Discretionary retirement investment decisions:

modeling individuals' retirement budget allocations and the impact of promotion versus prevention orientation

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Abstract

Retirement investments constitute a large part of many individuals' financial capital. The increasing pressures on state pensions and employer-based pension funds require more and more individuals to make additional retirement investments themselves. A key decision that they then face is how to allocate these discretionary investments across more versus less risky investment products. This paper investigates this investment allocation decision and how it is affected by individuals' promotion versus prevention orientation. We propose a Multiple Discrete-Continuous Extreme Value (MDCEV) model to capture the mutual dependence between individuals' choice of investment products and how much to invest in each product. We also capture in the model the impact of individuals' promotion versus prevention orientation by incorporating their general regulatory focus as well as their retirement investment-specific promotion versus prevention goals. Results from two studies involving representative samples of Dutch workers support the proposed model, with mutual dependence between investment product choice and investment amount allocation. The results also demonstrate support for the proposed theorizing for individuals' retirement investment-specific promotion versus prevention goals. However, they show no impact of a general promotion versus prevention orientation (regulatory focus).

Keywords retirement decision-making, discretionary retirement investments, investment risk, regulatory focus, retirement investment goals, investor heterogeneity, MDCEV model.

Samenvatting

Pensioenbeleggingen vormen een groot deel van het financiële kapitaal van veel individuen. Door de toenemende druk op overheidspensioenen en pensioenfondsen van werkgevers moeten steeds meer mensen zelf aanvullende pensioenbeleggingen doen. Een belangrijke beslissing waarmee ze dan worden geconfronteerd, is hoe ze deze discretionaire beleggingen verdelen over meer versus minder risicovolle beleggingsproducten. Dit artikel onderzoekt deze beslissing over beleggingstoewijzing en hoe deze wordt beïnvloed door de oriëntatie van individuen op promotie versus preventie. We stellen een MDCEV-model (Multiple Discrete-Continuous Extreme Value) voor om de wederzijdse afhankelijkheid vast te leggen tussen de keuze van beleggingsproducten door individuen en hoeveel ze in elk product investeren. We leggen in het model ook de invloed vast van de oriëntatie van individuen op promotie versus preventie door hun algemene focus op regelgeving op te nemen, evenals hun pensioenspecifieke doelstellingen voor promotie versus preventie. Resultaten van twee onderzoeken met representatieve steekproeven van Nederlandse werknemers ondersteunen het voorgestelde model, met wederzijdse afhankelijkheid tussen de keuze van beleggingsproducten en de toewijzing van beleggingsbedragen. De resultaten laten ook zien dat de voorgestelde theorie over de pensioendoelstellingen van individuen voor specifieke beleggingsstimulering versus -preventie wordt ondersteund. Ze laten echter geen invloed zien van een algemene oriëntatie op bevordering versus preventie (focus op regelgeving).

Trefwoorden: pensioenbesluitvorming, discretionaire pensioenbeleggingen, beleggingsrisico, focus op regelgeving, pensioenbeleggingsdoelen, heterogeniteit van beleggers, MDCEV-model.

1. Introduction

Over the past two decades, aging populations and lower interest rates have created financial pressures on pension capital worldwide (OECD 2021). It has become more challenging for occupational pension funds to provide pension plan participants with an adequate income after retirement (Hassel, Naczyk, and Wiß 2019). Pension systems in several countries have also shifted from Defined-Benefit (DB) occupational pension plans, with a guaranteed monthly retirement payment, to Defined-Contribution (DC) pension plans, where the investment risk is shifted to individuals (Hinrichs 2021). As a consequence, there is a greater burden on individuals to save more for their retirement, on top of their state pension and occupational pension fund savings (Garcia 2006; Orenstein 2011). Thus, many individuals need to increase their personal retirement savings from their own discretionary budget. A key decision that they face when doing so is how to allocate these investments across more versus less risky investment alternatives (Carlsson Hauff 2014). With pension reforms providing more personal autonomy in recent years, this decision can sometimes be made within an individuals' existing pension plan. More commonly, individuals can compare different retirement investment alternatives through a broker or directly in other retirement funds (Clare 2006; Langford, Faff, and Marisetty 2006).

To be able to support individuals in their decision-making and to target retirement investment alternatives more effectively towards them, it is important for pension fund managers, marketers, and policymakers to understand how individuals make these discretionary retirement investment decisions. In this paper, we develop a simultaneous model to help understand individual's choices of investment products and how much to invest in each product. These two decisions are likely to be interrelated, thus, understanding their relationship is important, for example to provide personal recommendations and guidance to individuals who need to make discretionary retirement investments. Research shows that, depending on their socio-demographic characteristics, some individuals may choose to invest their entire budget in a high-risk investment fund, while others may choose to spread their budget across high-, medium-, and low-risk investments, or to even allocate their entire budget to the lowest risk alternative (Agnew, Balduzzi, and Sundén 2003; Fagereng, Gottlieb, and Guiso 2017).

In relation thereto, it is also worthwhile to understand if there are common psychological factors that drive these allocation decisions. To this end, we propose that individuals' retirement investment decisions are likely to be impacted by their regulatory focus (Higgins 1998, Shah, Higgins, and Friedman 1998). Regulatory focus theory highlights individuals' general prevention versus promotion orientations as a motivational driver of their behavior (Crowe and Higgins 1997; Higgins 1998; Liberman et al. 1999). If individuals are promotion-focused they aspire mainly to work toward gains, whereas if they are prevention-focused they will be mainly concerned with preventing losses (Bullard and Manchanda 2017; Higgins et al. 2001; Idson, Liberman, and Higgins 2000). This framework has been applied widely to understand decision-making, goal pursuit, and behavior in various contexts, providing insights into how individuals approach challenges and opportunities based on their predominant regulatory focus orientation. In this paper, we propose that individuals' regulatory orientation is likely to also impact their preference to allocate money towards more versus less risky discretionary retirement investment products. In addition to (chronic) general promotion versus prevention orientation, individuals have also been shown to have domain-specific promotion and prevention goals (Zhou and Pham 2004). Therefore, we also analyze the impact of their retirement investment-specific promotion versus prevention goals, i.e. whether they focus more on preventing potential losses or on maximizing potential gains when they think about their retirement investments.

2. Individuals' decisions on how to allocate discretionary retirement investments

2.1 Modeling retirement investment allocations

When deciding to allocate specific amounts of money to one or more investment products that involve different levels of risk, the decision-making by individuals involves multiple discreteness. Such discreteness stems from the fact that there are numerous discrete products that individuals can choose to each select or not. At the same time, there is a continuous dimension in this decision process, it is necessary to decide on the amount of money that one wishes to allocate to each selected investment product.

