

Pension reform and intergenerational solidarity in The Netherlands;

A statistical analysis of changing policy preferences (2005-2017)

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Abstract

This thesis investigates the preferences and drivers behind the preferences of a representative group of Dutch people with regards to their PAYG general old age pension system and ways to make the system more financially sustainable between 2005 and 2018. Both reforms in 2011 and 2014 are included, raising the pension age by less than a year for some and more than seven years for later years. The main drivers being analysed are financial self-interest and intergenerational solidarity. This research finds some evidence pointing towards financial self-interest being a driver behind pension reform preferences and finds some evidence to point to the presence of intergenerational solidarity as a driver behind pension reform preferences. These results and the developments the research highlights are useful for further pension policy changes with regard to sustainability.

Keywords: PAYG, pension systems, intergenerational solidarity, financial sustainability, reform preferences, public pension reform.

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1. Introduction

Since before the late nineties there has been substantial discussion about welfare state retrenchment in general and public pension reform (Pierson, 1996, p.143) specifically in the Netherlands as well as other western developed welfare states (Allan and Scruggs, 2004, p.510). A great many reforms focused on creating sustainable long-term financial feasibility and an intergenerational load-sharing of costs and benefits. The main impetus towards public pension reform was given by the higher ratio of retirees to premium paying members of these PAYG (Pay As You Go) plans. In the Netherlands this ratio, the grey pressure, has steadily been increasing since the sixties, with the increase doubling since the 2000s (CBS, 2018), this demographic reality and the connected economic and financial consequences have spurred the public debate on reforms.

In 2003, Van Els et al, studied several characteristics of Dutch households in 2003, among which pension behaviour and preferences, using the DNB (Dutch National Bank) Household Survey, the DHS. A finding I found particularly interesting, is the relation between age and support for different types of public pension (AOW) reforms; (Van Els et al, 2003, p.10). They interpreted the 2003 results for a question regarding different options for financially shoring up the public pension system that preferences for intergenerational risk-sharing were not divided between different generations (Ibid.).

I thought that this finding was odd, as I would imagine there would be some effect for intergenerational solidarity/risk-sharing and decided to look into it.

This specific relation between age and pension reform preferences has not been researched since, except one longitudinal study for the Dutch case (Parlevliet, 2017), even though there is a rich dataset supporting this, the DHS¹. The DHS has surveyed a variety of socio-economic and demographic characteristics since 1997, among which the specific pension reform preferences Van Els et al tested, in some shape or form since 2003. The period of the dataset (2003-ongoing)² which asks the relevant pension-related questions also includes several reforms to the Dutch public pension system in the early 2010s, which gives us a natural experiment to draw upon.

¹ DNB (Dutch National Bank) Household Survey (DHS).

² Of which this research uses 2005-2017 for reasons explained in the third chapter.

This study by Parlevliet, useful as it is, still misses the period from 2014 onwards, during which the increase of the pension age was fast-tracked in 2014 and the effects of the initial reforms were starting to be felt. Parlevliet's study looks at the explanatory variables for pension reform preferences and finds that age does not matter as much as stated in the literature (Parlevliet, 2017, p.20). Instead it states that education, employment status and personality traits are the best explanatory variables for these preferences (Ibid.).

The specific reforms under consideration were; Raising the pension age of 65, Raising the public pension scheme contributions, Incomplete indexation of benefits to wage growth and Public pension scheme contributions also for 65-plus. The DHS tested the support for these specific reforms from 2003 onwards (CentERdata, 2003).

1.1 Type and goal of the research

This study looks at the relationships over time between characteristics of a variety of Dutch households and their attitudes towards different pension reforms and the change of these factors over time. The goal of this partially longitudinal research is to find out what drivers might determine attitudes toward pension system reform. The key concepts section (in Chapter 3) defines which attitudes have a hypothesized relation to specific traits.

The main motivation for this thesis exists out of four parts:

1. To establish a framework for analysing PAYG pension system constituents opinions and its reform;
2. To provide a base for further research and reforms to ensure financial feasibility of the Dutch old-age pension system;
3. To analyse the previously unanalysed 5+ years of DHS data in order to add to the historical overview of changing preferences and drivers behind pension reform attitudes in the era of the retrenchment of the welfare state;
4. To establish what the influence, if any, of intergenerational solidarity and financial self-interest on public pension reform is;

1.2 Added value of this research

The Netherlands is a developed democratic social market economy, and has been dealing with the effects of an aging population on the pension system, the tax system and the country in general for at least twenty years. It has an active debate on the pension system, as well as ongoing reforms, which prove as interesting testing points for different theories on public support and drivers for pension reform. Next to that, the relation between age, intergenerational solidarity and support for different types of public pension reforms have not been tested yet for the Dutch case, even though the data to do so, are present. The DHS is representative for the Dutch population at large, making for a great opportunity to analyse the Netherlands.

This study will be able to pinpoint what a representative selection of Dutch households think about different proposed pension reforms. This study also expands the testing of evidence of certain correlations of the study by van Els et al (2003) and Parlevliet (2017) over a longer time-period and may be able to confirm or disconfirm some trends they found.

The longitudinal design also expands the scope of testing of the current existing research, as there is currently no longitudinal examination of the interaction of these variables for the complete period of 2005-2017. There has also been much public discourse concerning this subject, even after the reforms took place (“Pensioenakkoord,” 2018) (De Vries, 2018), adding to the societal relevance of this research.

The existing research on factors that drive public opinion regarding pension system reform in The Netherlands consists of only few studies, which only cover the period up until 2014. Significant developments have taken place in the meantime, and the evidence collected since then should be properly audited for new insights and developments. Since the data on pension system reform and household characteristics have been gathered consistently, also from 2014 onwards, an update is useful. Next to that, the Netherlands is at a critical juncture for more pension reforms, for the private as well as public parts of the pension system (“Pensioenakkoord,” 2018) (De Vries, 2018) and this research might be able to inform these discussions. These last three factors give societal relevance to this research, as this research can be used to look at public support for further reforms and the impact of the previous reforms on the Dutch population. Some generalizable ideas, such as intergenerational solidarity, if proven, could also be used to increase intergenerational support for pension reforms by aiming for those reforms that bind the different generations together, rather than pit them against each other.

Academically this research will bring new findings to the table over a period and a location that was not studied before in pension research. This research will also contribute a new piece of data to the literature on drivers behind pension reform preferences.

1.3 Research question

The research on pension reform preferences is as of yet inconclusive, as different authors still point to different theories or explanatory variables as the drivers behind these preferences (Jaime-Castillo, 2013, p.391). Using this large trove of representative data, we are able to use statistical inference to determine the main drivers behind the attitudes and the changes of these attitudes in the Netherlands, possibly also finding out the intergenerational pressures behind these attitudes.

The main research question and the primary supporting research question are therefore:

What are the main drivers behind Dutch households' attitudes toward pension system reform from 2005 to 2017 and how did they change?

What role does intergenerational solidarity play in pension reform preferences?

1.4 Main findings

Financial self-interest seems to be one of the larger factors correlating with self-interested pension reform options, the older subgroup favored not increasing the pension age as well as not lowering pension payments. Those with higher incomes also favored a lower public pension payout over paying higher premiums. The higher a person's income, the less significant the public pension system is for their retirement plans. There are complications, however. Those in the younger group did not clearly prefer lowering the pension payouts, and the income variable, as well as the employment variable were insignificant, there where they, if the hypothesis were correct, would correlate with self-interest. This does mean that the first hypothesis is only confirmed partly.

The second hypothesis which asserted that having children positively affects intergenerational solidarity is largely confirmed. The effect of having children outside the household is the opposite of the effect of being older in the case of raising the retirement age, meaning that having children outside the household makes a person more likely to have preferences that indicate intergenerational solidarity. It must be noted that having children inside the household as well as having grandchildren did not show any statistically significant result in raising the retirement age. For the relation between a lower pension payout, the evidence is a lot clearer,

having children, in or outside of the household, or having grandchildren, all make people more likely to be in favor of lower payouts, rather than picking the less solidary option of higher premiums. This is the opposite effect of being older, which correlates more with being generationally selfish.

There are multiple caveats to these findings, as the effects do sometimes not fully align with the hypothesis, or in other places, where significant effects were expected, such as a preference for lower pension payouts for the younger group, failed to be significant. The hypothesis that having children or grandchildren makes people less generationally self-interested seems to be the most clearly proven hypothesis. A problem in interpreting this finding however is that for a robust interpretation of this finding, more statistically significant evidence of intergenerational selfishness would have made its case stronger.

These results are still tentative results that show a positive correlation between having children and showing more support for measures that are financially advantageous for younger people and disadvantageous for older people. Next to these results, it also matters that in the run up to the reform in 2012, there was a strong movement toward raising the public pension age, which tapered off when the reforms were being put into practice. For the rest, none of the time-effects tested were significant. Maybe future research, including more data might be able to discern of any time-effects or heterogeneous effects, but this research failed to establish any such effects to a statistically significant level.

2. Literature review

In this literature review I intend to give an overview of previous research done in the field of public opinion and pensions, focusing on intergenerational solidarity and self-interest, examine the definition of the relevant terms and their deficiencies and look at previous tests done in the field of intergenerational solidarity and (public) pension reform. I also explain the definition of a PAYG pension system, its vulnerabilities and possible remedies for these vulnerabilities. This section intends to combine the gathered insights of academia before me and identify conceptual mistakes. Using the previous literature, the ending of this chapter will explain the hypotheses of this research.

2.1 History of the Post-war Dutch Pension system

The Dutch AOW (Algemene Ouderdomswet)³, was written into law in 1957 as the more permanent replacement of Willem Drees' Noodwet Ouderdomsvoorziening.⁴ Both of the laws, at their inception, had as pre-conditions that any person that would receive money from the system would be of the age of sixty-five or over. The law codified several important elements of the national pension, namely the age of pension, the height of the pension and the universal coverage (Algemene Ouderdomswet, 2018) (Nadere wijziging van de Algemene ouderdomswet [...] Memorie van Toelichting nr.3, n.d.). Because of the still ongoing baby-boom and a life expectancy of 73 for those born and 80 for those aged 66 at the time (CBS: Statline, 2017 and 2018). It meant that from their pension onwards, people were expected to live approximately 10-15 more years. The ratio of pension beneficiaries to those not of the pension age was 14 per cent in 1950, meaning that for every person receiving a pension, seven people were paying into the PAYG system. The medium term financial feasibility was helped even more by the baby boom generation entering the labour force. In the 80's, due to young people not being able to enter the labour market, the government designed programs that made it possible for people to receive pension even earlier.

The ratio of pension beneficiaries to those not of the pension age kept mounting throughout the late twentieth century, especially for the last 15 years to 21,9 per cent in 2000, and further to 31,3 per cent in 2017 (Idem). It is expected that this ratio will keep mounting for the coming 20 years at least. Currently this means that for every pension beneficiary there are slightly more

³ Dutch for general old-age law.

⁴ Dutch for Emergency law for old-age care.

than 3 people working and paying into the pension system. This reality eventually led to attempts to guarantee the affordability of the pension system, with the pension age being raised in 2011 and a speeding up of this raised pension age in 2014. Now in 2018, there have been new talks about the pension system's fairness between the polder actors (Labor Unions, Employer representatives, Social-Economic Council and the government), possibly leading to tweaks to the pension system (De Vries, 2018).

2.2 Pension systems, financial sustainability and political incentives for reforms

The literature on consumption smoothing and optimal intergenerational social security programs began with Samuelson (Samuelson, 1958) (Samuelson, 1975). His knowledge lies at the basis of the general principle of pension systems, public or otherwise. He engendered the ideas of optimum intergenerational risk-pooling and was one of the early academics that looked at well-being under public pension systems.

Pierson, in a 1998 review article listed different contemporary challenges to the welfare state (Pierson, 1998), as perceived by different political and academic actors. The general point of this article pertaining to pensions focuses on the possible breakdown of the intergenerational pact. As PAYG pensions constitute a wealth transfer from the younger working population to the older, now pensioned generation, the age dependency ratio, the ratio between those of pension age (the receiving) and those that are paying into the PAYG system is shifting. The "increased public health" and the "much more generous pension provision" have put this ratio under pressure (Pierson, 1998, p.789). The intergenerational pact could then collapse under the perception of unjust and unbearably high taxes or premiums (Ibid.).

