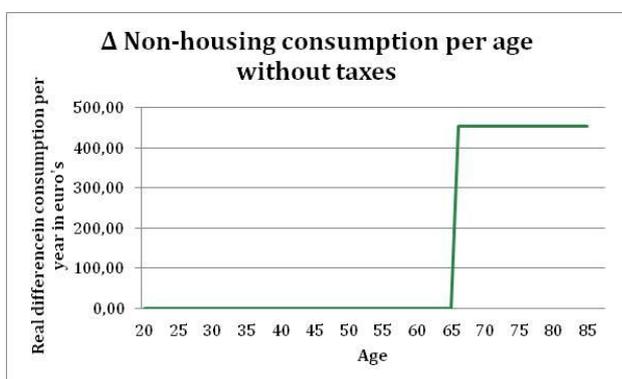
Figure 5.7	Figure 5.8
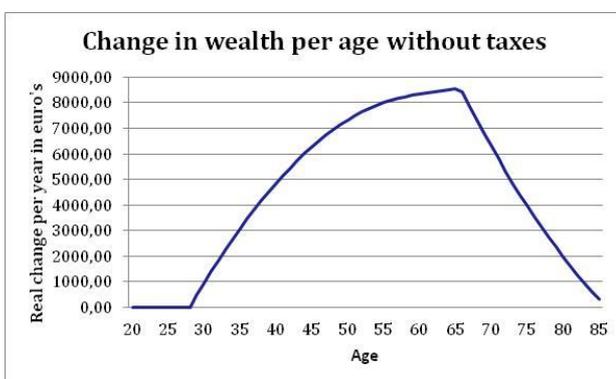
wealth of middle-income households per age category is shown in Figures 5.7 and 5.8.

Because the interest rate on a mortgage loan is higher than the return on pension savings, the reduction in housing costs will exceed the pension withdrawal. More specifically, the gain resulting from the reduction in mortgage loan exceeds the loss caused by the pension withdrawal. Households repay to their pension fund each year the decrease in housing costs, which results in higher pension savings at the age of 65. The difference in pension wealth at age 65 amounts to €8,551. The nominal return on pension savings is 2.54%, which means a real return of 0.053% when we take price inflation of 2% into account. If this pension wealth is transferred into annuity income, it will lead to an increase in pension income of (equation (20) is used for an annuity payment):

$$A = \frac{8551.32 * 0.0053}{1 - 1.0053^{-20}} = 451.76$$

Thus, the change in real consumption during retirement is a positive amount of €452.

4. Taxes and $r_p = r = 2.54\% < r_m = 4.7\%$

Finally, taxes are introduced in the situation where the return on pension savings is lower than the mortgage interest rate. Because the tax on pension withdrawals depends on the mortgage interest amount, it differs from the case with taxes and $r_p = r_m = r$. The tax rate of equation (82) only holds when the mortgage interest rate equals the return on pension savings. However, it does give an approximation of the tax rate that should be applied on the withdrawal; therefore an investigation is made of the financial

consequences with this specific tax rate. In addition, the financial consequences for retirement income are checked for the situation where the tax rate is equal to the marginal retirement income tax.

Firstly, the financial consequences are calculated using the tax rate given by (82):

$$t_u \left[(1 - 0.42(1 - C)) \left(1 + \frac{0.42 - 0.24}{1 + 0.42} \right) \right] = 0.24 - 0.42(1 - C) + \frac{(0.24 - 0.42)}{1 + 0.42}(1 - 0.42(1 - C))$$

$$1 - C = 1 - \frac{(28 + 30 - 28)0.047}{(1 + 0.047)^{28 + 30 - 28} - 1}$$

$$C = 0.475$$

$$t_u = -9.02\%$$

The value of the house bought at age t=28 is €256,885, thus the amount withdrawn from the pension savings account for the down payment is €25,689. The subsidy of 9.02% is equal to €2,316, so that the down payment to yield a lower mortgage loan becomes €28,004. This results in a mortgage loan of €228,881. The change in consumption is given by Figure 5.9 below.

With the introduction of the subsidy on the pension withdrawal, the increase in retirement income is slightly higher compared to the case without taxes. The real increase in yearly pension income during retirement with arbitrage opportunities in this model is €500 per year.

Figure 5.9: Financial consequences with a 9.02% subsidy
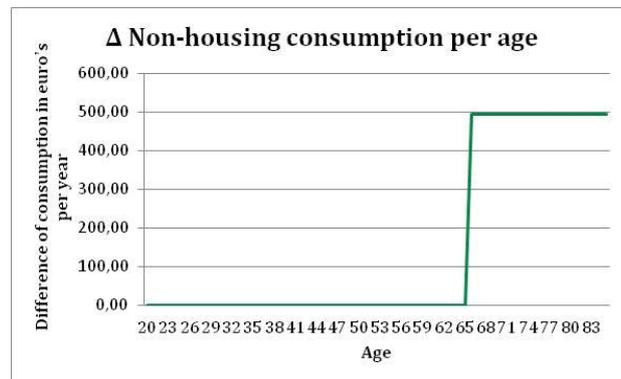
If the marginal tax rate on retirement income is applied, this would result in a tax of 24%, equal to €6,165. In this case, the down payment is €19,523, resulting in a mortgage loan of €237,362. The change in consumption is shown in Figure 5.10, the change in private wealth in Figure 5.11.

Figure 5.10: Financial consequences with a tax of 24%   **Figure 5.11: Change in equity with a tax of 24%**
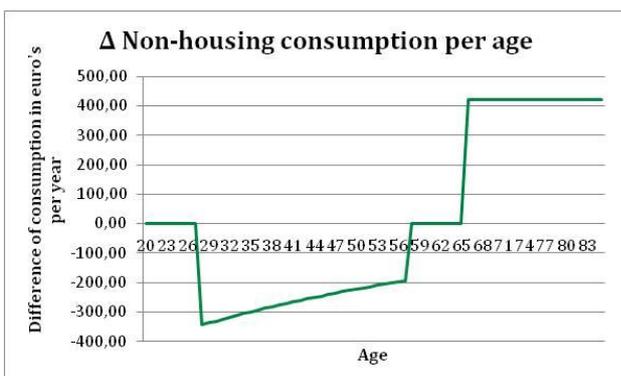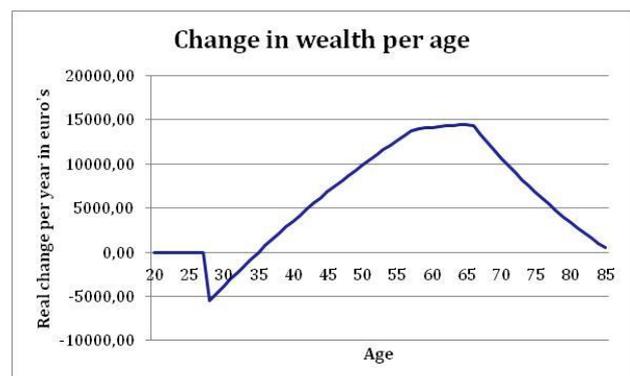
The largest difference compared to the case where a subsidy is granted lies in the change in consumption and wealth *before* retirement. As can be seen in Figure 5.10, consumption before retirement declines. This is a result of the tax introduced on the pension withdrawal. Individuals get a loan of €25,689 from their pension fund equal to 10% of the value of the house, which has to be repaid. At the same time, the mortgage loan decreases by €19,523, leading to a decrease of yearly housing costs. Figure 5.11 shows that the difference in the amount withdrawn from the pension savings account and the decrease in the mortgage loan result in a decline in total wealth at age 28. Over time, total wealth will be higher compared to the old situation since the nominal mortgage interest rate is higher than the nominal return on pension savings. Because of the tax that is introduced, the decrease in housing costs is less than the amount that should be repaid to the pension fund, which means a decline in pre-retirement consumption. The decline in consumption moderates over time because Figure 5.10 represents consumption adjusted for price inflation, thus showing the *real* change.

Finally, when a tax is introduced on the pension withdrawals, individuals gain from an increase in net retirement income of €420.

5.6.2. Single withdrawal for intertemporal substitution of consumption

When individuals have the possibility of withdrawing pension savings in order to reduce their mortgage loan, this will decrease the balance in their pension savings account. Individuals buy a house at age 28 and are allowed to withdraw μ% of the value of the house that they intend to buy. Because the male works fulltime and the female part-time, a larger part will be withdrawn from the pension account of the male (80%) compared to that of the female (20%):

$$W_{pm,28} = W_{pm,27}(1 + r_p)(1 + \pi_p) + \rho\ (Y_{gm,27} - \text{€}10{,}000) - (0.80 * \mu * V_{h,28})$$
$$W_{pf,28} = W_{pf,27}(1 + r_p)(1 + \pi_p) + \rho\ (Y_{fm,27} - \text{€}10{,}000) - (0.20 * \mu * V_{h,28})$$

$W_{pm,28}$	=	Male pension accrued at age 28
$W_{pf,28}$	=	Female pension accrued at age 28
r_p	=	Yearly return on pension savings
π_p	=	Yearly price inflation
ρ	=	Mandatory percentage of pension savings according to income
μ	=	Allowed percentage of the value of the house to be withdraw from the pension account
$V_{h,28}$	=	Value of the house bought at age 28

Until now, there are no differences compared to Section 5.5.3.1. The pension withdrawal results in a reduction of the mortgage loan needed for the purchase of the house and for the subsequent yearly housing costs. The difference is that, in this case, individuals can take advantage of the lower housing costs before retirement because they do not have to repay this to the pension fund.

1. No taxes and $r_p = r_m = r = 3.5\%$

To see which variables cause changes to the consumption and wealth patterns of individuals, the nominal mortgage interest rate is set at the nominal expected return on pension savings ($r_p = r_h = r = 3.5\%$). Price inflation is set at 2%, wage inflation at 3%.

Again, households buy a house at age *t=28*, with a withdrawal from the pension account being made for the down payment. The value of the house at age *t=28* is €256,885, of which 10% (€25,689) is financed by pension savings. Thus, the corresponding mortgage loan amounts to €231,196.39. This will lower the yearly housing costs from €13,967 to €12,570.

Figure 5.12 shows the difference in consumption per age category without taxes and with equal interest rates.

Figure 5.12
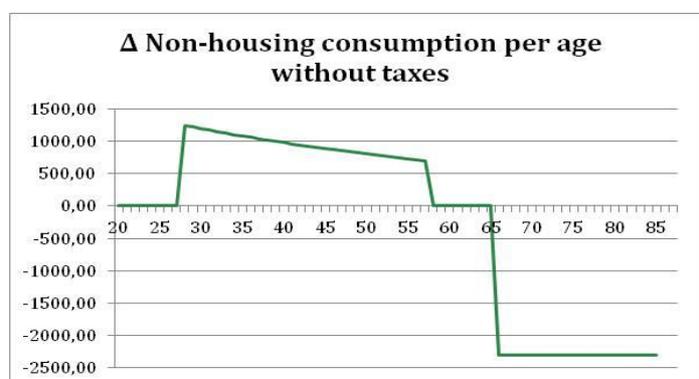
Households immediately benefit from the lower housing costs during the term of the mortgage loan. The declining difference in consumption is the result of the price inflation that is incorporated. More specifically, individuals have the same nominal increase in consumption every year, but because of price inflation (set at 2%) the real difference in consumption declines. Pension income declines more than the increase in consumption as it not only decreases with the amount withdrawn but also with the lost return on savings. Moreover, the duration of the pension period is shorter.

Next we calculate the present value of all future consumption from the age at which individuals enter the labor market. The present value of consumption in the 'old' situation is €2,377,307 compared to a consumption of €2,377,731 in the situation where individuals withdraw pension assets for the decrease of a mortgage loan.

2. Taxes and $r_p = r_m = r$

The tax on the pension withdrawal is the same as in Section 5.4.1. This is a single withdrawal for arbitrage opportunities (see equation (77)). The tax rate in this case is:

$$1 - C = 1 - \frac{(28 + 30 - 28)0.035}{(1 + 0.035)^{28+30-28} - 1} = 0.42$$

$$t_u = \frac{0.24 - 0.42(0.42)}{1 - 0.42(0.42)} = 7.78\%.$$

The pension withdrawal (€25,689) is thus subject to a tax of 7.78%, an amount of €1,998. This reduces the down payment to €23,691, resulting in a mortgage loan of €233,194. The yearly housing costs consequently decrease from €13,967 to €12,570.

Figure 5.13
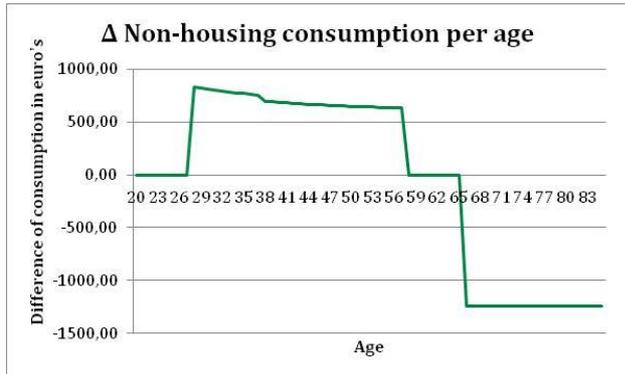
Figure 5.14
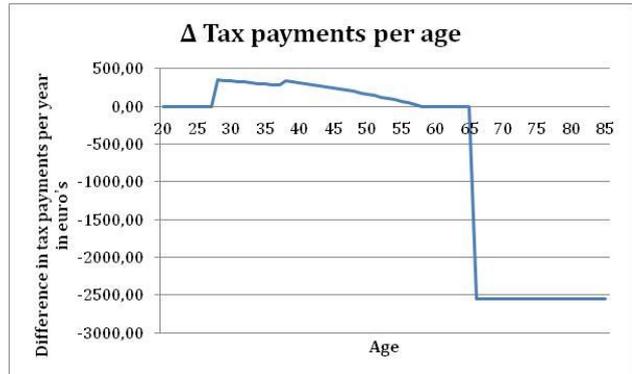
When taxes are introduced, the difference in consumption before as well as during retirement declines compared to the case without taxes (Figure 5.13). The reduction in the change in consumption before retirement is because housing costs are decreased by a lower amount compared to the case without taxes. The tax on the pension withdrawal introduces a gap between the amount withdrawn from the pension savings account and the down payment used for a house. Moreover, households benefit less from the mortgage interest deductibility through the decreased mortgage loan and lower mortgage interest; taxes are thus higher (Figure 5.14). The present value of all future consumption with the introduction of taxes increases from €1,352,629 to €1,357.152.