Research to date has typically modeled the decision of how much to invest and in which investment product in two separate steps. The first step would involve the use of traditional discrete choice models. In the second step, the continuous choice of how much to invest would be modeled by an ordinary linear regression model. For example, Ochmann (2014) applied a two-stage budgeting model on German survey data to model household decision-making for the discrete and the continuous asset choices. The discrete choice (whether to buy an asset) and the continuous choice (how much of this asset to buy, conditional on buying it) were estimated in an MNL model and a system of Seemingly Unrelated Regressions by Feasible Generalized Least Squares (FGLS), respectively, to account for cross-equation correlations. Similarly, Metzger (2017) applied a two-part model to estimate individuals' discrete decisions of whether to save or not and their continuous decision of how much to save. The first part was captured with a logit model, and the second part with a tobit model. He concludes that the decision whether or not to save and how much to save are independent of each other, but that the two-part model yields more detailed and differentiated insights into the saving decision process and the determinants of the saving rate, when compared with the standard tobit model. Vivel-Búa et al. (2019) used a probit and tobit model to study the discrete decision of whether to contribute to a pension plan and the continuous decision of how much to contribute to retirement in total. Their results reveal that the drivers of the decisions to participate in a pension plan and of how much to allocate to this plan are very similar.

Contrary to this previous research, we propose a simultaneous model to study how individuals make joint discrete and continuous decisions for retirement investments. In particular, we propose the Multiple Discrete Continuous Extreme Value (MDCEV) model as a parsimonious and analytically tractable model to achieve this objective (Bhat 2005, 2008). The MDCEV model is rooted in principles of consumer economics but, to this date, it has mainly been applied in transportation (e.g., which transportation modes to use and how long to travel with each) (Bhat 2002; Calastri et al. 2017; Yonezawa and Richards 2017). In many cases, these discrete and continuous decisions are highly interrelated in the sense that the optimal discrete choice depends partly on the outcome of the continuous choice, and vice versa. For example, consumers who seek product variety are more likely to equally distribute their budget over multiple products, while consumers who strongly prefer a particular brand are more likely to spend their entire budget on a single product.

We propose that similar interrelationships are also likely to occur in the decision of asset allocation among different investment products for retirement. For their discretionary retirement investments, individuals can spend their budget on one or more investment products, and their preference for specific investment products affects both their choice of investment products and how much they invest in each product (e.g., a choice of how much to allocate to stocks or bonds, or both). In section 3, we formally develop such a MDCEV model for retirement investment allocation decisions, to jointly accommodate the choice of alternatives and the amount allocated to these alternatives (Bhat 2005, 2008; Yonezawa and Richards 2017).

2.2 The impact of promotion versus prevention orientation

Regulatory focus theory speaks to how different individuals pursue their goals (Higgins 1998; Shah et al. 1998). A key aspect of this theory is that individuals can differ in that they can have a promotion or a prevention orientation when pursuing their goals. Individuals who are promotion-focused aspire to work toward gains (rather than to guard against losses), while those who are prevention-focused are concerned mainly about preventing losses (rather than working toward gains) (Bullard and Manchanda 2017; Higgins et al. 2001; Idson et al. 2000; Kurman and Hui 2011). To date only limited studies have been conducted on how regulatory focus may impact financial retirement decisions, and these studies mainly look at how much individuals are willing to save (Cho, Loibl, and Geistfeld 2014). In this paper, we extend this research by focusing on the impact of individuals' promotion versus prevention orientation on the retirement investment allocation decisions.

When a product alternative aligns well with an individual's regulatory orientation, this is referred to as regulatory fit, and a greater fit is likely to promote the individual's selection and valuation of an alternative (Avnet and Higgins 2006; Higgins 2000, 2005). As to retirement investment products, we anticipate that promotion-oriented individuals are more likely to have a greater regulatory fit with high-risk high-return investment products (e.g., equities) due to their focus on achieving financial gains (placing less emphasis on downside risks), while prevention-oriented individual are more likely to have a greater regulatory fit with low-risk low-return investment products (e.g., savings) to avoid financial losses (placing less emphasis on potential upside returns). Therefore, we predict, first, that promotion-oriented individuals are more likely to choose high-risk high-expected-return investment alternatives compared to prevention-oriented individuals, who are relatively more likely to choose low-risk low-expected-return alternatives. Second, we predict that the more promotion- or prevention-oriented consumers are, the more likely they are to allocate their entire investment in a single investment product (i.e., to the highest-risk highest-expected-return products versus the lowest-risk lowest-expected-return products respectively). We anticipate that individuals with a less pronounced regulatory orientation are more likely to balance their investment across different types of products.

While investors have a chronic self-regulatory orientation, they also tend to have more detailed category- or context-specific prevention and promotion goals. Their prevention versus promotion goals may differ by financial product category (Zhou and Pham 2004), and they may tend to focus more on minimizing losses than maximizing gains in long-term investments (Byrne 2007). Specific goals are also likely to differ between individuals, and these different specific goals affect their decision-making (Dellaert et al. 2018; Marley and Swait 2017). Therefore, we also investigate how retirement-investment-specific promotion and prevention goals differ among individuals and how this difference impacts their retirement investment allocation decisions. Since these goals are more directly connected to the decision of interest, we anticipate that individuals' specific goals will be more predictive of behavior than individuals' general promotion and prevention orientations (Weber, Blais, and Betz 2002). Consistent with our predictions for the impact of the general regulatory orientation, we predict that individuals with a retirement-investment-specific promotion goal are more likely to select high-risk high-expected-return investment products than those with a prevention goal. Besides, greater goal strength for either one of these two is likely to lead individuals to invest their entire budget in the investment product with the greatest regulatory fit.

3. A formal model of individuals' discretionary retirement investment allocations

We now develop a formal model of individuals' discretionary retirement investment allocation decisions. The model estimates parameters that describe how individuals combine discrete choices of investment alternatives and continuous budget allocations towards their chosen alternatives. These parameters provide insights into the relative importance of different factors that impact these decisions including their regulatory orientation, their retirement-investment-specific promotion versus prevention goal, and their socio-demographic characteristics.