Yigit Aydede expands the argument of generational selfishness to include the way in which reforms are introduced in a June 2010 paper (Aydede, 2010). Because the reforms are introduced gradually, usually through the large political implications and large political interests at stake, they are advantageous to current generations (Idem, p.179). The gradual introduction of a higher statutory retirement age, for example, impacts later generations fully, but hits current generations only partially (Ibid.). The Dutch pension reforms of 2012 and 2014 are good examples of this, as those aged fifty-five and over did not have to serve the full new pension receiving age of sixty-seven, rather they could retire between sixty-five and a half years and sixty-six years of age. Table 1 illustrates the current effect of the reform on the height of the statutory retirement age.

Table 1: Past and Projected Public Pension age increases as of 2018

Public Pension Age	Year
65	2012
65 and one month	2013
65 and two months	2014
65 and three months	2015
65 and six months	2016
65 and nine months	2017
66	2018
66 and four months	2019
66 and eight months	2020
67	2021
67 and three months	2022
67 and three months	2023
67 and six months	2027*
68 and nine months	2038*
70 and nine months	2050*
71 and three months	2060*

Sources: (Ibid.) (Belastingdienst: Wanneer bereikt u de AOW-leeftijd?, n.d.)

*The dates past 2023 are government projections of the public pension age. This age will be heightened by three months if people live longer, and the age will be determined five years in advance (SVB: AOW-Pensioen, n.d.). The highest pension age under the current system will be reached in 2060.

Aydede covers the incentives for policy-makers, through the use of a simple series of equations and assumptions based on a PAYG system that is hit with a demographic shock. His conclusions are that if the expectations of a future generation are that it will receive a pension decrease, it gives an incentive to the policy actor to take from the future generation, rather than the incumbent pension receivers. This reaction is based on the expectations of the future generations as well as the pension receivers, who cannot retroactively re-smooth their consumption to account for the shock (Aydede, 2010, p.185). This means that the optimal option for the policy-maker shifts to a solution to make the system more sustainable by taxing younger generations more than older generations (Aydede, 2010, p.189-190):

“Even if people realize that running a Ponzi scheme becomes infeasible in the face of cumulating shocks, a decreasing trend in their expectations for the sustainability of PAYG may create an irresistible incentive for governments to abuse the system by implementing biased policies towards the current generations.”(Ibid.)

The theoretical incentive to short-change a younger generation for a disinterested policy-maker is compounded by the incentives incumbent in the political economy of the retrenchment of the welfare state, as Pierson (Pierson, 1998) famously postulated. Pierson analysed the dynamics of the growing welfare state, as well as the shrinking welfare state. Among other factors he noted that the growth of the welfare state was much quicker and politically uncontroversial as it relied on a dynamic of concentrated benefits and diffuse losses on the crest of the post-war economic boom (Pierson, 1998, p.143). In the era of the retrenchment of the welfare state, of which the raising, sobering and changing of pension arrangements is seen as part of, there is a different playing field (Pierson, 1998, p.144). Those that received concentrated benefits, such as retirees, disability cheques and others, have organized into formal organizations with financial, political and social clout such as p.e. the AARP (American Association of Retired People), or in The Netherlands, the ANBO (Algemene Nederlandse Bond voor Ouderen, General Dutch Association for the Elderly) (Pierson, 1998, p.146). This means that reforming the system is much harder, and happens at a glacial pace compared to the rapid and generous expansion of the welfare state (Idem, p.145 and p. 178).

It is clear that reforming a public pension system is difficult, especially with defined benefits, such as in the Dutch PAYG system. This can explain part of the reason why the reforms that happened, happened relatively late after the demography had already become unfavourable, and the Dutch state had to pay money into the system p.e. (Boeri et al, 2002. p.1).

A large amount of the questions that the authors of this piece examined are almost analogous to the core questions in this research:

“Which reforms seem more politically feasible and why? Which groups of citizens are more likely to favour reforms? Do citizens’ opinions reflect their economic self-interest, as presumed by the literature on political economics?” (Boeri et al, 2002. p.2)

In their results they also discuss a suspicion that shifting the burden for reforms to ensure sustainability to future generations is one of the reasons why people seem to generally oppose reforms, even when convinced of their necessity (Ibid.).

The main determinants that were significant at the 0.1 level that they found were, “[age, income and education play[ing] an important role in shaping both the general view on the role of the state and the evaluation of these reform options.” (Idem, p.8). They also found differences between demographically and economically different groups such as “younger more educated richer males tend to say yes”, and “union members, residents of poor regions and those with a left-wing ideology tend to say no.” (Ibid.) This feeds further into the self-interest hypothesis and possible differences in how people with different ages might have different preferences. Most importantly for this research is the following finding: “Two sets of variables appear significant in all regressions: age and education.” (Idem p.8-9) The repeating mention of financial self-interest, age and education means that these are important drivers that need to be examined for this research. Naumann et al. also confirm their hypothesis on self-interest being an important driver for pension and welfare preferences and finds a correlation between being unemployed and being more in favour of social programs in general (Naumann et al., 2016, p.90).

Boeri et al. do conclude that there are two possible explanations why a large part of people are not in favour of reforms, even when they agree that the current system of public PAYG pensions is unsustainable, namely “Procrastination (time-inconsistent preferences), or intergenerational selfishness.” (Boeri et al, 2002. p.11) They try to define intergenerational selfishness as consciously transferring money from future generations to the current elderly, of which the authors find results through looking at the low support for financial aid for young job-seekers (Idem, p.12). I deign this argument not too strong. There is a big difference between active labour market policies (their reverse check on intergenerational selfishness) and pensions. People might deem the spending on job creation programs ineffective, and therefore not support this policy option. Research towards active labour market policies tend to skew in this direction also. Pensions on the other hand are social rights that people build up over time, in the case of PAYG pensions as a payment for your active working years paying for the pensions of the generations before you. Due to the inherent differences between the two programmes, their effects and perception by people, I find the check that they use for intergenerational selfishness to be insufficient, which is another reason to delve deeper into intergenerational selfishness and its effect on these preferences.

2.3 Current approaches to pension reform preferences

Antonio Jaime-Castillo compares three reforms to pension systems, raising contributions, raising the pension age and allowing choices for pension to be between public and private systems (Jaime-Castillo, 2013, p.390). He then looks at ideological drivers, regime drivers and controls for them with general demographic variables (Idem, p.396). One of the specific reasons he also mentions for performing his research, is the large amount of attention in the shape of research that public preferences on social policy receives, whilst there is little attention for preferences for different pension systems. (Idem, p.390)

Jaime-Castillo outlines the literature on social policy preferences and divides them into three different theories: “the self-interest approach, the ideological approach and the institutional theories.” (Jaime-Castillo, 2013, p.391):

1. The self-interest approach is the dominant approach, evolving from works in the seventies and eighties by Meltzer, Richard and Browning. This approach argues that net beneficiaries of wealth transfers are in favour of these wealth transfers, and the reverse is true for those contributing to these transfers (Ibid.);
2. The ideological approach, from the nineties onwards, which argues that the approval of wealth transfers/social policies are mainly driven by values, political orientation and ideology. With Feldman, Zaller and Jacoby being its main proponents. (Idem, p.392);
3. The most recent approach, popularized during the late noughties is the institutional approach. It takes a more society-wide approach, claiming that the attitudes toward different social policies depend on the welfare regime, consisting of ‘formalized social policy arrangements, a shared history of class mobilization, institutionalized solidarity, and social justice beliefs’ (Jakobsen, 2011 as cited in Jaime-Castillo, 2013, p.392). As these regimes are connected to the history and traditions of a country, there is an interaction between the values of a people and their regime. This creates ergodicity and a path dependency that creates a strong correlation between the institutions of a country, the values of a country’s people and their disposition towards reforms of social systems (Jaime-Castillo, 2013, p.392).

To me the institutional approach looks more like a more elaborate version of the ideological approach, as the basic variable that it would refer to would still be ideology, as ideologies generally have different positions on whether and in which way wealth transfers should take place. I do see how regime and history influences preferences, but the case for the regime having

a larger effect on preferences towards pension reforms seems weak, considering the different studies by Parlevliet (Parlevliet, 2017), Naumann et al. (Naumann et al., 2016) and Emery (Emery, 2012).

Parlevliet takes a different approach, looking at the predictive value of psychological traits in pension reform preferences. (Parlevliet, 2017) She uses the same dataset as this research, though for a shorter period of time and analysing different variables from the one in this research. She also finds an effect, similar to Naumann et al (Naumann et al., 2016), for occupational status (Parlevliet, 2017, p.14) influencing pension reform preferences. Also of importance to this research is the finding of a correlation between having grandchildren and favouring options that are not according to the narrow self-interest (Parlevliet, 2017, p.15). She does conclude that personality traits are robust drivers for pension reform preferences (Parlevliet, 2017, p.20)

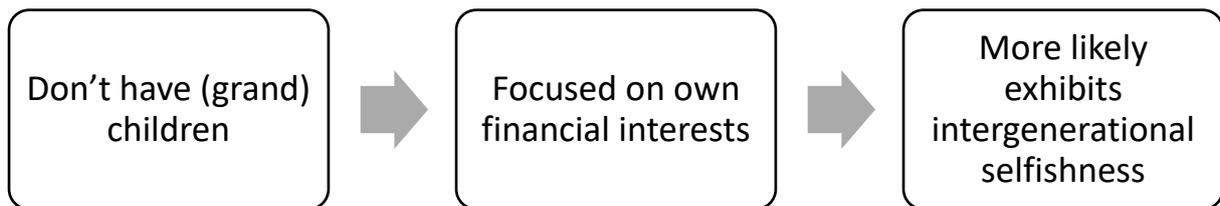
2.4 Hypotheses, theoretical model and causal mechanisms

The main causal mechanisms that this study investigates are listed here. They focus on financial self-interest, having children and intergenerational solidarity. The self-interest theory is based on (Naumann et al., 2016) and the statements concerning intergenerational solidarity are inspired by (Emery, 2012). The expected effects of intergenerational solidarity in this research are inspired on insights in demographic research (Howse, 2007). There is still much intergenerational solidarity in the shape of cohabitation, household help as well as financial help between parents and children, as for example about twenty-five per cent of European parents gave over two-hundred and fifty euros to their children each year (Fokkema et al., 2008, p.47 and p.83). This research theorizes that this type of solidarity also extends beyond the direct financial performed preferences of parents, and also affects their preferences with pension reforms, as seen in the following two figures:

Figure 1: Causal chain of the influence of offspring on intergenerational selfishness



Figure 2: Causal chain of the influence of no offspring on intergenerational selfishness



Research question 1: What are the main drivers behind Dutch households' attitudes toward pension system reform from 2005 to 2017 and how did they change?

Hypothesis 1: One of the main drivers behind Dutch peoples' attitudes toward pension system reform is their direct financial self-interest.

H0: No or negative correlation between financial self-interest and self-interested pension reform options

H1: Financial self-interest correlates positively with self-interested pension reform options

Research question 2: What role does intergenerational solidarity play in pension reform preferences?

Hypothesis 2: Having children will make a person less generationally selfish in pension system reform attitude, as their direct financial self-interest is combined with that of their offspring. This leads to people with (grand) children to exhibit less intergenerational selfishness.

H0: No or negative difference for (grand) parents with children

H1: More intergenerational solidary positions in (grand) parents than those with no children

Signals of pension reform options

This research uses three different answers to a question on reforming the public pension system, and these three different reform options have different signals, this is how this research expects these different options to weight against each other.

Option 1: Lowering the amount of public pension received

Lowering the amount of public pension received can be appealing to those who have time to plan for a lower pension when they retire, or depend less on public pensions. As this does not raise their pension age, or increase the amount of premiums they have to pay.

Option 2: Increasing the premiums for the working

Increasing the premiums for the working can be financially advantageous for those that are closer to the public pension age, and therefore have to pay fewer of the costs for maintaining the same level and time of expected public pensions.

Option 3: Increasing the pension age

Increasing the pension age can be advantageous for those very close to the pension age, as they will likely not be impacted by the reform, but disadvantageous for those close to the pension age or of middle age as they have little time to adjust to the extra two or more years of work expected of them. For those of a younger age it might be more preferred than the other ages, as they have a longer time to plan for this reform.

3. Data

This part of the thesis describes the data used in pursuing the research. Firstly it will go into the structure of the data, secondly the operationalization of the dependent variable and thirdly the descriptive statistics of the sample.

3.1 The location and limitations of the data

A long-term representative dataset of the Netherlands would be the best data to analyse these changing preferences over time. The Netherlands has very good usable data on during the last twenty years from the DHS (De Nederlandsche Bank Household Survey, Dutch Central Bank Household Survey) for survey data. The DHS in specific provides a great granularity and diversity in data, together with a sample size of 1000+ respondents. The CentERdata panel, from which the respondents of the DHS are taken also has the added boon of being a sample that is representative of the Dutch population at large (The CentER Panel: A representative online panel since 1991, n.d.).

