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# Netspar THESSES

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## The Road Ahead

Are individuals Able to Plan for their Retirement

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**The road ahead: Are individuals able to plan for their retirement?**

Master thesis Marketing

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## **ABSTRACT**

There are many signs that people are not saving enough for retirement with the consequence that they retire without adequate financial resources to maintain their comfortable life. Most studies have focused on the demographic and psychological factors that underlie financial planning and saving for retirement; however there has been little research on the level of certainty of individuals about their pension savings adequacy prediction. The aim of this research is to assess what factors determine the level of certainty with which people can properly predict whether they save enough for their pension to maintain a comfortable life. In this study these factors are divided into three categories; socio-demographic, psychological and external factors.

CentERdata has collected data from hundreds of households containing questions from various categories. In this study the relevant data is collected and then ordinal regressions are conducted to test the theoretical framework. Analyses reveal substantial support for the role of psychological factors on the level of certainty on the pension savings adequacy prediction. Four of six psychological factors appear to make a significant contribution to the model. Two demographic factors were also revealed to be important elements of the model as well as the external factor whose effect is partly supported by the model. These findings have implications for the development of psychologically based models of decision making and the improvement of training and educating people to make better informed pension decisions.

**Key words:** Retirement planning, decision making, pension savings adequacy prediction, uncertainty, psychological factors

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## **1 INTRODUCTION**

People are becoming more individualistic (Beck and Beck-Gernsheim 2001) with the result that they want to make their own choices. More and more decisions are left to consumers themselves. Consequently today consumers have a huge choice of freedom in various domains. This great freedom of choice also increases the individual responsibility to make informed decisions. Also in the field of finance it is up to the consumer to make decisions. This trend is also identified with pensions. The retirement benefit community is currently undergoing a paradigm shift as many organizations cast aside traditional defined benefit plans in favour of defined contribution plans. In other words, instead of employers providing defined benefit plans that are relatively risk free to employees, many organizations have decided to offer defined contribution plans in which employees are responsible for both contributing to the plan and making the investment decisions required therein (Mastin, 1998). Now the responsibility for retirement savings is shifted from employers and government to individuals. These changes may make people less confident about their retirement savings.

Even though the pension system in the Netherlands (see appendix A for an explanation of the Dutch pension system) is regulated quite properly, people should still consider whether they save enough. Because of various circumstances such as period of unemployment, divorce or diverse needs of people during retirement, determining if they have sufficient savings is very important as well as the level of certainty with which they can properly predict whether they save enough for retirement. Nevertheless, also thanks to changing trends, preparing for retirement is a decision in which individuals have to participate. This decision is very important for the future, but a lot of individuals tend to delay important retirement decisions, ending up with insufficient savings to maintain a comfortable life (Skinner 2007).

For many people retirement decisions are very difficult to make. It is quite complex and that is what people may deter from making retirement decisions. A lack of financial knowledge and information could be reasons not to plan. There is still much room for improvements in terms of training people to make better informed retirement decisions (Hershey et al. 1998). Also the fact that a lot of people live by the day and do not plan ahead, especially for retirement, is a problem. In an effort

to better understand the reasons why individuals are not saving at an adequate rate, researchers are focusing their attention on the factors that influence the tendency to plan and save (Jacobs-Lawson and Hershey 2005). Although much research has been done on the influence of demographic factors on retirement saving behaviour, the psychological concepts are underexposed.

According to Hershey et al. (1998) individuals seem not able to estimate balance between financial needs and resources across the years of retirement and therefore they presumably have more uncertainty. According to Lipshitz and Strauss (1997) uncertainty is a major obstacle to effective decision-making. Also in retirement decisions this could be an important factor to deter people from making these decisions. People dealing with uncertainty regarding their financial decisions, often defer these decisions. Examining this uncertainty is of great importance to get people more involved in their retirement decisions. No previous research has focused on the antecedent conditions. The goal of this research is to clarify what makes people (un)certain about their predictions whether they save enough for retirement. The level of certainty with which people can properly predict whether they save enough for retirement is an important theme in this study.

### **1.1 Research question**

There has been much research done on whether people save enough for their pension, usually with the result that they do not. But there has been little research on the level of certainty with which people can properly predict this. What makes some people more certain than others? I would like to investigate why certain people are more certain about their predictions concerning their pension savings while others are not. Besides I would like to examine what factors may have an impact on this level of certainty, for example demographic and/or psychological factors. Also external factors, on which you have little or no influence, may be important.

For my thesis, the following research question will be central:

**“What factors determine the level of certainty with which people can properly predict whether they save enough for their pension to maintain a comfortable life?”**

In order to answer the main research question I have composed the next questions:

- Which demographic factors affect the level of certainty with which individuals can properly predict whether they save enough for retirement?
- Which psychological dispositions affect the level of certainty with which individuals can properly predict whether they save enough for retirement?
- Which external forces affect the level of certainty with which individuals can properly predict whether they save enough for retirement?

## 1.2 Definitions

**What factors determine** refers to the factors that can influence the level of certainty with which individuals can predict whether they save enough for retirement. This research will include socio-demographic factors (such as age, gender, income, etc.), psychological factors (like perception of financial knowledge, goal clarity, expenditure control, etc.) and external factors.

**Properly predict** includes the level of certainty of individuals to have sufficient financial resources after retirement to live comfortably.

**Save enough to maintain a comfortable life** refers to the income after retirement which should be enough to maintain a comfortable life. This criterion is different for everyone and there are already several studies on what is now sufficient. For example in the article "Are you sure you're saving enough for retirement" by Skinner (2007) where he discusses the consumption behaviour of retired people. There is evidence that retired people have daunting wealth requirements and that they anticipate a modest decline in consumption. According to Hershey et al. (2007) financial advisors suggest that workers should plan for a retirement income that is 70-110% of their current income. According to the dictionary comfortable in the field of finances means sufficient to provide financial security. Someone who is financially well-situated can live comfortably. In this case the aim is that people will maintain their standard of living after retirement.

**Pension** is a regular payment made:

- by the state to people over a certain age to enable them to subsist without having work;

- by an employer to former employees after they retire;
- to a retired person as the result of his or her contributions to a personal pension scheme;
- on charitable grounds, by way of patronage, or in recognition of merit, service, etc.

This research will take into account the total amount of retirement income that one gets when one retires. However, sometimes the focus is more on savings income on which someone can exert influence such as a private pension plan.

### **1.3 Purpose of the research**

It is alarming to see that more and more people retire without adequate financial resources to maintain their comfortable life. The perceptions of the many kinds of uncertainty surrounding pension savings adequacy of individuals is influenced by several factors. The goal of my research is to examine these various factors which could affect the level of certainty about saving adequacy predictions. The focus of this research is to make clearer why certain individuals are more certain about their pension savings, than others. If this is clearer, marketing as a tool can be used to assist consumers by making these decisions, for example at websites. But also pension providers and government could benefit from these findings. For example if perceived financial knowledge appears to be a significant factor influencing the level of certainty to which individuals expect to save enough for retirement, then this could be the foundation to invest more in teaching people financial literacy. For marketers it is also interesting to know if certainty is mainly caused by psychological and/or external determinants.

Most academic studies have focused on psychological and demographic factors that underlie financial planning and saving for retirement. In my research I will focus on these factors as well but with regard to the level of certainty that individuals can properly predict whether they save enough for their pension. This level of certainty can contain very valuable information, especially for further research in this area.

Some university teachers and researchers from the marketing department of the Erasmus School of Economics are currently doing research in pensions, so I hope my thesis could contribute somewhat.

#### **1.4 Thesis outline**

To begin, I will outline the theoretical framework. Here the term (un)certainty will be explained and the hypotheses will be presented and underpinned. Also the possible interactions will be discussed and finally I will come to the conceptual model. Subsequently, the empirical elements will be addressed. All steps prior to the regression analysis will be explained discussed in this part of the thesis. Then the results of all statistical analysis will be presented. Finally, I will discuss the results, draw conclusions, mention the limitations and give recommendations for future research. In the appendix all the additional documentation are available.

## **2 THEORETICAL FRAMEWORK**

### **2.1 Introduction**

With the theoretical framework I will construct the outline of this study. First I will give an explanation of the term (un)certainty in the context of this study. Then I suggest the hypotheses and underpin them with academic literature. The chapter ends with the conceptual framework in which all effects discussed are summarized.

Given the theoretical background, I expect that individuals make different predictions with respect to their pension. The level of certainty with which individuals can predict whether they have sufficient savings for retirement is a major factor. That is why the dependent variable in my research will be:

*The level of certainty that individuals can properly predict whether they save enough for their pension*

The independent variables will include: socio-demographic factors (age, gender, education, income, family composition, house ownership), psychological factors (financial knowledge & skills, financial risk tolerance, savings behaviour, expenditure control, goal clarity, health perception, happiness) and external factors (expectations concerning social security, confidence in general economic conditions, employer offering pension). Some of these factors will only be used as controlled variables. The main focus will be on the psychological factors, because I believe that these factors can contribute most to the research. I also expect that precisely these factors can be influenced by marketing, for example by a good education program designed by marketers for a pension fund.

### **2.2 (Un)certainty**

(Un)certainty is a very broad concept. In the light of this research it is about the uncertainty that people have on decision making, especially financial decisions. Uncertainty is a major obstacle to effective decision making. According to Anderson et al. (1981) uncertainty is a situation in which one has no knowledge about which of several states of nature has occurred or will occur. Lipshitz and Strauss (1997) have showed in their research that decision makers distinguished among three types of uncertainty: inadequate understanding, incomplete information and

undifferentiated alternatives. They propose that uncertainty in the context of action is a sense of doubt that blocks or delays action. In the case of (not) making retirement decisions this could be a very relevant theory given that many people postpone this decision (Lusardi and Mitchell, 2005). Uncertainty could be a reason why so many people postpone important decisions concerning their pension. The effects of this uncertainty can cause people to be hesitant, indecisive and lead to procrastination.

Making good plans for retirement is extremely important, but is often underestimated by people. It is difficult to predict whether you actually save enough for retirement. Having sufficient financial knowledge and information is very important to make this decision (Hershey et al., 1998). To be certain about saving enough for retirement one must know what his/her future retirement needs are and what resources are needed to fulfil these needs. Matching the future needs and resources however for many people appeared to be a difficult task. According to Rohwedder and van Soest (2006) successful retirement planning requires that individuals form expectations about their retirement income and adjust their saving behaviour accordingly. Uncertainty, for example about these expectations, could play a major role. If you expect to have financial resources to live comfortably after retirement, how certain are you that your expectation is indeed true? This is one of the key questions in this study. I will try to find factors that influence this level of (un)certainty in the retirement decision making process and explain them.

### **2.3 Hypotheses**

#### Socio-demographic

For the socio-demographic element I have formulated a number of hypotheses. These factors are important in determining which groups of the population are more certain about their predictions whether they save enough for retirement.

#### **Age**

According to Padawer et al. (2007) older people tend to have higher future time perspective scores, so they are more orientated to the future than younger people. Future time perspective is important for retirement planning, because the construct how far an individual looks into the future when thinking about his or her life can be a

very important indicator for the tendency of financial planning and decision making (Jacobs-Lawson et al., 2005, Padawer et al., 2007).

DeVaney and Su (1997) found in their research that older people are more likely to plan for retirement. Also Kamakura et al. (1991) found that life cycle stage of a household influences the order of acquisition of financial services. If one is further in the life cycle stage it focuses more on retirement savings. So I suggest that older people are generally more concerned with their finances, because of their life experience and life cycle stage. Besides, the fact that the date of retirement approaches closer might be important. These factors could also be a reason for older people to be more certain about their pension savings. They probably have more savings and more experience with making important financial decisions, such as buying a house and the financial responsibility for having children. Therefore I propose that older people are generally more certain about their pension savings adequacy prediction than younger people.

*H1a: Older people are more certain about their pension savings adequacy prediction*

### **Gender**

Again according to Padawer et al. (2007) males tend to have higher future time perspective scores, which make them more orientated to the future than women. The research of Jacobs-Lawson et al. (2004) has also shown that women spent less time thinking about retirement than men. Glass and Kilpatrick (1998a+b) found that women, especially baby boomers, lack planning and saving for financial security in retirement. Research of Jacobs-Lawson et al. (2004) showed several reasons why women tend to be less prepared for retirement. For example women anticipate difficulties in financing their pension. Or they tend to view retirement planning as less important compared to men. Also women are more anxious about the onset of retirement, and they even tend to hold more negative attitudes about the prospect to stop working. Perhaps these findings are derived from earlier notions that men should take care of all the financial matters. However this traditional idea today is slowly disappearing, because women are more independent now. It is still very likely that they still fall behind with respect to men, with the result that they are less

concerned with retirement preparation. As a result I suspect that men are more certain about their pension savings adequacy prediction.