3.1 Utility specification

The foundation of the MDCEV model is a utility function that characterizes the utility of an asset allocation to different retirement investment alternatives *k* (1 to *K*) available to the individual (individual subscripts are omitted for clarity in our notation). Individuals are assumed to maximize this utility when making their allocation decisions. The resulting decision problem is then specified as follows (Bhat 2008):

$$Max_{x_k}\, U(x_1, \dots, x_K) = \sum_{k=1}^{K} \frac{\gamma_k}{\alpha} \psi_k \left[\left(\frac{x_k}{\gamma_k} + 1 \right)^{\alpha} - 1 \right]$$
$$s.t. \sum_{k=1}^{K} x_k = B,\ x_k \geq 0\ \ \forall (k = 1, \dots, K) \tag{1}$$

where x_k is the amount allocated to investment product *k*, and *B* is the total budget available to the individual. The parameters ψ_k in equation 1 represent the marginal utility of allocating budget to investment product x_k at the point of zero investment (i.e., its baseline marginal utility). A higher value of ψ_k implies that an individual can increase his or her overall utility by investing more in investment product *k* compared to the other products available. The γ_k parameters in the equation allow for corner solutions that reflect the discrete nature of the choice (i.e., zero consumption levels for some investment products). They also reflect satiation that may occur when spending more and more of one's budget on a given alternative. A higher value of γ_k indicates a lower satiation effect and, hence, a higher total investment in alternative x_k. The parameter α is also related to satiation. To ensure identification of all model parameters, we select the $\alpha - \gamma$ profile, where α is assumed equal for all products (Pinjari and Bhat 2010).

3.2 Model estimation

When estimating the MDCEV model, the parameters in the utility function are specified as follows. First, the baseline marginal utility ψ_k is specified as:

$$\begin{gathered}\psi_k = \psi(z, \varepsilon_k) = \exp(\delta_k + \beta_k z + \varepsilon_k) \\ = \exp(\delta_k + \beta_{reg.k} \cdot RegulatoryOrientation + \beta_{goal.k} \cdot PromotionGoal\ + \\ +\beta_{soc1.k} \cdot SocioChar1 + \cdots + \beta_{socS.k} \cdot SocioCharS +\ \varepsilon_k)\end{gathered} \tag{2}$$

where, δ_k is the constant for the baseline marginal utility parameter of investment product *k*, z is a vector of the variables that capture the impact of an individual's chronic regulatory orientation, i.e. the promotion versus prevention goal, as well as his or her socio-economic characteristics (1 to S), and β_k is a vector of estimated parameters that capture the impact of z on the marginal utility of investment *k*. Finally, ε_k is the random error component in the model, which allows for unexplained variance between alternatives and individuals, and which is assumed to be independently and identically distributed following a Gumbel distribution.

Next, the satiation parameters γ_k are specified as follows:

$$\begin{gathered}\gamma_k = \theta_k + \lambda_k z \\ = \theta_k + \lambda_{reg.k} \cdot RegulatoryOrientation + \lambda_{goal.k} \cdot PromotionGoal \\ +\lambda_{soc1.k} \cdot SocioChar1 + \cdots + \lambda_{socS.k} \cdot SocioCharS\end{gathered} \tag{3}$$

where θ_k are the constants for the satiation for investment product *k*, while λ_k are the estimated parameters that capture the satiation impact of *z*. A positive value of λ_k implies that the corresponding z variable is associated with a higher value of γ_k, which implies lower satiation and therefore higher willingness of the individual to invest their money in the k^{th} financial product, ceteris paribus.

The model is estimated using maximum likelihood, which requires the likelihood of the data, given the model and specific values of the model parameters. The likelihood that an individual chooses a specific investment allocation $x_1^*, x_2^*, \ldots, x_M^*$, 0, ..., 0, where the individual invests in M investment products, chosen from all available investment products *K*, is given by:

$$L(x_1^*, x_2^*, x_3^*, \ldots, x_M^*, 0,0, \ldots ,0) = \frac{1}{\sigma^{M-1}} \left[\prod_{m=1}^{M} f_m\right] \left[\sum_{m=1}^{M} \frac{1}{f_m}\right] \left[\frac{\prod_{m=1}^{M} e^{\frac{V_m}{\sigma}}}{\left(\sum_{k=1}^{K} e^{\frac{V_k}{\sigma}}\right)^M}\right] (M-1)! \tag{4}$$

where the first product is the baseline, σ is an estimated scale parameter, $f_m = \frac{1}{x_m^* + \gamma_m}$, and V_k summarizes the attractiveness of investing in product *k*:

$$V_k = \beta_k z_k + (\alpha - 1)\ln\left(\frac{x_k^*}{\gamma_k} + 1\right), \forall k \tag{5}$$

To ensure identification similar to other types of choice models, the coefficients for one of the alternatives are set to zero. Applying this to the first investment product we have $\beta_1 = 0$. More details about the estimation of the MDCEV model can be found in Lloyd-Smith (2020). For our empirical analyses in Study 1 and Study 2, we used the open source package Apollo to estimate this model (Hess and Palma 2019)[1].

1. Hess, S. & Palma, D. (2019), Apollo version 0.3.0, user manual, www.ApolloChoiceModelling.com

4. Brief overview of studies

We conducted two empirical studies to test the proposed model and theorizing. (Data and analyses for all studies will be made available at https://osf.io/yu5h4/). Study 1 analyzed decisions from a representative sample of Dutch workers to test the proposed model and theorizing. In this study, individuals made retirement investment product allocation decisions from a hypothetical discretionary budget (N=857). The results show that their choices of investment products and how much to invest in each product are indeed mutually dependent, as anticipated. They furthermore show that, although these decisions are not explained by individuals' general regulatory focus, they are significantly impacted by their retirement investment-specific promotion versus prevention goal. As predicted, having a promotion (vs. prevention) goal significantly increases their investments in more (vs. less) risky investment alternatives.

Study 2 next analyzed individuals' self-reported discretionary savings and investment intentions for a broader set of investment purposes (including retirement), again in a representative sample of Dutch workers (N=828). The results of this study replicate the findings from Study 1 in a broader, more realistic setting. They also show that individuals who are planning to put money aside specifically for retirement are more likely to have a promotion goal and to invest in more risky investment products than those with other savings or investment objectives.

5. Study 1 – Discretionary retirement investment allocations in a controlled hypothetical scenario

5.1 Method, Measures, and Sample

Method. Participants in Study 1 were presented with a controlled hypothetical scenario and asked to imagine that they had recently received an inheritance of 50,000 euros and, based on financial advice, were considering to invest or save part or all of this amount for their retirement (see Appendix A for details). Participants indicated how much of this amount they would want to put aside for retirement and then chose how they would allocate this amount between three retirement investment products: stocks, bonds, or savings. Their budget allocation over the three retirement investment alternatives was modeled with the proposed MDCEV model.