One limitation of the data is that in the 2002 DHS data used by Van Els et al, the way the pension question, DNB207a, was phrased in their iteration of the DHS, changed significantly in 2005. This means that the most important source for the purpose of this research was unusable until the survey of 2005. From the 2005 DHS onwards the phrasing of the specific pension-reform question remains largely the same until the most recent data available, 2017. This will be explored later in this section. The research then has a twelve year time-frame that includes the largest, most impactful pension reform since the permanent establishment of the modern Dutch AOW-public pension system in 2011, the reform raising the pension age for the first time in 2013 (by one month) and the speeding up of the reform in 2014.

The relevant population is the Dutch adult population, from which the DHS sample is taken. The unit of analysis is the individual, as the DHS is a survey consisting of surveyed individuals.

In short, these data create an excellent opportunity to test the current theories on drivers for pension reform preferences, as well as possible intergenerational effects, a not as well examined driver, as explained in the previous chapter.

3.2 The DHS variables and their operationalization

As this research is quantitative, and uses survey data, it is important to inspect the usability of the questions in the survey for the purpose of the research. This section covers the different variables used for the descriptive statistics and the statistical analysis of the research, firstly, paying specific attention pension reform preferences, the variable central to this thesis. First this section will look at the phrasing of the question, secondly this section will examine the independent variables, both on their own as well as with the dependent variable.

Pension reform preferences: The key variable for this research

The most important variable for the purpose of this research is the variable DNB207a. This variable is a question that offers three different options related to pension reform. From 2005 to 2011 this variable refers to this question and the following possible answers:

“To make sure that the general old-age pension remains affordable certain measures have to be taken. Which of the following measures appeals to you most?

1 a lower general old-age pension at the age of 65;

2 an increase of the old-age pension premium for people working;

3 increase the age by two years (from 65 to 67 years of age) on which one will receive the general old-age pension.” (CentERdata, 2005)

The question clearly indicates that it targets the financial feasibility of the general old-age pension and offers the reader three options to ensure this feasibility.

Firstly a lower general old age pension, meaning that the pension payment that one receives monthly will be reduced. This would lead to savings on the spending side of the pension system. There are many ways in which this could be achieved, from taxing the general pension more, to lowering the public pension benefits, but the effect remains the same.

Secondly, increasing the old-age pension premium for those working. This means that there is more money flowing into the PAYG system from the working population. The proposed option would tax the working population so that those of pension ages would be able to receive the same amount of benefits at the same age.

Thirdly, increasing the age at which one would receive the general old-age pension. This would mean that there are more people paying premiums relative to the number of people in

retirement. The ratio of paying members and receiving members of the PAYG system would be skewed more favourably, making its finances more feasible.

From 2011-2017 the question changed to a question with the following possible answers, additions to the 2005-2011 version have been marked in **bold** and subtractions have been marked with a ~~striketrough~~:

“Recently, it has been decided to increase the general old-age pension age.

To make sure that the general old-age pension remains affordable certain measures have to be taken. Which of the following measures appeals to you most?

1 A lower general old-age pension ~~at the age of 65~~;

2 An increase of the old-age pension premium for people working;

3 Increase the age on which I will receive the general old-age pension.

3 **Increase the age by two years (from 65 to 67 years of age) on which one will receive the general old-age pension.**” (CentERdata, 2011)

This change in the variable was precipitated by the heightening of the pension age starting from 2013 onwards, as indicated in the introduction to the altered question. The addition of the sentence marked in bold means that the effect of the change of the pension age will be salient, as it is read just before answering the question. This means that this variable, for its function as a signal to compare pre-reform and post-reform attitudes works well.

The omission at answer one, “A lower general old-age pension ~~at the age of 65~~” (Ibid.), still holds the same signal, meaning a lower general old-age pension. However, its appeal might be changed because of its lack of a concrete age marker. If it turns out that the proportion of people favouring this option broadens during the analysis, countermeasures cannot be taken as this happens at the time of the first reform. If the proportion of people favouring this option diminishes however, we can assume that the effect of this change will have been insignificant in comparison with the signal function that the questions are supposed to have.

Question three has been changed most out of all the questions. The two changes are:

1. The subject of the question has become the more personal 'I' instead of the more general 'one';
2. The proposed age for the raising of the pension age has been changed from a concrete change 65 to 67 to a general heightening.

The first change might lead to less people being in favour of this option, as this option, counter to all the other options in the 2011-2016 version, uses the more personal 'I'. If the proportion of people choosing this option diminishes, extra attention will have to be paid to the period effects in the model.

The second change is similar in effect to the altered 2011-2016 version of answer one. This means that the lack of a concrete age marker might change its appeal. When checking for robustness, these changes will need to be explained and accounted for, in order to make valid claims.

The useful part of the change in the variable DNB207a is that it happened before 2013, the year the change took effect, so if there are negligible unaccounted changes from 2010-2012, it means that this variable remains usable. Because it does not coincide with the 2011 reform, taking effect in 2013 (Wet verhoging AOW- en pensioenrichtleeftijd, n.d.), it also does not influence the results from 2012 to 2014. This means that if there are unaccounted changes in 2010-2012, I can still measure the effect of the 2013 reform independently from the rest of the panel data. The only complication would be the anticipation effects, as this reform was publicized about widely during the time before it became law.

3.3 Descriptive statistics

The descriptive statistics in this serve to give more insight into the spread of the data, important trends and interesting patterns. It is divided into two parts, firstly the raw descriptive data about sex, age, employment, numbers of respondents etc. Secondly the change over time in the data, specifically pertaining to pension reform preferences.

Table 2: Sample summary statistics entire sample, 2005-2017.⁵

Variables	Observations	Mean	St. Dev	Min	Max
Young age (20-39)	40095	.3457	.4756	0	1
Medium age (40-49)	40095	.2089	.4065	0	1
Old age (50-69)	40095	.4455	.4970	0	1
Sex	60787	1.5034	.4999	1	2
# of children in the household	60787	1.1681	1.2448	0	7
# of children not in household	27998	.8960	.8960	0	12
Education	60633	5.082	1.9515	1	9
Lower education	50880	.4687	.4990	0	1
Vocational education	60633	.1642	.3705	0	1
Higher education	60633	.2816	.4498	0	1
Grandchildren	22008	1.6145	.4867	1	2
Income	24208	29984.29	23945.95	0	582476
First quartile income	24208	.2681	.4430	0	1
Second quartile income	24208	.2216	.4153	0	1
Third quartile income	24208	.2490	.4325	0	1
Fourth quartile income	24208	.2613	.4394	0	1
Partner	60787	.8481	.3590	0	1
Employed	51206	.0493	.2164	0	1
Unemployed	51206	.6823	.4656	0	1

Source: (CentERdata 2005-2017)

⁵ A full table of the questions used for these variables can be found in APPENDIX II.

The proportion of male to female respondents is almost 50/50, with 28033 female respondents and 27722 male respondents with a yearly deviation of generally less than one per cent in the ratio of males to females. There are 55774 unique households responding to the survey, with an average of 2.1 persons from the household responding to the survey. This number of responding persons from the household is very consistent over the years, with a variation of less than half a per cent in all cases. As the data are representative for the Dutch population, it allows us to make inferences about The Netherlands at large.

The dummy variables made from the education level variable are divided as follows: Education levels “Special education, primary education, pre-vocational education, pre-university education” have all been combined to generate lower education, the lowest education level. Vocational education consists of senior vocational education (MBO), higher education refers to vocational colleges (HBO) and academic education (WO).

Income has been divided up into four quartiles with each quartile representing approximately twenty-five per cent of the sample to account for all the outliers and to compare 4 larger groups of different earning capacities. Quartile one includes all the yearly incomes up to 14000 euros, quartile two, all the yearly incomes from 14000 to 28000 euros, quartile three all the yearly incomes from 28000 euros to 42000 euros and quartile four all the incomes higher than 42000 euros.

Table 3: Sample summary statistics baseline, 2005-2017.⁶

Variables	Observations	Mean	St. Dev	Min	Max
Young age (20-39)	9978	.0681	.2518	0	1
Medium age (40-49)	9978	.6209	.4852	0	1
Old age (50-69)	9978	.3111	.4630	0	1
Sex	9978	1.4365	.4960	1	2
# of children in the household	9978	.8150	1.1110	0	7
# of children not in household	9978	.7982	1.1407	0	9
Education	9978	4.7981	1.4808	1	9
Lower education	9978	.4015	.4902	0	1
Vocational education	9978	.2232	.4164	0	1
Higher education	9978	.3716	.4833	0	1
Grandchildren	9978	1.7788	.4151	1	2
Income	9978	34499.69	25972.64	0	553731
First quartile income	9978	.2005	.4004	0	1
Second quartile income	9978	.1982	.3987	0	1
Third quartile income	9978	.2613	.4394	0	1
Fourth quartile income	9978	.3400	.4737	0	1
Partner	9978	.7734	.4187	0	1
Employed	9978	.7070	.4552	0	1
Unemployed	9978	.2931	.4552	0	1

Source: (CentERdata 2005-2017)

Baseline regression sample summary statistics

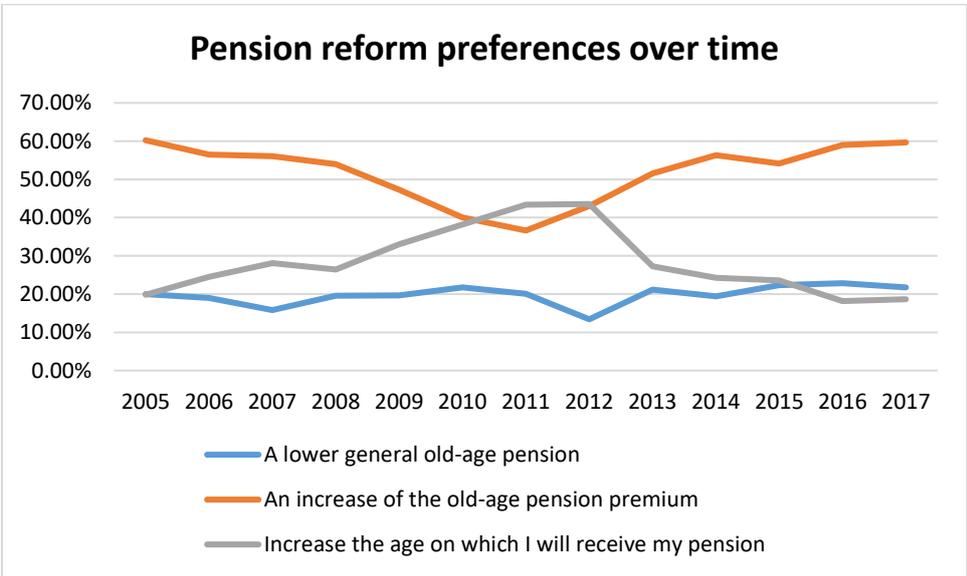
Above, the data from the sample that was used in the baseline regression is represented with summary statistics. The main reasons this sample is significantly smaller than the original sample by a factor two are the amount of observations that are included in the pension reform preference question and the different questions which have no overlapping data on the same persons. The sex ratio remains about the same as the initial sample, though several other factors vary in this sample. There is a higher representation of richer and more highly educated people, but all variables are quite similar to the larger sample. The minimum and maximum values remain almost identical to the larger sample, and the standard deviations are also roughly the same, there are no abnormally large deviations from the original sample.

⁶ A full table of the questions used for these variables can be found in APPENDIX II.

3.4 Pension reform preferences

This variable, which lists the preferences for pension reform throughout the period of the research, shows some interesting changes throughout time. Split between different age groups it also reveals the relative preferences between the younger and older groups in favour of certain reforms. It also helps to illustrate the asymmetrical effect of the reform, as the reform of the AOW system is a trapped reform. It impacts some age groups more than others, varying from six extra months of work before receiving the general old age pension until six extra years of work before receiving the general old age pension. As mentioned in the introduction, some older age-groups have been unaffected by this reform.