3. No taxes and $r_p = r = 2.54\% < r_m = 4.7\%$

The value of the house and the pension withdrawal remain the same (€256,885 and €25,689 respectively). Because of the high mortgage interest rate, yearly housing costs decrease substantially: from €16,114 to €14,529. This is a decrease of more than €1,500 in housing costs per year.

Figure 5.15
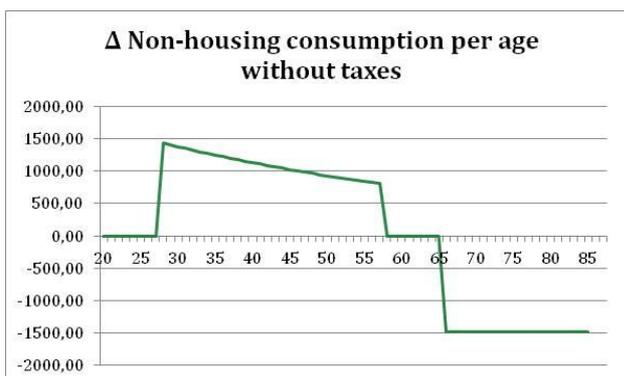
Real consumption before retirement increases by only €1,050 on average per year. The higher increase in the difference in consumption before retirement is due to the higher mortgage interest rate: individuals thus benefit more from the substitution between pension savings and mortgage loan redemptions. Because the return on pension savings is lower, the fall in retirement income is also lower compared to the case with equal interest rates. The present value of consumption without taxes increases from €2,956,249 to €2,963,681.

4. Taxes and $r_p = r = 2.54\% < r_m = 4.7\%$

Lastly, taxes are introduced together with a difference between the mortgage interest rate and the return on pension savings. The tax rate determined by equation (77) only holds when the interest rates are

equal. However, as it will approximately give the tax rate that should be applied, we will use this tax rate. Moreover, the financial consequences when the marginal tax rate on retirement income is used are examined. The tax rate applied is:

$$1 - C = 1 - \frac{(28 + 30 - 28)0.047}{(1 + 0.047)^{28+30-28} - 1} = 0.52$$

$$t_u = \frac{0.24 - 0.42(0.52)}{1 - 0.42(0.52)} = 2.52\%.$$

The 2.52% tax rate is equal to €647, with the down payment to secure a lower mortgage loan being €25,042. This results in a mortgage loan of €231,843. As a result of the lower mortgage loan the housing costs are thus reduced from €16,144 per year to €14,570.

The financial consequences for households with a tax rate of 2.52% are given by Figure 5.16 below. Due to tax distortions (such as the deductibility of mortgage interest), the increase in consumption before retirement is lower than the decrease in housing costs (Figure 5.15). The increase in consumption during the working years is lower compared to the case without taxes also because the decrease in the mortgage loan is smaller compared to the situation without taxes. On average, households will have higher real consumption between ages 28 to 58 of €800 per year, which is the same as the loss of retirement income. The present value of consumption increases from €1,714,366 to €1,724,335.

When the marginal tax rate on retirement income is used (i.e. 24%), the amount of tax to be paid is €6,165.24. This lowers the mortgage loan to €237,361.63, which in turn leads to a reduction of yearly housing costs from €16,114 to €14,917. The financial consequences for individuals are given in Figure 5.17. When a tax rate of 24% is applied, the real gain in consumption per year decreases to merely €600 per year. The decrease in consumption during retirement does not change. There is a smaller increase in the present value of consumption with this tax higher rate; in the new situation this is €1,719,466.

**Figure 5.16: Financial consequences with 2.52% tax**
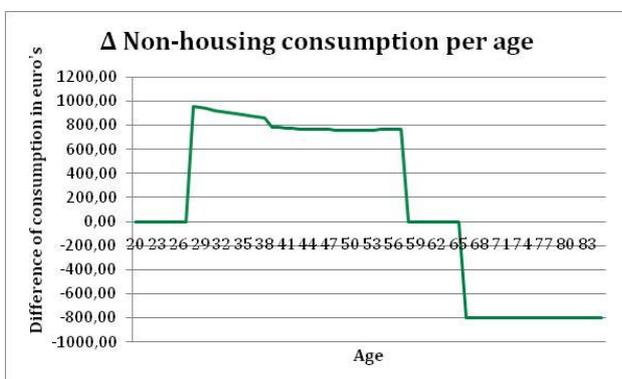
Figure 5.17: Financial consequences with 24% tax
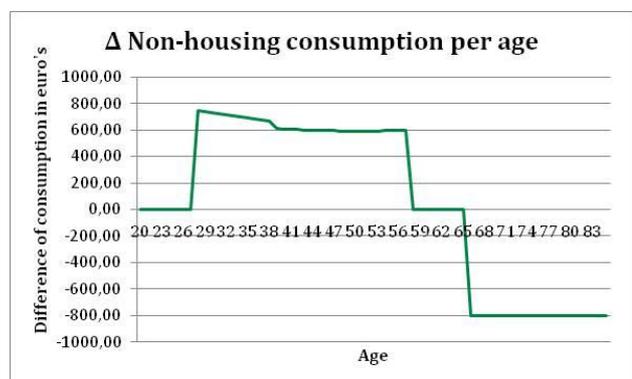
5.7. Regular withdrawals for intertemporal substitution consumption

This section introduces a new link between pension wealth and housing wealth, involving the partial replacement of monthly pension premiums by extra mortgage payments during a number of years, and also enabling households to make use of the intertemporal substitution of consumption. The difference with Section 5.3.2 is that the yearly annuity payments that households make remain the same. After the partial substitution of pension premiums by mortgage repayments, individuals make the same annuity payment as before. This causes reduction of the balance of the mortgage loan. Therefore, housing costs will disappear at an earlier stage.

The substitution of pension savings by extra mortgage repayments is allowed for X years, and pension payments decrease by θY. The yearly mortgage repayments directly increase by θY. Hence, the development of the pension savings account during these X years is as follows:

$$W_{pm,t} = W_{pm,t-1}\left(1 + r_p\right) + (\rho - \theta)\,(Y_{gm,t} - €10,000)$$
$$W_{pf,t} = W_{pf,t-1}\left(1 + r_p\right) + (\rho - \theta)\,(Y_{fm,t} - €10,000)$$

$W_{pm,t}$	=	Male pension accrued at age t
$W_{pf,t}$	=	Female pension accrued at age t
r_p	=	Yearly return on pension savings
π_p	=	Yearly price inflation
ρ	=	Mandatory percentage of pension savings based on income
θ	=	Allowed percentage of decrease in pension savings per year

Again, first the results will be shown when the nominal mortgage interest rate is equal to the nominal return on pension savings ($r_p = r_h = 3.5\%$). Households are allowed between ages 35-45 to substitute one-third of their pension premiums by extra mortgage repayments. In other words, between ages 35-45 households have to pay only 10% of their gross income to their pension fund, and 5% may be used for extra mortgage repayments.

1. No taxes and $r_p = r_m = r = 3.5\%$

With the partial substitution of pension premiums by mortgage payments, nothing will change in the consumption pattern before the repayment of the mortgage. During the period of substitution (i.e. between ages 35-45), consumption does not change since the lower pension premiums are offset by extra mortgage repayments. Also, total wealth does not change during these years as the decrease in pension wealth is perfectly offset by an increase in housing wealth (Figure 5.19 on the next page).
Consumption in the new situation changes from the age of 52; from that age on, disposable consumption is much higher. This is because the mortgage loan is paid off six years earlier compared to the old situation, leading to elimination of housing costs. The decreasing slope of the change in consumption during the working period is due to the decline in purchasing power as a result of price inflation. This does not hold for retirement income since pension savings are linked to prices.

Figure 5.18

Figure 5.19

Figure 5.18 — Δ Non-housing consumption per age without taxes

Figure 5.19 — Δ Wealth per age without taxes
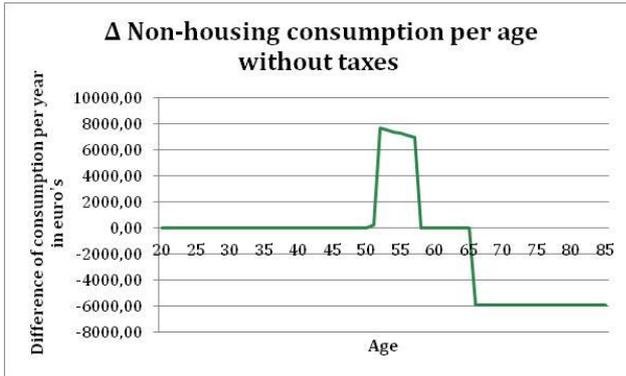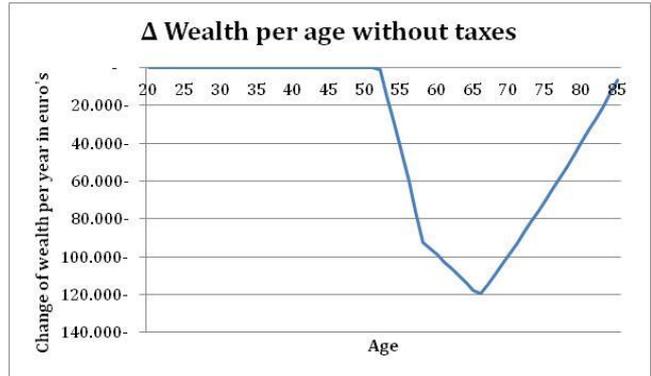
The difference in total wealth is shown in Figure 5.19. Remember that total wealth was made up of pension savings plus the value of the house, minus the outstanding mortgage loan. As can be seen in Figure 5.19, total wealth does not change until the age of 52. This is because the extra mortgage repayments exactly offset the decrease in pension wealth. From the age of 52 total wealth declines because pension wealth is lower compared to the old situation as the reduction in pension payoff is no longer offset by another form of private wealth.

The present value of future consumption with this link between pension wealth and housing wealth increases slightly to €2,377,683.

2. Taxes and $r_p = r_m = r = 3.5\%$

Because pension withdrawals are made in different years, the tax on the pension withdrawal will increase over the years in which pension savings are substituted. That is because the tax on pension withdrawals depends on the year in which the pension withdrawal is made. In other words, in this section the time of withdrawal, i.e. *t=w*, is not constant anymore. The following tax rates will apply per age:

Table 5.1: Tax rate on a pension withdrawal per age

Age	Tax rate
35	11.6609%
36	12.2212%
37	12.7823%
38	13.3442%
39	13.9068%
40	14.4698%
41	15.0333%
42	15.5970%
43	16.1609%
44	16.7247%
45	17.2885%

Figure 5.20 shows the fluctuations in non-housing disposable consumption and Figure 5.21 the fluctuations in total wealth per age.

Figure 5.20

Δ Non-housing consumption per age

Figure 5.21

Δ Wealth per age
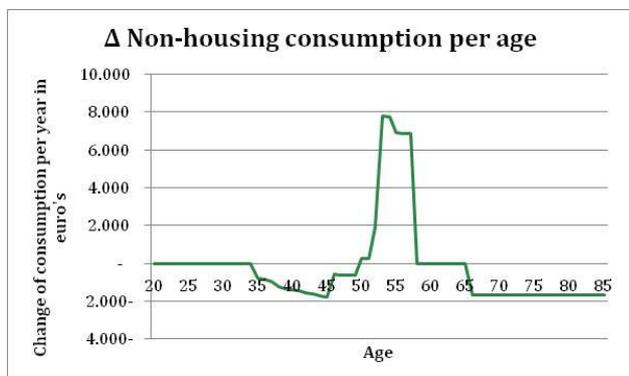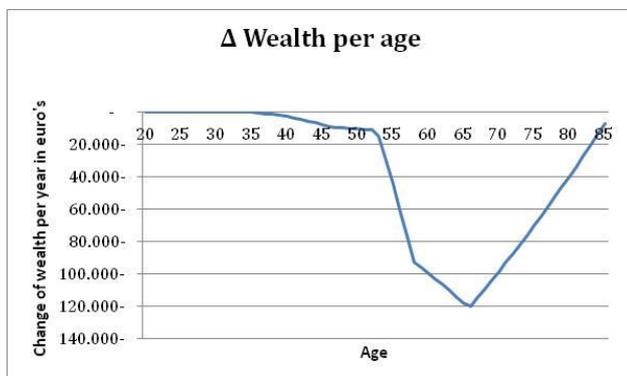
With the introduction of taxes, non-housing consumption decreases between the ages 35-50. The decrease during the years of substitution of the pension payments results from the decline in tax benefit; pension savings, which are tax deductible, are lower (10% instead of 15%). The decrease between the ages 45-50 is caused by the split of the mortgage payments between principal and interest. A larger part of the mortgage loan is repaid as a result of the extra mortgage payments. The mortgage debt thus decreases, and less interest needs to be paid. Individuals profit from the mortgage interest rate deductibility at a lower rate since interest payments decline.

From age 50, individuals benefit from the Hillen Act (explained in Chapter 4) as the tax on homeownership is removed. This leads to an increase in consumption. From age 52, the mortgage loan is repaid so that consumption increases. The decrease in the positive change in consumption is caused by (1) price inflation (real consumption decreases when we have a constant nominal increase in consumption) and (2) the tax on the pension withdrawal increases as an individual become older (w increases).

Total wealth now declines from age 35 as the decrease in pension payments is larger than the increase in mortgage payments, due to the introduction of the tax on the withdrawal. The total difference in wealth at the age of retirement does not change compared to the case without taxes, as the missed pension wealth and payoff do not change.

The present value of future consumption decreases from €1,352,629 to €1,348,479.

3. No taxes and $r_p = r = 2.54\% < r_m = 4.7\%$

Figure 5.22 on the next page shows the difference in consumption when the return on pension savings is lower compared to the mortgage interest rate. Consumption before retirement increases more compared to the case where $r_p = r_m = r$. This is because individuals benefit more from extra mortgage repayments since their mortgage loan is more expensive due to the higher mortgage interest rate.