Measures and other explanatory variables. After this allocation decision, their general prevention versus promotion orientation was measured using the 11 items from the Regulatory Focus Survey on a 5-point Likert scale (Higgins et al. 2001 - See Appendix B for the detailed questions and the scoring key). The retirement-investment-specific prevention versus promotion goal of participants was measured by asking them to indicate the degree to which they had a prevention versus promotion goal in mind when making their discretionary retirement investment decisions. The goal endpoints on this scale were "avoid losing money" (prevention goal) and "gain more money" (promotion goal), respectively (Zhou and Pham, 2004). Participants used a slider to indicate to what extent each of the two goals was the most important in their decision, see Appendix C for more details. Several socio-demographic variables were also included as predictor variables in the model. For example, women have been found to more inclined to invest in low-risk pension assets than men, allocating a smaller percentage to stocks than bonds (Bajtelsmit 1999; Bernasek and Shwiff 2001; Hinz, McCarthy, and Turner 1997). Younger, low income, and more practically educated individuals also tend to be more risk averse with respect to pensions compared to older, high income, and academically educated individuals (Bateman et al., 2010).

Sample. Data for Study 1 were collected in the Dutch Longitudinal Internet studies for the Social Sciences (LISS) panel administered by CentERdata. The questionnaire was presented to 1,397 panel members employed or actively looking for work and aged between 30~65 years, Of these, 1,067 participants responded, meaning a response rate of 76.4%. Among those who responded, 1,003 participants completed the survey. Participants were given a small monetary reward for completing the survey. Participants' ages ranged from 30 to 61 years (M = 47.28, SD = 9.14). The sample was largely balanced in terms of gender, with 52.5% being female. Almost half of the sample involved highly educated people, with 49.9% having a bachelor or higher degree. The majority (98.5 %) were employed.

5.2 Results

Descriptive results. 857 out of the 1003 participants who completed the survey chose to put part or all of their inheritance budget from the hypothetical scenario aside for retirement. The remaining 146 participants, i.e. those who did not allocate any budget for retirement, were excluded from the analyses. On average, participants allocated 29,267 euros (58.5%) from the budget to their retirement investments, of which 7,786 euros to stocks, 8,439 euros to bonds, and 13,041 euros to savings (see Table 1).

Table 1. Summary Statistics of Retirement Investment Allocations (N=857)

Option	N	% of the sample	Amount in euros*
Stocks	541	63.1	7,786 (10,230)
Bonds	573	66.9	8,439 (9,498)
Savings	645	75.3	13,041 (13,796)
Total	857	100	29,267 (12,806)

* *Standard deviation in parentheses.*

Figure 1. Study 1: Participants Selecting Savings Only, Mixed, and Stocks and Bonds Only Investment Product Allocations

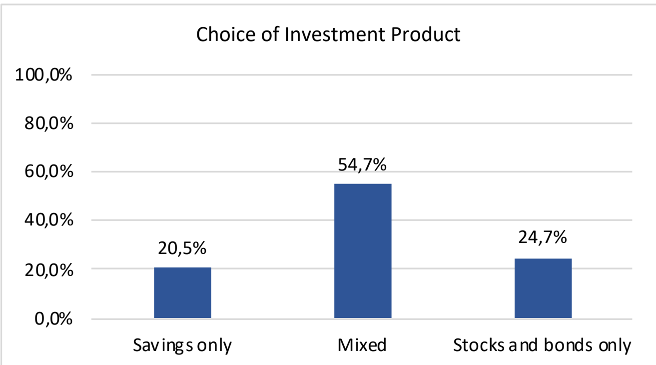

Fig. 1a – Choice of Investment Product

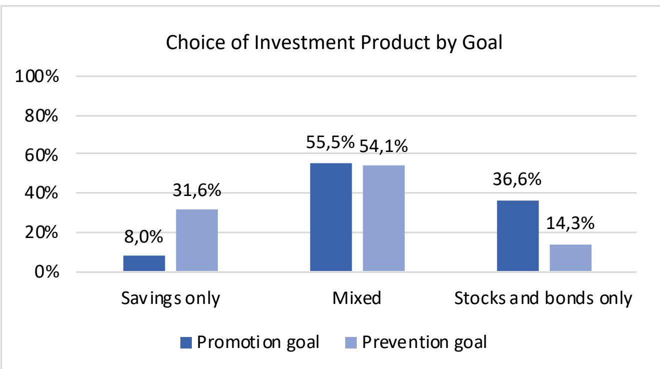

Fig. 1b – Choice of Investment Product by Promotion vs. Prevention Goal

When we take an initial look at only the discrete choices of participants' retirement investments (see Figure 1a), we see that 20.5% of the participants invested only in savings, 24.7% invested only in stocks and/or bonds, and 54.7% in a mix of savings and stocks and/or bonds.

Of all participants, 26.7% had a general promotion orientation, but only 23.6% had a retirement-investment-specific promotion goal.[2] Foreshadowing the estimation findings reported in the next section, Figure 1b illustrates the differences in investment product selections by individuals who have a retirement investment-specific promotion versus prevention goal. One remarkable difference is the much smaller percentage of participants with a promotion goal who selected savings only (8.0%), compared to those with a prevention goal (31.6%).

Table 2. MDCEV model results: Discrete choice parameter ψ

Variable name	Stocks		Bonds	
	Coeff.	t-ratio	Coeff.	t-ratio
δ	**-.95****	-3.31	**-.71****	-2.68
General promotion focus	.01	.05	.09	.46
Domain-specific promotion goal	**1.26****	6.49	**.66****	3.67
Male	**.40***	2.17	-.13	-.73
High education level	**.41***	2.17	**.55****	3.05
40<=Age<50	.09	.36	.36	1.53
50<=Age<60	.14	.59	.36	1.58
60<=Age<70	.04	.11	.52	1.60
Married	-.24	-1.26	-.03	-.15

** p<0.01, * p<0.05.
Savings is taken as the baseline and thus has all parameters fixed at 0.

Model results. The model estimation results are presented in Tables 2 and 3. Table 2 shows the utility parameters in the MDCEV model (eq.2), which primarily explain the discrete choice of investment products. Savings have been set as the baseline in the model estimation (with all savings parameters fixed to 0) and are therefore not included in the table. The negative baseline utility constants for stocks (δ_{stock} = -.95, p < .000) and bonds (δ_{bond} = -.71, p = .008) show that participants are most likely to allocate money to savings, followed by bonds and then stocks. The results also show that there is no significant effect of individuals' general regulatory orientation. However, the effect of their retirement-investment-specific promotion goal is significant. As expected, individuals with a promotion goal are more likely to invest in stocks ($\beta_{goal.stock}$ = 1.26, p < .000) or bonds

2 See Appendices B and C for the detailed questions for measuring general and retirement-specific goals.

($\beta_{goal.bond}$ = .66, p < .000) than those with a prevention goal. As to the impact of socio-demographic characteristics, the results show, in line with earlier research, that men are more likely to invest in stocks than women ($\beta_{male.stock}$ = .40, p = .030) (Mandal and Brady 2020). Participants with a higher education are also more likely to invest in stocks ($\beta_{highedu.stock}$ = .41, p = .030) as well as in bonds ($\beta_{highedu.bond}$ = .55, p = .002).