*H1b: Men are more certain about their pension savings adequacy prediction*

### **Education**

The research of Padawer et al. (2007) has also shown that people who are more highly educated have longer future orientations. This can indicate that they will start earlier with making the appropriate pension plans. Joo and Pauwels (2002) found that those who had higher levels of education had higher levels of retirement confidence. The level of education serves a strong predictor in determining someone's knowledge about retirement-related concepts (Mastin, 1998). Higher educated people are more likely to have good financial insights. They are in a better position to make a good estimation of sufficient financial resources that are required after retirement. Thus consistent with previous studies, I hypothesize that higher educated people are more certain about their retirement savings adequacy prediction.

*H1c: Higher educated people are more certain about their pension savings adequacy prediction*

### **Income**

Future time perspective is also higher for individuals with higher incomes (Padawer et al., 2007). According to Malroutu and Xiao (1995) those having annual incomes between \$10,000 and \$19,999 were less likely to perceive having adequate retirement income. People on low incomes will probably be more involved in managing their finances from day to day to cover current consumption. This is often a stressful task and long-term future planning often will not take place. Canova et al. (2005) argue that families with few financial resources save mainly to provide for daily expenses and at the highest income levels, motivations concerning retirement, children and growth are important. Given that they know what they want people with higher incomes are more certain. In the event there is money to be saved, it will still be less at low incomes. This could cause greater uncertainty with regard to saving

enough for retirement. However they can also be very certain that they don't save enough for retirement. Individuals with higher incomes generally got more disposable income for saving activities and they are more likely to focus on life domains for which retirement income is required, such as housing, travelling, children studying (Jacobs-Lawson et al., 2004). Joo and Pauwels (2002) found that people with higher incomes tend to have higher levels of retirement confidence. Overall I propose that people with higher incomes are more certain about their predictions whether they save enough for retirement.

*H1d: People with higher income are more certain about their pension savings adequacy prediction*

### **Family composition**

Unfortunately there are no direct scientific theories that underpin this assertion. But still I believe this assumption is valid. According to Lusardi and Mitchell (2007) people with children have accumulated more wealth than the childless. I expect having a stable family structure will ensure that the finances of that family are properly controlled. I propose that families with children generally will have a stable income. Presumably they are also less willing to take risks. They are willing to make long-term decisions, because of their future time perspective. The prospect that the children will go to school and university for example, will persuade parents to have a good savings plan. Also enjoying the grandchildren in their old age is an important motive to organize the pension savings well. Yabiku (2000) suggests that for men children are expected to be associated with higher pension coverage, because it may encourage them to pursue jobs with higher income and status. For women this is slightly different, because they often stay home to take care of the children.

Another additional factor that is relevant is the social support hypothesis from van Dalen et al. (2008). That is the stronger the support from spouses for saving for retirement, the more likely someone will save and consequently the more likely he will perceive his pension savings as adequate. Making retirement decisions is a household affair and spousal support may encourage making the right decisions. It could be inferred that together as a couple you come to more rational decisions as supposed to purely individual decisions. The family composition and the effects on the level of certainty about the pension savings adequacy prediction are not

investigated before. I come to the hypothesis that families with children are more certain about their pension savings adequacy prediction.

*H1e: Families with children are more certain about their pension savings adequacy prediction*

### **House ownership**

Not only the influence of value of financial assets on retirement wealth should be included; also nonfinancial assets such as the value of housing equity should be taken into account. Home equity accounts for the largest share of total household wealth in the United States (Yuh et al. 1998). People, who own a house, can use their housing equity (Skinner, 2007 and Lusardi and Mitchell, 2007) to finance their consumption during retirement, for example by selling the house or taking a second mortgage or entering into home equity loans. A home owner will be better off in retirement than a tenant of a house, because of the great potential of home equity which they can use as security for unexpected expenses. Therefore I propose that people who own a house are more certain about saving enough for their pension.

*H1f: People who own a house are more certain about their pension savings adequacy prediction*

### Psychological

Because not much is known about the psychological factors that can influence financial planning for retirement (Hershey et al., 2007), the emphasis of the research will be on this topic. Understanding the role of psychological factors in the retirement planning process may have important implications for marketing research in the area of pensions. Regarding the psychological factors, I made the following hypotheses.

### **Financial knowledge and skills**

This prediction is based on the assumption that individuals who have a higher level of financial knowledge and skills are generally better in making financial decisions. Consequently someone who knows a lot of financial issues is also expected to be

more certain about his predictions about pension savings, because he can use this financial knowledge to make proper retirement decisions. One important reason why some individuals fail to plan for retirement is the lack of important financial knowledge (Hershey et al. 1998). This inadequate understanding and sometimes also incomplete information can make people uncertain about this important financial decision. Especially young workers tend to show high levels of retirement anxiety because they lack accurate information about retirement (Hayslip et al., 1997). High-knowledge individuals have consistently been shown to plan and save more than individuals with less financial knowledge and skills. Financial knowledge will be positively related to perceived savings adequacy (knowledge hypothesis) according to van Dalen et al. (2008). Also Hershey and Mowen (2000) have shown in their research that financial knowledge is an important determinant of retirement savings decision quality. According to this research self-rated financial knowledge would be positively associated with perceived financial preparedness. So individuals who believe they know more about financial matters and decision making also perceive that they are financially better prepared for retirement. Lusardi and Mitchell (2005) also emphasize that consumer decisions concerning retirement savings require substantial financial literacy. With this literacy individuals are more certain about saving enough for retirement, because of their information resources and adequate understanding of financial matters. Usually high-knowledge individuals are also better in making trade-offs and weighing the pros and cons, so they come to an informed financial decision (Jacobs-Lawson and Hershey, 2005). Therefore they score not only better on saving adequacy but they will also achieve a higher level of certainty concerning their predictions whether they save enough for their pension.

*H2: People with a high perception of financial knowledge and skills are more certain about their pension savings adequacy prediction*

### **Financial risk tolerance**

Not much research focuses on financial risk tolerance and its influence on retirement decisions (Jacobs-Lawson and Hershey, 2005). Studies show that people who are risk-tolerant prefer to invest in high risk options, for example equities, and risk averse individuals prefer to invest in bonds and certificates of deposit. I believe that people who have a lower financial risk tolerance take fewer financial risks and therefore they

are more likely to make retirement plans. They want to make sure they made good arrangements concerning their pension, so they will not end up with insufficient savings. However there are implications that people who tend to be very risk averse with respect to the pension allocation decision, are more likely to retire with significantly lower pension wealth than those people who are more risk tolerant (Bajtelsmit et al., 1999). Also Yuh and DeVaney (1996) have shown that people who were unwilling to take financial risks end up with less savings after retirement. A possible reason could be the fact that most pensions nowadays require more self-direction of pension account decisions. Another reason could be that people invest their retirement savings in less risky assets, which give lower returns in general. Due to this risk aversion there is a greater conservatism, resulting in lower income replacements for these people according to Bajtelsmit and VanDerhei (1997). Although these lower income replacements, due to a taste for low-risk, low-return assets (Hariharan et al., 2000), I hypothesize that risk averse people are more certain about their pension savings adequacy prediction, because they won't take the risk of living by the day without any planning or making risky investments and they probably will choose a stable pension plan. In order to overcome uncertainty it is indeed important that the needs as well as the future resources coincide and if one is very risk tolerant the future resources may be less transparent.

*H3: People with a low financial risk tolerance are more certain about their pension savings adequacy prediction*

### **Goal clarity**

According to van Dalen et al. (2008), individuals with higher future time perspectives will have higher levels of perceived savings adequacy (future time hypothesis). Lusardi and Mitchell (2007) also highlight that planning is a major indicator for saving enough for retirement. Having clear goals stimulates making plans for the future. As one grows older one will be more concerned with future goals, because time passes (Hershey et al., 2007). In accordance with Stawski et al. (2007) goals play a critical role in the retirement planning process. Clearer retirement goals are associated with a more active pattern of retirement planning behaviours. People with future plans for after retirement are more likely involved in planning and financing these goals. Goals for example allow individuals to form expectations about future resource needs. They

also help increase both actual savings levels as well as the intention to save. Having no concrete future plans can make people insecure about financial decisions, because they lack information about their future needs. So I assume that people who look into the future and have clear future goals are more certain about their pension savings adequacy prediction, because of their preparation for retirement.

*H4: People who have a clear goal concerning their future are more certain about their pension savings adequacy prediction*

### **Savings behaviour**

Many people save little for their pension, because they simply don't think about retirement planning. This applies also to saving in general. People who are not thinking ahead will be less inclined to save. On the other hand people who focus on the future are generally saving more (van Dalen et al., 2008). Also high-knowledge individuals have been shown to save more. Joo and Pauwels (2002) have found that having savings is positively related to retirement confidence. However, no earlier research has focused on savings behaviour and the level of certainty with which people can predict whether they save enough for retirement. If you already care about saving in general, then you're probably more concerned with retirement savings and you will be more certain about it, because you're more involved with matching your future needs and resources.

*H5: People who care about saving in general are more certain about their pension savings adequacy prediction*

### **Expenditure control**

This spending control is obviously related to financial planning and knowledge and also with savings behaviour. But in itself it is a good predictor of whether people save enough for retirement. People, who find it easy to control spending, will also be more certain about their pension, mainly because they generally have a good overview of their finances. Individuals, who spend their money immediately and even get into debt, will be less certain about it, because they are already struggling to make ends meet. One of the problems is the gap between intentions and actions (Laibson et al.,

1998). So a consumer makes saving plans, but is eventually tempted to spend this money. This indicates a lack of self control and should be supported by external commitments to prevent overconsumption. Also Thaler and Shefrin (1981) discusses the problem of self-control with the conflict between planning and doing and the importance of precommitment in order to overcome this problem. According to Yuh et al. (1998) household spending behaviour is significantly related to retirement adequacy. Spending at least as much as household income decreases the probability of adequate retirement wealth. It can also be supposed that households who spend their whole income on consumption now, have higher estimated retirement consumption needs. On the other hand this higher level of consumption needs will be much more difficult to achieve, because of the overspending. It may however be possible that they still are very certain about their predictions, but then in the sense that they are sure that they do not save enough for retirement. Nevertheless, I propose that people who find it easier to control expenditure are more certain their predictions whether they save enough for their pension.

*H6: People who find it easy to control spending are more certain about their pension savings adequacy prediction*

### **Health perception**

Health is one of the strongest forecasters of retirement attitude and behaviour (Kim et al. 2005). Health is positively related to attitudes to retirement and post retirement satisfaction. People with better health status had higher levels of retirement confidence. One of the major goals of the Health and Retirement Study (HRS) was to explore the role of health in the retirement decision (Wallace and Herzog, 1995). According to them health is a major factor affecting retirement timing. It is an important predictor for retirement age. But I also assume that people, who have a good health perception, so they think they are and stay healthy, are more certain about their pension savings adequacy prediction. Because they don't have to deal with a lot of uncertainty concerning their health, they can better predict and plan their pension savings. Also the prospect of not being dependent on health insurance plays a role. People with a poorer health got a great chance of retiring earlier and ending up with insufficient pension savings, including by high medical costs (Skinner,

2007). They will be less certain about what their future needs will be, because it strongly depends on their (health) situation and their income is uncertain.

*H7: People with good health perception are more certain about their pension savings adequacy prediction*

#### External

For the last part I will take some external factors into account. One of them is the expectations of the social security rules and the others are controlled variables. The individuals can exert little or no influence on these external factors. But these factors can affect the level of certainty that people have about their retirement savings.