Figure 5.22
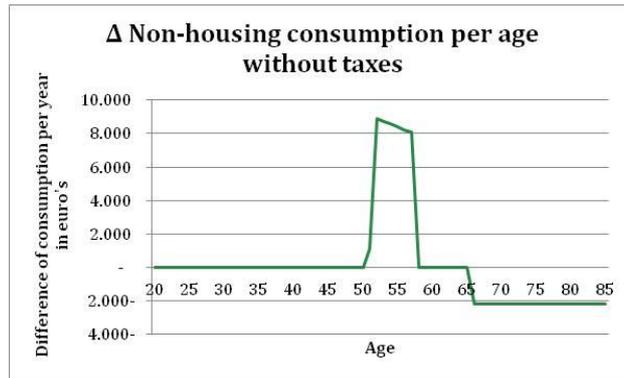
Total wealth does not change during the period when pension savings are partly substituted by extra mortgage repayments (Figure 5.23). After the substitution period, total wealth is higher until the age at which the mortgage loan is fully repaid in the new situation. This is the result of the higher mortgage repayments after this period compared to interest payments (Figure 5.24).

Figure 5.23
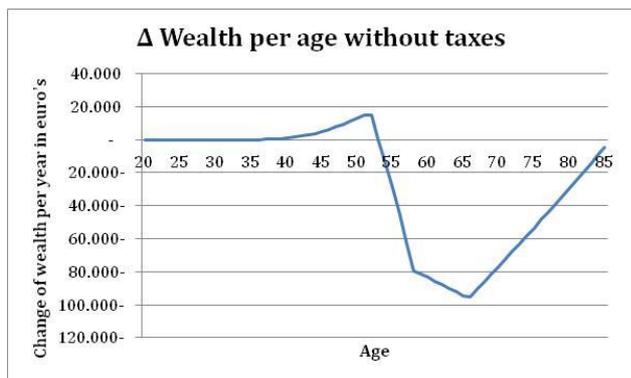
Figure 5.24
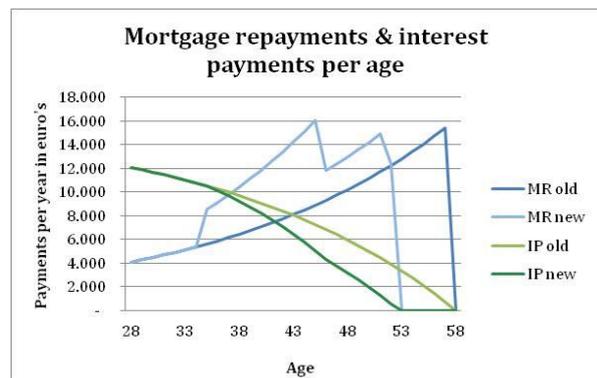
With an annuity mortgage loan, the borrower pays every year the same amount to the bank that provides the loan. When individuals between the ages 35-45 make extra mortgage repayments, the outstanding mortgage loan balance will be significantly lower at age 45. Therefore, also less interest will be paid. This means that between age 45 and the age at which the mortgage loan is fully repaid, the amounts that a borrower pays to the bank exist of more repayment of principal than interest compared to the old situation (the total payment amount does not change). Therefore, total wealth increases because housing wealth increases more than the amount by which pension wealth decreases. Total wealth decreases from the time when the mortgage loan is fully repaid, since from that time pension wealth will be lower compared to the old situation, which is not offset by an increase in another form of private wealth.

When the nominal mortgage interest is higher than the nominal return on pension savings, total consumption increases. The net present value of future consumption goes up from €2,956,249 to €2,967,801.

4. Taxes and $r_p = r = 2.54\% < r_m = 4.7\%$

The change in consumption with the introduction of taxes and a difference between the mortgage interest rate and the return on pension savings is shown in Figure 5.25.

Figure 5.25
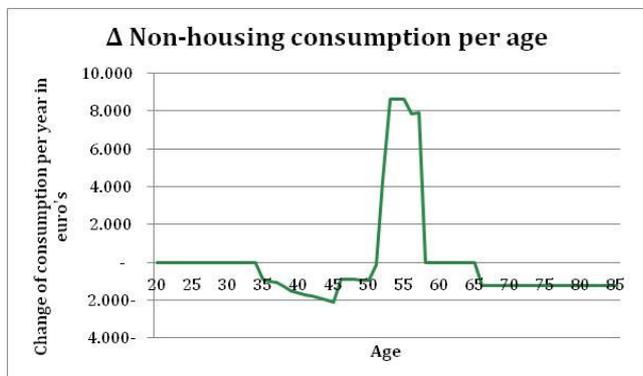
Figure 5.26
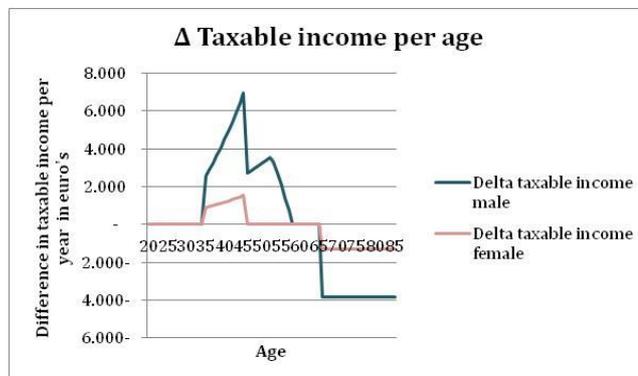
First of all, consumption during the period when pension savings may be substituted by extra mortgage repayments will be lower. This is because individuals have to save an equal percentage of their gross income for private wealth (15%), while only 10% is deductible from taxable income. Pension premiums are fully deductible from taxable income, whereas for mortgage payments only the mortgage interest is deductible. Therefore, taxable income in the ages 35-45 goes up (Figure 5.26). Thereafter, the yearly annuity mortgage payments consist more of mortgage repayments than interest payments compared to the old situation (explained in Figure 5.24). The lower interest amounts paid result in less tax benefit from mortgage interest deductibility. The taxable income of the male in the household thus goes up, and non-housing disposable consumption goes down. Also in this case, individuals benefit sooner from the tax provisions of the Hillen Act, so that consumption increases from the age of 50. Between the ages 52-58, consumption increases €8,000. This sharp increase is due to the mortgage loan being fully repaid.

With the introduction of taxes and $r_p < r_m$, the decrease in consumption during retirement is €1,200 lower than in the case without taxes and equal interest rates.

Also, when taxes are introduced, and with mortgage interest higher than the return on pension savings, there is a small positive change in the present value of future consumption. This increases from €1,714,366 to €1,715,440.

5.8. Summary

This chapter has explored several possible links between pension wealth and housing wealth. There are two reasons to make use of pension wealth for housing purposes: (1) to change the nature of savings, and (2) to change the level of savings.

When households want to change the nature of their savings, they make use of arbitrage opportunities. In this case, a loan is offered by the pension fund that is used to decrease the outstanding mortgage loan. This

can be done by making a single withdrawal or by making regular withdrawals. The reduced mortgage loan leads to reduced housing costs. The reduction in housing costs must be repaid to the pension fund in order to eliminate the loan from the pension fund. Arbitrage opportunities exist only if the interest rate on the mortgage loan is higher than the return on pension savings.

To change the level of savings, we allowed households to make use of intertemporal substitution of consumption. In this way, a single or multiple amounts are withdrawn from the pension savings account. These amounts are directed to the bank to lower the outstanding mortgage loan balance. Accordingly, households profit from a higher consumption pattern before their age of retirement. This will result in lower pension wealth. Households gain from intertemporal substitution only if the individual discount rate is higher than the interest rate set by the government (which is assumed to be equal to the mortgage interest rate and the return on pension savings).

The financial consequences are calculated for three different situations:

1) A single withdrawal for arbitrage opportunities. As explained above, arbitrage opportunities exist only when the mortgage interest rate is higher than the return on pension savings. If we introduce a mortgage loan where the interest rate is fixed for 10 years, the nominal mortgage interest rate will be 4.7%. Because the money is borrowed from a bank and can thus be considered a 'safe loan', this is compared to a return on pension savings with the same risk profile and duration, thus a Dutch government bond. A Dutch government bond has a nominal return of 2.54%. The borrower withdraws 10% of the value of a house from his/her pension savings account in order to make a down payment on the house. Because the borrower must repay the lower housing costs back to the pension fund, there will be no change in total consumption before retirement. Middle-income households will have a real net increase in consumption of €420 per year during the retirement period.

2) A single withdrawal for intertemporal substitution of consumption. The same assumptions and variables are used as in the case for arbitrage opportunities. Thus, 10% of the value of the house is withdrawn from the pension savings account in order to lower the mortgage loan needed for purchase of the house. The nominal mortgage interest rate is set at 4.7% and the nominal return on pension savings at 2.54%. For middle-income households this will result in an average real net increase in consumption of €800 per year during the time that the household has an outstanding mortgage loan, and a real net decrease in retirement income of €800 per year.

3) Regular withdrawals for intertemporal substitution, reducing the total duration of the mortgage. Households are allowed to substitute one-third of the yearly pension savings by extra mortgage payments during the 35-45 age period. The yearly annuity payment (principal plus interest) is not adjusted, so that the mortgage loan will be fully repaid at an earlier stage of life. The nominal mortgage interest rate is set at 4.7% and the nominal return on pension savings at 2.54%. In this case, the mortgage loan is fully repaid at age 52 instead of 58, leading to an increase in real net consumption of €8,000 per year. The increase in consumption before the age of retirement results in a real net decrease in pension income of merely €1,200 per year.

6. Dutch interest in using pension savings for housing purposes

When we consider combining pension wealth and housing wealth, the first question that arises is whether this will make Dutch households financially better off (which is investigated in Chapter 5). Aside from this important consideration, it is important to know whether Dutch households actually wish to combine their pension wealth with their housing wealth. This chapter investigates the question: are Dutch households interested in combining pension wealth and housing wealth? And if so, is that because households wish to save for retirement in a *different* way than through their pension fund, or because they wish to save *less* for their pension and instead consume more now?

6.1. Theoretical Framework

Aside from hyperbolic discounting (explained in Chapter 1), another fact seems to impact the degree to which individuals are willing to save for retirement: their inability to imagine themselves as retirees. Pronin et al. (2008) showed in several experiments that individuals make the same decisions about their future self as they would do for others, which are different from the decisions they would make for their present selves. According to Hershfield et al. (2011), if people are estranged from their future selves, the decision to consume or to save feels like a choice between spending money on yourself or giving it to a stranger. They conducted research in which two groups saw a different picture of themselves in a virtual mirror; the treatment group saw a picture of their future self, while the control group got a digital representation of their current self. In the Hershfield study, participants were given the task of imagining that they had unexpectedly received $1,000 and were asked how they would allocate it among four options. One of those four options was to 'invest it in a retirement fund'. Among the 50 participants investigated, the individuals in the treatment group, who had seen their future self, were more than twice as much willing to save their money for retirement compared to the control group.

In another study by Hershfield et al. (2011), participants were asked how much they would want to *contribute* to their pension fund. Here also a distinction was made between the treatment group and the control group by giving them a picture of their current self (control group) or future self (treatment group) (Figure 6.1).

Figure 6.1: Example of the digital representations shown to individuals
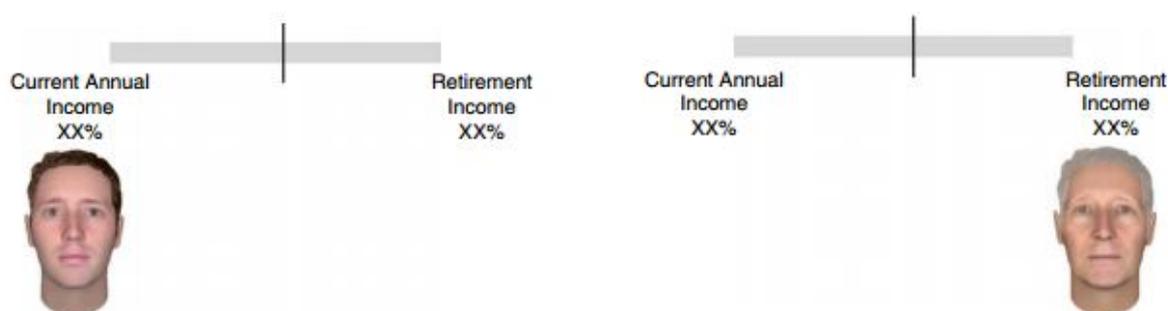
Source: Hershfield et al. (2011)

To help the individual participants in the study, they were shown how their chosen contribution rate would affect current and future income. Also in this case, individuals in the treatment group were more concerned about their pension income; the contribution rates chosen were 6.76% in the treatment group compared to 5.2% in the control group.

If this holds, i.e. if individuals indeed lack the willingness to save for their retirement income because they perceive their 'future self' as someone else, it would be helpful to give them the option to save in a way whereby it is more obvious that they gain from saving for the future. If they already own their house, it might be more obvious to see the benefit of building housing wealth by increasing their mortgage repayments so that their private debt goes down. People know that when the mortgage loan is repaid, their housing costs will disappear at an earlier stage of life.

Moreover, as the use of pension savings for housing purposes decreases mortgage debt, this could be of interest for a household whose mortgage loan exceeds the value of the property. There is also the liquidity motive for individuals who are unemployed or who have less income as a result of the financial crisis, so that some extra income would be welcome (to make use of *intertemporal substitution of consumption,* explained in Chapter 2).

6.2. Characteristics that may impact interest in pension withdrawals

6.2.1. Age of the individuals

Retirees are likely to have a different view on the use of pension savings as they already experience dependency on pension savings for their retirement income. This means that there may be differences in interest between workers and retirees. As individuals face behavioral biases such as hyperbolic discounting, they will be inclined to consume as much as possible. In that respect, the interest to use pension savings before the age of retirement may be much higher among young persons compared to older ones.

6.2.2. The housing position of individuals

There will be a difference in the degree of interest between **tenants and homeowners**. A couple that wants to move to a privately owned house but currently lives in a rental house faces borrowing constraints due to the strict lending standards of banks. It may be quite willing to sacrifice pension savings in order to become eligible for a mortgage loan as it is in the couple's **interest to become homeowners**. On the other hand, a tenant who has no desire to become a homeowner will have no such interest.

Not only tenants but also homeowners may have the **desire to move**. If they do so, it might be in their interest to make a single withdrawal in order to obtain a lower mortgage loan, or to buy a larger house. Homeowners who have no plans to move will be less interested in a single withdrawal for a down payment as they will not buy a house in the near future. Instead, if they face high mortgage installment requirements and other recurring costs, they will be more interested in monthly withdrawals of pension savings.