Table 3. MDCEV model results: Continuous choice parameter γ

Variable name	Stocks		Bonds		Savings	
α_base			-27.78 (-.45)			
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
θ	**-1.41****	-6.29	**-.86****	-3.60	-.03	-.09
General promotion focus	-.11	-.57	.02	-.13	-.10	-.44
Domain-specific promotion goal	.19	1.12	-.01	-.09	**-.49***	-1.96
Male	.06	.37	.19	1.25	-.06	.27
High education level	. 21	1.30	-.13	-.79	.47	-1.81
40<=Age<50	.16	.69	.12	.56	**.67***	2.35
50<=Age<60	.20	.95	.29	1.39	**.57***	2.12
60<=Age<70	.48	1.48	.21	.71	.73	1.30
Married	**.33***	2.11	-.01	.05	.26	1.14

** p<0.01, * p<0.05;
Note that for the estimation, the amounts have been scaled down by 10,000.

Table 3 reports the parameter estimates for the satiation parameter γ, which drives the continuous amount that is allocated (eq.3). The satiation parameters of stocks, bonds, and savings show that investing in stocks results in the highest satiation (θ_{stock} = -1.41, p = .001) (note that a lower value for γ implies greater satiation), followed by investing in bonds (θ_{bond} = -.86, p < .000). In other words, ceteris paribus, participants allocate less of their budget in stocks, even when they decide to invest in stocks. The same applies to bonds, although the effect is not as strong. We find no effect of general regulatory orientation on the amount that is allocated per investment product. However, there is a negative effect of a retirement- investment-specific promotion goal on the savings amount, which confirms the idea that people with a promotion goal focus more on the upside potential of investments ($\lambda_{goal.saving}$ = -.49, p = .049). In terms of socio-demographic characteristics, there are some effects, but not many. Middle-aged persons tend to invest more in savings ($\lambda_{age40-50.saving}$ = .67, p = .019; $\lambda_{age50-60.saving}$ = .57, p = .034), and married persons allocate more to stocks ($\lambda_{married.stock}$ = .33, p = .035).

The model results in Tables 2 and 3 provide the directions and statistical significance of the effects we study. Unfortunately, there is no closed form solution for the probability of investing in each product or for the amount invested in each product. This makes it difficult to come up with a direct interpretation of the economic impact of the phenomena we study. For example, we cannot determine the percentage of variance explained in the investments. However, both the demographic variables and the participants' goals contribute statistically significantly ($p < .001$) to the model fit. Given the moderate sample size, this suggests that the impact is also economically meaningful.

5.3 Conclusion

Summarizing, the results of Study 1 provide clear support for the anticipated interrelationship between individuals' choices of retirement investment products and the amount they allocate to these products. Taking into account the many mixed strategies that individuals follow, the results show that individuals are not only less likely to choose stocks and bonds to invest in for retirement than savings; they also tend to invest lower amounts in these products when they are chosen.

The results do not provide support for an effect of individuals' general regulatory focus on these decisions. However, a retirement-investment-specific promotion goal has strong effect on their choice of investment product in the expected direction. We find that individuals who have a promotion goal are more likely to choose stocks and/or bonds. There is also an expected effect on their product-specific budget allocation, as we find that individuals with a promotion goal allocate lower amounts to savings.

6. Study 2 – Individuals' real-world investment intentions across risky and non-risky funds

The aim of Study 2 was twofold. First, it was meant to analyze individuals' self-reported discretionary savings and investment intentions for a broader set of purposes, including retirement, and, second, to elicit their responses for a more realistic setting. The use of a broader set of investment purposes also allowed us to explore whether the impact of having a promotion versus prevention goal differs for individuals who are planning to put money aside specifically for retirement or for other purposes.

6.1 Method, Measures, and Sample

Method and Measures. Participants in Study 2 were first asked how much money they were planning to put aside for savings and investments in the coming year. Then, specifically for our research objectives, they were asked to allocate this amount among three investment alternatives: stocks, bonds, and savings. They were also asked to answer questions on the purposes that they wanted to use their savings and investments for (including retirement). Finally, the participants' general regulatory orientation, retirement-investment-specific promotion versus prevention goal, and socio-demographic variables were measured in the same way as in Study 1. Their allocation over the three investment alternatives was modeled using the proposed MDCEV model.

Sample. Data were again collected in the Dutch Longitudinal Internet studies for the Social Sciences (LISS) panel administered by CentERdata. The questionnaire was presented to 1,239 panel members employed or actively looking for work and aged between 30~65 years old. Of these, 945 participants responded, leading to a response rate of 76.3%. 939 of the 945 participants completed the survey. Participants again were given a small monetary reward for completing the survey. The age of the participants ranged from 31 to 62 years (*M* = 47.45, SD = 9.25). The sample was largely balanced in terms of gender, with 54.1% being female. A little over half of the sample population consisted of highly educated people, with 51.1% having a bachelor or higher degree. The majority (97.8%) were employed, while the remaining participants were either self-employed or actively searching for a job. A detailed overview of the questionnaire is provided in Appendix C.

6.2 Results

The results show that 828 of the 939 participants planned to save or invest in the coming year. Participants who did not plan to save or invest were excluded from further analysis. On average, participants planned to save or invest a total of 8,770 euros, allocating 2,177 euros to stocks, 464 to bonds, and 6,129 to savings. Of those who planned to save or invest, 38.6% indicated retirement as at least one of their purposes for doing so. Finally, 26.2% of the participants had a general regulatory orientation that was promotion-focused, and 26.8% had a promotion goal for their investments. When we compare the promotion versus prevention goals for those with and without a retirement investment purpose, we see that 38.8% with a retirement purpose had a promotion goal, while 19.3% without a retirement purpose had a promotion goal.