#### **Expectations social security**

Nowadays there is much speculation about increasing the state pension age at which you are entitled to income replacement. Boskin (1975) as well as Crawford and Lilien (1981) emphasizes the influence of social security on retirement decisions. Confidence in government programs concerning social security plays a role in preparing for retirement (Kim et al. 2005). According to the study of van Dalen et al. (2008) retirement savings decisions are also based on the institutional forces. That is the fact that individual savings decisions are shaped by the quality and design of pension institutions. This also applies to social security rules. If people expect that the current social security rules remain the same, they will be better able to anticipate on these rules. They can thus take into account existing arrangements and then adjust their retirement savings. Therefore they will be more certain about their predictions whether they save enough for their retirement. Besides, if you are saving for the future you are putting your trust in a system of social security that is prevalent today. The state is the provider of public pensions but also the protector of the public interest who regulates the pension and insurance industry. Having appropriate regulatory guidelines and a prudent oversight generates trust. The institutional trust hypothesis (van Dalen et al. 2008) suggests that higher levels of trust in the prevailing pension institutions will be associated with higher levels of perceived savings adequacy. Future policy changes could bring down the level of trust. But above all, what is important is that with uncertain prospects for social security rules people can hardly determine how much they need to save now when it is uncertain when they

will be eligible to receive pension benefits. Hence I assume that people who expect social security rules remain the same are more certain about their pension savings adequacy prediction.

*H8: People who expect the social security rules remain the same within the next ten years are more certain about their pension savings adequacy prediction*

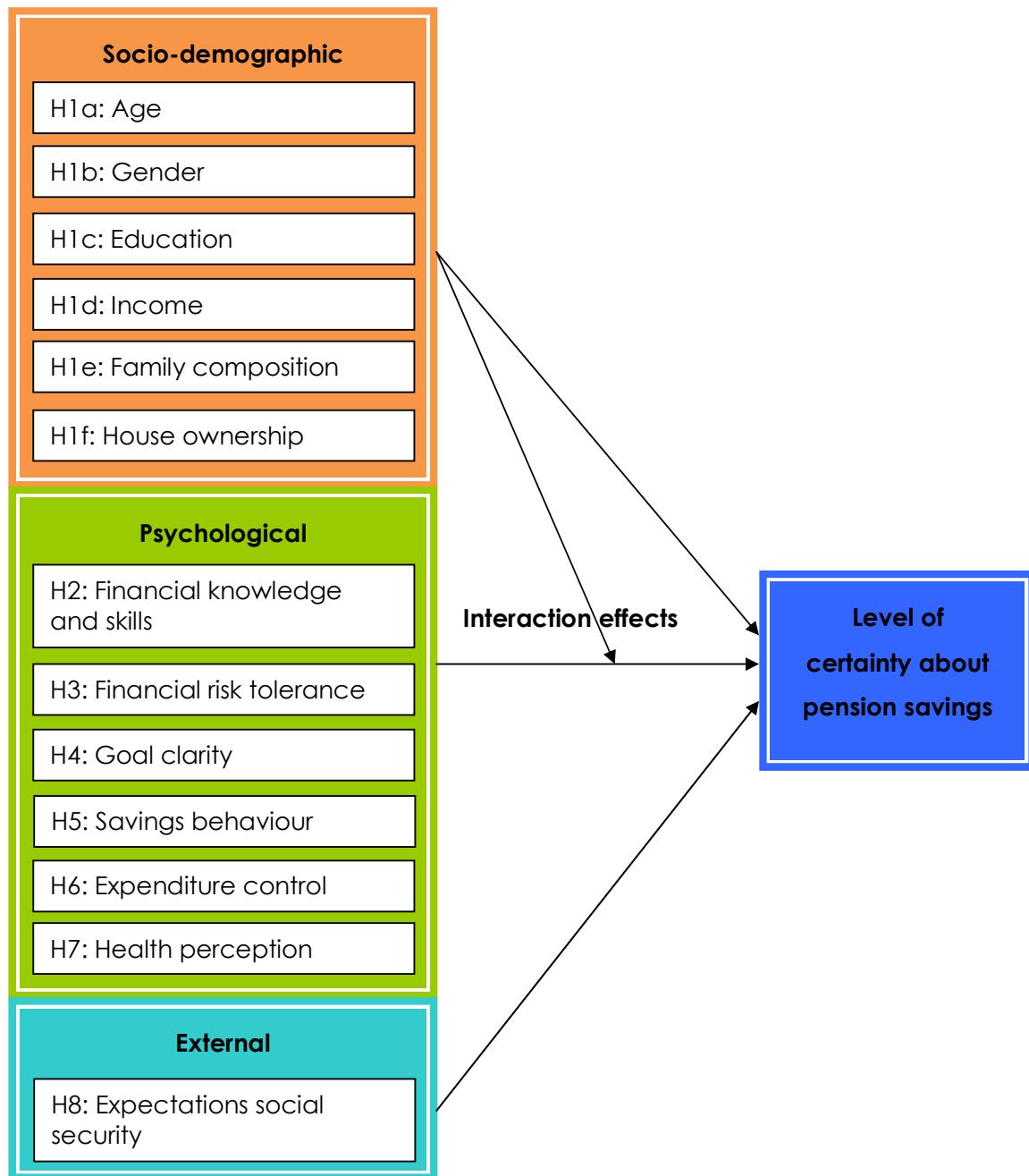
## **2.4 Interactions**

This study may also include interaction effects, where two factors, discussed above, together have a positive effect on the level of certainty. The presence of interactions may have important implications for the interpretation of the statistical outcomes. Interaction describes the situation in which the simultaneous influence of two variables on a third variable is not additive. In the interest of the research I find it most interesting to study the interactions of a psychological factor in combination with a demographic or external factor, because of its focus on psychological factors. During the research I will examine different interactions, but I am specifically interested in the moderating effect between the factors gender (H1b) and financial knowledge and skills (H2). For example, men are more certain about their pension savings and people who have a high perception of financial knowledge and skills are more certain about these savings. It is possible that the respondents who are male and have high self-rated financial knowledge and skills are more certain about their retirement savings. So I propose that the effect for high perception of financial knowledge and skills on the level of certainty about pension savings is more important for respondents who are male.

## 2.5 Conceptual model

The conceptual model consists of the eight hypotheses discussed above classified into three categories, socio-demographic, psychological and external. Besides these hypotheses I will also examine interaction effects between psychological and socio-demographic/external factors.

**Figure 1** Conceptual framework



### **3 EMPIRICAL ELEMENTS**

Now that I have composed eight hypotheses and a dependent variable within the theoretical framework it is time to collect and analyse the appropriate data. In order to answer the hypotheses appropriate constructs should be drawn to collect the data. In the following paragraphs I will describe the method and collection of data. Then I describe the control variables which will be taken into account in the research. In preparation to draw conclusions about the level of certainty with which people can properly predict whether they save enough for retirement I will run several statistical tests such as ordinal regression. Thereafter, the statistic results will be discussed.

#### **3.1 Method**

Because I use data from an existing database, I will not make and distribute a questionnaire. For my research, I of course have to determine which questions are appropriate to measure what I want to examine. Below is a table showing the used constructs. The appendix B includes all questions from the survey used in this research.

**Table 1 Description of constructs**

<b>Independent variables</b>	<b>Used questioning</b>
Level of certainty	Construct measuring the degree to which the respondents are certain that their expectations about retirement income come true
Age	Measured in years
Gender	1 = Male, 2 = Female
Education	Nominal scale: six categories indicating the highest level of education
Income	Monthly household net income in euro's
Family composition	Number of children living at home in the household, varying from 0 to 9

House ownership	Type of dwelling where the household lives classified into five types
Financial knowledge and skills	Construct measuring the degree to which the respondents consider themselves financially literate
Financial risk tolerance	Construct measuring the degree to which the respondents deal with financial risks
Goal clarity	Construct measuring the degree to which the respondents have a clear future vision about life after retirement
Savings behaviour	Construct measuring the degree to which the respondents care about saving in general
Expenditure control	Construct measuring the degree to which the respondents find it difficult to control their expenses
Health perception	General health status classified into five categories
Expectations social security	Construct measuring the degree to which the respondents expect the social security rules remain the same

### 3.2 Data collection

The data is collected by CentERdata with the DNB Household Survey over the year 2009. This survey is a unique data set that allows people to study psychological as well as economic aspects of financial behaviour. It is a panel survey that started in 1993. This organization annually collects data from 2000 Dutch households who are participating in the CentERpanel. The CentERpanel is an internet panel, which reflects the Dutch-speaking population. The panellists complete a questionnaire each week, without the intervention of an interviewer. This has great advantages, because respondents answer questions at a time that suits them. Moreover, they

have all documents (annual statement, bank account statement etc.) within reach at that time. After downloading the data of the entire survey, the required constructs for this research were collected in a separate SPSS data file.

### **3.3 Control variables**

Some variables might affect the relationship between the independent and dependent variables. In order to control for these effects I will include some control variables. The focus is not on these variables but they are nevertheless included in the analysis because they may appear important. Appendix B contains the relevant questions concerning the control variables.

#### **Expectations financial resources**

This question is closely related to the dependent variable on the level of certainty with which people can properly predict whether they save enough for retirement. This question is about whether people expect to have sufficient financial resources to live comfortably after retirement. Because there is reference to this expectation, I will use this factor as control variable to control for its effect in the model. It is possible that someone who expects to have more than sufficient or far too few financial resources actually is more certain about this prediction.

#### **Happiness**

This factor will be used as controlled variable in order to control for the effect of happiness on the level of certainty whether individuals save enough for retirement. There could be an effect of people who are (un)happy on this level of certainty, for example people who are happier could be more certain about their pension savings.

#### **Economic situation of the household**

When people have more confidence in the economic situation of the household they will perhaps be more optimistic and are more likely to be engaged with their finances. In a situation which is stable, there will probably be less uncertainty. Consumers were asked to forecast the economic situation of the household over five years compared with the current situation. In order to take this possibility into account I therefore will use this partly external factor as controlled variable.

### **Employer offering pension**

The question that is relevant here is whether you have entitlement to pension from your current (or last) job (before retirement). Because people often in addition save a part of their pension through their employer and pension fund, this factor should also be included. If your employer offers you some kind of pension this could take away some of the uncertainty whether you save enough for retirement. If your employer contributes to your pension, you have at least something you can fall back on. According to Kim et al. (2005) having pensions at work will give employees higher levels of retirement confidence. Therefore this factor is included as controlled variable.

### **Future time perspective**

This construct includes something a little different than goal clarity. It is about whether people are preoccupied with their future. I believe it will be interesting to engage this concept in the analysis to see if there are differences between these two concepts. The construct consists of three compositions so I have performed a factor and reliability analysis to turn this construct into one workable variable and to see if it is indeed different from goal clarity.

### **3.4 Dataset adjustments**

In order to increase model fit in the regression analyses I will use some dummy variables. These variables take the values 0 or 1 to indicate the absence or presence of some categorical effect that may be expected to shift the outcome. For the question concerning the family composition the number of children living at home in the household is coded 0 for none and 1 for one or more children. This also applies to the question of the employer offering a pension as well as with the missing answers to this question; yes/answered is coded 1 and no/missing is coded 0. Also for the two questions on social security I created dummy variables for change and missing values, mainly because I consider relevant whether people expect a change, yes or no. Indeed I will not further investigate how they expect the change will be. In addition, these two questions are from a dataset of 2007 so I want to check how many respondents answered the questions. On the question about the expectations of the gross state pension rules I coded the values of respondents who believe the social security rules remain the same (answer = 1) as 1 and those who believe there is

going to be a change 0. On the question about the expectations about the tax rules I coded the values of respondents who believe this tax remain (almost) the same (answer = 1 or 2) as 1 and those who believe there is going to be a change 0. For the dummy of answering these questions 0 means not answered and 1 means answered. In particular, I have merged answer categories. Later I will examine what question (or both questions) on social security is applicable in the research. Finally, for the main occupation of respondents I made nine dummy variables.

## **4      RESULTS**

Now that the methods are adopted, the results of different analyses are discussed below. First I will perform factor analyses and subsequent the reliability analyses. After the appropriate decisions are taken following the previous analyses, the descriptive statistics will be discussed. Ultimately, the regression analyses with the results are revealed.

### **4.1    Factor analysis<sup>1</sup>**

In this case it is essential to start with factor analysis for the different latent variables, because some of the factors cannot directly be measured or because some variables are measured by different items. The construct of financial risk tolerance, for example, consists of six propositions. It is important to examine whether these propositions correctly measuring the construct of financial risk tolerance. The advantage of this technique is that you can reduce a number of variables, by combining two or more variables into a single factor. Because I don't want the factors to correlate, also after rotation, I choose for the method of orthogonal varimax rotation, which makes interpretation much easier. Here I will perform factor analysis on the first five psychological constructs; financial knowledge and skills, financial risk tolerance, goal clarity, savings behaviour and expenditure control. I will use the Kaiser criterion which means retaining all factors with eigenvalues greater than 1 and drop all components with eigenvalues under 1. The variance explained after the first factor analysis is 63.9 % (see appendix C).