6.2.3. The value of the mortgage loan and the privately owned house

As a result of the financial crisis, house prices have dropped dramatically. At the moment, over a million households in the Netherlands are currently **'under water'** (Homefinance, 2013), meaning that they have a mortgage loan that is higher than the current market value of their house. Overall, the total difference in the Netherlands of households who have mortgage loans that are higher than the value of a house is 65 billion euros (DNB, 2013). This is relevant for people with a negative wealth who want to move. It might be in their interest to have the opportunity to withdraw a single amount from their pension savings in order to pay off the difference between their mortgage loan and the value of their house.

6.2.4. The outstanding mortgage loan

Finally, for homeowners who still have an **outstanding mortgage** loan it might be in their interest to make regular withdrawals from their pension savings account for extra mortgage repayments. This would lower their monthly housing costs so that more money is available for consumption before retirement. If the mortgage loan is already fully repaid, then it will be of no interest to use pension savings for housing purposes as the privately owned house is already completely paid off.

6.3. The Dutch Household Survey

It is relevant to know what considerations people have in deciding whether it is in their interest to use part of their pension savings for a mortgage loan. If people wish to use their pension savings, is this strictly because they prefer to consume now rather than save for their pension income, or is it because they do not like the way we have to build up our private wealth for a pension in the Netherlands?

6.3.1. The Survey

A survey on this was conducted by CentERpanel, which adequately represents the Dutch population. CentERpanel has a database of households in the Netherlands that fill out questionnaires at home every week via the Internet. Households without a computer are provided with a simple computer and Internet access, so that it is possible to reach participants from all ages and income levels (CentERdata, 2013).

The questionnaire was completed between September 13 and 17, 2013. A pre-selection was made to exclude students and children from the survey. This is because children who still live with their parents as well as students are not relevant for the questionnaire since they do not face decisions about the purchase of a house. The questions were submitted to 2,853 participants aged 16 and older; 1,907 of them completed the survey (73.8%).

6.3.2. The Questionnaire

In the questionnaire, two different combinations of pension wealth and housing wealth were investigated:
1. *Single withdrawal* from the pension savings account to reduce the mortgage loan needed to buy a new house.
2. *Regular withdrawals* from the pension savings account to enable extra mortgage repayments.

As explained in Section 6.2, the combination which would interest individuals most depends on the home occupation status. Moreover, whether a person is interested in a link between pension wealth and housing wealth will also depend on that person's labor market status (i.e. whether the participant is retired or not). Therefore, the combination of pension wealth and housing wealth (single or regular withdrawal(s)) shown to individuals depended on age, homeownership or tenancy, and the desire to move within a few years. These characteristics were asked at the start of the questionnaire so that participants could be divided into categories.

Figure 6.2: Questionnaire sent, based on characteristics of the participants
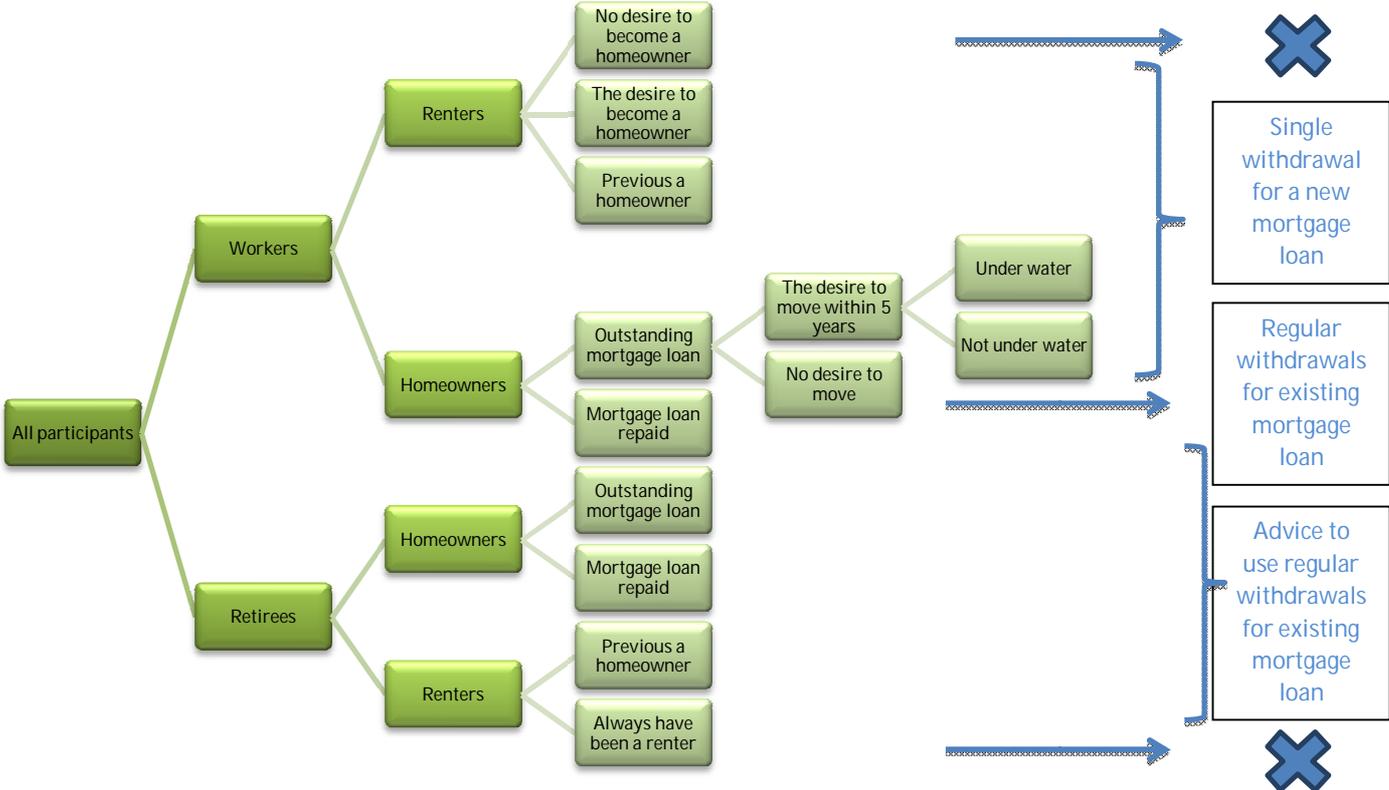
Questionnaire sent to workers:

- **Homeowners**
    - *Homeowners with an outstanding mortgage loan who have no wish to move:* When individuals do not wish to move, they are unlikely to buy a new house within a few years. According to Kahneman & Snell (1992), it is very difficult for people to imagine what they would do in a particular situation. More specifically, there is a gap between what we would do in a particular situation and what we actually do. Therefore, survey participants who do not intend to move within five years were asked whether they would wish to make *regular withdrawals* to pay off their existing mortgage loan.
    - *Homeowners with an outstanding mortgage loan who wish to move:* Homeowners who wish to move were asked whether they would want to be in a position to make a *single withdrawal* for the down payment of a new mortgage loan.

- o *Homeowners who had fully repaid their mortgage loan:* When a mortgage loan is already completely repaid, it is not useful to withdraw pension savings for housing purposes. Therefore, these people were asked whether they would *advise* homeowners with an outstanding mortgage loan to make *regular withdrawals* in order to repay their existing mortgage loan.

- **Tenants**
  - o *Tenants who wish to buy a house:* Tenants might be willing to buy a house in a couple of years, especially young people who have just entered the labor market. Therefore, such participants were asked whether they would want to make a *single withdrawal* in order to reduce the mortgage loan needed for the purchase of a house.
  - o *Tenants who were homeowners in the past:* Tenants who were homeowners in the past might rent now because of the high mortgage repayments. These participants were asked whether they would be interested in a *single withdrawal* from their pension savings account for the purchase of a house.
  - o *Tenants who do not wish to become a homeowner:* Tenants who do not wish to become homeowners have no intent to use pension savings for the housing market, so this group was excluded from the panel.

Questionnaire sent to retirees:

- **Homeowners**
  - o *Retired homeowners:* As retirees experience the level of their retirement income, the question was asked whether they would advise workers to use pension savings for periodic mortgage repayments before the age of retirement.

- **Tenants**
  - o *Retired tenants who were homeowners in the past:* Retired participants who live in a rental house but who owned a house in the past have the experience of repaying a mortgage loan. Hence, they were asked whether they would *advise* homeowners who are not retired to make *regular withdrawals* to repay their outstanding mortgage loan.
  - o *Retirees who have always rented:* For retired persons who have never been a homeowner the questionnaire is not relevant, so they were excluded from the survey.

The complete questionnaire sent to participants can be found in the appendix.

6.4. Results

6.4.1. Housing status of the participants in the survey

Because we needed to know the housing status of survey participants so as to ask the right questions about pension wealth and housing wealth, this was the first question asked. The housing position of the participants is shown in Figure 6.3.

Figure 6.3

Housing position of the participants
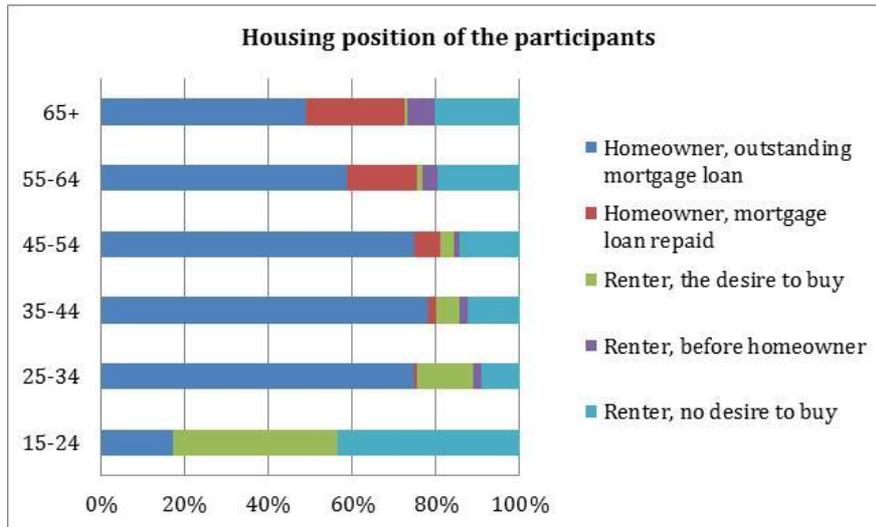
There is a large jump in the number of homeowners among participants in the 15-24 and 25-34 age categories. This is due to the fact that a larger percentage of persons in the 25-34 age category is active in the labor market. This is in line with the relation found between income and homeownership: owning a house is positively related to net income at a significance level of 5%.

Among the homeowners, the share of participants with an outstanding mortgage loan has a significant negative relation with the age of individuals. However, a majority of the retirees who own a house still have an outstanding mortgage loan.

Figure 6.4

Do you have the desire to move in 5 years?
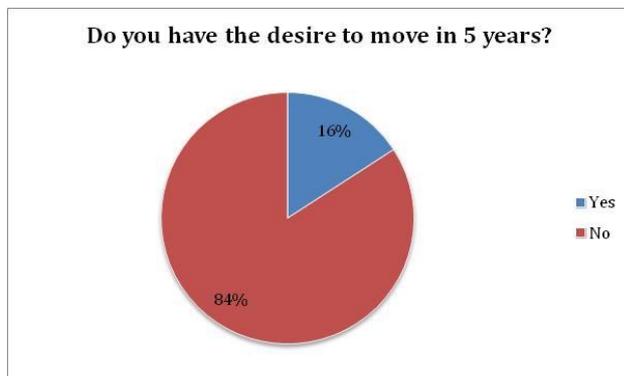
As we also wanted to know whether participants wish to move to another house, this was the next question participants had to answer. Among the homeowners in the panel, 16% would want to move to another house within five years (Figure 6.4).

Figure 6.5

Do you estimate the value of your mortgage higher compared to the value of your house?
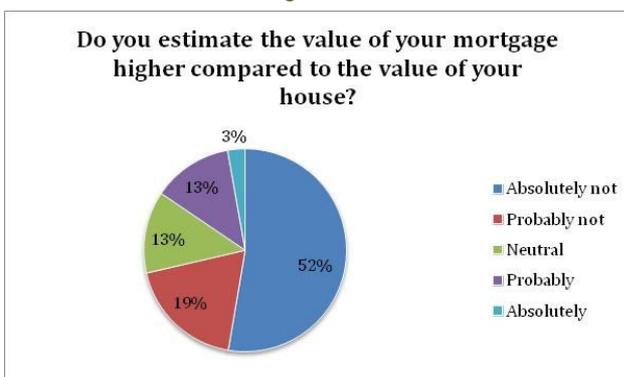
Among the homeowners with an outstanding mortgage loan, 16% estimated the balance of their mortgage loan to be higher than the value of their property (Figure 6.5). Younger persons indicated significantly more often that they were 'under water', which is in line with the data described in Chapter 1.

6.4.2. The scaled importance of savings, debt, and recurring costs

Before giving any information about using pension savings for housing purposes, people had to scale the importance of multiple (money-) related issues. Figures 6.6, 6.7, and 6.8 show the results of the scaled importance that workers assigned to minimization of debt, low recurring costs, and a high level of retirement income. Furthermore, homeowners were asked to scale the importance of the repayment of a mortgage loan, while tenants were asked to scale the importance of becoming a homeowner.

One result among the homeowners was that a mortgage loan is not perceived in the same way as consumer debt. More specifically, the repayment of a mortgage loan is seen as less important compared to debt minimization. The importance of the repayment of a mortgage loan decreases when participants are older. This could be due to government restrictions. Individuals who buy a new house nowadays have to buy an annuity or straight-line mortgage loan, which has to be repaid within 30 years in order to be entitled to mortgage interest deductibility. Homeowners only can profit 30 years from this mortgage interest deductibility (explained in Chapter 4). Another reason may be that older persons have less debt since they have repaid a larger part of their mortgage loan.

Another interesting fact from the comparison of participants with different housing positions is the scaled importance assigned to minimization of debt. This is perceived as by far the most important aspect among the homeowners who have repaid their mortgage loan.

Finally, minimization of debt is more often seen as 'very important' than a high level of retirement income, reason for us to suggest that individuals might be interested in using pension savings for housing purposes. However, as mortgage loans are not perceived in the same way as minimization of debt, no conclusions can be drawn from these findings.