Figure 3: Pension reform preferences through time



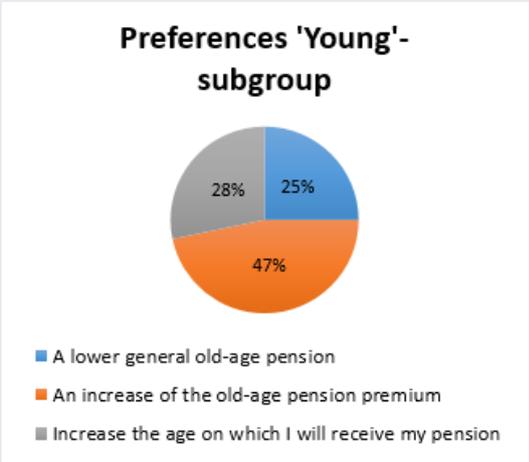
Source: (CentERdata 2005-2017)

The option featuring a lower general old-age pension stays unpopular over time, never rising above twenty-three per cent of the preferred option. The most interesting development featured however, is the interchange between the increase of the premium payments and an increased age for the pension. The increase of the premium is very popular at over sixty per cent at the start of the research as well as the ending of the research, and the popularity of raising the pension age increases throughout the period, until it plateaus when the actual reform bill passes parliament in 2011. From 2012 onwards, when the reform is enacted and sped up (2014) support for this option shrinks from forty-three per cent of the respondents to a historical low of eighteen per cent in 2016. Seeing that the question before was about raising the pension receiving age to sixty-seven years, and the question then changes to an age above sixty-seven years, this is a

shift that shows a lot about the exact preferences; of those forty-three per cent supporting the raising of the pension age, somewhere between twenty and twenty-five per cent only support a raising of the pension age by two years, and about eighteen per cent support an even further increase.

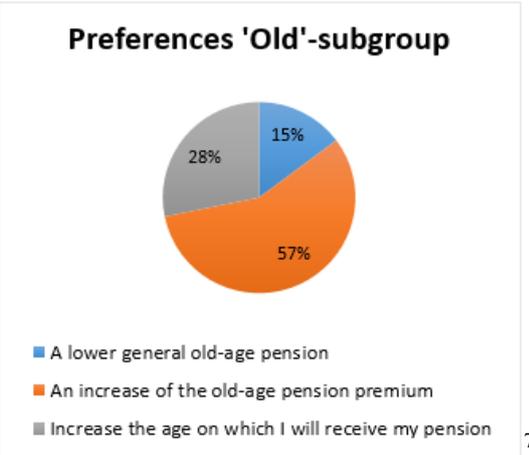
As visible in the next figures, the decline of the popularity of raising the pension age is quite similar when dividing the population into a younger group and an older group.

Figure 4: Pension Reform Preferences for the Younger subgroup



Source: (CentERdata 2005-2017)

Figure 5: Pension Reform Preferences for the older subgroup



Source: (CentERdata 2005-2017)

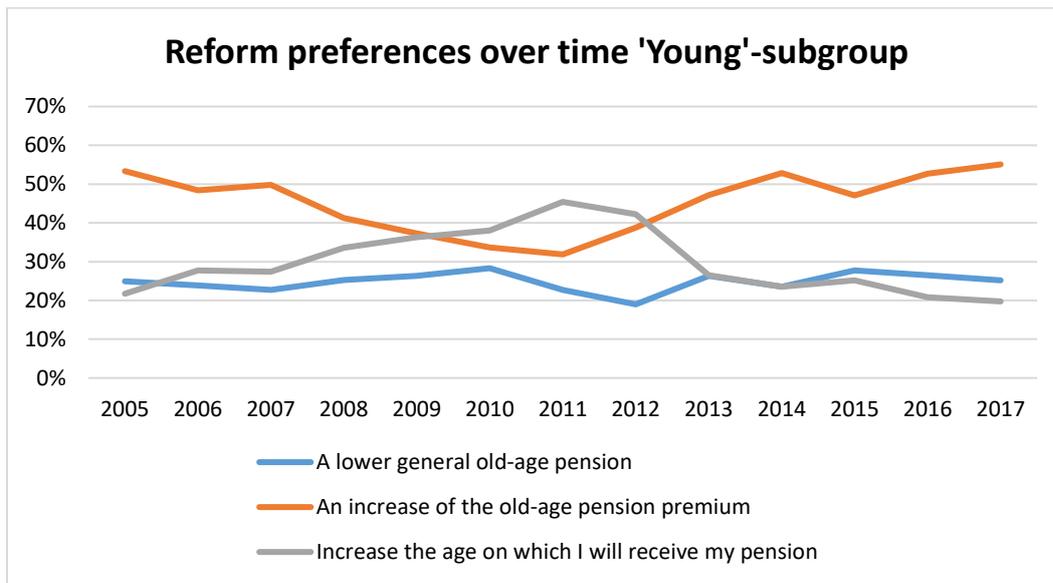
The ‘young’-subgroup consists of people between the ages of twenty and forty years old. The ‘old’-subgroup consists of people between the ages of fifty to seventy, provided they are not

⁷ The preferences for the middle age group can be found in appendix I

receiving any pension, as that disqualifies a person from being part of the questionnaire. The 'medium'-subgroup then makes up the people aged forty to fifty. The 'young'-subgroup is almost twice as likely as the 'old'-subgroup to support a lower general old-age pension. For the 'young'-subgroup increasing the pension age and lowering the pension benefits are almost equally preferable, where increasing the age of the general old age pension is much more preferable to the 'old'-subgroup. Both groups seem to support increasing the premium paid into the system over the other two options. The 'young'-subgroup does support this option by nine percentage points fewer.

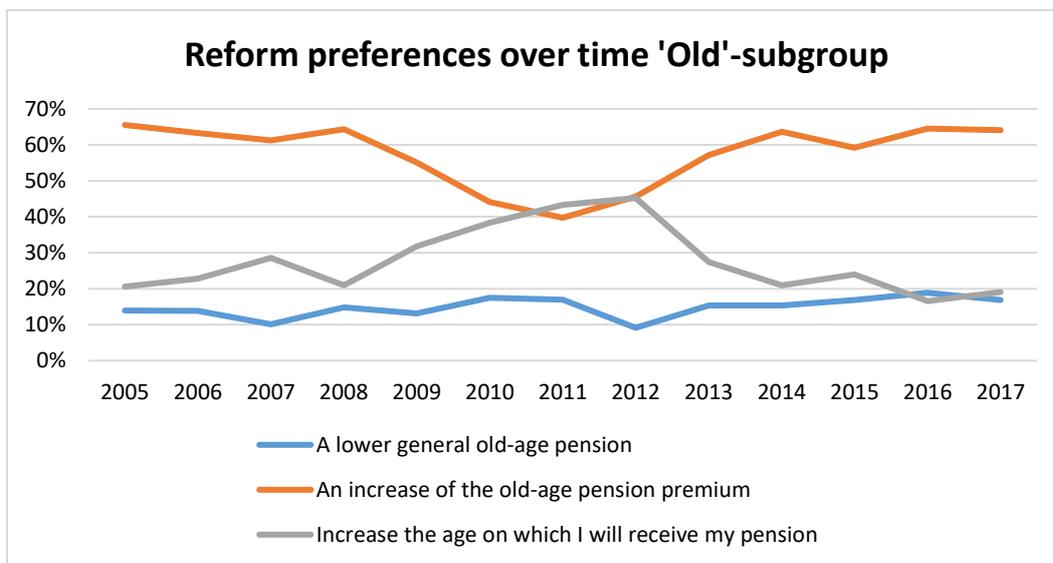
The same general trend is present over time in both groups over time (see figures overleaf), with the popularity of heightening the pension age reaching its zenith in 2011-2012, and then steeply dropping off. The preferences of the 'young'-subgroup as well as the 'old'-subgroup drop sixteen and eighteen percentage points respectively from 2012 to 2013 towards increasing the pension age. Until 2016 for the 'young'-subgroup, this option decreases a further five percentage points in popularity, whereas for the 'old'-subgroup it drops another twelve percentage points. It shows a decreasing willingness for the people in the 'old'-subgroup to take an extra heightening of the pension age as time goes on. The 'young'-subgroup continues to be more, and increasingly more favourable towards receiving a lower general old-age pension, with a gap of ten percentage points more willing to take a cut in their pension income than the 'old'-subgroup. The 'old'-subgroup grows massively in favour of an increase in the premium, which could be a logical result of the reduced years of premium that this group has to pay, between ten and one year(s) of premium payments left for this group. Sixty-four per cent of the 'old'-subgroup favours this option versus fifty-three per cent of the 'young'-subgroup in 2016. This gap is not unlike the gap between the two groups in 2005, with sixty-seven per cent versus forty-four per cent in favour. Another interesting difference between the older and the younger group is the spread of support, the older group has a significantly more outspoken preference from ten per cent for the least favoured reform to sixty per cent for the most favoured reform. The younger group has a fifty to twenty per cent spread in the most divergent case.

Figure 6: Pension Reform Preferences for the Younger subgroup over time



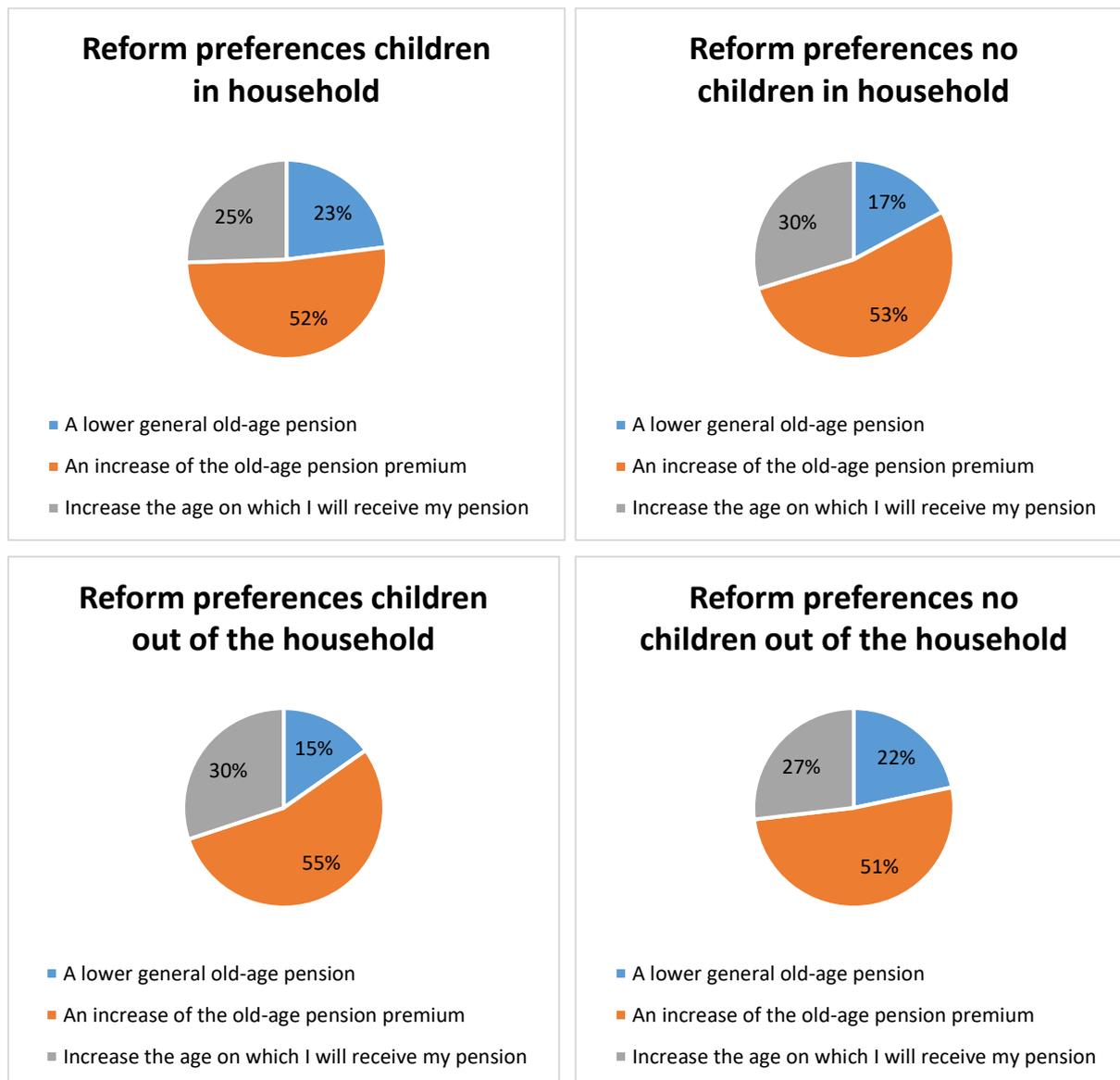
Source: (CentERdata 2005-2017)

Figure 7: Pension Reform Preferences for the older subgroup over time



Source: (CentERdata 2005-2017)

Figure 8, 9, 10 and 11: Pension Reform Preferences for groups with and without children in the household



Source: (CentERdata 2005-2017)

The previous four figures show comparisons between the groups of people with and without children, those with children represented on the left hand side. These figures do not correct for the age of the groups of people, so they will logically include an older subset of the population, especially in the children outside of the household subset. Interestingly, those with no children out of the household are more in favour of intergenerationally solidary positions than those with children outside of the household. Looking at the baseline regression, the lack of compensation for the age of the respondents can explain part of this, as in the baseline regression, there is more evidence to support the position that having children outside of the household is associated with intergenerational solidarity.