Figure 2a presents an initial look at the participants' intentions for investment product selections for the coming year. 68.2 % of the participants intended to invest only in savings, 3.6% only in stocks and/or bonds, and 28.1% in a mix of savings and stocks and/or bonds. Figure 2b illustrates the differences in investment product selections by individuals with a promotion versus prevention goal. There are some clear differences. For example, a smaller percentage of participants who have a promotion goal selected savings only for their investments (33.3%) compared to those who have a prevention goal (81.0%).

Figure 2. Study 2: Participants Selecting Savings Only, Mixed, or Stocks and Bonds Only Investment Product Allocations

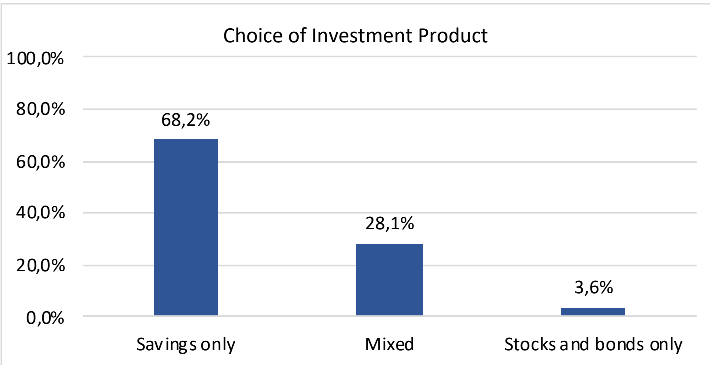

Fig. 2a – Choice of Investment Product

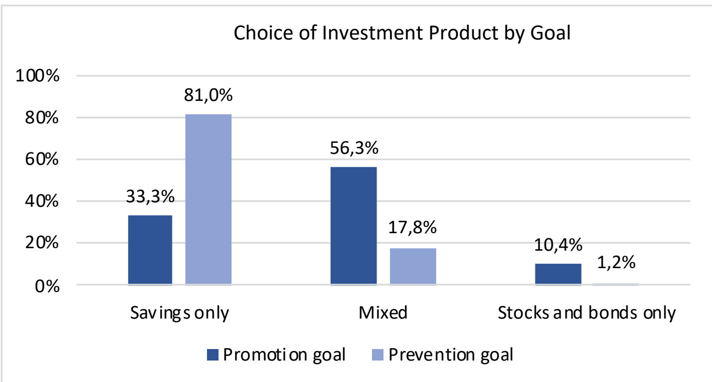

Fig. 2b – Choice of Investment Product by Promotion vs. Prevention Goal

Table 4 presents the estimates of the utility parameter ψ of the MDCEV model (eq. 2), which reflects the discrete choice part of the model. The negative baseline utility constants in the table show that participants are less likely to choose to invest in stocks (δ_{stock} = -3.62, *p* = .000) and bonds (δ_{bond} = -3.82, *p* = .000) than in savings. As in Study 1, there is no significant effect of general regulatory orientation. However, also as in Study 1, participants with a retirement-investment-specific promotion goal are more likely to invest in stocks ($\beta_{goal.stock}$ = 1.70, *p* = .000) or bonds ($\beta_{goal.bond}$ = .79, *p* = .026) than those with a prevention goal. Regarding the impact of socio-demographic characteristics, individuals aged 50 to 60 are more likely to invest in stocks ($\beta_{age50-60.stock}$ = 1.09, *p* = .013), and individuals aged 50 to 60 as well as those aged 40 to 50 in bonds ($\beta_{age50-60.bond}$ = 1.05, *p* = .028 and $\beta_{age40-50.bond}$ = 1.21, *p* = .013, respectively). Married persons are less likely to invest in stocks ($\beta_{married.stock}$ = -.84, *p* = .004).

Table 4. MDCEV model results: Discrete choice parameter ψ

Variable name	Stocks		Bonds	
	Coeff.	t-ratio	Coeff.	t-ratio
δ	**-3.62****	-3.89	**-3.82****	-3.56
General promotion focus	.26	.68	.05	.12
Domain-specific promotion goal	**1.70****	5.45	**.79***	2.23
Male	.30	.93	-.12	-.32
High education level	.43	1.43	.13	.40
40<=Age<50	.85	1.86	**1.21***	2.48
50<=Age<60	**1.09***	2.48	**1.05***	2.20
60<=Age<70	.62	.84	.83	1.05
Married	**-.84****	-2.85	-.50	-1.53

** p<0.01, * p<0.05

Savings is taken as the baseline and thus has all parameters fixed at 0.

The parameters in Table 5 explain the continuous choice (eq. 3). The satiation parameters of stocks, bonds, and savings show that, contrary to Study 1, investing in stocks results in the lowest satiation (θ_{stock} = 30.65, *p* = .000), followed by savings (θ_{saving} = 8.25, *p* = .000), and then bonds (θ_{bond} = 5.23, *p* = .000). In other words, ceteris paribus, participants would invest more in stocks, followed by savings and bonds. The results show no effect of general regulatory orientation on the amount that is allocated per investment product. However, there is a significant effect of a retirement-investment-specific promotion goal on the amount of savings in the expected negative direction ($\lambda_{goal.saving}$ = -1.36, *p* = .033). In terms of socio-demographic characteristics, there are again some limited effects. Males tend to invest more in bonds ($\lambda_{male.bond}$ = .94, *p* = .006), as do individuals with a higher education ($\lambda_{highedu.bond}$ = .96, *p* = .003). Married persons allocate more to stocks ($\lambda_{married.stock}$ = .53, *p* = .039).

Table 5. MDCEV model results: Continuous choice parameter γ

Variable name	Stocks		Bonds		Savings	
α_base			-3.79	(-.51)		
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
θ	**30.56****	164.80	**5.23****	10.18	**8.25****	6.06
General promotion focus	-.00	-.01	.10	.35	.20	.30
Domain-specific promotion goal	-.05	-.17	-.37	-1.01	**-1.36***	-2.14
Male	.19	.70	**.94****	2.76	-.90	-1.29
High education level	. 23	.88	**.96****	2.99	.42	.75
40<=Age<50	-.15	-.41	-.26	-.64	.79	1.19
50<=Age<60	-.37	-1.25	-.09	-.23	1.18	1.52
60<=Age<70	.60	.99	.32	.36	.44	.41
Married	**.53***	2.07	.13	.40	-.29	-.53

** p<0.01, * p<0.05

The Impact of Saving and Investing for Retirement

We now examine whether there are differences in individuals' investment allocations depending on whether they indicated retirement as one of the purposes of their savings and investments for the coming year (recall that 38.6% of the participants indicated retirement as one of their purposes, while the others did not). Figure 3a presents the mix of the participants' investments and savings product selection intentions by retirement purpose (yes, no). The results show that 49.4 % of the participants with a retirement purpose invested only in savings, versus 80.1% of those without a retirement purpose. Related thereto, 6.6% of the participants with a retirement purpose invested only in stocks and/or bonds versus 1.8% of those without a retirement purpose. Figure 3b illustrates the dual differences in investment product allocations by individuals with and without a retirement purpose and by promotion versus prevention goal. Here too, we observe some differences. For example, for persons with a retirement purpose, the percentage allocated to savings shifts from 19.4% with a promotion to goal to 68.4% with a prevention goal, while for those without a retirement purpose, the percentage shifts from 51.0% with a promotion goal to 87.1% with a prevention goal.