Figure 6.6

113

Figure 6.7

Scaled importance of homeowners, mortgage loan repaid (N=118)

Figure 6.8
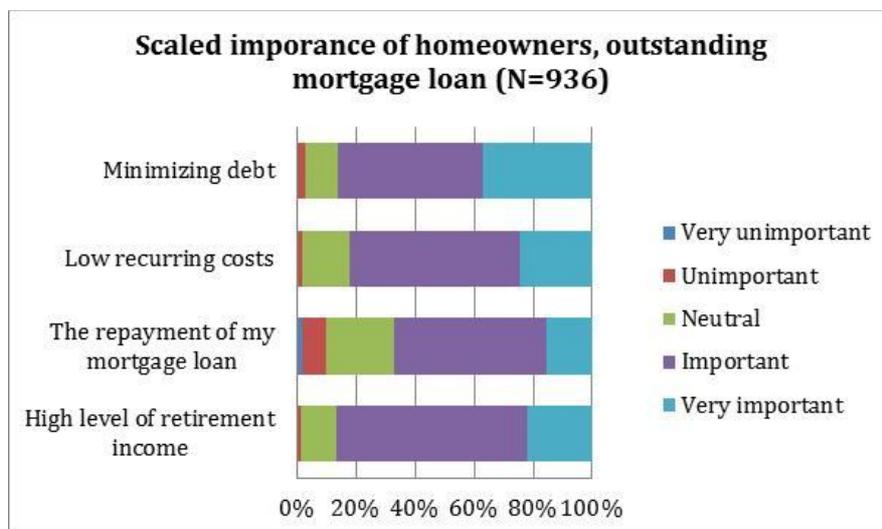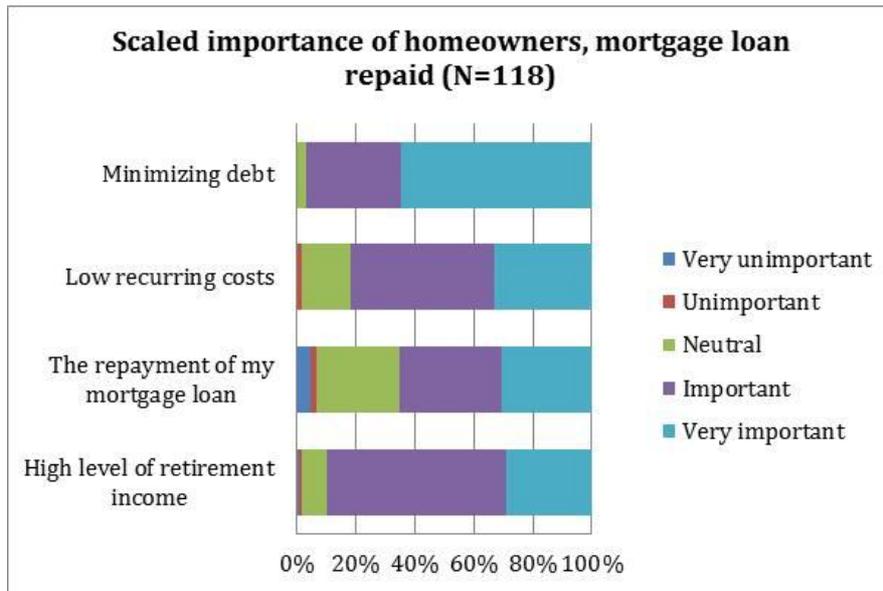
Scaled importance of renters (N=118)
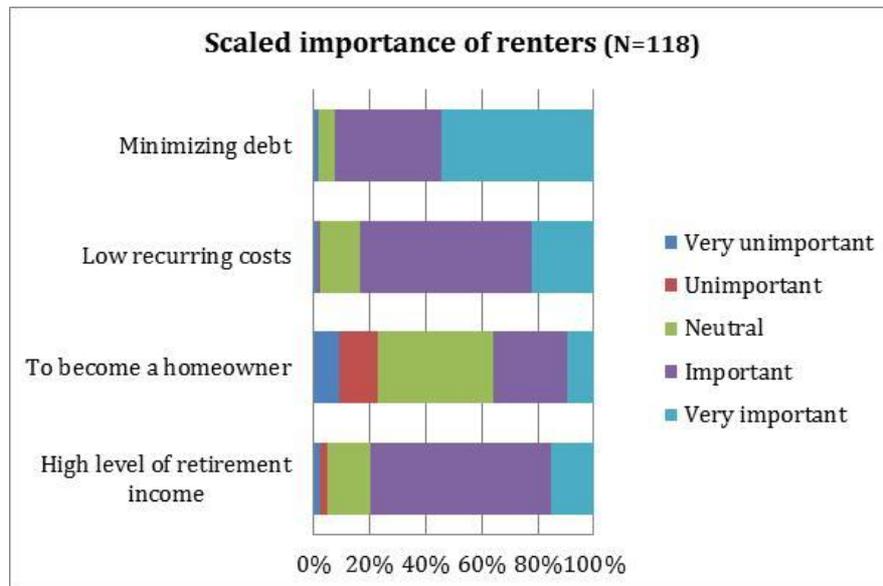
6.4.3. Interest among participants to make a single withdrawal

Before being asked to indicate whether they would want to make a single withdrawal from their pension savings account, participants were provided with information on the use of pension savings for a mortgage loan. It was pointed out to them that if they wanted to buy a house, they would have to obtain a high mortgage loan while at the same time having substantial pension savings. Also, the related advantages (lower mortgage loan and lower housing costs) and disadvantages (lower pension) were presented.

The extent to which individuals would choose to make a down payment when purchasing a new house through the use of a single pension withdrawal is shown in Figures 6.9 and 6.10 on the next page.

Figure 6.9   Figure 6.10

Interest to make a single pension withdrawal among the homeowners with the desire to move (N=148)

Interest to make a single pension withdrawal among the renters (N=118)
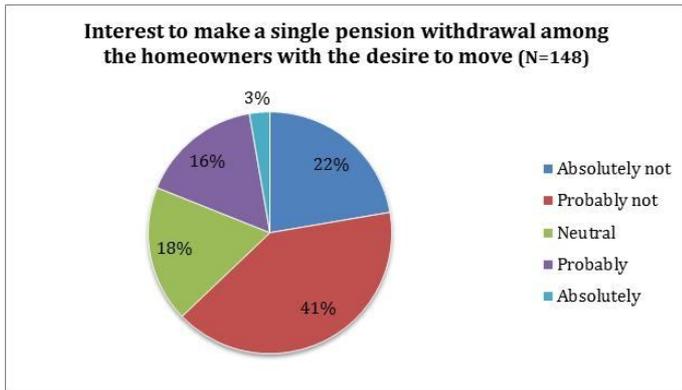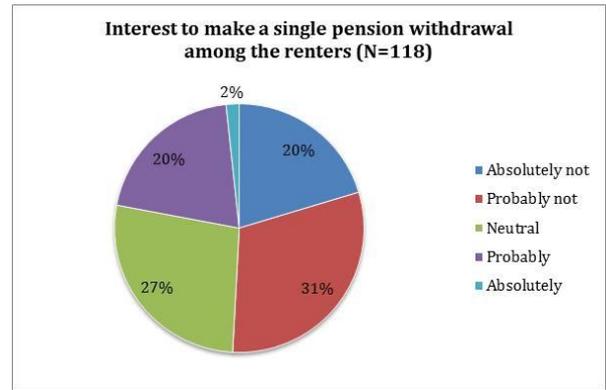
Looking at the willingness to use pension savings for a mortgage loan, individuals who rent are more likely to make use of a single pension withdrawal compared to homeowners who wish to move: 22% of tenants probably or absolutely would want to use this combination, compared to 19% of homeowners who intend to move. Also, fewer individuals reject the use of pension savings for the down payment of a mortgage loan. However, there is no significant difference in the willingness to use pension savings between the group of individuals who are tenants and want to buy compared to the individuals who rent but were homeowners in the past.

Accordingly, participants were asked why they would or would not wish to make a single pension withdrawal. If they were neutral in the use of pension savings for a mortgage loan, the question was asked what would make them decide to make a single pension withdrawal.

One detail that should be noted is the small number of participants who are tenants that wish to buy and do not reject the use of pension savings. This might influence the level of significance in this survey.

Figure 6.11

Reason to be interested in a single pension withdrawal among homeowners with the desire to move (N=28)

- Lower debt
- To move earlier
- Lower housing costs
- Mortgage repayments are more safe than pension savings
- I would like to save less
- Otherwise...

25% 11% 25% 25% 3% 11%

Figure 6.14

Reason to be interested in a single pension withdrawal among renters (N=26)

- Lower debt
- To move earlier
- Lower housing costs when I buy a house
- Mortgage repayments are more safe than pension savings
- I would like to save less
- Otherwise...

15% 0% 38% 35% 0% 12%

Figure 6.12

Reason for not being interested in a single pension withdrawal among homeowners with the desire to move (N=93)

- It is important to have enough pension wealth
- I don't want have the temptation of spending my savings
- The use of mortgage interest deductibility
- Investment in pension is more safe
- Otherwise...

54% 24% 5% 5% 12%

Figure 6.15

Reason for not being interested in a single pension withdrawal among renters (N=51)

- It is important to have enough pension wealth
- I don't want have the temptation of spending my savings
- The use of mortgage interest deductibility
- Investment in pension is more safe
- Otherwise...

57% 15% 5% 8% 15%

Figure 6.13

The fact on which the degree of interest is dependent among homeowners with the desire to move (N=26)

- The financial consequences
- The amount of the permitted withdrawal
- Otherwise...

58% 38% 4%

Figure 6.16

The fact on which the degree of interest is dependent among renters (N=32)

- The financial consequences
- The amount of the permitted withdrawal
- Otherwise...

34% 44% 22%

6.4.3.1. Reasons for interest (or not) in a single pension withdrawal among homeowners wishing to move

Of homeowners who wish to make a single pension withdrawal, 75% give the reason of lower debt, lower housing costs, and the perceived safety of mortgage repayments (each counting for 25%); 11% give the reason of being sooner in the position to move, but that has no significant relation with the extent to which their mortgage loan balance is higher compared to the value of their house. People selecting 'otherwise' found it more important to have more consumption during the working period since that is perceived as more expensive.

For individuals who do not wish to withdraw their pension savings (Figure 6.12), the reason selected most is the importance of having enough pension income (54%). Next to the importance of pension income, individuals are afraid of the temptation to consume pension savings before their retirement, with higher educated persons taking this consideration significantly more into account. Clearly, higher educated persons are more aware of the risks related to the permission to withdraw pension savings. The majority of the participants who gave a different answer than the options shown have not built up enough pension or see no effective way to transform home wealth into pension income in the Netherlands.

People who are neutral about the use of pension savings for a down payment (Figure 6.13) mostly give as reasons the dependency on the return on pension savings and the mortgage interest rate. Also the amount of the permitted withdrawal is seriously taken into consideration, with individuals in the lower income categories taking this consideration more into account. However, as this panel is very small, we cannot make any reliable conclusions from this result.

6.4.3.2. Reasons for interest (or not) in a single pension withdrawal among tenants

The majority of the participants who would wish to make a single pension withdrawal give lower housing costs as their reason. This enhances the idea of withdrawing pension savings in order to benefit from lower housing costs during the working years (i.e. *intertemporal substitution of consumption*). An interesting fact about the tenants is that, of all the participants who would wish to make a single pension withdrawal, no one wants to do so in order to move earlier. Another striking point is that more than one-third regard the repayment of a mortgage loan as safer compared to pension savings with a pension fund (Figure 6.14). The majority of participants who gave another reason than the multiple choice options stated that they prefer lower housing costs and that they would save for their retirement income by themselves. This enhances the idea of preferring to save in another way than as required by Dutch pension schemes.

Finally, most participants who are neutral about the use of pension savings state as reason the dependency on the permitted withdrawal amount. This is contrary to homeowners, as their decision is mostly guided by financial considerations. This may reflect the degree of education, as homeowners have had significantly higher education compared to the tenants in this panel; it may be that homeowners understand the exchange of the mortgage interest rate and the return on pension savings better.

6.4.4. Interest among participants in making regular withdrawals

The study of the level of interest in making regular withdrawals was conducted among the participants who own a house with an outstanding mortgage loan, and who do not have the intention to move.

Before asking whether participants would wish to make regular pension withdrawals for the repayment of a mortgage loan, information was given on the use of pension withdrawals. More precisely, participants were provided with information about the use of pension savings for mortgage repayment and the corresponding advantages (lower housing costs sooner, lower mortgage loan) and disadvantages (lower pension income, as we investigate the interest in *intertemporal substitution of consumption*). Participants then had to score their interest in using regular pension withdrawals. Finally, they were asked to give their underlying reason for their scaled interest.

Figure 6.17
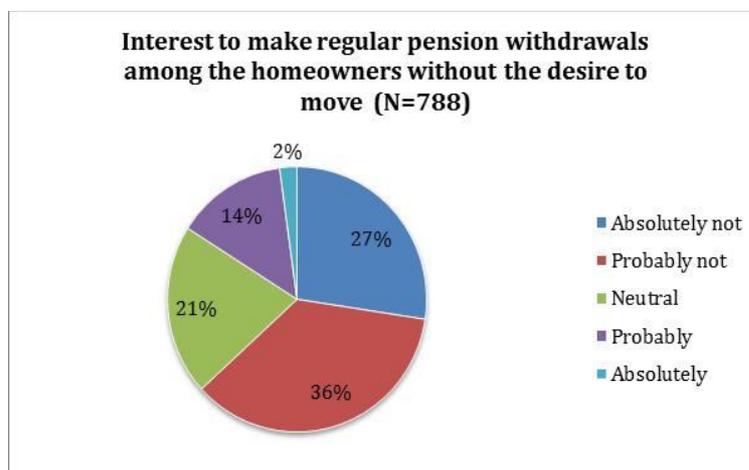
The majority of homeowners who do not intend to move would not use pension savings for mortgage loan repayment (63%). When individuals rated high retirement income as more important (see Section 6.4.2), their willingness to use pension savings statistically decreased significantly. No significant relation was noted with the rated importance of mortgage repayments.

A significant negative relationship exists between the age of participants and the willingness to substitute pension savings by mortgage repayments. There is a significantly higher interest among the 25-34 and 45-54 age groups compared to the 55-64 age group. Moreover, if individuals are 'under water' and/or have children, they are more willing to use pension savings for mortgage repayment.

As to participants who choose not to substitute their pension savings, most reject this because they find it important to have enough pension income (Figure 6.18 on the next page). This reason is chosen significantly more often by individuals who rate a high level of retirement income as more important (Section 6.4.2). Next to the importance of having a high level of pension income, 20% of the participants reject the use of regular withdrawals because they do not want to be tempted to use pension savings before their retirement. Clearly, individuals are afraid of falling into the temptation to use pension savings as they consider the risk of consuming too much pension wealth. Another interesting fact to note is that individuals *without* children give significantly more the reason of the importance of retirement income. By contrast, participants *with* children more often reject the use of pension savings because of the

corresponding temptation to consume pension savings. This may reflect the fact that households with children have a higher need to withdraw their pension assets because of higher recurring costs.