4. Model & Results

This section consists of a description and explanation of the multinomial probit models used in this research and the results of these models. These results are then discussed with reference to their coefficients, statistical significance and their implications for the proposed hypotheses of this research. This section concludes with robustness checks.

4.1 The multinomial probit and the models

A multinomial probit or logit are the most appropriate analytical tools to use with the dependent variable that we are analyzing: three different pension reform preferences that are being weighed against each other, this necessitates a multinomial approach.

A multinomial probit takes one of the options of the dependent variable as the base outcome, and weighs the preferences for the remaining options of the dependent variable relative to this base outcome. The probit weighs these preferences for each independent variable added in the equation, and through this process you can compare the different preferences that different independent variables correlate with.

The probit part of the multinomial probit lets us see which factors are correlated with the three different reforms, or nominal categories. The limitations of a probit models are that it only shows the directionality and degree of importance of the variables, it will not provide the granularity of a regular regression. In this case I deem this granularity less necessary as the directionality will give a good idea whether something has a negative or positive effect on a driver. Secondly, the current debate concerning pension reform preferences is not yet looking at particulars, it is more looking at which drivers are more important than others, so the degree of importance is also useful, and once again granularity will not add much to the knowledge gained from this research. Further research could look into marginal effects, considering the significance of these results.

For this research I created five models. The first model is the baseline model, it looks at the baseline variables established in the data section. The second model looks at the interaction effects for the younger age group and the older age group, to see whether there are different, possibly heterogeneous or diverging incentives to be found. The third, fourth and fifth models

look at the interaction effects of having children (both inside as well as outside of the household) and grandchildren respectively, much in the same way as the second model.⁸

4.2 The Results

Table 4: Multinomial probit baseline, 2005-2017. Source DHS

Variables	Coef.	Std. Err.	z	P>z	95% conf interval	
A lower general old-age pension						
Young age	.1540	.0859	1.79	0.073	-.0144 0.3225	
Old age	-.4215***	.0536	-7.87	0.000	-.5264 -.3165	
Medium age	Omitted					
Sex	.0468	.0504	0.93	0.353	-.0519 .1456	
# of children in the household	.0846***	.0217	3.90	0.000	.0421 .1271	
# of children not in household	.1032***	.0253	4.07	0.000	.0535 .1528	
Lower education	-.2641***	.0528	-5.00	0.000	-.3676 -.1605	
Vocational education	-.2061***	.0579	-3.56	0.000	-.3196 -.0926	
Higher education	Omitted					
Grandchildren	.1919**	.0679	2.83	0.005	.0588 .3251	
First quartile income	-.0402	.0773	-0.52	0.603	-.1918 .1113	
Second quartile income	-.1694*	.0680	-2.49	0.013	-.3027 -.0361	
Third quartile income	-.1605**	.0573	-2.80	0.005	-.2728 -.0481	
Fourth quartile income	Omitted					
Partner	.0939	.0561	1.67	0.094	-.0160 .2038	
Employed	.0156	.0565	0.28	0.783	-.0951 .1262	
Unemployed	Omitted					
2005	-.2373*	.0955	-2.48	0.013	-.4244 -.0501	
2006	-.1372	.0969	-1.42	0.157	-.3271 .0527	
2007	-.4007***	.1018	-3.94	0.000	-.6002 -.2011	
2008	-.1537	.0996	-1.54	0.123	-.3489 .0414	
2009	.0094	.1007	0.09	0.925	-.1880 .2068	
2010	.2730**	.1037	2.63	0.008	.0698 .4761	
2011	.4514***	.1020	4.42	0.000	.2515 .6513	
2012	-.0672	.1077	-0.62	0.533	-.2784 .1440	
2013	-.1552	.1120	-1.38	0.166	-.3749 .0645	
2014	-.2890	.1688	-1.71	0.087	-.6198 .0419	
2015	.0900	.0954	0.94	0.346	-.0971 .2770	
2016	.0401	.098	0.41	0.682	-.1520 .2322	
2017	Omitted					
_cons	-1.0102***	.1854	-5.45	0.000	-1.3736 -.6468	
* = $P \leq 0.05$ ** = $P \leq 0.01$ *** = $P \leq 0.001$						

⁸ Models two through five are not represented as a table in the main body of the text, but the code to recreate them is available in the appendices.

An increase of the old-age pension premium (base outcome)						
Variables	Coef.	Std. Err.	z	P>z	95% conf interval	
Increase the age on which I will receive my pension						
Young age	.2530**	.0835	3.03	0.002	.0895	.4166
Old age	-.3335***	.0510	-6.54	0.000	-.4333	-.2336
Medium age	Omitted					
Sex	-.1983***	.0466	-4.25	0.000	-.2897	-.1069
# of children in the household	-.0071	.0211	-0.33	0.738	-.0485	.0342
# of children not in household	.1485***	.0226	6.58	0.000	.1043	.1927
Lower education	-.3904***	.0482	-8.11	0.000	-.4848	-.2960
Vocational education	-.4010***	.0548	-7.32	0.000	-.5085	-.2936
Higher education	Omitted					
Grandchildren	-.0237	.0597	-0.40	0.691	-.1406	.0932
First quartile income	.0020	.0711	0.03	0.978	-.1375	.1414
Second quartile income	-.0473	.0622	-0.76	0.447	-.1693	.0747
Third quartile income	-.1416**	.0532	-2.66	0.008	-.2459	-.0374
Fourth quartile income	Omitted					
Partner	-.1772***	.0500	-3.55	0.000	-.2751	-.0792
Employed	-.2615***	.0498	-5.25	0.000	-.3591	-.1638
Unemployed	Omitted					
2005	-.0980	.0959	-1.02	0.307	-.2860	.0901
2006	.1888*	.0951	1.99	0.047	.0024	.3751
2007	.2801**	.0944	2.97	0.003	.0951	.4651
2008	.1817	.0970	1.87	0.061	-.0085	.3719
2009	.5494***	.0959	5.73	0.000	.3614	.7374
2010	.9421***	.0978	9.63	0.000	.7504	1.1338
2011	1.0759***	.0973	11.06	0.000	.8852	1.2666
2012	.9670***	.0963	10.05	0.000	.7784	1.1557
2013	.3391***	.1057	3.21	0.001	.1320	.5462
2014	.2532	.1537	1.65	0.100	-.0481	.5544
2015	.2949**	.0957	3.08	0.002	.1073	.4825
2016	-.0769	.1026	-0.75	0.454	-.2781	.1243
2017	Omitted					
¤ _cons	.0902	.1684	0.54	0.592	-.2399	.4203

* = $P \leq 0.05$

** = $P \leq 0.01$

*** = $P \leq 0.001$

Source: (CentERdata 2005-2017)

In the baseline model there are many significant effects, and many of these significant effects far above the five percent level by a factor of ten. The effects observed in the table both confirm as well as contradict the hypotheses of this research.

Looking at the rows which compare a lower general old age pension to the base outcome, some interesting findings emerge. The older age group has a strong preference against a lower pension pay out, though the younger age group is not significant. A strong correlation across the board can be found when looking at children, the more children, inside the household,

outside the household, or the presence of grandchildren, they all correlate positively with more intergenerational solidarity; they all correlate with preferring lower pay-outs over the base outcome. The higher the income of a respondent, the higher the preference for a lower general old-age pension. This seems in accordance with financial interest, as the higher the income, the lower the dependence on the public pension is, as there are more second, third and fourth pillar pension arrangements to count on. Those with lower education levels also have a distinct preference for paying higher premiums over lower public pension payments. A possible threat to interference are the residuals, which are significant, meaning that there is a variable that still accounts for an important part of the variation.

In the table containing the results for the comparison between increasing the pension age and the base outcome, there are also many interesting correlations. There is an increasing preference for raising the pension age, tapering off after 2011, which concurs with the spike of support for the raising of the pension age observed in figure six and seven. Being gainfully employed is negatively correlated to preferring to raise the pension age. There is no statistically significant effect for those with grandchildren, only having children outside of the household is significantly and positively correlated with preferring an increased pension age. A most important finding is the correlation between age and preferences for a heightened pension age; the older a person, the more likely they are to oppose a raising of the pension age. This correlation shows in both the young- and old-groups relative to the medium age group. Those in lower and vocational education are also much more negative towards raising the pension age than those with an academic education. There is no general significant trend to be found with regard to income.

The second model attempts to tease out whether period effects are different for young and old. We don't observe any significant time-effects when testing the different age groups at each other. Having a partner, the education level, the gender and having children however do have significant positive correlations with the lower pension pay-outs.

Interestingly, when looking at the significant variables for increasing the pension age, the number of children outside of the household correlates negatively with the proposed increase of the pension age. However, including the confidence interval, this effect is doubtful, but noteworthy still, as it contradicts the previous results and the hypothesis. Broadly the direction of the correlations of the baseline remains the same except for this difference.

Just looking at the age and time interaction effects for the older subgroup changes very little about what we know. There are no significant correlations observed beyond those already seen in the baseline. The same holds true for looking at possible changes over time in the disposition of the younger subgroup. This seems to indicate that the differences of opinions have not diverged significantly over time.

Looking at the time effects of the most promising variables, the number of children living inside the household and outside of the household delivers the following two tables. None of these effects result in any significant results.

4.3 Hypothesis testing

What are the main drivers behind Dutch households' attitudes toward pension system reform from 2005 to 2017 and how did they change?

Hypothesis 1: One of the main drivers behind Dutch peoples' attitudes toward pension system reform is their direct financial self-interest.

Financial self-interest seems to be one of the larger factors correlating with self-interested pension reform options as put forward in the method, the older subgroup favored not increasing the pension age as well as not lowering pension payments. Those with higher incomes also favored a lower public pension payout over paying higher premiums. This also confirms this hypothesis, as the higher a person's income, the less significant the public pension system is for their retirement plans. There are complications, however. Those in the younger group did not clearly prefer lowering the pension payouts, and the income variable, as well as the employment variable were insignificant, there where they, if the hypothesis were correct, would correlate with self-interest. This does mean that the first hypothesis is only confirmed partly.

What role does intergenerational solidarity play in pension reform preferences?

Hypothesis 2: Having children will make a person less generationally selfish in pension system reform attitude, as their direct financial self-interest is combined with that of their offspring. This leads to people with (grand) children to exhibit less intergenerational selfishness.

This hypothesis is largely confirmed. The effect of having children outside the household is the opposite of the effect of being older in the case of raising the retirement age, meaning that having children outside the household makes a person more likely to have preferences that indicate intergenerational solidarity. It must be noted that having children inside the household

as well as having grandchildren did not show any statistically significant result in raising the retirement age. For the relation between a lower pension payout, the evidence is a lot clearer, having children, in or outside of the household, or having grandchildren, all make people more likely to be in favor of lower payouts, rather than picking the less solidary option of higher premiums. This is the opposite effect of being older, which correlates more with being generationally selfish.

4.4 Robustness checks

There are different ways in which this research is countervailing threats to interference, among which the quality of the dataset and several robustness checks mentioned below.

Maturation and mortality of households, skewing the sample is countervailed by the use of the DNB household survey, as it consists of a representative sample of the Dutch population. The selection of households is kept constantly representative by the compilers of the DHS dataset and is covered in this way.

One of the main threats to inference for the model used is multicollinearity, the used model in Stata automatically corrects for these threats.

Most of the variables used in this research being ordinal or categorical, normal ways of checking robustness are rendered ineffective to a degree (Karlson et al., 2012, p.286). Another potential problem for the robustness of the results is the fact that no psychological factors were included in this research, those could add to an omitted variable bias.

5. Discussion and Conclusions

The main goal of this research was to investigate the effect, if any of financial interest, intergenerational solidarity on preferences for public pension reform. In order to ascertain this relation, survey data about some fifty-thousand people over a period of twelve years were analyzed using summary statistics and several multinomial probit models.

The results show a large number of statistically significant correlations, both confirming as well as confounding the hypotheses set out to test in this research.