Figure 3. Study 2: Investments by Retirement Purpose - Participants Selecting Savings Only, Mixed, or Stocks and Bonds Only Investment Product Allocations

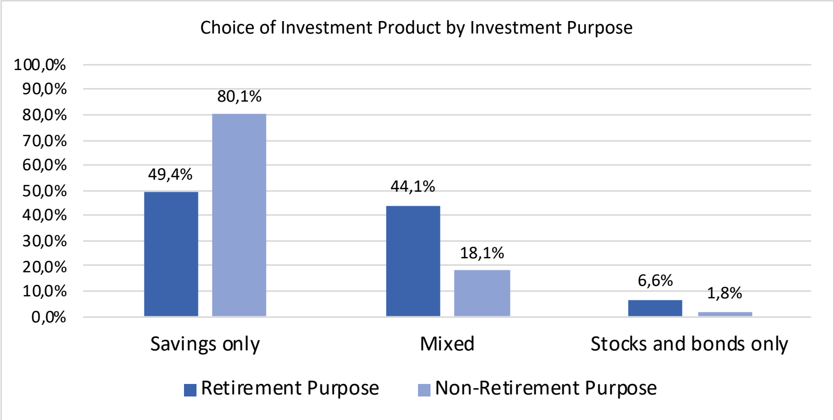

Fig. 3a – Choice of Investment Product by Purpose (retirement - yes, no)

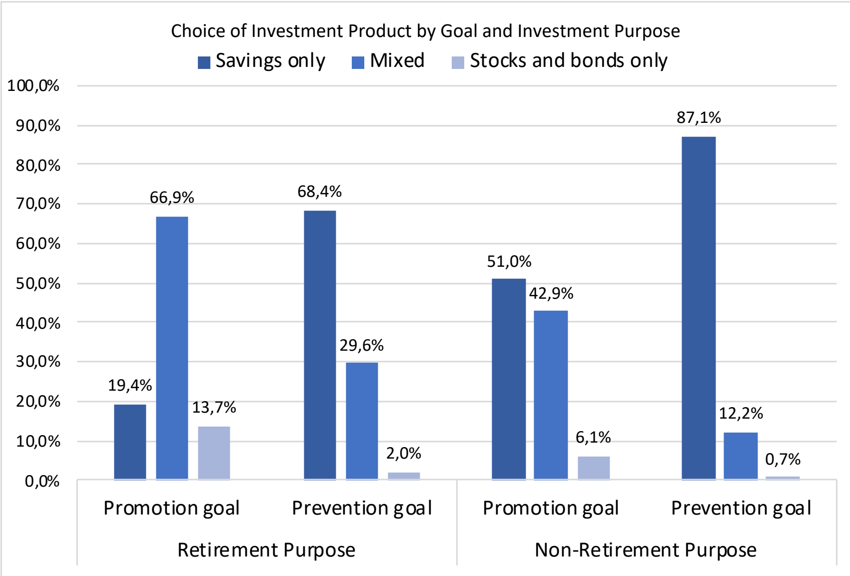

Fig. 3b – Choice of Investment Product by Purpose (retirement - yes, no) and Promotion vs. Prevention Goal

Finally, we analyzed the impact of the retirement investment purpose of participants on their decisions using the MDCEV model (see Appendix D for the full estimation results). To do so, a binary indicator variable was created to reflect whether a participant indicated having an investment purpose specifically for retirement or not. This indicator variable was then added to the model and introduced as a moderator with individuals' general regulatory orientation and their retirement-investment-specific promotion versus prevention goal. People with a retirement-specific promotion goal are more likely to invest in stocks if they intend to use the money they have put aside for retirement ($\beta_{\text{goal}\_retire\_purpose\_stock}$ = 1.22, p = .000). We find no impact of retirement purpose on the effect of individuals' general regulatory orientation.

Similar to Study 1, we find that the demographic variables and also the goal-related information have a highly statistically significant contribution to the model fit.

6.3 Conclusion

The results of Study 2 provide further support for the anticipated interrelationship between individuals' choice of investment products and the amount they allocate to these products in a general and more realistic setting. As in Study 1, the estimates show that individuals are less likely to choose stocks and bonds than savings. However, in the more realistic setting of Study 2 they tend to invest more in stocks when these are chosen, compared to savings and bonds. This may be due to the less restricted budget that a subset of the individuals have at their disposal in the more realistic setting, compared to the fixed hypothetical budget setting in Study 1. Also as in Study 1, the results do not provide support for any effect of individuals' general regulatory focus on the allocation decision. However, there is a strong effect of retirement-specific promotion goal on their choice of investment product in the expected direction (i.e., having a promotion goal leads to more stocks and bonds being chosen). There is also an effect on individuals' product-specific budget allocation in the expected direction (i.e., having a promotion goal leads to less investment in savings). Finally, a further detailed analysis of the moderating effect of having a retirement purpose on individuals' savings and investment allocations revealed little impact of this purpose on their choices and allocations for investment products.

7. Conclusion and discussion

Individuals worldwide more and more need to allocate savings from their personal income towards their retirement. A key decision they face is how to allocate this money across more versus less risky investment alternatives (Carlsson Hauff 2014). In this paper, we developed and tested a simultaneous (MDCEV) model to help understand the potential connections between individuals' choice of investment products and how much to invest in each product. The results of two studies show that these decisions are indeed interrelated and that there are common psychological and socio-demographic factors that drive these important allocation decisions. We focused on individuals' retirement investment goals in particular and find that individuals who have a promotion goal in the retirement investment domain (i.e., who aspire mainly to achieve gains with their investments) are more likely to invest in stocks and bonds and to invest more in these categories, compared to individuals who have a retirement- investment-specific prevention goal (who are more likely to select and invest more in savings). The results of the two studies do not support an effect of individuals' more general regulatory focus on retirement investment decisions. Finally, the results largely support earlier findings that gender, education level, age, and marital status can help predict individuals' investment asset allocation decisions.