Figure 6.18

Reason for not being interested in regular pension withdrawals among homeowners without the desire to move (N=497)

Figure 6.19

Otherwise... (N=91)
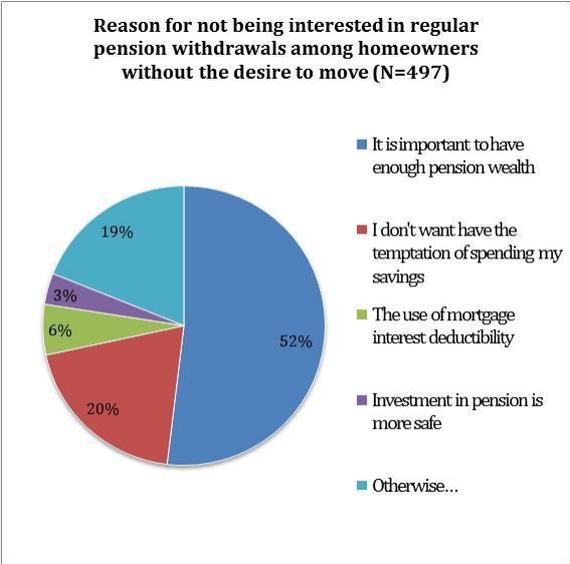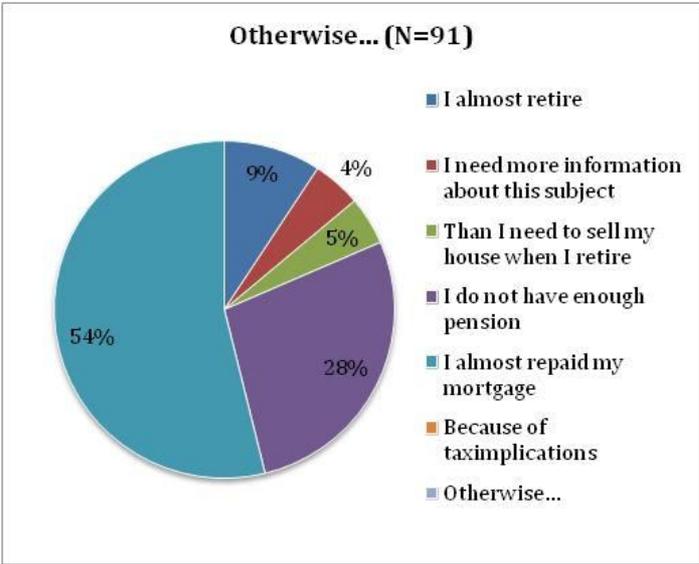
Participants were also allowed to give another answer if their reason to reject the use of regular withdrawals was not included in the multiple choice answers (Figure 6.19). When these answers are grouped into new categories, more than 50% of the participants who chose a reason other than the options shown would not use their pension savings because of a negligible mortgage loan. Another 28% reject the use of regular withdrawals because they do not have enough pension wealth for the repayment of their mortgage loan.

Figure 6.20

Reason to be interested in regular pension withdrawals among homeowners without the desire to move (N=126)
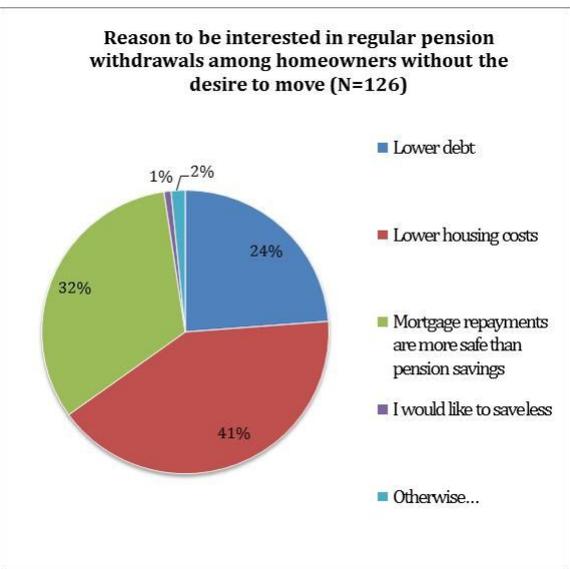
When individuals wish to make regular pension withdrawals, they do so mostly because of the resulting lower housing costs (41%) (Figure 6.20). This enhances the idea of using pension savings to consume more today and save less for retirement (i.e. *intertemporal substitution of consumption*). Participants who scaled minimization of debt as more important significantly more intent on making regular withdrawals because of the resulting lower mortgage loan. Remarkably, almost one-third of the participants who would substitute pension savings do so because they consider mortgage repayments safer than pension savings. Such persons might also be interested in using pension savings for *arbitrage opportunities.*

Figure 6.21

The fact on which the degree of interest is dependent among homeowners without the desire to move (N=163)

- The financial consequences
- The amount of the permitted withdrawal
- Otherwise...
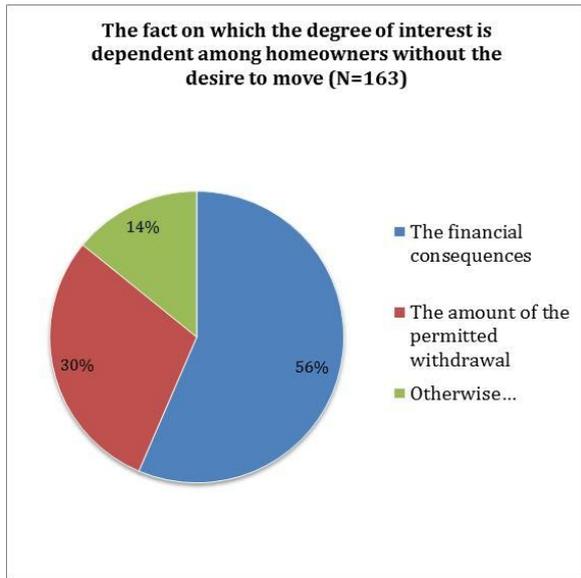
Finally, the survey examined what factors determine whether individuals would use pension savings if they are neutral on this subject. The reason given most is the dependency on the financial consequences: the return on pension savings and the interest rate on mortgage loans. Males choose significantly more for this reason, which cannot be explained by a degree of education. Moreover, there is a negative relationship between the choice of the financial consideration and yearly net income. Also, the amount allowed to be withdrawn makes sense to participants: 30% opt for this reason. Individuals with a higher net income chose significantly more often for the option that it depends on the amount permitted to withdraw. If individuals indicate the amount of their mortgage loan being higher than the value of their house, then the permitted amount to be withdrawn is considered more often.

6.4.5. The advice of homeowners who have repaid their mortgage loan and of retirees

It is relevant to consider whether homeowners who repaid their mortgage loan and retirees would advise homeowners with an outstanding mortgage loan to substitute pension savings by mortgage repayments through the use of regular withdrawals. The results are shown in Figures 6.22 and 6.23.

In total, 24% of the homeowners advise making use of regular withdrawals. Of the retirees, 19% give the advice to make regular withdrawals from the pension savings account to repay the outstanding mortgage loan. Clearly, homeowners who have repaid their mortgage loan and retirees view substitution of pension wealth and housing wealth more positively than homeowners with an outstanding mortgage loan (where 16% stated interest in the use of regular pension withdrawals).

Figure 6.22

Figure 6.23

The advice of homeowners who have repaid their mortgage loan to make regular pension withdrawals (N=117)

- Absolutely not
- Probably not
- Neutral
- Probably
- Absolutely

The advice of retirees to make regular pension withdrawals (N=423)

- Absolutely not
- Probably not
- Neutral
- Probably
- Absolutely
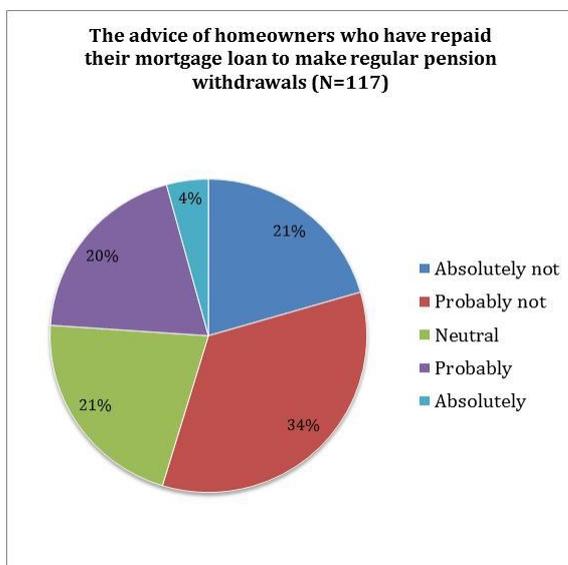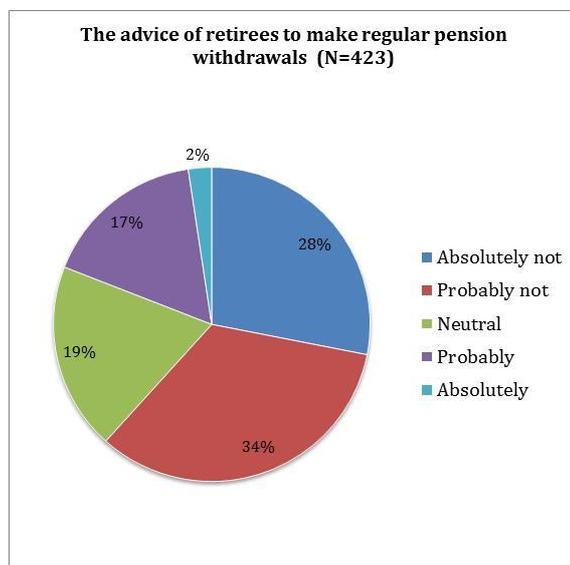
Still, a majority of the participants does not advise making regular pension withdrawals for mortgage repayments. The reasons for homeowners and retirees for advising (or not) the use of regular withdrawals are shown in Figures 6.24 through Figure 6.29 on the next page.

<u>6.4.5.1. The advice of retirees</u>

The reason given most often by retirees for not advising to substitute pension savings (Figure 6.24) is that it is important to have enough pension wealth. A difference between retirees compared to workers in the panel who have repaid their mortgage loan is that retirees more often give the reason that saving via the pension fund is safer compared to investing money in a house. As to retirees who gave another answer than the optional answers, most of them indicated that there is no effective way transforming housing wealth into pension income and thereby being in possession of more illiquid assets.

Contrary to homeowners who repaid their mortgage loan, the majority of the retirees advise making use of regular pension withdrawals because of the consequently lower housing costs.

Among the retirees who were neutral in their advice to use pension savings (Figure 6.26), nearly the same percentage of participants gave the reason that it depends on the financial consequences of the pension withdrawal. Also among the retirees, men gave significantly more often the reason that it depends on the financial consequences. Moreover, retired participants with a lower yearly net income gave this reason significantly more often than participants with a higher net income. The participants who gave another answer than the options provided mostly said that they would not know whether they would advise others to use pension savings.

<u>6.4.5.2. The advice of homeowners who have repaid their mortgage loan</u>

The reasons given most by homeowners who advise against using pension savings for mortgage repayments are (again) the temptation to use pension savings and the importance of retirement income. However, participants who have repaid their mortgage loan point more often at the danger of the temptation to use pension savings and less for the importance of retirement savings compared to participants with an outstanding mortgage loan.

An interesting fact from the consideration in this group is that a majority of the participants who advise others to use pension savings give the reason that mortgage repayments are safer than savings in a pension fund (43%), as shown in Figure 6.28. It could be that these individuals have fully repaid their mortgage loan because they perceive mortgage repayments as less risky.

Finally, fewer participants who are neutral on the advice to substitute pension savings and mortgage loan repayments consider the financial consequences (meaning the comparison of mortgage interest rate and return on pension savings). Instead they choose more for the amount that individuals may withdraw. Individuals who chose the open option mostly gave the reason that they need more information about the financial situation of others in order to give a sensible advice.

Figure 6.24

The reason not to advise the usage of regular pension withdrawals among retirees (N=259)

- It is important to have enough retirement income — 45%
- You should not have the temptation to use pension savings — 37%
- To make use of the mortgage interest deductibility — 6%
- Investment in pension is more safe — 8%
- Otherwise… — 4%

Figure 6.27

The reason not to advise the usage of regular pension withdrawals among homeowners who repaid their mortgage loan (N=63)

- It is important to have enough retirement income — 41%
- You should not have the temptation to use pension savings — 41%
- To make use of the mortgage interest deductibility — 7%
- Investment in pension is more safe — 5%
- 6%

Figure 6.25

The reason to advice the usage of regular pension withdrawals among retirees (N=80)

- To have lower debt — 29%
- To have lower housing costs — 42%
- Mortgage repayments are more safe than pension savings — 24%
- To save less for retirement income — 2%
- Otherwise… — 3%

Figure 6.28

The reason to advice the usage of regular pension withdrawals among homeowners who repaid their mortgage loan (N=28)

- To have lower debt — 21%
- To have lower housing costs — 32%
- Mortgage repayments are more safe than pension savings — 43%
- To save less for retirement income — 0%
- Otherwise… — 4%

Figure 6.26

The fact on which the degree of interest is dependent among retirees (N=81)

- The financial consequences — 45%
- The amount of the permitted withdrawal — 44%
- Otherwise… — 11%

Figure 6.29

The fact on which the degree of interest is dependent among homeowners who repaid their mortgage loan (N=25)

- The financial consequences — 28%
- The amount of the permitted withdrawal — 52%
- Otherwise… — 20%

6.5. Summary

A survey was conducted by CentERpanel to examine the level of interest among the Dutch population in using pension wealth for the repayment of a mortgage loan. Also asked was: if Dutch households are interested in using pension wealth for a mortgage loan, is this because they want to save for retirement in a *different* way than via their pension fund, or because they want to save *less* for retirement income? Furthermore, the survey examined the considerations that people make in their interest (or lack thereof) in a link between pension wealth and housing wealth.