**Table 2    Factor analysis 1**

<b>Component</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Financial knowledge and skills	3/3	0/3	0/3	0/3	0/3	0/3
Financial risk tolerance	0/6	0/6	3/6	3/6	0/6	0/3
Goal clarity	0/3	3/3	0/3	0/3	0/3	0/3
Savings behaviour	0/3	0/3	0/3	0/3	1/3	2/3
Expenditure control	1/3	0/3	0/3	0/3	2/3	0/3
<b>Total questions</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>

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<sup>1</sup> See appendix C for the results of the complete analysis

After running the first factor analysis a number of things stand out. The desired number of constructs is five, but there are six components. Furthermore, not all questions are in the desired construct. For example, the three questions which should belong to the construct of expenditure control fall apart into two components. This also applies to the construct of savings behaviour. Additionally, questions concerning financial risk tolerance fall apart into two separate constructs. To reach a solution, I will choose three (matching) propositions regarding risk tolerance and I will delete one proposition of savings behaviour (It is not always wise for me to save because a number of cases have to do with having good luck or bad luck) and one question of expenditure control (How well do you keep up your (household) expenditure?). After removal of the faulty questions/propositions I performed the factor analysis for a second time. Again I will use the Kaiser criterion which means retaining all factors with eigenvalues greater than 1 and drop all components with eigenvalues under 1. The variance explained after the second factor analysis is 70.4 %.

**Table 3 Factor analysis 2**

Component	1	2	3	4	5
Financial knowledge and skills	3/3	0/3	0/3	0/3	0/3
Financial risk tolerance	0/3	0/3	3/3	0/3	0/3
Goal clarity	0/3	3/3	0/3	0/3	0/3
Savings behaviour	0/2	0/2	0/2	2/2	0/2
Expenditure control	0/2	0/2	0/2	0/2	2/2
<b>Total questions</b>	3	3	3	2	2

#### **4.2 Reliability analysis<sup>2</sup>**

After the factor analysis I will run a reliability analysis in order to check the reliability of the questionnaire scale. A scale should consistently reflect the construct it is measuring. Cronbach's  $\alpha$  is the most common measure of scale reliability. Questions can be removed with the purpose to improve reliability; if the deletion of an item increases Cronbach's  $\alpha$  considerably then this means an improvement of reliability. The question 'Do you find it difficult to control your spending' in the construct of expenditure control has a reversed scale. So a higher value means that someone finds it more difficult to control expenditure, while I just want to say that a higher

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<sup>2</sup> See appendix D for the results of the complete analysis

value means someone finds it easier to control expenditure. To avoid negative covariances and even a negative Cronbach's alpha I have reversed the scoring before I conducted the reliability analysis.

**Table 4 Reliability analysis**

Construct	Initial Cronbach's $\alpha$	Adjustments	Final Cronbach's $\alpha$
Financial knowledge and skills	0.810	none	0.810
Financial risk tolerance	0.719	none	0.719
Goal clarity	0.775	removal Q3	0.847
		none	0.775
Savings behaviour	0.599	none	0.599
Expenditure control	0.587	none	0.587

For the first two constructs the values of Cronbach's  $\alpha$  reflect a good degree of reliability. The construct of goal clarity includes a question which could improve the value of Cronbach's  $\alpha$  by removing it. But because the initial  $\alpha$  is already above 0.7, which reflects good reliability, I decided to keep this question, because I believe three items say more than two. Following this analysis shows that the same variables as after the second factor analysis will be applied. For the constructs I will take the average values of the corresponding items.

#### 4.3 Descriptive statistics<sup>3</sup>

The data that was collected by CentERdata comprises 984 respondents. By several reasons, there are missing values in the dataset. For example, for answering the question about financial risk tolerance one has to have a total net household income of at least € 10,000. Especially on the psychological constructs I found it important to have complete data. Hence, I have reduced the dataset to 702 respondents so that the amount of missing values is minimized. For the construct of social security there is unfortunately no recent data so therefore I will use data from 2007. This data includes 166 missing values; however I created dummy variables to control for missing answers.

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<sup>3</sup> See appendix E for the results of the complete analysis

As the data comes from a large panel of CentERdata I assume that the sample is representative for the population. Of all respondents 52.6 % (n = 369) is male and 47.4 % (n = 333) is female. So the representation between men and women is rather fairly distributed. The age varies between 25 and 65 years with an average age of 48 years. This wide age range makes this study interesting because many other studies (for example Glass and Kilpatrick (1998a+b) or Lusardi and Mitchell (2007)) focus on the baby boom generation (born between 1945-1955) when it comes to pension issues. The younger generations are often neglected in pension studies, but this research will focus on all age groups. This can be seen in the average age of the respondents.

The net monthly household income varies between € 0.00 and € 8430.00 with an average monthly income of € 2777.00. The majority of the respondents have finished a degree (MBO, HBO and WO) of education after high school (approximately 60%). There is also a fairly large group which did not start/finish another degree of education after obtaining a VMBO diploma. Of all the respondents 70.2 % is performing paid employment and 12.0 % is taking care of the household. The remaining respondents have different kind of occupations such as freelance or self-employment, volunteer work and some are (partially) disabled. This data all seem to be representative.

A small majority (55.8 %) of the respondents has no children living at home. This may indicate that they do not have children at all or that the child(ren) no longer lives at home. The other part (44.2 %) is a parent, varying from one to five children living at home. Of the group of parents the majority has two children. Over three-quarters of the respondents (76.6 %) own a house. The remaining respondents are renting a house.

#### 4.4 Regression analysis<sup>4</sup>

Because there are multiple independent variables I use ordinal regression which appears in the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p + \varepsilon$$

$Y$  = Level of certainty

$X_6$  = House ownership

$\beta_0$  = Intercept

$X_7$  = Financial knowledge and skills

$\varepsilon$  = Error term

$X_8$  = Financial risk tolerance

$X_1$  = Age

$X_9$  = Goal clarity

$X_2$  = Gender

$X_{10}$  = Savings behaviour

$X_3$  = Education

$X_{11}$  = Expenditure control

$X_4$  = Income

$X_{12}$  = Health perception

$X_5$  = Family composition

$X_{13}$  = Expectations social security

$$\text{Level of Certainty} = \beta_0 \text{ Int} + \beta_1 \text{ Age} + \beta_2 \text{ Gen} + \beta_3 \text{ Edu} + \beta_4 \text{ Inc} + \beta_5 \text{ FamCom} + \beta_6 \text{ HouOwn} + \beta_7 \text{ KnowSki} + \beta_8 \text{ RiskTol} + \beta_9 \text{ GoalCl} + \beta_{10} \text{ SavBeh} + \beta_{11} \text{ ExpCon} + \beta_{12} \text{ HealthPer} + \beta_{13} \text{ SocSec} + \varepsilon$$

The construct of level of certainty consists of a 7-point scale. You can rank the values (totally uncertain – totally certain), but the real distance between categories is unknown, they tell us nothing about the differences between values. The aforementioned dependent variable is an ordinal categorical variable and therefore I will perform ordinal regression. I will start with testing separate concepts and then the entire general model, next I will add control variables, dummy variables, and finally examine interaction effects.

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<sup>4</sup> See appendix F for the results of the complete analysis

<b>Table 5 Results</b>		Demographic		Psychological		External		General model		Interaction	
<b>Variable</b>		<b>β</b>	<b>P</b>	<b>β</b>	<b>P</b>	<b>β</b>	<b>P</b>	<b>β</b>	<b>P</b>	<b>β</b>	<b>P</b>
H1a: Age		<b>0.046</b>	0.000	<b>0.024</b>	0.003	<b>0.046</b>	0.000	<b>0.024</b>	0.003	<b>0.024</b>	0.003
H1b: Gender	-0.163	0.228	0.028	0.845	-0.137	0.314	0.047	0.741	0.033	0.952	
H1c: Education	0.006	0.911	-0.072	0.156	0.004	0.929	-0.073	0.154	-0.072	0.155	
H1d: Income	<b>0.153</b>	0.014	0.114	<b>0.074</b>	<b>0.147</b>	0.018	0.114	0.076	0.114	0.076	
H1e: Family composition	-0.054	0.710	-0.090	0.553	-0.030	0.837	-0.074	0.623	-0.074	0.625	
H1f: House ownership	-0.135	0.407	0.112	0.504	-0.122	0.455	0.115	0.495	0.115	0.495	
H2: Financial knowledge and skills	-	-	<b>0.780</b>	0.000	-	-	<b>0.776</b>	0.000	<b>0.769</b>	0.004	
H3: Financial risk tolerance	-	-	<b>-0.147</b>	0.018	-	-	<b>-0.151</b>	0.015	<b>-0.151</b>	0.015	
H4: Goal clarity	-	-	<b>0.635</b>	0.000	-	-	<b>0.637</b>	0.000	<b>0.637</b>	0.000	
H5: Savings behaviour	-	-	0.036	0.551	-	-	0.035	0.560	0.035	0.561	
H6: Expenditure control	-	-	-0.014	0.821	-	-	-0.015	0.811	-0.015	0.811	
H7: Health perception (bad)	-	-	<b>-0.225</b>	0.030	-	-	<b>-0.220</b>	0.033	<b>-0.220</b>	0.034	
H8: Expectations social security	-	-	-	-	<b>0.305</b>	0.051	0.186	0.242	0.186	0.243	
Interaction H1b x H2	-	-	-	-	-	-	-	-	-	0.004	0.979
Pseudo R-Square	0.076	0.263	0.082	0.266	0.082	0.266	0.082	0.266	0.082	0.266	

Are individuals able to plan for their retirement?  
T.C. Andeweg

### **Demographic factors**

When examining only the demographic factors, age and income make a significant contribution to the level of certainty, however the effect is not extremely strong. As the age/income rises, the level of certainty about saving enough for retirement increases. The level of certainty category (1-7) increases with every year the person ages or every euro the income increases. The other demographic factors make no significant contribution. The effect size of the model is quite small (pseudo R-square), probably due to the low number of independent variables or because it is hard to explain only by demographic factors.

### **Demographic and psychological factors**

After addition of the psychological (key) factors you can immediately see that four of these constructs contribute significantly to the model. In addition, age also remains significant, but income is now excluded from the significance of 5%. Having more financial knowledge and skills, makes people more certain about their expectations concerning their retirement savings. This also goes for goal clarity; the higher the goal clarity is the more certain is an individual. These two psychological factors have a pretty strong effect on the level of certainty ( $\beta = 0.780$  and  $\beta = 0.635$ ).

The negative  $\beta$  for risk tolerance means that if a person accepts more risk, he is less certain about his prediction whether he is saving enough for retirement. This also applies to health perception, due to a reversed question scale. As the state of health gets worse, one is more uncertain about his/her expectations to have financial resources to live comfortably after retirement. In other words this indicates that healthier people have higher levels of certainty about this.

The factors savings behaviour and expenditure control make no significant contribution to the model even if you add and review them separately in the model. Up to now, as many as four of six key factors contribute significantly to the model. With the inclusion of the psychological factors the effect size of the model is stronger, showed by the higher value of pseudo R-square.

### **Demographic and external factors**

When involving only the demographic and external factors, age and income contribute both significantly again. There are not much great differences compared to the model with demographic factors only. However, the external factor in this case also provides a significant contribution. Someone who believes the social security rules remain (almost) the same, is more certain about his/her pension savings compared to someone who expects that the social security rules will change. I have chosen to incorporate only the second question on social security (about tax) in the model because taken separately it makes a significant contribution and together with the first question it makes the most significant contribution, while the first one does not all. Nevertheless, the first question (about state pension), taken separately in the model, provides a significance level of 0.07. Although the construct on social security is based on somewhat older data from 2007 there is still a strong indication that this construct affects the level of certainty with which people can properly predict whether they save enough for retirement.

### **General model**

Ultimately, I have included the entire model in the regression (demographic, psychological and external factors). The regression results of the general model are fairly similar to those of the regression of demographic and psychological factors. One striking difference is that the external factor is now far from significant ( $p = 0.242$ ). Likely the psychological factors will have a more explanatory character on the dependent variable.