5.1 Main conclusions

Financial self-interest seems to be one of the larger factors correlating with self-interested pension reform options, the older subgroup favored not increasing the pension age as well as not lowering pension payments. Those with higher incomes also favored a lower public pension payout over paying higher premiums. The higher a person's income, the less significant the public pension system is for their retirement plans. There are complications, however. Those in the younger group did not clearly prefer lowering the pension payouts, and the income variable, as well as the employment variable were insignificant, there where they, if the hypothesis were correct, would correlate with self-interest. This does mean that the first hypothesis is only confirmed partly.

The second hypothesis which asserted that having children positively affects intergenerational solidarity is largely confirmed. The effect of having children outside the household is the opposite of the effect of being older in the case of raising the retirement age, meaning that having children outside the household makes a person more likely to have preferences that indicate intergenerational solidarity. It must be noted that having children inside the household as well as having grandchildren did not show any statistically significant result in raising the retirement age. For the relation between a lower pension payout, the evidence is a lot clearer, having children, in or outside of the household, or having grandchildren, all make people more likely to be in favor of lower payouts, rather than picking the less solidary option of higher premiums. This is the opposite effect of being older, which correlates more with being generationally selfish.

There are multiple caveats to these findings, as the effects do sometimes not fully align with the hypothesis, or in other places, where significant effects were expected, such as a preference for lower pension payouts for the younger group, failed to be significant. The hypothesis that

having children or grandchildren makes people less generationally self-interested seems to be the most clearly proven hypothesis. A problem in interpreting this finding however is that for a robust interpretation of this finding, more statistically significant evidence of intergenerational selfishness would have made its case stronger.

These results are still tentative results that show a positive correlation between having children and showing more support for measures that are financially advantageous for younger people and disadvantageous for older people. Next to these results, it also matters that in the run up to the reform in 2012, there was a strong movement toward raising the public pension age, which tapered off when the reforms were being put into practice. For the rest, none of the time-effects tested were significant. Maybe future research, including more data might be able to discern of any time-effects or heterogeneous effects, but this research failed to establish any such effects to a statistically significant level.

Referring back to the different theories on pension reform preferences (Jaime Castillo, 391, 2013), the results can be said to be in line with the first proposed theory to a degree, which references support to pension reform options based on financial self-interestedness.

The descriptive data are interesting also, as they show a strong reduction in support for increasing the pension age after the implementation of the heightened pension age in 2012, which was also visible as a time-effect in the regression.

5.2 The impact

The knowledge gained from this research is a good source to consider before engaging in future changes to the Dutch pension system in several ways. Firstly, the changing opinions over time about pension system reform, such as the continually strong support for the raising of pension premiums relative to the other options, or the significantly decreased support for raising the pension age, give an indication of which reform would have the most public support at a given time. So if further reforms are needed, this part of the research can provide a starting point for analyzing options to make the system financially sustainable in the future. A good example would be the support for further raising the pension age, which is much lower now, and would therefore not be a politically sensible option anymore.

Secondly, this research gives an indication that having children increases intergenerational solidarity. This could mean that parents calculate their children's financial fate with their own financial situation, instead of just considering their own financial situation. Thirdly the study

also nuances the sometimes polarizing views in society about generational conflict and ‘greedy baby boomers’. Many older people were willing to take positions that were not financially self-interested, especially when they had had children, showing that solidarity exists from older generations to younger generations, and that the differences in opinions on this specifically generationally charged topic are not as divergent as sometimes claimed.

This research was one of the first researches delving into the nature of intergenerational solidarity’s influence on pension reform preferences. As the large number of used and usable variables indicate, the DHS dataset is a treasure trove for researchers looking into questions regarding to the pension system. This dataset has much more information to yield. Further research could be done into figuring out a larger amount of the drivers behind pension reform preferences, as there is still a need for financial sustainability in many of the public as well as private pension systems in the world.

For the Dutch case in particular, repeating this research with updated insights and new data will prove invaluable in charting the trends in public opinion of pension reform. Research into the effect of savings and knowledge about pensions can also be done with the data used in this thesis. The bottom of the barrel in terms of useful research material and strengthening the academic literature has not nearly been reached.

5.3 Limits of the research

The limits of this research are the limits of the quality and the representativeness of the data. As the data pertains to the Dutch population, a society that is rich, post-industrialized and aging, it can be compared with other like populations in different pension systems, also due to the quality of the data and the representativeness of the sample taken. The comparison between this population and developing countries, could however be problematic, due to the different demographic and economic factors and the different pension systems in these countries, meaning that these results are not universally applicable.

The use of the multinomial probit introduces some limitations to this research: it means that the results can’t be used as easily to find the marginal effects of a variable, meaning that the findings aren’t as granular as researches using normal multiple regression. The choice for a multinomial probit and the nature of the variables (mostly categorical and ordinal) also limits the robustness checks that were performed for this research.

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Appendix I: Figures and tables

All these tables and figures are based on the data-set used and referred to in the main body of the text.

Figure I: Pension Reform Preferences for the medium age subgroup

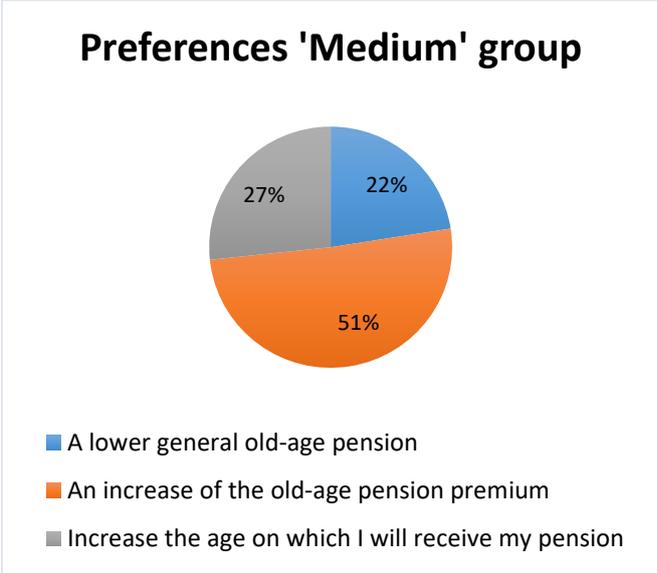
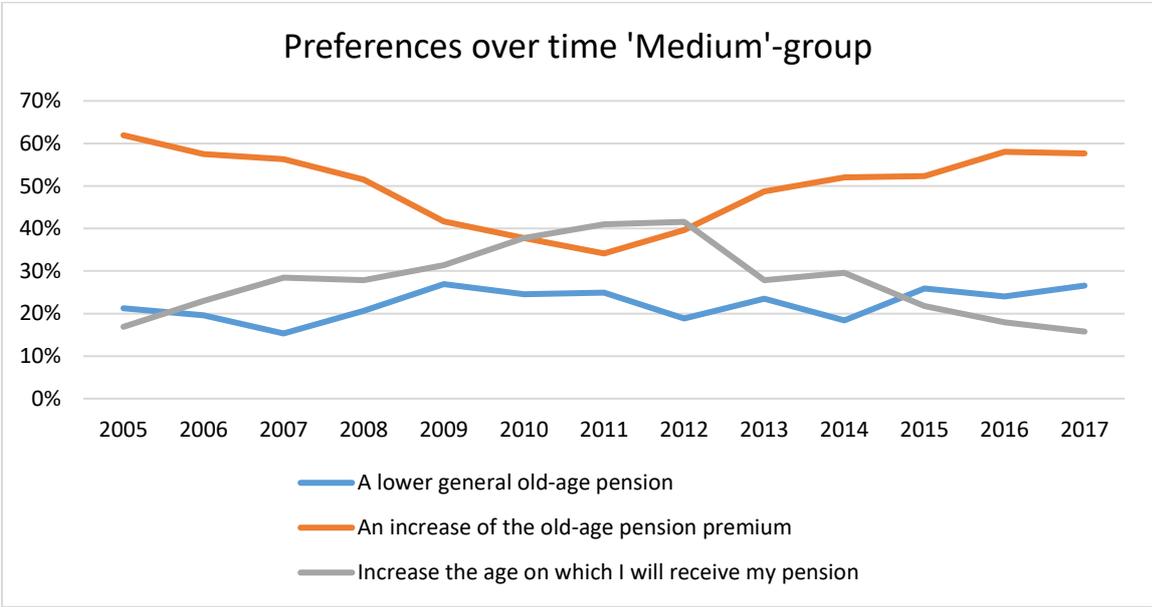


Figure II: Pension Reform Preferences for the medium age subgroup over time



Appendix II: The DHS Questions used as variables

“2005-2011

*DNB207A To make sure that the general old-age pension remains affordable certain measures have to be taken. Which of the following measures appeals to you most?

1 a lower general old-age pension at the age of 65.....

DNB207B **Pro-pro young people) Risk averse maybe pro, against elderly and close to pension**

2 an increase of the old-age pension premium for people working

DNB207B **Pro-risk averse pro- close to pension, pro elderly**

3 increase the age by two years (from 65 to 67 years of age) on which one will receive the general =old-age pension **Pro elderly anti close to pension younger workers?**

..... DNB207B

*DNB207B Which of the two remaining measures appeals the most to you thereafter?

1 a lower general old-age pension at the age of 65.....DNB208

2 an increase of the old-age pension premium for people workingDNB208

3 increase the age by two years (from 65 to 67 years of age) on which one will receive the general

old-age pensionDNB208

2011-2016

Recently, it has been decided to increase the general old-age pension age.

To make sure that the general old-age pension remains affordable certain measures have to be taken. Which of the following measures appeals to you most?

1 A lower general old-age pension.....DNB207B

2 An increase of the old-age pension premium for people working.....DNB207B

3 Increase the age on which I will receive the general old-age pension. DNB207B

Highest level of education completed

- 1 (Voortgezet) speciaal onderwijs / (continued) special educationBEZIGHEI
- 2 Kleuter-, lager- of basisonderwijs / kindergarten/primary education..BEZIGHEI
- 3 Voorbereidend middelbaar beroepsonderwijs (VMBO) / pre-vocational educationBEZIGHEI
- 4 HAVO/VWO / pre-university educationBEZIGHEI
- 5 MBO of het leerlingwezen / senior vocational training or training through apprentice systemBEZIGHEI
- 6 HBO (eerste of tweede fase) / vocational colleges.....BEZIGHEI
- 7 Wetenschappelijk onderwijs WO / university education.....BEZIGHEI
- 8 Did not have education (yet).....BEZIGHEI
- 9 other sort of education/trainingBEZIGHEI

GESLACHT

Sex of the respondent

- 1 male POSITIE
- 2 female..... POSITIE

OPLMET

Highest level of education completed

- 1 (Voortgezet) speciaal onderwijs / (continued) special educationBEZIGHEI
- 2 Kleuter-, lager- of basisonderwijs / kindergarten/primary education...BEZIGHEI
- 3 Voorbereidend middelbaar beroepsonderwijs (VMBO) / pre-vocational educationBEZIGHEI
- 4 HAVO/VWO / pre-university educationBEZIGHEI
- 5 MBO of het leerlingwezen / senior vocational training or training through apprentice systemBEZIGHEI
- 6 HBO (eerste of tweede fase) / vocational colleges.....BEZIGHEI
- 7 Wetenschappelijk onderwijs WO / university education.....BEZIGHEI
- 8 Did not have education (yet).....BEZIGHEI
- 9 other sort of education/trainingBEZIGHEI

BEZIGHEI

Primary occupation of the respondent

1 employed on a contractual basis.....	AANTALHH
2 works in own business.....	AANTALHH
3 free profession, freelance, self-employed.....	AANTALHH
4 looking for work after having lost job	AANTALHH
5 looking for first-time work	AANTALHH
6 student	AANTALHH
7 works in own household	AANTALHH
8 retired [pre-retired, AOW, VUT].....	AANTALHH
9 (partly) disabled.....	AANTALHH
10 unpaid work, keeping benefit payments.....	AANTALHH
11 works as a volunteer	AANTALHH
12 other occupation.....	AANTALHH
13 too young, has no occupation yet	AANTALHH

GEBJAAR

Year of birth of the respondent

any answer.....GESLACHT

AANTALKI

Number of children in the household

0 none	STED
1 1 child.....	STED
2 2 children	STED
3 3 children	STED
4 4 children	STED
5 5 children	STED
6 6 children	STED
7 7 children	STED
8 8 children	STED
9 9 children or more	STED

PARTNER

Is there a partner present in the household?