In the survey, we distinguished three different concepts for households with different housing positions:

1) The interest in a single withdrawal: Tenants who wish to buy a house and participants who own a house and wish to move were asked whether they would want to make a single withdrawal for a down payment on the house. About 20% of the participants expressed interest in making a single pension withdrawal for the down payment of the house. When the amount involved is such that retirement income will not fall too much and the after-tax mortgage interest rate is higher than the after-tax return on pension savings (i.e. when adding the participants who indicated being neutral for these reasons), this interest level rises to 40%. A majority of the participants who reject making a single pension withdrawal gave as reason the importance of a high level of pension income. The resulting lower housing costs are the main driver of the participants who are in favor of a single pension withdrawal.

2) The interest in regular withdrawals: This was surveyed among the homeowners in the panel with an outstanding mortgage loan who do not intend to move. The majority of the participants was not interested in using pension savings for housing purposes, and also among these participants the reason given most is the importance of a high level of pension income. Most of the survey participants who would wish to make pension withdrawals gave the resulting lower housing costs as reason. Furthermore, more than one-third gave as reason that it feels safer to make mortgage repayments than rely on pension savings.

3) The advice to make regular pension withdrawals: Retirees and homeowners were asked whether they would advise others to make regular pension withdrawals. Most of the participants did not advise using pension wealth for repayment of a mortgage loan because of the importance of a high level of retirement income. An interesting fact is that a majority the homeowners who have repaid their mortgage loan, who advise others to use pension savings, give as their reason that mortgage repayments are safer than savings in a pension fund (43%).

Conclusions

There are two reasons to make use of pension savings for housing purposes: (1) to change the *nature* of savings, and (2) to change the *level* of savings. When a household chooses to change the nature of its savings, it effectively is provided a loan by the pension fund that can be used to lower its mortgage loan. Consequently, the reduction in housing costs are repaid to the pension fund. By doing so, they make use of *arbitrage opportunities.* Arbitrage opportunities exist only when the mortgage interest rate is higher than the after-tax return on pension savings.

To change the level of savings, we could allow households to make use of *intertemporal substitution of consumption.* In this way, one or multiple withdrawals are made from pension savings and directed to the bank, thereby decreasing the outstanding mortgage loan balance. Or, alternatively, there is a partial replacement of monthly pension premiums by extra mortgage payments during a number of years. In this way a household can benefit from a higher consumption pattern before the age of retirement. Households will gain from intertemporal substitution of consumption only if the individual discounts future consumption at a higher rate than the discount rate used by the government.

Pension savings can be used for the purchase of a house by withdrawing such savings, which are then used for the down payment on the house. By doing so, it becomes easier to become eligible for a mortgage loan, and the housing costs and/or the mortgage interest rate involved in buying a house will be lower. Pension wealth can also be used as collateral, thus reducing the risk for banks and the corresponding mortgage interest rate.

Persons who already own their house can use their pension savings for mortgage repayment purposes. By doing so, they pay less to their pension account to apply the same amount towards an increase in mortgage payments. In this way, homeowners have a lower outstanding debt and will benefit sooner from full homeownership.

When people are allowed to consume the correspondingly lower housing costs, a negative consequence is a reduction of their retirement income. This negative aspect is eliminated if it is mandatory to repay the reduction in housing costs to the pension fund. Also, individuals may be faced with a higher amount of illiquid assets at the age of retirement. Therefore, when allowing the use of pension savings for housing purposes, care should be taken that there are cost-effective ways to transform housing wealth into pension income.

In addition to households, also other parties will be affected by the use of pension savings for housing purposes. The government will generate higher taxes due to the lower amount of deductible mortgage interest, and fewer households will need to make use of the National Mortgage Guarantee. At the same time, more regulation will be necessary. This is because (1) individuals might decide to buy a larger and/or more expensive house, making their wealth more vulnerable to the evolution of the value of their

home, and (2) when a household decides to sell its home, the wealth freed up may be used for something other than retirement income. Government intervention is highly recommended to oversee the consequences.

When a pension fund offers households the option to withdraw pension savings for housing purposes, this will result in greater satisfaction on the part of pension fund members who wish to make use of such option. A disadvantage could be the eventually lower return earned by the pension fund on pension savings, as that would require more liquid assets in the investment portfolio. Pension funds can mitigate this effect by charging this cost to individuals who withdraw pension savings.

Looking at foreign countries that have already implemented the use of pension savings for the housing market, we see that this implementation does not directly improve the financial position of retirees. More specifically, retirees in countries that offer the possibility of withdrawing pension savings are not necessarily in a better financial position than retirees in countries without this possibility. However, in financial terms they are not necessarily worse off. An intrinsic element to prevent worsening of the financial position of retirees as a result of allowing pension savings to be used for housing purposes is *regulation*. Individuals need to have clear allocations, and strict regulations are thus desirable to protect them from overspending pension savings before the age of retirement.

When considering how to implement the use of pension savings for housing purposes in the Netherlands to make use of arbitrage opportunities, it is useful to look at the financial arrangements in Canada to see how such link can be arranged. Canada provides a method to help first-time home buyers without the need to adjust their retirement income. In Canada, pension funds may offer a loan that is used for the down payment on the house. This loan must be repaid in 15 years through equal yearly installments. The Canadian system also offers solutions for difficulties that may arise regarding the repayment of the pension withdrawal. If the amount withdrawn has not been fully repaid at the retirement age, the individual may choose to make further repayments during the retirement period or to accept a lower retirement income. Nevertheless, the missed retirement income is added to taxable income to prevent the government from losing tax revenues.

If we want to permit individuals to withdraw pension savings to make use of intertemporal substitution of consumption, it is useful to look at the financial arrangements of the United States and Switzerland. In the United States, first-time home-buyers can make a single pension withdrawal that should be used to decrease the mortgage loan balance. Individuals have to pay the marginal income tax on their amount withdrawn. Switzerland shows us how the level of the permitted withdrawals or pledged amount should be structured; this is dependent on the age of the individual (i.e. decreases as individuals are older). This arrangement should be taken over as it moderates the fall in retirement income among different age categories. Just as the United States, Switzerland also offers the possibility to withdraw pension savings for housing purposes, whereby the amount withdrawn is taxable at a rate lower than the normal income

tax rate. Individuals are obliged to repay the distribution if and when the property is sold. The amount to be repaid consists of the sales price, excluding the amount of interest.

The elaboration of Dutch tax policy and the current Dutch pension system presents multiple difficulties for implementation of pension saving withdrawals. First of all, the problem of the backloading of benefits must be solved. Also, the Netherlands has an EET tax pension program whereby only pension benefits are taxed. If pension withdrawals are allowed, then taxes will be due before the age of retirement. When a link between pension savings and housing wealth is implemented in the Netherlands, I would recommend to apply a tax rate on the pension withdrawal that is lower than the marginal income tax. This for the reason that the tax should include a subsidy for the missed mortgage interest deductibility and the difference between the income tax on labor income and pension income must be compensated.

We developed a model to simulate the consumption pattern of Dutch households. In this model the financial consequences of the introduction of pension withdrawals for the housing market were calculated. For a single pension withdrawal to reduce the mortgage loan needed when buying a house, we assumed a mortgage interest rate of 4.7% and a return on pension savings of 2.54%. Households were allowed to withdraw 10% of the value of the house from their pension savings account. The tax rate applied is set such that there is no impact on public finances. In the situation where the loan offered by the pension fund must be repaid, a middle-income household will have a real net increase in consumption of €440 per year during retirement. This result can be explained by arbitrage opportunities: pension savings now have a higher pay off during the term of the mortgage loan (with repayments to the pension fund being mandatory).

We also examined the financial effects when individuals do not have to repay the loan offered by the pension fund. In that situation, individuals are allowed to consume the decrease in housing costs before retirement (i.e. they make use of intertemporal substitution of consumption). This will result for middle-income households in an average real net increase in consumption of €800 per year during the time that the household has an outstanding mortgage loan, and a real net decrease in retirement income of €800 per year. The present value of lifetime consumption is higher when individuals are allowed to make use of pension withdrawals for the down payment, even when a tax rate equal to the marginal income tax of retirement income is applied.

Lastly, a case is considered where individuals substitute one-third of their pension savings by extra mortgage repayments between the ages 35-45. After the partial substitution of pension premiums by mortgage repayments, individuals make the same annuity payment as before. Therefore, housing costs will disappear at an earlier stage. In this case real net consumption increases by €8,000 per year between the age of 52 and 58 because the mortgage loan is now repaid six years earlier. The increase in consumption before the retirement results in a real net decrease in pension income of €1,200 per year. The change in the present value of lifetime consumption heavily depends on the degree to which the mortgage interest is higher than the return on pension savings and the tax rate applied.

Finally, from the survey among Dutch households we can conclude that a majority (60%) of the participants are not interested in using pension savings for the repayment of a mortgage loan. The main reason given is the importance that they attach to a high level of retirement income. Moreover, individuals are afraid of the temptation to consume their pension savings.

When individuals choose to substitute pension wealth for housing wealth, most participants mention the resulting lower housing costs as their reason. Another reason frequently given by survey participants who would wish to use pension savings is that they regard mortgage repayments as safer than pension savings.

Would it be wise to implement a policy whereby individuals are allowed to substitute pension wealth by housing wealth before their retirement? To answer this question, more research is needed on the financial results for the retirement period, since these results only hold on a simplified model. Further research is required to measure the financial consequences for households with the introduction of stochastic returns on pension savings and fluctuating housing prices.

What link between pension wealth and housing wealth is most desirable? That depends on the preferences of households. When individuals wish to make use of pension savings in order to lower their housing costs, I would recommend implementing a link where the duration of the mortgage loan is not affected. By doing so, they immediately gain from a higher consumption pattern at the time the first pension withdrawal is made until the time when the mortgage loan is fully repaid. Also, the net present value of lifetime consumption increases most among the links investigated for intertemporal substitution of consumption.

If someone does not want to experience a drop in retirement income, or if such person regards mortgage repayments as safer than pension savings, pension funds could offer a loan to be used for housing purposes. It is best to offer a single withdrawal for down payment purposes as this eases the way to homeownership and lowers the mortgage interest expense. If the after-tax mortgage interest rate is higher than the after-tax return on pension savings, then households will have less debt, the risk for banks offering mortgage loans will be lower, the government will benefit from the lower cost of mortgage interest deductibility, and households will gain from higher retirement income.

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Appendix

Leeftijd	Man	Vrouw
25	5,7%	4,8%
26	4,8%	4,2%
27	4,5%	3,7%
28	4,3%	3,5%
29	4,0%	3,3%
30	3,7%	3,0%
31	4,0%	2,7%
32	4,0%	2,6%
33	3,9%	2,4%
34	3,5%	2,1%
35	3,6%	1,8%
36	3,1%	1,6%
37	3,4%	1,2%
38	2,4%	1,1%
39	2,1%	0,9%
40	2,2%	0,8%
41	2,0%	0,8%
42	1,8%	0,8%
43	1,7%	0,8%
44	1,6%	0,8%
45	1,7%	0,8%
46	1,5%	0,9%
47	1,4%	0,9%
48	1,5%	1,0%
49	1,6%	0,9%
50	1,1%	1,1%
51	1,2%	1,0%
52	1,1%	1,0%
53	1,0%	1,0%
54	1,1%	0,9%
55	0,9%	0,8%
56	0,9%	0,9%
57	1,0%	0,7%
58	0,7%	0,8%
59	0,1%	0,5%
60	0,2%	0,4%
61	-0,1%	-0,1%
62	0,2%	-0,1%
63	-1,0%	0,0%
64	-0,1%	0,1%
65	-0,2%	0,1%

Questionnaire

Vraag 1

Wat is uw woonsituatie?

1 Ik heb een koophuis, met lopende hypotheek

2 Ik heb een koophuis, hypotheek afgelost

3 Ik heb een huurhuis, als het mogelijk is wil ik kopen

4 Ik heb een huurhuis, voorheen had ik een koophuis

5 Ik heb een huurhuis en geen behoefte aan een koophuis

Vraag 2

Hebt u de behoefte om in de komende 5 jaar te verhuizen?

1 Ja

2 Nee

Vraag 3

Is naar uw inschatting uw huidige hypotheek momenteel hoger dan de waarde van uw huis?

1 zeker niet

2 waarschijnlijk niet

3 waarschijnlijk wel

4 zeker wel

5 ik weet het niet

Vraag 4

Geef alstublieft voor de volgende aspecten aan in hoeverre u deze belangrijk vindt:

a) Later een goed pensioen

b) Mijn hypotheek aflossen

c) Lage maandelijkse lasten

d) Weinig schuld

1 heel onbelangrijk

2 onbelangrijk

3 neutraal

4 belangrijk

5 heel belangrijk

Vragen voor mensen die niet willen verhuizen:

Vraag 5

Leest u alstublieft het onderstaande bericht goed door.

Veel mensen met een eigen huis hebben een hypotheek. Zij hebben vaak ook een hoog spaarbedrag bij een pensioenfonds of verzekeringsmaatschappij. Misschien wordt het in de toekomst mogelijk gemaakt om met het opgebouwde pensioen de hypotheek af te lossen. Hierdoor wordt er nog steeds vermogen opgebouwd, maar meer via de eigen woning en minder via het pensioenfonds. Dit zou op de volgende manier voor u in zijn werk gaan:

Uw pensioen gebruiken voor de aflossing van uw hypotheek: iedere maand mag u een bedrag van uw opgebouwde pensioen gebruiken om een deel van de hypotheek af te lossen.

Voordeel: U hebt lagere woonlasten en een lagere hypotheek

Nadeel: U hebt later een lager pensioen

Zou u gebruik willen maken van uw pensioen om uw huidige hypotheek af te lossen?

1 zeker niet

2 waarschijnlijk niet

3 neutraal

4 waarschijnlijk wel

5 zeker wel

Als vraag 5 > 3

Vraag 6a

Wat is de belangrijkste reden waarom u gebruik zou willen maken van uw pensioen voor de aflossing van uw hypotheek?

1 Hierdoor heb ik eerder mijn (rest)schuld afgelost.

2 Hierdoor heb ik lagere woonlasten.

3 Hierdoor stop ik mijn geld in mijn eigen huis en dat vind ik fijner omdat ik bij een pensioenfonds niet zie waar mijn geld heen gaat.

4 Ik heb niet de behoefte om zoveel pensioen op te bouwen als ik nu doe.

5 Anders, namelijk...

Als vraag 5<3

Vraag 6b

Wat is de belangrijkste reden waarom u geen gebruik zou willen maken van uw pensioen voor de aflossing van uw hypotheek?

1 Het is belangrijk om genoeg inkomen te hebben als ik stop met werken.

2 Ik wil niet in de verleiding komen om mijn opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Ik wil maximaal gebruik kunnen maken van mijn hypotheekrenteaftrek.