Income is still not significant at the 5% level, but because he falls well within the 10% level, we can conclude that the rise in income is likely to have a positive effect on the level of certainty. Age is, in line with the expectation, a significant factor; older people seem to be more certain about their predictions of having enough financial resources to live comfortably after retirement. Financial knowledge and skills, financial risk tolerance, goal clarity and health perception contribute significantly to the model and confirm several hypotheses. The external factor, expectations about changes in social security rules, hypothesized to contribute to the level of certainty turns out to be insignificant in the general model.

The results of the general model thus indicate that the four psychological factors and age mainly contribute to the level of certainty with which people can properly predict whether they save enough for retirement. Improvements can almost certainly be made in the psychological area. For example having enough financial knowledge and skills to make appropriate retirement decisions appears to be a very important factor and it deserves the attention of marketers. As already suggested by Hershey et al. (1998), people must be trained and educated to make better informed retirement decisions. This could also boost the level of certainty of individuals.

### **General model and control variables**

Later I also added the control variables and dummy variables to the general model to control for additional effects (see appendix F). These all appeared not to contribute significantly, except one control variable. Expectations about the amount of financial resources to live comfortably after retirement show a significant contribution to the model. In line with expectations, the regression analysis shows that those who expect to have more than enough or far too few financial resources are less uncertain about this expectation than those who think to have little too short, just enough, or to keep something. An unforeseen circumstance of misjudge will not that easily lead to someone, who expects to have far too few resources, suddenly has sufficient financial resources. And vice versa for someone who expects to have more than enough financial resources.

### **Interaction effects<sup>5</sup>**

Finally, I have examined which interactions have a significant effect on the level of certainty. So to the general model I have added all the possible combinations between the psychological constructs and demographic or external factors. I expected the factors gender (H1b) and financial knowledge and skills (H2) to have a moderating effect, but this does not appear to be the case. However, there appear to be three cases of interaction with a significance level of 5% and another five cases with a significance level of 10%. The red marked numbers in the interaction table (appendix) show a significance level between 5% and 10%. The most convincing interaction is the one between age and goal clarity. These factors

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<sup>5</sup> See appendix F for the results of the complete analysis

reinforce each other; those who are older whilst having more goal clarity are even more likely to be more certain about saving enough for retirement. By adding this interaction to the general model, age and goal clarity separately appear not to make a significant contribution to the model any longer, because of their moderating effect on the dependent variable. Age could partly have a direct effect on the level of certainty and a non-declared effect. The indirect effect then runs by mediation through the construct of goal clarity.

Gender, income and family composition in combination with any psychological construct do not include significant interactions. Education and health perception as well as house ownership and health perception show a significant interaction effect. By adding the interaction between education and health perception to the general model education seems to move more towards significance and health perception is not. Being higher educated and having a poorer health perception pull down the effect of certainty. This could be because higher educated people can better understand the problems of having a poorer state of health. The interaction between house ownership and health perception included in the general model ensures that both variables are suddenly (almost) significant. Those who live in a rented house and have a poorer health perception are more certain about their pension savings adequacy prediction. Those two effects can cause a strengthening of the feeling of certainty, because these people are sure they have insufficient savings for retirement.

**Table 6 Interactions**

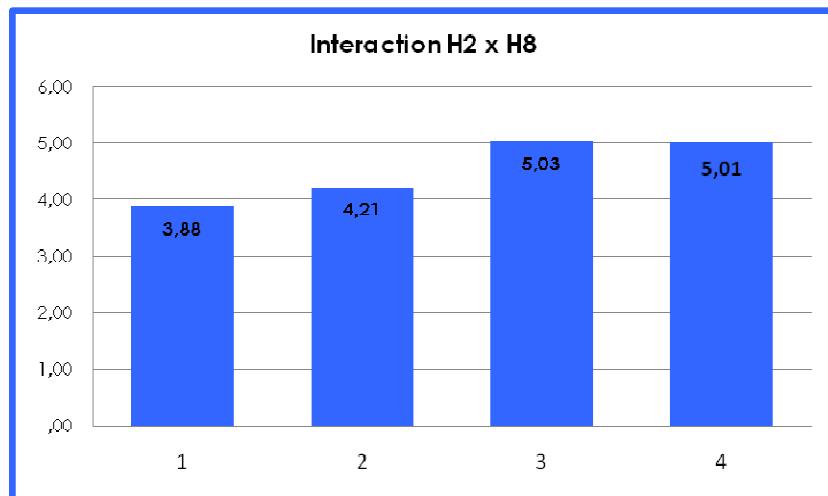
	H1a x H4	H1c x H7	H1f x H7	H8 x H2
Variable	(β/p)	(β/p)	(β/p)	(β/p)
H1a: Age	-0.045 / 0.068	0.026 / 0.001	0.026 / 0.001	0.024 / 0.003
H1b: Gender	0.020 / 0.888	0.055 / 0.704	0.047 / 0.746	0.031 / 0.831
H1c: Education	-0.085 / 0.096	0.266 / 0.085	-0.067 / 0.191	-0.073 / 0.155
H1d: Income	0.107 / 0.095	0.098 / 0.126	0.114 / 0.075	0.106 / 0.101
H1e: Family composition	-0.017 / 0.911	-0.062 / 0.683	-0.074 / 0.625	-0.077 / 0.611
H1f: House ownership	0.105 / 0.532	0.085 / 0.613	-0.804 / 0.073	0.111 / 0.511
H2: Financial knowledge	0.766 / 0.000	0.763 / 0.000	0.752 / 0.000	0.893 / 0.000

and skills				
H3: Financial risk tolerance	-0.148 / 0.017	-0.153 / 0.014	-0.152 / 0.014	-0.152 / 0.014
H4: Goal clarity	-0.546 / 0.194	0.630 / 0.000	0.625 / 0.000	0.644 / 0.000
H5: Savings behaviour	0.032 / 0.597	0.037 / 0.546	0.054 / 0.375	0.032 / 0.592
H6: Expenditure control	0.001 / 0.988	-0.014 / 0.825	-0.017 / 0.782	-0.009 / 0.893
H7: Health perception	-0.229 / 0.027	0.345 / 0.187	-0.718 / 0.005	-0.218 / 0.035
H8: Expectations social security	0.223 / 0.161	0.199 / 0.210	0.173 / 0.276	1.204 / 0.038
Interaction	0.025 / 0.003	-0.158 / 0.019	0.387 / 0.027	-0.313 / 0.071
Pseudo R-Square	0.274	0.271	0.271	0.269

Finally, the interaction between expectations about social security rules and financial knowledge and skills is almost significant. This implicates that someone who expects social security rules will change while being financially illiterate is more likely to be less certain about his/her pension savings compared to those who are financially literate and believe rules remain (almost) the same. To clarify the effects of this interaction, on the basis of median split, I divided the group of respondents in two, where one half is low financially literate and the other half is high financially literate. Then there is the dichotomy expected change in social security rules, yes or no. Group 1 consists of the people who are low financially literate and believe rules are going to change. Group 2 are low financially literate but expect the social security rules remain the same. The third group consists of high financially literate people who think the rules will change. Finally the fourth group consists of those who are high financially literate and believe social security rules will not change. Then I analyzed the average scores of these groups on the level of certainty with which people can properly predict whether they save enough for retirement.

Figure 2 shows the average scores of the groups. It follows that those who score lower on financial knowledge and skills and believe the social security rules will change are more uncertain about their predictions. People, who are financially literate but expect social security rules will change, can probably limit their level of certainty because they can use their financial knowledge and skills to oversee the consequences of this expected change.

**Figure 2 Interaction Financial knowledge and skills x Expectations social security**



## 5 CONCLUSION

Returning to the question that led to this research: What factors determine whether individuals can properly predict whether they save enough for their pension to maintain a comfortable life? The value of studies on this issue is of great importance for individuals as well as the pension industry and marketers. As in the future much can be improved to avoid unnecessary shortfalls in pension income. This research has focused on demographic, psychological and external factors which could affect the level of certainty with which individuals can properly predict whether they save enough for retirement. The demographic factors include background information and other personal data of the respondents. Of these factors, only age yielded a significant contribution to the level of certainty. But also income gives an indication that a change in income influenced the level of certainty. The study emphasized especially on the psychological factors, because these factors generally can be influenced by marketing programs. There appear to be as many as four psychological factors which contribute significantly to the model. There was also an external factor included in the research, however this was not significant, yet there is a strong indication that this factor has an effect on the level of certainty. The following summary shows which hypotheses are supported by the research. It follows that the psychological factors explain significantly more than the other factors.

**Table 7 Hypotheses**

Factors	Variable	Level of certainty
Demographic	H1a: Age	Supported
	H1b: Gender	-
	H1c: Education	-
	H1d: Income	Partly supported
	H1e: Family composition	-
	H1f: House ownership	-
Psychological	H2: Financial knowledge and skills	Supported
	H3: Financial risk tolerance	Supported
	H4: Goal clarity	Supported
	H5: Savings behaviour	-
	H6: Expenditure control	-
	H7: Health perception	Supported
External	H8: Expectations social security	Partly supported

## **5.1 Discussion**

Many of the demographic factors were found to be insignificant. However, there are many psychological factors that contribute significantly to the level of certainty with which people can properly predict whether they save enough for retirement. Expectations about changing social security rules appeared to be not significant. If only the demographic and external factors were included in the model, the external factor contributed significantly in the sense that people who expect social security rules to remain the same are more certain about their pension savings. But by adding the psychological concepts social security was found to be dominated by the other factors. The same applies to the net monthly household income. Before the addition of psychological factors to the model, income contributed within the 5% significance level. Later it was within the 10% significance level, so we can conclude that an increase in income leads to a slight increase in the level of certainty, but it is influenced by other factors since the effect of income has been taken over by psychological factors.

Age is highly significant and exerts influence. With each year the age increases the level of certainty rises slightly. Thus the hypothesis that older people are more certain about their pension savings is supported. Consequently, especially younger people could use some assistance in preparing for retirement. It is important that people at a young age feel involved with their retirement savings, so they will be more certain about making predictions whether they are saving enough for their pension. Despite much discussion in the literature, other demographic factors turned out to be insignificant. This could be because these studies do not originate from the Netherlands and/or use other questionnaires and here is another dependent variable than other studies used.

Those who believe they know a lot of financial issues and know where to get the right information and are sure of themselves when taking financial decisions are more certain about their predictions whether they save enough for retirement. Of all significant results financial knowledge and skills has the strongest effect on the level of certainty ( $\beta = 0.776$  with  $p = 0.000$ ). Accordingly, people with a high perception of financial knowledge and skills are more certain about their pension savings. Educating people could be a good method to make them more certain about their

pension savings. You could measure the effectiveness of education programs, by offering people training and then measure the level of certainty again.

Also having more goal clarity has a pretty strong effect on the level of certainty ( $\beta = 0.637$  with  $p = 0.000$ ). The hypothesis that people who have a clear goal concerning their future are more certain about their pension savings is valid. Those who think much about their life and know what they want to do after retirement will therefore be more certain that they can properly predict whether they save enough for their pension. There appears to be an interaction effect between goal clarity and age. This means that people who are older and have more goal clarity are even more likely to be more certain about their retirement savings. It is therefore important to trigger (especially younger) people to think more about their future and to develop clearer future goals. Having clearer goals about the future increases the likelihood that they will feel more certain about their predictions whether they save enough for retirement, especially when they get older.

Following the results show that the assumption that people with good health perception are more certain about their pension savings is supported. As the general state of health is less good, people seems to be more uncertain about making predictions about saving enough for retirement. This could be because people with a poorer health are generally more uncertain about their future needs and resources. They often do not yet know what future needs they will have and how much income is needed for this. Will they be able to continue working until retirement or will they become disabled before? Will they rely heavily on their health insurance or will they have to bear the cost of expensive treatments? These are all issues that could influence the level of certainty.

Those who take more financial risk appear to be less certain about making predictions whether they save enough for retirement. It is still possible that people who are risk averse end up with less pension income than those who are very risk tolerant, but they are more certain about their pension savings. People with high financial risk tolerance should therefore be made better aware of the consequences of taking risks. More research could be done on the actual amount of pension

income to compare whose pension income is higher; from those who are risk taking or risk averse.