0 no

WONING

1 yes

WONING

KK

Do you have any grandchildren?

1 yesHKK

2 noKIDOUT

HKK

How many grandchildren do you have?

number.....KIDOUT

KIDOUT

Do you have any children not/no longer belonging to your household?

We mean children who are not living with you (and your partner) (anymore).

1 yesHKIDOUT

2 noBEZIG

HKIDOUT1

How many of your children live outside your household?

Would you count **all** the children who lived with you (and your partner).” (CentERdata, 2016)
(CentERdata, 2005)

BEZIGHEI

Primary occupation of the respondent

1 employed on a contractual basis.....

2 works in own business.....

3 free profession, freelance, self-employed.....

4 looking for work after having lost job

5 looking for first-time work

6 student

7 works in own household

8 retired [pre-retired, AOW, VUT].....

9 (partly) disabled.....

10 unpaid work, keeping benefit payments.....

11 works as a volunteer

12 other occupation.....

13 too young, has no occupation yet

BEZIG What do you consider to be your primary occupation?

1 paid job.....DNB215

2 looking for a job after having lost my former jobDNB215

3 looking for first-time work/looking for work after having been without a job for a long time
.DNB215

4 student, trainee/apprentice receiving only an allowance for expensesDNB215

5 work in my own householdDNB215

6 retired, living off interest-yielding investments.....DNB215

7 early retirementDNB215

8 (partially) disabled.....DNB215

9 unpaid work, keeping my benefit paymentsDNB215

10 work as a volunteer.....DNB215

11 other.....DNB215

Key concepts and their operationalization into variables

Table 1. Key concepts and operationalization (Adapted from van der Stegen 2017)

Variable and coding	Conceptualization	Operationalization	Measurement
Youngest test group (IV) <i>Young</i>	This is defined as all people from the age of 20 up to and including the age of 39.	The question “What is your age?”	Being in the middle test group is denoted as filling out an age between 19 and 40.
Gender of person (IV) <i>geslacht</i>	This is defined as whether you have a male or female sex.	The question “What is your sex?”	Being of the male sex is denoted as ‘1’, being of the female sex is denoted as ‘2’.
Partner (IV) <i>partner</i>	This is defined as whether you have a partner in the household.	The question “Is there a partner in the household?”	Having a partner in the household is denoted as ‘1’, no is denoted as ‘0’.
Middle test group (IV) <i>Medium</i>	This is defined as all people from the age of 40 up to and including the age of 49.	The question “What is your age?”	Being in the middle test group is denoted as filling out an age between 39 and 50.
Oldest test group (IV) <i>Old</i>	This is defined as all people from the age of 50 up to and including the age of 69 that are no receiving a public pension.	The question “What is your age?” and “Are you receiving public pension?”	Being in the oldest test group is denoted as filling out an age between 49 and 70. DNB207a is only tested for those not receiving AOW.
Education (IV) <i>OPLMET</i>	This is defined as the highest completed education level.	The question “What is your highest completed education level?”	‘1’ denotes education up to and including finishing secondary school, ‘2’ denotes finishing vocational education (MBO), ‘3’ denotes finishing vocational college (HBO) and ‘4’ denotes finishing university education.
Income (IV) <i>BTOT*</i>	This is defined as the gross personal income over the past year.	Adding up all the different income variables. ⁹	‘1’ denotes a gross yearly personal income below €14000, ‘2’ denotes an income between €14000 and €28000; ‘3’ denotes an income between €28000 and €42000 and ‘4’ denotes an income larger than €42000.

⁹ btot = loon + vut + pens + wao + ww + wg + aow + aww + abw + waz + wajong + ioaw + alim + max(winst,0) + hprem + hwf. (CentERdata, 2013, p.5)

<p>Attitude toward Pension reform (Dependent Variable) <i>DNB207a</i></p>	<p>This is defined as a preference between “a lower general old-age pension”, “an increase of the old-age pension premium for people working” and “Increase the age on which I will receive the general old-age pension.”</p>	<p>The question “Which of the following measures appeals to you most? 1 A lower general old-age pension 2 An increase of the old-age pension premium for people working 3 Increase the age on which I will receive the general old-age pension.”</p>	<p>The support for the respective pension reform is measured as a number of people that entered the respective pension reform as their preferred reform.</p>
<p>Number of children in the household/number of children outside the household (IV) <i>AANTALKI/HKIDOUT</i></p>	<p>This is defined as whether a person has any children in their household/children outside of the household.</p>	<p>The question: “What is the number of children in your household?”/ “Do you have any children not/no longer belonging to your household?”</p>	<p>The number of children is measured by the respective number of children reported to be in- and outside of the household.</p>
<p>Having grandchildren/number of grandchildren (IV) <i>KK/HKK</i></p>	<p>This is defined as whether a person has grandchildren, and how many grandchildren a person has.</p>	<p>The question: “Do you have any grandchildren?”/“How many grandchildren do you have?”</p>	<p>Answering with ‘Yes’ or ‘No’/ Indicating the number of grandchildren a person has.</p>
<p>Occupational status (IV) <i>BEZIGHEI/BEZIG</i></p>	<p>This is defined as what a person’s primary occupation is.</p>	<p>The question: “Primary occupation of the respondent?”</p>	<p>Answering one of the following options: ‘1’ is denoted as “Employed on a contractual basis; works in own business; free profession, freelance, self-employed; student; works in own household; works as a volunteer; other occupation.” ‘2’ is denoted as “Looking for work after having lost job; looking for first-time work; (partly) disabled; unpaid work, keeping benefits.”</p>

Appendix III: STATA code used in the research

This section contains the main body of STATA code used in this research, for replication purposes. If there are any elements unclear, please contact me.

```
use "wrk2017en_1.0.dta", clear
merge 1:1 nohold nomem using "hhi2017en_1.0.dta"
gen jaar=2017
save "data2017.dta", replace
use "wrk2016en_1.0.dta", clear
merge 1:1 nohold nomem using "hhi2016en_1.0.dta"
gen jaar=2016
save "data2016.dta", replace
use "wrk2015en_1.0.dta", clear
merge 1:1 nohold nomem using "hhi2015en_2.1.dta"
gen jaar=2015
save "data2015.dta", replace
use "wrk2014en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2014en_2.0.dta"
gen jaar=2014
save "data2014.dta", replace
use "wrk2013en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2013en_2.0.dta"
gen jaar=2013
save "data2013.dta", replace
use "wrk2012en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2012en_2.0.dta"
gen jaar=2012
save "data2012.dta", replace
use "wrk2011en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2011en_2.0.dta"
gen jaar=2011
save "data2011.dta", replace
use "wrk2010en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2010en_2.0.dta"
gen jaar=2010
save "data2010.dta", replace
use "wrk2009en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2009en_2.0.dta"
gen jaar=2009
save "data2009.dta", replace
use "wrk2008en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2008en_2.0.dta"
gen jaar=2008
save "data2008.dta", replace
use "wrk2007en_2.0.dta", clear
merge 1:1 nohold nomem using "hhi2007en_2.0.dta"
gen jaar=2007
save "data2007.dta", replace
```

```

use "wrk2006en_2.0.dta", clear
merge 1:1 nohhold nomem using "hhi2006en_2.0.dta"
gen jaar=2006
save "data2006.dta", replace
use "wrk2005en_2.0.dta", clear
merge 1:1 nohhold nomem using "hhi2005en_2.0.dta"
gen jaar=2005
save "data2005.dta", replace
use "data2017.dta", clear
append using "data2016.dta"
append using "data2015.dta"
append using "data2014.dta"
append using "data2013.dta"
append using "data2012.dta"
append using "data2011.dta"
append using "data2010.dta"
append using "data2009.dta"
append using "data2008.dta"
append using "data2007.dta"
append using "data2006.dta"
append using "data2005.dta"
save "datatotal.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2017en_1.0.dta", clear
merge 1:1 nohhold nomem using "wrk2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2017en_1.0.dta"
destring pro1, replace
gen jaar=2017
save "bigdata2017.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2016en_1.0.dta", clear
merge 1:1 nohhold nomem using "wrk2016en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2016en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2016en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2016en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2016en_1.0.dta"
drop _merge

```

```

merge 1:1 nohhold nomem using "agw2016en_1.0.dta"
destring pro1, replace
gen jaar=2016
save "bigdata2016.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2015en_2.1.dta", clear
merge 1:1 nohhold nomem using "wrk2015en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2015en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2015en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2015en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2015en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2015en_1.0.dta"
destring pro1, replace
gen jaar=2015
save "bigdata2015.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2014en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2014en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2014en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2014en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2014en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2014en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2014en_2.0.dta"
destring pro1, replace
gen jaar=2014
save "bigdata2014.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2013en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2013en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2013en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2013en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2013en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2013en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2013en_3.0.dta"
destring pro1, replace

```

```

gen jaar=2013
save "bigdata2013.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2012en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2012en_3.0.dta"
destring pro1, replace
gen jaar=2012
save "bigdata2012.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2011en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2011en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2011en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2011en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2011en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2011en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2011en_3.0.dta"
destring pro1, replace
gen jaar=2011
save "bigdata2011.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2010en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2010en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2010en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2010en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2010en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2010en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2010en_2.0.dta"
destring pro1, replace
gen jaar=2010
save "bigdata2010.dta", replace

```

```

cd "C:\Users\Luc\Desktop\stata"
use "hhi2009en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2009en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2009en_2.1.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2009en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2009en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2009en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2009en_3.0.dta"
destring pro1, replace
gen jaar=2009
save "bigdata2009.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2008en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2008en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2008en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2008en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2008en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2008en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2008en_3.0.dta"
destring pro1, replace
gen jaar=2008
save "bigdata2008.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2007en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2007en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2007en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2007en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2007en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2007en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2007en_3.0.dta"
destring pro1, replace
gen jaar=2007
save "bigdata2007.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2006en_2.0.dta", clear

```

```

merge 1:1 nohhold nomem using "wrk2006en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2006en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2006en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2006en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2006en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2006en_3.1.dta"
destring pro1, replace
gen jaar=2006
save "bigdata2006.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2005en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2005en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "hse2005en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "inc2005en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "wth2005en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2005en_3.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agw2005en_3.0.dta"
destring pro1, replace
gen jaar=2005
save "bigdata2005.dta", replace
use "bigdata2017.dta", clear
append using "bigdata2016.dta", force
append using "bigdata2015.dta", force
append using "bigdata2014.dta", force
append using "bigdata2013.dta", force
append using "bigdata2012.dta", force
append using "bigdata2011.dta", force
append using "bigdata2010.dta", force
append using "bigdata2009.dta", force
append using "bigdata2008.dta", force
append using "bigdata2007.dta", force
append using "bigdata2006.dta", force
append using "bigdata2005.dta", force
save "bigdatatotal.dta", replace
merge 1:1 nohhold nomem using "psy2017en_1.0.dta"
drop _merge
cd "C:\Users\Luc\Desktop\stata"
use "hhi2005en_2.0.dta", clear
use "wrk2005en_2.0.dta", clear
use "hse2005en_2.0.dta", clear

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use "inc2005en_2.0.dta", clear
use "wth2005en_2.0.dta", clear
use "agi2005en_3.0.dta", clear
use "agw2005en_3.0.dta", clear
cd "C:\Users\Luc\Desktop\stata"
use "hhi2017en_1.0.dta", clear
merge 1:1 nohhold nomem using "wrk2017en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2017en_1.0.dta"
gen jaar=2017
save "meddata2017.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2016en_1.0.dta", clear
merge 1:1 nohhold nomem using "wrk2016en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2016en_1.0.dta"
gen jaar=2016
save "meddata2016.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2015en_2.1.dta", clear
merge 1:1 nohhold nomem using "wrk2015en_1.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2015en_1.0.dta"
gen jaar=2015
save "meddata2015.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2014en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2014en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2014en_2.0.dta"
gen jaar=2014
save "meddata2014.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2013en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2013en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2013en_2.0.dta"
gen jaar=2013
save "meddata2013.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2012en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2012en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2012en_2.0.dta"
gen jaar=2012
save "meddata2012.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2011en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2011en_2.0.dta"
drop _merge