4 Het lijkt mij veiliger om mijn geld te stoppen in een pensioenfonds dan in mijn huis.

5 Anders, namelijk...

Als vraag 5=3

Vraag 6c

Waar hangt het van af of u gebruik zou willen maken van uw pensioen voor uw hypotheek?

1 Of ik er financieel op vooruit ga, dat ligt aan de rente op mijn hypotheek en het rendement op mijn pensioen.

2 Aan het bedrag dat ik mag onttrekken voor mijn hypotheek; ik wil niet in de verleiding komen om te veel opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Anders, namelijk...

Vragen voor mensen die wel willen verhuizen:

Vraag 5

Leest u alstublieft het onderstaande bericht goed door.

Veel mensen met een eigen huis hebben een hypotheek. Zij hebben vaak ook een hoog spaarbedrag bij een pensioenfonds of verzekeringsmaatschappij. Misschien wordt het in de toekomst mogelijk gemaakt om het opgebouwde pensioen te gebruiken voor een hypotheek. Hierdoor wordt er nog steeds vermogen opgebouwd, maar meer via de eigen woning en minder via het pensioenfonds. Dit zou op de volgende manier voor u in zijn werk gaan:

Eenmalig het pensioen gebruiken voor een hypotheek: wanneer u een nieuw huis koopt, betaalt u een deel met uw opgebouwde pensioen. Hierdoor kunt u een lagere hypotheek afsluiten dan de waarde van het huis, omdat u nu alvast een deel betaalt. Of u kunt hier de restschuld van uw huidige hypotheek mee aflossen.

Voordeel: U hebt lagere woonlasten en een lagere hypotheek

Nadeel: U hebt later een lager pensioen

Zou u gebruik willen maken van uw pensioen voor een nieuwe hypotheek?

1 zeker niet

2 waarschijnlijk niet

3 neutraal

4 waarschijnlijk wel

5 zeker wel

Als vraag 5>3

Vraag 6a

Wat is de belangrijkste reden waarom u gebruik zou willen maken van uw pensioen voor een hypotheek?

1 Hierdoor heb ik eerder mijn (rest)schuld afgelost.

2 Hierdoor kan ik eerder verhuizen.

3 Hierdoor heb ik wanneer ik een nieuw huis koop lagere lasten.

4 Hierdoor stop ik mijn geld in mijn eigen huis en dat vind ik fijner omdat ik bij een pensioenfonds niet zie waar mijn geld heen gaat.

5 Ik heb niet de behoefte om zoveel pensioen op te bouwen als ik nu doe.

6 Anders, namelijk...

Als vraag 5<3

Vraag 6b

Wat is de belangrijkste reden waarom u geen gebruik zou willen maken van uw pensioen voor een hypotheek?

1 Het is belangrijk om genoeg inkomen te hebben als ik stop met werken.

2 Ik wil niet in de verleiding komen om mijn opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Ik wil maximaal gebruik kunnen maken van mijn hypotheekrenteaftrek.

4 Het lijkt mij veiliger om mijn geld te stoppen in een pensioenfonds dan in mijn huis.

5 Anders, namelijk...

Als vraag 5=3

Vraag 6c

Waar hangt het van af of u gebruik zou willen maken van uw pensioen voor een hypotheek?

1 Of ik er financieel op vooruit ga, dat ligt aan de rente op een hypotheek en het rendement op mijn pensioen.

2 Aan het bedrag dat ik mag onttrekken voor mijn hypotheek; ik wil niet in de verleiding komen om te veel opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Anders, namelijk...

Vragen voor mensen die de hypotheek hebben afgelost, niet gepensioneerd (vraag 1=2):

Vraag 2

Geef alstublieft voor de volgende aspecten aan in hoeverre u deze belangrijk vindt:

    a)   Later een goed pensioen

    b)   Een hypotheek snel aflossen

    c)   Lage maandelijkse lasten

    d)   Weinig schuld

1 heel onbelangrijk

2 onbelangrijk

3 neutraal

4 belangrijk

5 heel belangrijk

Vraag 3

Leest u alstublieft het onderstaande bericht goed door.

Veel mensen met een eigen huis hebben een hypotheek. Zij hebben vaak ook een hoog spaarbedrag bij een pensioenfonds of verzekeringsmaatschappij. Het opgebouwde pensioen mag niet gebruikt worden vóór het bereiken van de pensioenleeftijd. Misschien wordt het in de toekomst mogelijk gemaakt om met het opgebouwde pensioen de hypotheek af te lossen. Hierdoor wordt er nog steeds vermogen opgebouwd, maar meer via het eigen huis en minder via het pensioenfonds. Dit zou op de volgende manier in zijn werk gaan:

Het pensioen gebruiken voor de aflossing van een hypotheek: iedere maand mag er een deel van het pensioen gebruikt worden om de hypotheek af te lossen.
Voordeel: Er zijn lagere woonlasten
Nadeel: Het pensioen daalt

Zou u mensen met een hypotheek willen aanraden om gebruik te maken van het pensioen om de huidige hypotheek af te lossen?
1 zeker niet
2 waarschijnlijk niet
3 neutraal
4 waarschijnlijk wel
5 zeker wel

Als vraag 3>3

Vraag 4a

Wat is de belangrijkste reden waarom u mensen met een hypotheek wilt aanraden om gebruik te maken van het pensioen voor de aflossing de hypotheek?

1 Hierdoor is de (rest)schuld eerder afgelost.

2 Hierdoor dalen de woonlasten.

3 Hierdoor wordt er geld in een eigen huis gestopt en dat vind ik fijner omdat ik bij een pensioenfonds niet zie waar mijn geld heen gaat.

4 Ik heb nooit de behoefte gehad om zoveel pensioen op te bouwen als ik nu doe.

5 Anders, namelijk...

Als vraag 3<3

Vraag 4b

Wat is de belangrijkste reden waarom u mensen met een hypotheek niet wilt aanraden om gebruik te maken van het pensioen voor de aflossing van een hypotheek?

1 Het is belangrijk om genoeg inkomen te hebben als je stopt met werken.

2 Je moet niet in de verleiding komen om het opgebouwd pensioen te gebruiken voordat je met pensioen gaat.

3 Je moet maximaal gebruik maken van de hypotheekrenteaftrek.

4 Het lijkt mij veiliger om geld te stoppen in een pensioenfonds dan in een eigen huis.

5 Anders, namelijk...

Als vraag 3=3

Vraag 4c

Waar hangt het van af of u mensen met een hypotheek wilt aanraden om gebruik te maken van het pensioen voor een hypotheek?

1 Of zij er financieel op vooruit gaan, dat ligt aan de rente op een hypotheek en het rendement op een pensioen.

2 Aan het bedrag dat ze mogen onttrekken voor een hypotheek; je moet niet in de verleiding komen om te veel opgebouwd pensioen te gebruiken voordat je met pensioen gaat.

3 Anders, namelijk...

Vragen voor mensen die huren en willen kopen, of voorheen een koophuis hadden, niet gepensioneerd (vraag 1=2 of 3):

Vraag 2

Geef alstublieft voor de volgende aspecten aan in hoeverre u deze belangrijk vindt:

    a) Later een goed pensioen

    b) In het bezit komen van een eigen huis

    c) Lage maandelijkse lasten

    d) Weinig schuld

1 heel onbelangrijk

2 onbelangrijk

3 neutraal

4 belangrijk

5 heel belangrijk

Vraag 3

Leest u alstublieft het onderstaande bericht goed door.

Wanneer u in de toekomst een huis wilt kopen, hebt u waarschijnlijk een hypotheek nodig. Vermoedelijk hebt u ook een hoog spaarbedrag bij een pensioenfonds of verzekeringsmaatschappij. Misschien wordt het in de toekomst wel mogelijk uw opgebouwde pensioen te gebruiken voor een hypotheek. Hierdoor bouwt u nog steeds vermogen op, alleen meer via een eigen huis en minder via het pensioenfonds. Dit zou op de volgende manier voor u in zijn werk gaan:

Eenmalig het pensioen gebruiken voor een hypotheek: wanneer u een huis koopt, betaalt u een deel met uw opgebouwde pensioen. Hierdoor kunt u een lagere hypotheek afsluiten dan de waarde van het huis, omdat u nu alvast een deel betaalt.

Voordeel: U hebt lagere woonlasten en een lagere hypotheek nodig

Nadeel: U hebt later een lager pensioen

Zou u gebruik willen maken van uw pensioen voor een nieuwe hypotheek?

1 zeker niet

2 waarschijnlijk niet

3 neutraal

4 waarschijnlijk wel

5 zeker wel

Vraag 4a

Wat is de belangrijkste reden waarom u gebruik zou willen maken van uw pensioen voor de aflossing van uw hypotheek?

1 Hierdoor heb ik een lagere schuld wanneer ik een huis koop.

2 Hierdoor kan ik eerder verhuizen.

3 Hierdoor heb ik wanneer ik een huis koop lagere lasten.

4 Hierdoor stop ik mijn geld in mijn eigen huis en dat vind ik fijner omdat ik bij een pensioenfonds niet zie waar mijn geld heen gaat.

5 Ik heb niet de behoefte om zoveel pensioen op te bouwen als ik nu doe.

6 Anders, namelijk...

Vraag 4b

Wat is de belangrijkste reden waarom u geen gebruik zou willen maken van uw pensioen voor de aflossing van uw hypotheek?

1 Het is belangrijk om genoeg inkomen te hebben als ik stop met werken.

2 Ik wil niet in de verleiding komen om mijn opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Ik wil maximaal gebruik kunnen maken van de hypotheekrenteaftrek.

4 Het lijkt mij veiliger om mijn geld te stoppen in een pensioenfonds dan in mijn huis.

5 Anders, namelijk...

Vraag 4c

Waar hangt het van af of u gebruik zou willen maken van uw pensioen voor een hypotheek?

1 Of ik er financieel op vooruit ga, dat ligt aan de rente op een hypotheek en het rendement op mijn pensioen.

2 Aan het bedrag dat ik mag onttrekken voor mijn hypotheek; ik wil niet in de verleiding komen om te veel opgebouwd pensioen te gebruiken voordat ik met pensioen ga.

3 Anders, namelijk...

Vragen voor gepensioneerden die in het bezit zijn van een eigen huis, of voorheen in het bezit waren
van een eigen huis (vraag 1=1 of 2 of 4):

Vraag 2

Terugkijkend op uw carrière met de ervaring die u nu hebt, wat had u liever anders gedaan voordat u met pensioen ging?

Ik zou…

    a) meer gespaard hebben voor mijn pensioen

    b) meer hypotheek hebben afgelost

    c) gezorgd hebben voor lagere maandelijkse lasten

    d) minder schuld hebben opgebouwd

1 helemaal oneens

2 oneens

3 neutraal

4 eens

5 helemaal eens

Vraag 3

Leest u alstublieft het onderstaande bericht goed door.

Veel mensen met een eigen huis hebben een hypotheek. Zij hebben vaak ook een hoog spaarbedrag bij een pensioenfonds of verzekeringsmaatschappij. Het opgebouwde pensioen mag niet gebruikt worden vóór het bereiken van de pensioenleeftijd. Misschien wordt het in de toekomst mogelijk gemaakt om met het opgebouwde pensioen de hypotheek af te lossen. Hierdoor wordt er nog steeds vermogen opgebouwd, maar meer via de eigen woning en minder via het pensioenfonds. Dit zou op de volgende manier in zijn werk gaan:

Het pensioen gebruiken voor de aflossing van een hypotheek: iedere maand mag er een deel van het pensioen gebruikt worden om de hypotheek af te lossen.

Voordeel: Er zijn lagere woonlasten

Nadeel: Het pensioen daalt

Zou u jongeren aanraden om gebruik te maken van het pensioen om hun hypotheek af te lossen?

1 zeker niet

2 waarschijnlijk niet

3 neutraal

4 waarschijnlijk wel

5 zeker wel

Vraag 4

Wat is de belangrijkste reden waarom u jongeren wilt aanraden om gebruik te maken van het pensioen voor de aflossing van de hypotheek?

1 Hierdoor is de (rest)schuld eerder afgelost.

2 Hierdoor dalen de woonlasten.

3 Hierdoor wordt er geld in een eigen huis gestopt en dat vind ik fijner omdat ik bij een pensioenfonds niet zie waar mijn geld heen gaat.

4 Ik heb nooit de behoefte gehad om zoveel pensioen op te bouwen als ik heb gedaan.

5 Anders, namelijk...

Vraag 4b

Wat is de belangrijkste reden waarom u jongeren niet wilt aanraden om gebruik te maken van het pensioen voor de aflossing van een hypotheek?

1 Het is belangrijk om genoeg inkomen te hebben als je stopt met werken.

2 Je moet niet in de verleiding komen om het opgebouwd pensioen te gebruiken voordat je met pensioen gaat.

3 Je moet maximaal gebruik maken van de hypotheekrenteaftrek.

4 Het lijkt mij veiliger om geld te stoppen in een pensioenfonds dan in een eigen huis.

5 Anders, namelijk...

Vraag 4c

Waar hangt het van af of u jongeren wilt aanraden om gebruik te maken van het pensioen voor een hypotheek?

1 Of zij er financieel op vooruit gaan, dat ligt aan de rente op een hypotheek en het rendement op een pensioen.

2 Aan het bedrag dat ze mogen onttrekken voor een hypotheek; je moet niet in de verleiding komen om te veel opgebouwd pensioen te gebruiken voordat je met pensioen gaat.

3 Anders, namelijk...

Vraag 2

Terugkijkend op uw carrière met de ervaring die u nu hebt, wat had u liever anders gedaan voordat u met pensioen ging?

Ik zou...

    a) meer gespaard hebben voor mijn pensioen

    b) een huis hebben gekocht

    c) gezorgd hebben voor lagere maandelijkse lasten

    d) minder schuld hebben opgebouwd

1 helemaal oneens

2 oneens

3 neutraal

4 eens

5 helemaal eens

Vragen voor huurders zonder de behoefte aan een koophuis, niet gepensioneerd (vraag 1=5):

Vraag 2

Geef alstublieft voor de volgende aspecten aan in hoeverre u deze belangrijk vindt:

a) Later een goed pensioen

b) In het bezit komen van een eigen huis

c) Lage maandelijkse lasten

d) Weinig schuld

1 heel onbelangrijk

2 onbelangrijk

3 neutraal

4 belangrijk

5 heel belangrijk