The psychological factors are often contributing to the level of certainty with which people can properly predict whether they save enough for retirement. This is valuable information for marketers to work with in order to assist people in making retirement decisions. After all, we all want to prevent people to end with a shortfall in retirement income.

## **5.2 Limitations**

Much of the researched literature is American and the survey was conducted in the Netherlands. It contains a representation of the Dutch society so we can generalize the findings of this research for the Dutch population. However it is not possible to generalize the results across the entire world population. Especially since some of the survey questions, such as those relating to the social security, are specifically related to a country.

Besides, this study consisted of a collection of questions from a much larger dataset. Also there are some groups of respondents filtered from some survey questions or even the entire dataset. For example the questions on financial risk tolerance could only be filled in by respondents with a total net household income of at least €10,000. Respondents whose main occupation is attending school or college, being too young for an activity or those who are already retired, are excluded from the research. The questions on social security dated from an earlier survey, so these results are not entirely recent. This limits the generalization somewhat. Although this factor has no significant outcome in the whole model, there is a strong indication that an expected change in social security rules affects the level of certainty. I expect that when this factor is measured at the same time as the other factors, the indication is even stronger, perhaps even significantly, because the results are more in line.

## **5.3 Future research**

Future research could further enhance the understanding of retirement savings issues caused by uncertainty, such as the possible procrastination of important retirement

decisions. Especially companies in the pension branch, such as funds and insurance companies can benefit from more research in this area. But it can also reveal valuable information for the government and consumer themselves.

After discovering which groups of the population are more certain about predicting whether they save enough for retirement, you can further examine these characteristics and use this valuable information for further research. For instance use dissimilar retirement intervention programs for young and older people to meet their different needs.

In order to overcome the problems of uncertainty it is important to recognize the aforementioned (chapter 2.2) types of uncertainty; inadequate understanding, incomplete information and undifferentiated alternatives. For example, if there is incomplete information about retirement plans, you can provide better information in order to reduce uncertainty. It is also important to further investigate how uncertainty is actually related to behaviour. Do people who are more uncertain really act different than people who are more certain?

A follow-up study could include the provision of an education program to a part of the respondents. The results on the level of certainty of the study after training can then be compared with the results before the training and possibly with a control group. Follow-up research could again prove that the degree of financial knowledge and skills plays a major role in making retirement decisions. And marketing as a tool can be used to provide people with better information.

In this study I used questions from a very large questionnaire that included several subjects. But perhaps one can be studied only with retirement-related questions. More profound questions can be asked to reveal other important factors that could influence the level of certainty. In order to increase the effect size of the model, more explanatory questions could be added in future research, such as questions on personality, social forces and economic forces.

In the end it is extremely important that people are aware of their retirement savings, so that they can enjoy their lives after their retirement.

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## REFERENCES

- Anderson, B.F., Deane, D.H., Hammond, K.R., and McClelland, G.H. (1981). "Concepts in judgment and decision research", New York: Praeger.
- Bajtelsmit, V.L., Bernasek, A., and Jianakoplos, N.A. (1999). "Gender differences in defined contribution pension decisions", *Financial Services Review*, 8, 1–10.
- Bajtelsmit, V.L., and VanderHei, J.A. (1997). "Risk aversion and retirement income adequacy", in Mitchell, O.S. (Ed.) *Positioning Pensions for the Year 2000*, Philadelphia: University of Pennsylvania Press, 45–66.
- Beck, U., and Beck-Gernsheim, E. (2001). "Individualization", Sage Publications.
- Boskin, M.J. (1975). "Social Security and Retirement Decisions", NBER Working Paper No. 107.
- Canova, L., Rattazzi, A.M.M., and Webley, P. (2005). "The hierarchical structure of saving motives", *Journal of Economic Psychology*, 26, 21-34.
- Crawford, V.P., and Lilien, D.M. (1981). "Social Security and the Retirement Decision", *The Quarterly Journal of Economics*, 96 (3), 505-529.
- Dalen van, H.P., Henkens, K., and Hershey, D.A. (2008). "Are pension savings sufficient? Perceptions and expectations of American and Dutch workers", CentER Discussion paper 2008-58.
- DeVaney, S.A., and Su, Y. (1997). "Factors predicting the most important source of retirement income", *Compensation and Working Conditions*, 2, 25-31.
- Glass, J.C., and Kilpatrick, B.B. (1998a). "Financial planning for retirement: An imperative for baby boomer women", *Educational Gerontology*, 24, 595-617.
- Glass, J.C., and Kilpatrick, B.B. (1998b). "Gender comparisons of baby boomers and financial preparation for retirement", *Educational Gerontology*, 24, 719-745.

Hariharan, G., Chapman, K.S., and Domian, D.L. (2000). "Risk tolerance and asset allocation for investors nearing retirement", *Financial Services Review*, 9, 159–170.

Hayslip, B., Beyerlein, M., and Nichols, J.A. (1997). "Assessing anxiety about retirement: the case of academicians", *International Journal of Aging and Human Development*, 44, 15–36.

Hershey, D.A., Henkens, K., and van Dalen, H.P. (2007). "Mapping the minds of retirement planners: A cross-cultural perspective", *Journal of Cross-cultural Psychology*, 38(3), 361-382.

Hershey, D.A., Jacobs-Lawson, J.M., McArdle, J.J., and Hamagami, F. (2007). "Psychological Foundations of Financial Planning for Retirement", *Journal of Adult Development*, 14, 26-36.

Hershey, D.A., Jacobs-Lawson, J.M., and Neukam, K.N. (2002). "Influences of age and gender on workers' goals for retirement", *International Journal of Aging & Human Development*, 55, 163-179.

Hershey, D.A., and Mowen, J.C. (2000). "Psychological determinants of financial preparedness for retirement", *The Gerontologist*, 40, 687–697.

Hershey, D.A., Walsh, D.A., Brougham, R., Carter, S., and Farrell, A. (1998). "Challenges of training pre-retirees to make sound financial planning decisions", *Educational Gerontology*, 24, 447-470.

Jacobs-Lawson, J.M., and Hershey, D.A. (2005). "Influence of knowledge, future time perspective, and risk tolerance on retirement savings", *Financial Services Review*, 14, 331–334.

Jacobs-Lawson, J.M., Hershey, D.A., and Neukam, K.A. (2004). "Gender differences in factors that influence time spent planning for retirement", *Journal of Women and Aging*, 16, 55–69.

Joo, S., and Pauwels, V.W. (2002). "Factors affecting workers' retirement confidence: A gender perspective", *Financial Counseling and Planning*, 13(2), 1-10.

Juster, F.T., and Suzman, R. (1995). "An Overview of the Health and Retirement Study", *The Journal of Human Resources*, Vol. 30, 7-56.

Kamakura, W.A., Ramaswami, S.N., and Srivastava, R.K. (1991). "Applying latent trait analysis in the evaluation of prospects for cross-selling of financial services", *International Journey of Research in Marketing*, Vol. 8(4), 329-349.

Kim, J., Kwon, J., and Anderson, E. (2005). "Factors related to retirement confidence: Retirement preparation and workplace financial education", *Financial Counseling and Planning*, 12(2), 77-89.

Laibson, D.I., Repetto, A., and Tobacman, J. (1998). "Self-Control and Saving for Retirement", *Brookings Papers on Economic Activity*, Vol. 1998(1), 91-172.

Lipshitz, R., and Strauss, O. (1997). "Coping with Uncertainty: A Naturalistic Decision-Making Analysis", *Organizational Behavior and Human Decision Processes*, 69(2), 149-163.

Lusardi, A., and Mitchell, O.S. (2007). "Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth", *Journal of Monetary Economics*, 54, 205-224.

Lusardi, A., and Mitchell, O.S. (2005). "Financial Literacy and Planning: Implications for Retirement Wellbeing", Michigan Retirement Research Center Research Paper No. WP 2005-108.

Malroutu, Y.L., and Xiao, J.J. (1995). "Perceived adequacy of retirement income", *Financial Counseling and Planning*, 6, 17-23.

Mastin, T. (1998). "Employees' understanding of employer sponsored retirement plans, a knowledge gap perspective", *Public Relations Review*, 24, 521-534.

Padawer, E.A., Jacobs-Lawson, J.M., Hershey, D.A., and Thomas, D.G. (2007). "Demographic indicators as predictors of future time perspective", *Current Psychology*, 26, 102–108.

Rohwedder, S., and van Soest, A. (2006). "The Impact of Misperceptions about Social Security on Saving and Well-being", *Michigan Retirement Research Center, Research Paper No. 2006-118*.

Skinner, J. (2007). "Are You Sure You're Saving Enough for Retirement?", *Journal of Economic Perspectives*, 21(3), 59-80.

Stawski, R.S., Hershey, D.A., and Jacobs-Lawson, J.M. (2007). "Goal clarity and financial planning activities as determinants of retirement savings contributions ", *Aging and Human Development*, Vol. 64(1) 13-32.

Sunden, A.E., and Surette, B.J. (1998). "Gender differences in the allocation of assets in retirement savings plans", *The American Economic Review*, 88, 207–211.

Taylor, M.A., and Shore, L.M. (1995). "Predictors of planned retirement age: An application of Beehr's model", *Psychology and Aging*, 10, 76-83.

Thaler, R.H., and Shefrin, H.M. (1981). "An Economic Theory of Self-Control", *The Journal of Political Economy*, Vol. 89(2), 392-406.

Wallace, R.B., and Herzog, A.R. (1995). "Overview of the Health Measures in the Health and Retirement Study", *The Journal of Human Resources*, Vol. 30, 87-107.

Yabiku, S.T. (2000). "Family history and pensions: The relationships between marriage, divorce, children, and private pension coverage", *Journal of Aging Studies*, Vol. 14(3), 293-312.

Yuh, Y., and DeVaney, S.A. (1996). "Determinants of couples' defined contribution retirement funds", *Financial Counseling and Planning*, 7, 31–38.

Yuh, Y., Hanna, S., and Montalto, C.P. (1998). "Mean and pessimistic projections of retirement adequacy", *Financial Services Review*, 7, 175–193.

## **APPENDIX**

### **A      Explanation Dutch pension system**

In the Netherlands the pensions system consists of three levels, namely a flat-rate public pension scheme, earnings-related occupational plans and voluntary retirement savings (van Dalen et al. 2008). The first one is actually called the 'Algemene Ouderdoms Wet (AOW)' and comprises a state pension, which is guaranteed for all Dutch citizens who have attained the age of 65. In view of the pensions crisis proposals are currently being treated by the government to reform the state pension, for example by increasing the state pension age to 67. However, there is much resistance to this reform proposal. On the second level employers are not required to offer pension schemes to their employees, but due to the strong forces of collective wage agreements, almost everyone is covered by at least some form of occupational pension, which are mainly defined benefit plans. Although there are few defined contribution plans in the Netherlands, there may also be reforms toward those plans. The third level is the voluntary retirement savings which currently have begun to emerge and more individuals enter into private pension arrangements with an insurance company. Also retirement annuities are becoming more popular among those who seek early retirement. In contrast to the Dutch system in the United States the pension system relies more on individual responsibility and self-determination due to the more voluntary character of pension plans. Because of the mandatory character of the Dutch pension system, a relatively small number of older individuals are poorly supported in retirement.

## **B Questionnaire**

## **Level of certainty**

It is difficult to predict whether you actually save enough for retirement.

You indicate that you expect to have financial resources to live comfortably after retirement.

How sure are you that your expectations really come true?

1      2      3      4      5      6      7

Age

Age of Household member ....

## Gender

### Gender of the respondent

1 Male

2 Female

Education

## Education in CBS-categories

## 1 elementary school

2 vmbo

3 havo/vwo

4 mbo

5 hbo

6 wo

### Income

Net monthly household income in euro's ....

## Family composition

### Number of children living at home in the household

0 None

## 1 One child

## 2 Two children

- 3 Three children
- 4 Four children
- 5 Five children
- 6 Six children
- 7 Seven children
- 8 Eight children
- 9 Nine children or more

### **House ownership**

Type of dwelling

- 1 house ownership
- 2 rental house
- 3 sublet
- 4 free house
- 9 unknown

### **Financial knowledge and skills**

To what extent do you agree with the following statements?

- 1 I know a lot of financial issues.
- 2 When I need financial services, I know exactly where I can get the right information.
- 3 I'm sure of myself when I have to take financial decisions.