```

```

merge 1:1 nohhold nomem using "agi2011en_2.0.dta"
gen jaar=2011
save "meddata2011.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2010en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2010en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2010en_2.0.dta"
gen jaar=2010
save "meddata2010.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2009en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2009en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2009en_3.0.dta"
gen jaar=2009
save "meddata2009.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2008en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2008en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2008en_3.0.dta"
gen jaar=2008
save "meddata2008.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2007en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2007en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2007en_2.0.dta"
gen jaar=2007
save "meddata2007.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2006en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2006en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2006en_3.0.dta"
gen jaar=2006
save "meddata2006.dta", replace
cd "C:\Users\Luc\Desktop\stata"
use "hhi2005en_2.0.dta", clear
merge 1:1 nohhold nomem using "wrk2005en_2.0.dta"
drop _merge
merge 1:1 nohhold nomem using "agi2005en_3.0.dta"
gen jaar=2005
save "meddata2005.dta", replace
use "meddata2017.dta", clear
append using "meddata2016.dta"
append using "meddata2015.dta"
append using "meddata2014.dta"
append using "meddata2013.dta"

```

```

append using "meddata2012.dta"
append using "meddata2011.dta"
append using "meddata2010.dta"
append using "meddata2009.dta"
append using "meddata2008.dta"
append using "meddata2007.dta"
append using "meddata2006.dta"
append using "meddata2005.dta"
save "meddatatotal.dta", replace
use "meddatatotal.dta", clear
gen age = jaar - floor(gebjaar)
replace age =. if (age < 20)
replace age =. if (age > 69)
gen loweraow=(dnb207a==1)
replace loweraow=. if (dnb207a==.)
gen higherprem=(dnb207a==2)
replace higherprem=. if (dnb207a==.)
gen higherage=(dnb207a==3)
replace higherage=. if (dnb207a==.)
gen young = (age>=20 & age<40)
replace young=. if age==.
gen youngdnb207a1 = 1 if dnb207a == 1 & young == 1
egen totyoungdnb207a1 = count(youngdnb207a1), by (jaar)
gen youngdnb207a2 = 1 if dnb207a == 2 & young == 1
egen totyoungdnb207a2 = count(youngdnb207a2), by (jaar)
gen youngdnb207a3 = 1 if dnb207a == 3 & young == 1
egen totyoungdnb207a3 = count(youngdnb207a3), by (jaar)
gen medium = (age>=40 & age<50)
replace medium=. if age==.
gen meddnb207a1 = 1 if dnb207a == 1 & medium == 1
egen totmeddnb207a1 = count(meddnb207a1), by (jaar)
gen meddnb207a2 = 1 if dnb207a == 2 & medium == 1
egen totmeddnb207a2 = count(meddnb207a2), by (jaar)
gen meddnb207a3 = 1 if dnb207a == 3 & medium == 1
egen totmeddnb207a3 = count(meddnb207a3), by (jaar)
gen old = (age>=50 & age<70)
replace old=. if age==.
gen olddnb207a1 = 1 if dnb207a == 1 & old == 1
egen totolddnb207a1 = count(olddnb207a1), by (jaar)
gen olddnb207a2 = 1 if dnb207a == 2 & old == 1
egen totolddnb207a2 = count(olddnb207a2), by (jaar)
gen olddnb207a3 = 1 if dnb207a == 3 & old == 1
egen totolddnb207a3 = count(olddnb207a3), by (jaar)
gen agegroup1= (age>=20 & age<30)
replace agegroup1=. if age==.
gen agegroup2= (age>=30 & age<40)
replace agegroup2=. if age==.
gen agegroup3= (age>=40 & age<50)
replace agegroup3=. if age==.
gen agegroup4= (age>=50 & age<55)

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```

replace agegroup4=. if age==.
gen agegroup5= (age>=55 & age<60)
replace agegroup5=. if age==.
gen agegroup6= (age>=60 & age<65)
replace agegroup6=. if age==.
gen agegroup7= (age>=65 & age<70)
replace agegroup7=. if age==.
gen jaar2005=(jaar==2005)
replace jaar2005=. if jaar==.
gen jaar2006=(jaar==2006)
replace jaar2006=. if jaar==.
gen jaar2007=(jaar==2007)
replace jaar2007=. if jaar==.
gen jaar2008=(jaar==2008)
replace jaar2008=. if jaar==.
gen jaar2009=(jaar==2009)
replace jaar2009=. if jaar==.
gen jaar2010=(jaar==2010)
replace jaar2010=. if jaar==.
gen jaar2011=(jaar==2011)
replace jaar2011=. if jaar==.
gen jaar2012=(jaar==2012)
replace jaar2012=. if jaar==.
gen jaar2013=(jaar==2013)
replace jaar2013=. if jaar==.
gen jaar2014=(jaar==2014)
replace jaar2014=. if jaar==.
gen jaar2015=(jaar==2015)
replace jaar2015=. if jaar==.
gen jaar2016=(jaar==2016)
replace jaar2016=. if jaar==.
gen jaar2017=(jaar==2017)
replace jaar2017=. if jaar==.
gen jaar2005old=jaar2005*old
gen jaar2006old=jaar2006*old
gen jaar2007old=jaar2007*old
gen jaar2008old=jaar2008*old
gen jaar2009old=jaar2009*old
gen jaar2010old=jaar2010*old
gen jaar2011old=jaar2011*old
gen jaar2012old=jaar2012*old
gen jaar2013old=jaar2013*old
gen jaar2014old=jaar2014*old
gen jaar2015old=jaar2015*old
gen jaar2016old=jaar2016*old
gen jaar2017old=jaar2017*old
gen jaar2005young=jaar2005*young
gen jaar2006young=jaar2006*young
gen jaar2007young=jaar2007*young
gen jaar2008young=jaar2008*young

```

```

gen jaar2009young=jaar2009*young
gen jaar2010young=jaar2010*young
gen jaar2011young=jaar2011*young
gen jaar2012young=jaar2012*young
gen jaar2013young=jaar2013*young
gen jaar2014young=jaar2014*young
gen jaar2015young=jaar2015*young
gen jaar2016young=jaar2016*young
gen jaar2017young=jaar2017*young
gen jaar2005medium=jaar2005*medium
gen jaar2006medium=jaar2006*medium
gen jaar2007medium=jaar2007*medium
gen jaar2008medium=jaar2008*medium
gen jaar2009medium=jaar2009*medium
gen jaar2010medium=jaar2010*medium
gen jaar2011medium=jaar2011*medium
gen jaar2012medium=jaar2012*medium
gen jaar2013medium=jaar2013*medium
gen jaar2014medium=jaar2014*medium
gen jaar2015medium=jaar2015*medium
gen jaar2016medium=jaar2016*medium
gen jaar2017medium=jaar2017*medium
gen jaar2005kk=jaar2005*kk
gen jaar2006kk=jaar2006*kk
gen jaar2007kk=jaar2007*kk
gen jaar2008kk=jaar2008*kk
gen jaar2009kk=jaar2009*kk
gen jaar2010kk=jaar2010*kk
gen jaar2011kk=jaar2011*kk
gen jaar2012kk=jaar2012*kk
gen jaar2013kk=jaar2013*kk
gen jaar2014kk=jaar2014*kk
gen jaar2015kk=jaar2015*kk
gen jaar2016kk=jaar2016*kk
gen jaar2017kk=jaar2017*kk
generate nohold100 = 100 * nohold
generate id = nohold100 + nomem
gen dumkids=0
replace dumkids=1 if (hkidout>0 | aantalki>0)
replace dumkids=. if hkidout==.
replace dumkids=. if aantalki==.
replace hkidout=0 if kidout==2
gen opl1= (oplmet>=1 & oplmet<5)
replace opl1=. if oplmet==.
gen opl2= (oplmet==5)
replace opl2=. if oplmet==.
gen opl3= (oplmet>=6 & oplmet<8)
replace opl3=. if oplmet==.
replace opl1=. if oplmet==8
replace opl1=. if oplmet==9

```

```

gen btot1= (btot<14000)
replace btot1=. if btot==.
gen btot2= (btot>=14000 & btot<28000)
replace btot2=. if btot==.
gen btot3= (btot>=28000 & btot<42000)
replace btot3=. if btot==.
gen btot4= (btot>=42000)
replace btot4=. if btot==.
gen jaar2005aantalki=jaar2005*aantalki
gen jaar2006aantalki=jaar2006*aantalki
gen jaar2007aantalki=jaar2007*aantalki
gen jaar2008aantalki=jaar2008*aantalki
gen jaar2009aantalki=jaar2009*aantalki
gen jaar2010aantalki=jaar2010*aantalki
gen jaar2011aantalki=jaar2011*aantalki
gen jaar2012aantalki=jaar2012*aantalki
gen jaar2013aantalki=jaar2013*aantalki
gen jaar2014aantalki=jaar2014*aantalki
gen jaar2015aantalki=jaar2015*aantalki
gen jaar2016aantalki=jaar2016*aantalki
gen jaar2017aantalki=jaar2017*aantalki
gen jaar2005hkidout=jaar2005*hkidout
gen jaar2006hkidout=jaar2006*hkidout
gen jaar2007hkidout=jaar2007*hkidout
gen jaar2008hkidout=jaar2008*hkidout
gen jaar2009hkidout=jaar2009*hkidout
gen jaar2010hkidout=jaar2010*hkidout
gen jaar2011hkidout=jaar2011*hkidout
gen jaar2012hkidout=jaar2012*hkidout
gen jaar2013hkidout=jaar2013*hkidout
gen jaar2014hkidout=jaar2014*hkidout
gen jaar2015hkidout=jaar2015*hkidout
gen jaar2016hkidout=jaar2016*hkidout
gen jaar2017hkidout=jaar2017*hkidout
gen working=(bezighei>=1 & bezighei<4)
gen work01q=(bezighei>=1 & bezighei<4)
replace work01q=. if bezighei==12
replace work01q=1 if (bezig==1 & jaar>=2005 & jaar<2007)
replace work01q=. if (bezig==. & jaar>=2005 & jaar<2007)
replace work01q=. if bezighei==. & jaar>=2007
gen unempl01q=(bezighei>=4 & bezighei<13)
replace unempl01q=1 if bezighei==13
replace unempl01q=1 if (bezig>=2 & bezig<12 & jaar>=2005 & jaar<2007)
replace unempl01q=. if (bezig==. & jaar>=2005 & jaar<2007)
replace unempl01q=. if bezighei==. & jaar>=2007
replace unempl01q=. if (unempl01q==0 & work01q==0)
replace unempl01q=. if (unempl01q==1 & work01q==1)
replace work01q=. if (unempl01q2==0 & work01q==0)
replace work01q=. if (unempl01q2==1 & work01q==1)
gen work01q2=(bezighei>=1 & bezighei<4)

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replace work01q2=1 if bezighei==12
replace work01q2=1 if (bezig==1 & jaar>=2005 & jaar<2007)
replace work01q2=. if (bezig==. & jaar>=2005 & jaar<2007)
replace work01q2=. if bezighei==. & jaar>=2007
gen unempl01q2=(bezighei>=4 & bezighei<13)
replace unempl01q2=1 if bezighei==13
replace unempl01q2=1 if (bezig>=2 & bezig<12 & jaar>=2005 & jaar<2007)
replace unempl01q2=. if (bezig==. & jaar>=2005 & jaar<2007)
replace unempl01q2=. if bezighei==. & jaar>=2007
egen testmissing=rowmiss(dnb207a young old medium geslacht aantalki hkidout oplmet kk
btot partner working unemployed jaar2005 jaar2006 jaar2007 jaar2008 jaar2009 jaar2010
jaar2011 jaar2012 jaar2013 jaar2014 jaar2015 jaar2016 jaar2017)mprobit dnb207a young old
medium geslacht aantalki hkidout oplmet kk btot partner working unemployed jaar2005
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mprobit dnb207a young old medium geslacht aantalki hkidout opl1 opl2 opl3 kk btot1 btot2
btot3 btot4 partner working unemployedjaar2005 jaar2006 jaar2007 jaar2008 jaar2009
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mprobit dnb207a young old medium geslacht aantalki hkidout oplmet kk btot partner working
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mprobit dnb207a young old medium geslacht aantalki hkidout oplmet kk btot partner working
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mprobit dnb207a young old medium geslacht aantalki hkidout oplmet kk btot partner working
unemployed jaar2005 jaar2006 jaar2007 jaar2008 jaar2009 jaar2010 jaar2011 jaar2012
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mprobit dnb207a young old medium geslacht aantalki hkidout oplmet kk btot partner working
unemployed jaar2005 jaar2006 jaar2007 jaar2008 jaar2009 jaar2010 jaar2011 jaar2012
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jaar2012medium jaar2013medium jaar2014medium jaar2015medium jaar2016medium
jaar2017medium
mprobit dnb207a young old medium geslacht aantalki hkidout oplmet kk btot partner working
unemployed jaar2005 jaar2006 jaar2007 jaar2008 jaar2009 jaar2010 jaar2011 jaar2012
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