Strongly disagree

Strongly agree

1                  2                  3                  4                  5

### **Financial risk tolerance**

To what extent do you agree with the following statements?

- 1 I think it's more important to invest safely and get a guaranteed return than to take risks in hopes to get the highest return.
- 2 For myself I close out investing in shares because I think that's too risky.
- 3 If I think an investment will be profitable I'm willing to borrow money.
- 4 I want to be able to assume that my investments are solid.

5 I am increasingly convinced that I should take more financial risk if I want to improve my financial position.

6 I'm willing to take the risk that I will lose money if there is also the chance that I will win money.

Completely disagree                              Totally agree

1    2    3    4    5    6    7

### **Goal clarity**

To what extent do you agree with the following statements?

1 I have a clear vision about what life will look like at my pension.

2 I know what I want to do after my retirement.

3 I think a lot about my life after retirement.

Strongly disagree                              Strongly agree

1    2    3    4    5

### **Savings behaviour**

Would you indicate the extent to which you agree or disagree with the following statements?

1 means 'completely disagree'

7 means 'totally agree'

1 Saving and investing carefully are the key factors to become wealthy.

2 Eventually people who cope well with their finances remain rich.

3 It is not always wise for me to save because a number of cases have to do with having good luck or bad luck.

### **Expenditure control**

Do you find it difficult to control your spending? Would you indicate on a scale of 1 to 7 how difficult you find it, where 1 means very easy and 7 means very difficult.

Very easy                                      Very difficult

1    2    3    4    5    6    7

How well do you keep up your (household) expenditure?

- 1 I keep up the expenses very bad.
  - 2 I keep up the expenses pretty bad.
  - 3 I keep up the expenses somewhat.
  - 4 I keep up the expenses well.
  - 5 I keep up the expenses very well.

Some people spend all the money they receive immediately. Others save to have some money in reserve. Would you indicate on a scale of 1 to 7 what you do with the money you have left after you have paid for food, rent and other necessities, where 1 means you want to spend your money immediately and 7 means that you want to keep as much money on?

Want to spend all my  
money immediately

Want to keep as  
much money on

1      2      3      4      5      6      7

## Health perception

What is generally the state of your health?

- 1 excellent
  - 2 good
  - 3 okay
  - 4 not so good
  - 5 bad

## Expectations social security

The current state pension for married couples is about 16,000 euro gross annually starting on the age of 65. Do you expect the gross state pension still exists over ten years in its current form, i.e. starting at the same age and has the same purchasing power?

- 1 yes
  - 2 no, will commence earlier than 65 years
  - 3 no, will commence later than 65 years
  - 4 no, it will come out relatively higher

- 5 no, it will come out relatively lower
- 6 no, will commence earlier than 65 years and will come out relatively higher
- 7 no, will commence later than 65 years and will come out relatively lower
- 8 else
- 9 I don't know

The levy on the first tax brackets for those aged over 64 is lower than for those aged under 65. Do you expect that over ten years this tax is still lower for people aged over 64?

- 1 yes, with an equally big difference like now between the age groups
- 2 yes, but with less difference like now between the age groups
- 3 no, equal to one another
- 4 no, higher for the age group above 64
- 5 else
- 9 I don't know

### **Expectations financial resources**

Based on how you plan to live after retirement and given that your current savings behaviour does not adapt, do you think you will have sufficient financial resources to live comfortably after retirement?

- 1 I expect to have far too little
- 2 I expect to have little too short
- 3 I expect to have just enough
- 4 I expect to keep something
- 5 I expect to have more than enough

### **Happiness**

Overall, to what extent do you find yourself a happy person?

- 1 very happy
- 2 happy
- 3 not happy, not unhappy

- 4 unhappy
- 5 very unhappy
- 6 I don't know

### **Economic situation household**

How do you think the economic situation of your household is over 5 years compared to your current situation?

- 1 much worse
- 2 worse
- 3 (approximately) the same
- 4 better
- 5 far better
- 99 I don't know

### **Employer offering pension**

Are you from your current (last) job (for retirement) entitled to a pension (other than state pension)?

- 1 yes
- 2 no

### **Future time perspective**

Would you indicate on a scale of 1 to 7 to what extent you agree with the following statements?

- 1 I think about how things in the future might be and try to influence them in my everyday life.
- 2 Often I am involved in matters that will have affects over a couple of years.
- 3 I only deal with things of this moment, assuming that the future course will be okay.

Totally not applicable                      Totally applicable  
to me    to me  
1    2    3    4    5    6    7

## **Main occupation**

Main occupation of the respondent

- 1 Paid employment
- 2 Family business
- 3 Freelance
- 4 Looking for work after job loss
- 5 Looking for work for the first time
- 7 Household care
- 9 (Partially) disabled
- 10 Unpaid work + benefits
- 11 Volunteering
- 12 Something else

## C Factor analysis

**KMO and Bartlett's Test 1**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.728
Bartlett's Test of Sphericity	3663.237
df	153
Sig.	.000

**Total Variance Explained 1**

Comp onent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.370	18.723	18.723	3.370	18.723	18.723	2.394	13.299	13.299
2	2.559	14.215	32.938	2.559	14.215	32.938	2.070	11.502	24.801
3	1.883	10.460	43.398	1.883	10.460	43.398	2.044	11.354	36.154
4	1.432	7.953	51.352	1.432	7.953	51.352	1.898	10.545	46.699
5	1.170	6.500	57.852	1.170	6.500	57.852	1.627	9.037	55.736
6	1.093	6.070	63.922	1.093	6.070	63.922	1.474	8.186	63.922
7	.945	5.249	69.172						

Extraction Method: Principal Component Analysis.

**Rotated Component Matrix 1**

	Component					
	1	2	3	4	5	6
I know a lot of financial issues.	.788					
When I need financial services, I know exactly where I can get the right information.	.787					
I'm sure of myself when I have to take financial decisions.	.826					
I think it's more important to invest safely and get a guaranteed return than to take risks in hopes to get the highest return.				.807		
For myself I close out investing in shares because I think that's too risky.					.656	
If I think an investment will be profitable I'm willing to borrow money.			.714			
I want to be able to assume that my investments are solid.					.822	
I am increasingly convinced that I should take more financial risk if I want to improve my financial position.			.807			
I'm willing to take the risk that I will lose money if there is also the chance that I will win money.			.805			
I have a clear vision about what life will look like at my pension.	.844					
I know what I want to do after my retirement.	.845					
I think a lot about my life after retirement.	.721					
Saving and investing carefully are the key factors to become wealthy.						.777
Eventually people who cope well with their finances remain rich.						.862
It is not always wise for me to save because a number of cases have to do with having good luck or bad luck.					.553	
Do you find it difficult to control your spending?						.770
How well do you keep up your (household) expenditure?	.508					.772
Would you indicate on a scale of 1 to 7 what you do with the money you have left after you have paid for food, rent and other necessities?						

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

**KMO and Bartlett's Test 2; after removal faulty questions**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.711
Bartlett's Test of Sphericity	2725.331
df	78
Sig.	.000

**Total Variance Explained 2; after removal faulty questions**

Com pone nt	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.187	24.518	24.518	3.187	24.518	24.518	2.212	17.018	17.018
2	2.019	15.533	40.051	2.019	15.533	40.051	2.078	15.987	33.005
3	1.527	11.745	51.796	1.527	11.745	51.796	1.940	14.925	47.930
4	1.298	9.981	61.776	1.298	9.981	61.776	1.464	11.265	59.196
5	1.118	8.600	70.376	1.118	8.600	70.376	1.453	11.181	70.376
6	.704	5.413	75.789						

Extraction Method: Principal Component Analysis.

**Rotated Component Matrix 2; after removal faulty questions**

	Component				
	1	2	3	4	5
I know a lot of financial issues.	.788				
When I need financial services, I know exactly where I can get the right information.	.824				
I'm sure of myself when I have to take financial decisions.	.849				
If I think an investment will be profitable I'm willing to borrow money.			.731		
I am increasingly convinced that I should take more financial risk if I want to improve my financial position.			.822		
I'm willing to take the risk that I will lose money if there is also the chance that I will win money.			.827		
I have a clear vision about what life will look like at my pension.	.846				
I know what I want to do after my retirement.	.847				
I think a lot about my life after retirement.	.728				
Saving and investing carefully are the key factors to become wealthy.				.822	
Eventually people who cope well with their finances remain rich.				.851	
Do you find it difficult to control your spending?					-.824
Would you indicate on a scale of 1 to 7 what you do with the money you have left after you have paid for food, rent and other necessities?					.841

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

## D Reliability analysis

**Reliability Statistics; Financial knowledge and skills**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.811	3

**Item-Total Statistics; Financial knowledge and skills**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I know a lot of financial issues.	6.67	3.171	.654	.431	.747
When I need financial services, I know exactly where I can get the right information.	6.10	3.329	.645	.417	.756
I'm sure of myself when I have to take financial decisions.	6.10	3.227	.681	.464	.718

**Reliability Statistics; Financial risk tolerance**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.719	.719	3

**Item-Total Statistics; Financial risk tolerance**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
If I think an investment will be profitable I'm willing to borrow money.	4.88	6.966	.469	.222	.712
I am increasingly convinced that I should take more financial risk if I want to improve my financial position.	4.40	5.968	.561	.338	.603
I'm willing to take the risk that I will lose money if there is also the chance that I will win money.	4.51	6.348	.592	.361	.567

**Reliability Statistics; Goal clarity**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.775	.774	3

**Item-Total Statistics; Goal clarity**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I have a clear vision about what life will look like at my pension.	5.32	3.061	.707	.563	.588
I know what I want to do after my retirement.	4.98	3.047	.680	.549	.618
I think a lot about my life after retirement.	6.07	3.864	.464	.217	.847

**Reliability Statistics; Goal clarity; after removal faulty question**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.847	.847	2

**Item-Total Statistics; Goal clarity; after removal faulty question**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I have a clear vision about what life will look like at my pension.	3.21	1.142	.734	.539	.847
I know what I want to do after my retirement.	2.87	1.086	.734	.539	.847

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

**Reliability Statistics; Savings behaviour**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.599	.601	2

**Item-Total Statistics; Savings behaviour**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Saving and investing carefully are the key factors to become wealthy.	4.31	1.719	.429	.184	. <sup>a</sup>
Eventually people who cope well with their finances remain rich.	4.21	2.010	.429	.184	. <sup>a</sup>

- a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

**Reliability Statistics; Expenditure control**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.587	.591	2

**Item-Total Statistics; Expenditure control**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Do you find it difficult to control your spending?	4.8973	1.589	.420	.176	. <sup>a</sup>
Would you indicate on a scale of 1 to 7 what you do with the money you have left after you have paid for food, rent and other necessities?	4.9540	2.136	.420	.176	. <sup>a</sup>

- a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

## E Descriptive statistics

**Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	369	52.6	52.6	52.6
	Female	333	47.4	47.4	100.0
	Total	702	100.0	100.0	

**Age**

N	Valid	702
	Missing	0
Mean		48.34
Minimum		25
Maximum		65

**Net monthly household income**

N	Valid	702
	Missing	0
Mean		2776.6804
Minimum		.00
Maximum		8430.00

**Education in CBS categories**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary school	21	3.0	3.0	3.0
	vmbo	185	26.4	26.4	29.3
	havo/vwo	68	9.7	9.7	39.0
	mbo	143	20.4	20.4	59.4
	hbo	186	26.5	26.5	85.9
	wo	99	14.1	14.1	100.0
	Total	702	100.0	100.0	

**Main occupation**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Paid employment	493	70.2	70.2	70.2
	Family business	4	.6	.6	70.8
	Freelance	36	5.1	5.1	75.9
	Looking for work after job loss	13	1.9	1.9	77.8
	Looking for work for the first time	2	.3	.3	78.1
	Household care	84	12.0	12.0	90.0
	(Partially) disabled	50	7.1	7.1	97.2
	Unpaid work + benefits	3	.4	.4	97.6
	Volunteering	10	1.4	1.4	99.0
	Something else	7	1.0	1.0	100.0
Total		702	100.0	100.0	

**Number of children living at home in the household**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	392	55.8	55.8	55.8
	One child	79	11.3	11.3	67.1
	Two children	158	22.5	22.5	89.6
	Three children	62	8.8	8.8	98.4
	Four children	9	1.3	1.3	99.7
	Five children	2	.3	.3	
	Total	702	100.0	100.0	

**Type of dwelling**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	House ownership	538	76.6	76.6	76.6
	Rental house	162	23.1	23.1	99.7
	Free house	2	.3	.3	
	Total	702	100.0	100.0	

## F Regression statistics

### Demographic

Pseudo R-Square

Cox and Snell	,076
Nagelkerke	,078
McFadden	,023

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	-1,431	,620	5,326	1	,021	-2,646	-,216
	[Level of certainty = 2]	-,150	,593	,064	1	,800	-1,313	1,012
	[Level of certainty = 3]	1,034	,589	3,080	1	,079	-,121	2,188
	[Level of certainty = 4]	2,206	,593	13,821	1	,000	1,043	3,369
	[Level of certainty = 5]	3,453	,602	32,948	1	,000	2,274	4,632
	[Level of certainty = 6]	5,518	,631	76,585	1	,000	4,282	6,754
Location	Age	,046	,007	38,102	1	,000	,031	,060
	Gender	-,163	,135	1,451	1	,228	-,428	,102
	Education	,006	,050	,012	1	,911	-,092	,103
	Income	,153	,062	6,058	1	,014	,031	,275
	Family composition	-,054	,147	,138	1	,710	-,342	,233
	House ownership	-,135	,163	,688	1	,407	-,455	,184

Link function: Logit.

## Demographic + psychological

Pseudo R-Square

Cox and Snell	,263
Nagelkerke	,272
McFadden	,089

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	,807	,825	,955	1	,328	-,811	2,424
	[Level of certainty = 2]	2,176	,810	7,223	1	,007	,589	3,763
	[Level of certainty = 3]	3,510	,812	18,673	1	,000	1,918	5,101
	[Level of certainty = 4]	4,883	,822	35,304	1	,000	3,272	6,493
	[Level of certainty = 5]	6,322	,834	57,432	1	,000	4,687	7,957
	[Level of certainty = 6]	8,582	,863	98,949	1	,000	6,891	10,274
Location	Age	,024	,008	8,876	1	,003	,008	,040
	Gender	,028	,143	,038	1	,845	-,252	,308
	Education	-,072	,051	2,013	1	,156	-,172	,028
	Income	,114	,064	3,189	1	,074	-,011	,240
	Family composition	-,090	,151	,352	1	,553	-,386	,207
	House ownership	,112	,168	,446	1	,504	-,217	,442
	Financial knowledge and skills	,780	,098	63,665	1	,000	,588	,971
	Financial risk tolerance	-,147	,062	5,598	1	,018	-,268	-,025
	Goal clarity	,635	,096	44,104	1	,000	,448	,823
	Savings behaviour	,036	,060	,355	1	,551	-,082	,154
	Expenditure control	-,014	,063	,051	1	,821	-,138	,110
	Health perception	-,225	,103	4,724	1	,030	-,427	-,022

Link function: Logit.

## Demographic + external

Pseudo R-Square

Cox and Snell	,082
Nagelkerke	,084
McFadden	,025

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	-1,270	,625	4,128	1	,042	-2,495	-,045
	[Level of certainty = 2]	,013	,599	,000	1	,983	-1,160	1,186
	[Level of certainty = 3]	1,200	,595	4,069	1	,044	,034	2,367
	[Level of certainty = 4]	2,380	,600	15,737	1	,000	1,204	3,556
	[Level of certainty = 5]	3,634	,609	35,670	1	,000	2,442	4,827
	[Level of certainty = 6]	5,699	,637	79,952	1	,000	4,450	6,949
Location	Age	,046	,007	38,457	1	,000	,031	,060
	Gender	-,137	,136	1,013	1	,314	-,403	,130
	Education	,004	,050	,008	1	,929	-,093	,102
	Income	,147	,062	5,592	1	,018	,025	,269
	Family composition	-,030	,147	,042	1	,837	-,319	,258
	House ownership	-,122	,163	,557	1	,455	-,442	,198
	Dummy social security no change	,305	,156	3,808	1	,051	-,001	,611
	Dummy social security missing values	,025	,174	,021	1	,885	-,317	,367

Link function: Logit.

## General model

Pseudo R-Square

Cox and Snell	,266
Nagelkerke	,275
McFadden	,090

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	,866	,827	1,098	1	,295	-,754	2,486
	[Level of certainty = 2]	2,236	,811	7,601	1	,006	,647	3,826
	[Level of certainty = 3]	3,570	,814	19,238	1	,000	1,975	5,165
	[Level of certainty = 4]	4,949	,824	36,104	1	,000	3,335	6,563
	[Level of certainty = 5]	6,395	,836	58,474	1	,000	4,756	8,034
	[Level of certainty = 6]	8,657	,865	100,186	1	,000	6,961	10,352
Location	Age	,024	,008	8,937	1	,003	,008	,040
	Gender	,047	,143	,109	1	,741	-,234	,328
	Education	-,073	,051	2,029	1	,154	-,172	,027
	Income	,114	,064	3,146	1	,076	-,012	,239
	Family composition	-,074	,152	,241	1	,623	-,371	,223
	House ownership	,115	,168	,465	1	,495	-,215	,445
	Financial knowledge and skills	,776	,098	63,080	1	,000	,584	,967
	Financial risk tolerance	-,151	,062	5,953	1	,015	-,273	-,030
	Goal clarity	,637	,096	44,119	1	,000	,449	,825
	Savings behaviour	,035	,060	,339	1	,560	-,083	,154
	Expenditure control	-,015	,063	,057	1	,811	-,139	,109
	Health perception	-,220	,103	4,526	1	,033	-,423	-,017
	Dummy social security no change	,186	,159	1,367	1	,242	-,126	,497
	Dummy social security missing values	-,100	,177	,322	1	,570	-,447	,246

Link function: Logit.

## General model + control variables + dummy variables

Pseudo R-Square

Cox and Snell	,358
Nagelkerke	,371
McFadden	,130

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	-2,084	1,106	3,548	1	,060	-4,253	,085
	[Level of certainty = 2]	-,675	1,090	,384	1	,535	-2,811	1,461
	[Level of certainty = 3]	,758	1,089	,484	1	,487	-1,377	2,893
	[Level of certainty = 4]	2,260	1,094	4,264	1	,039	,115	4,404
	[Level of certainty = 5]	3,872	1,100	12,390	1	,000	1,716	6,028
	[Level of certainty = 6]	6,370	1,115	32,619	1	,000	4,184	8,556
Location	Age	,026	,009	8,142	1	,004	,008	,044
	Gender	-,029	,164	,031	1	,860	-,350	,292
	Education	-,046	,056	,674	1	,412	-,157	,064
	Income	,055	,072	,581	1	,446	-,086	,195
	Family composition	-,008	,163	,003	1	,960	-,328	,312
	House ownership	,095	,182	,273	1	,601	-,262	,453
	Financial knowledge and skills	,789	,107	54,609	1	,000	,580	,999
	Financial risk tolerance	-,139	,067	4,318	1	,038	-,271	-,008
	Goal clarity	,600	,105	32,679	1	,000	,394	,805
	Savings behaviour	-,004	,064	,003	1	,956	-,130	,123
	Expenditure control	-,142	,069	4,250	1	,039	-,277	-,007
	Health perception	-,042	,121	,122	1	,727	-,279	,194
	Dummy social security no change	,135	,168	,647	1	,421	-,194	,464
	Dummy social security missing values	-,207	,190	1,191	1	,275	-,580	,165
	Happiness	-,102	,114	,793	1	,373	-,325	,122
	Economic situation household	-,188	,110	2,911	1	,088	-,404	,028
	Dummy employer offering pension	,028	,268	,011	1	,917	-,497	,553
	Dummy employer offering pension missing values	,258	,327	,622	1	,430	-,382	,898
	Future time perspective	,008	,070	,012	1	,911	-,129	,144
	[Main occupation = 2]	,484	,979	,245	1	,621	-,1,434	2,402
	[Main occupation = 3]	,100	,389	,066	1	,798	-,663	,862
	[Main occupation = 4]	-,658	,564	1,361	1	,243	-,1,765	,448
	[Main occupation = 5]	0 <sup>a</sup>		0				
	[Main occupation = 7]	,426	,288	2,196	1	,138	-,138	,990
	[Main occupation = 9]	-,233	,328	,505	1	,477	-,875	,409
	[Main occupation = 10]	-,308	1,072	,082	1	,774	-,2,408	1,793
	[Main occupation = 11]	-,184	,605	,093	1	,761	-,1,369	1,001
	[Main occupation = 12]	-,123	,771	,026	1	,873	-,1,634	1,387
	[Financial resources = 1]	-,412	,425	,942	1	,332	-,1,245	,421
	[Financial resources = 2]	-2,213	,331	44,680	1	,000	-,2,862	-,1,564
	[Financial resources = 3]	-2,127	,292	53,111	1	,000	-,2,699	-,1,555
	[Financial resources = 4]	-1,192	,293	16,562	1	,000	-,1,766	-,618
	[Financial resources = 5]	0 <sup>a</sup>		0				

Link function: Logit.

a. This parameter is set to zero because it is redundant.

## General model + interaction H1a x H4

Pseudo R-Square

Cox and Snell	,274
Nagelkerke	,283
McFadden	,093

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Level of certainty = 1]	-2,375	1,395	2,896	1	,089	-5,110	,360
	[Level of certainty = 2]	-1,008	1,385	,529	1	,467	-3,722	1,707
	[Level of certainty = 3]	,325	1,386	,055	1	,815	-2,393	3,042
	[Level of certainty = 4]	1,705	1,391	1,502	1	,220	-1,021	4,431
	[Level of certainty = 5]	3,168	1,393	5,174	1	,023	,438	5,897
	[Level of certainty = 6]	5,484	1,397	15,403	1	,000	2,746	8,223
Location	Age	-,045	,025	3,326	1	,068	-,094	,003
	Gender	,020	,144	,020	1	,888	-,262	,302
	Education	-,085	,051	2,765	1	,096	-,185	,015
	Income	,107	,064	2,781	1	,095	-,019	,233
	Family composition	-,017	,153	,013	1	,911	-,317	,283
	House ownership	,105	,169	,391	1	,532	-,225	,436
	Financial knowledge and skills	,766	,098	61,329	1	,000	,575	,958
	Financial risk tolerance	-,148	,062	5,697	1	,017	-,270	-,027
	Goal clarity	-,546	,420	1,690	1	,194	-1,369	,277
	Savings behaviour	,032	,060	,280	1	,597	-,087	,151
	Expenditure control	,001	,063	,000	1	,988	-,123	,125
	Health perception	-,229	,104	4,879	1	,027	-,432	-,026
	Dummy social security no change	,223	,160	1,962	1	,161	-,089	,536
	Dummy social security missing values	-,081	,178	,210	1	,647	-,430	,267
	Age * Goal clarity	,025	,009	8,527	1	,003	,008	,042

Link function: Logit.

## Interactions

Interactions ( $\beta/p$ )	Financial knowledge and skills	Financial risk tolerance	Goal clarity	Savings behaviour	Expenditure control	Health perception
Age	0.003 / 0.696	-0.001 / 0.914	<b>0.025 / 0.003</b>	-0.008 / 0.168	<b>0.010 / 0.089</b>	-0.004 / 0.654
Gender	0.004 / 0.979	0.042 / 0.731	0.141 / 0.389	-0.145 / 0.224	-0.088 / 0.461	-0.107 / 0.595
Education	0.071 / 0.205	0.054 / 0.163	-0.055 / 0.310	<b>0.066 / 0.092</b>	-0.002 / 0.957	<b>-0.158 / 0.019</b>
Income	0.033 / 0.638	-0.018 / 0.691	0.052 / 0.452	0.011 / 0.812	-0.032 / 0.523	-0.073 / 0.339
Family composition	-0.257 / 0.123	-0.112 / 0.331	0.094 / 0.573	0.046 / 0.701	0.050 / 0.686	0.038 / 0.853
House ownership	-0.015 / 0.939	<b>0.253 / 0.064</b>	0.022 / 0.903	0.127 / 0.285	-0.148 / 0.238	<b>0.387 / 0.027</b>
Expectations social security	<b>-0.313 / 0.071</b>	-0.003 / 0.979	-0.217 / 0.217	0.036 / 0.775	<b>0.225 / 0.066</b>	-0.166 / 0.416