7.1 Theoretical Implications

In theoretical terms, this research has implications for the literature on individual financial decision-making, as well as for the literature on regulatory focus (promotion versus prevention). In terms of financial decision-making, the proposed MDCEV model offers a new approach to modeling consumers' discrete choice of financial products, jointly with their continuous choice of how much to invest in these products (Bhat 2005, 2008). The model accounts for the fact that these decisions are likely to depend on similar both observable and unobservable characteristics. With this model we could show that individuals' discrete investment product choices are, as expected, interrelated with their continuous budget allocation choice. In terms of regulatory focus, the empirical findings of the two studies provide support for the theory that having a promotion versus prevention goal for retirement investments predicts individual decisions related to investment products (Higgins 2000, 2005, Avnet and Higgins 2006). Participants with a promotion goal preferred riskier investment products and allocated more money towards these products. In addition, the results do not support the theoretical prediction of impact of individuals' more general regulatory focus on retirement investment decisions.

7.2 Practical Implications

As more and more pension systems shift from DB to DC, individuals’ pension income at retirement depends not only on the investment decisions by pension fund managers but also on the retirement investment decisions of participants. Retirement decisions that are not aligned with one’s preferences can strongly affect individuals’ personal welfare during retirement as well as that of society as a whole, depending, for example, on the level of dependence of retirees on social security income. Consumer-focused communications and decision support by pension funds and other investment services can prevent these costs by helping individuals to make decisions that increase their welfare at retirement. The findings in this paper offer insights into possibly effective communication strategies and decision support for achieving such outcomes.

More generally, the results of the two studies show that communication strategies and government policies to support discretionary savings for retirement should ideally not be “one-size-fits-all” because of the diverse character of the preferences and goals of individuals. More individual targeting of communications, and perhaps also recommendations of retirement investment alternatives, may help individuals in making better retirement investment decisions and hence, hopefully, enjoying a better quality of life after retirement.

7.3 Limitations of This Research and Future Avenues

Some limitations of this research are worth noting as they open up potential avenues for future research. The choices we observed in the two studies varied in terms of realism and context, and the findings were robust to these variations. However, neither study took account of the real-world budget allocation decisions of individuals in the past. Future research could analyze other retirement-specific secondary data, combined with personalized surveys on individuals’ investment goals to further analyze the external validity of our findings. This research could also incorporate realistic budget constraints for each individual (Castro et al. 2012; Satomura, Kim, and Allenby 2011). In relation thereto, the set of investment products in our data consisted of three generic investment alternatives. Future research could include more diverse investment products. Pension investment products also often have life-cycle features that dynamically vary the investment product mix over time. It would be interesting to study how individuals' promotion versus prevention goals impact their preference for different dynamic strategies, such as whether or not to continue taking investment risk after retirement. This could also be studied in combination with the decision on when to retire, which might have additional impact on the preferred investment strategies.

The survey data collected in our studies included socio-demographic features and measures of regulatory focus, (retirement) investment-specific promotion vs. prevention goal, and investment purpose (Study 2 only). However, they did not include other potentially relevant psychological factors such as risk preference and financial literacy, that can also impact individuals' financial decision-making. Future research could include such other variables and investigate how they relate to retirement-investment-specific goals. Such future research could help paint a more detailed picture of psychological motives that play in an individual's selection of retirement investment products in relation to his or her goals.

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Appendix A. Hypothetical Scenario in Study 1

Imagine the following situation:

You have been a bit concerned about your future pension income for some time. Recently, you received an unexpected inheritance of 50,000 euros from a distant family member. You decided to contact a financial advisor to see if it would be wise to use some or all of this money for your retirement. The financial advisor tells you that it is worth setting aside more money for your retirement. Doing so would help achieve a level of pension income that you need to maintain a comfortable lifestyle after retirement.

1. Based on the financial advisor's advice, how much of the inheritance would you want to set aside for your retirement, on top of any pension contributions you normally make?

I would set aside _______ euros.

The adviser proposes **three categories** to which you could allocate all or part of the inheritance for your future pension.

2. Assume you could allocate this total amount strictly across the following three categories. How much would you choose to allocate to each category? (You may choose not to allocate any amount to a specific category. The sum of the three categories should equal the amount in Question 1)

Stocks _______ euros
Bonds ________ euros
Savings _______ euros
Not applicable

Appendix B. Regulatory focus questionnaire

In these questions you are asked HOW FREQUENTLY specific events actually occur or have occurred in your life. Please indicate your answer to each question by circling the appropriate number below it.

1. Compared to most people, are you typically unable to get out of life what you want?

1	2	3	4	5
never or seldom		sometimes		very often

2. Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?

1	2	3	4	5
never or seldom		sometimes		very often

3. How often have you accomplished things that got you "psyched up" to work even harder?

1	2	3	4	5
never or seldom		few times		many times

4. Did you often get on your parents' nerves when growing up?

1	2	3	4	5
never or seldom		sometimes		very often

5. How often did you obey the rules and regulations that were established by your parents?

1	2	3	4	5
never or seldom		sometimes		always

6. Growing up, did you ever act in ways that your parents thought were unacceptable?

1	2	3	4	5
never or seldom		sometimes		very often

7. Do you often do well at things that you try?

1	2	3	4	5
never or seldom		sometimes		very often

8. Not being careful enough has gotten me into trouble at times.

1	2	3	4	5
never or seldom		sometimes		very often

9. When it comes to achieving things that are important to me, I find that I don't perform as well as I would ideally like to do.

1	2	3	4	5
never true		sometimes true		very often true

10. I feel like I have made progress toward success in my life.

1	2	3	4	5
certainly false				certainly true

11. I have found few hobbies or activities that capture my interest or motivate me to put effort into them.

1	2	3	4	5
certainly false				certainly true

Regulatory Focus Scoring Key:

Promotion = [(6 – Q1) + Q3+ Q7 + (6 – Q9) + Q10 + (6 – Q11)] / 6

Prevention = [(6 – Q2) + (6 – Q4) + Q5 + (6 – Q6) + (6 – Q8)] / 5

Regulatory Focus score = promotion – prevention

Appendix C. Liss panel survey

1. How much of your total net income do you plan to put aside either in savings or investments in 2023?
   _______ euros

2. Assume you could allocate this total amount only across the following three categories. How much would you allocate to each of the three categories? (You may choose not to allocate any amount to a specific category.)
   The sum of the three categories should equal the amount in Question 1.

Categories	Characteristics
Stocks	• Any investment in shares or portfolios of shares • Typically high risk and high return expectation • Estimated annual return 4~5% (adjusted for inflation)
Bonds	• Any investment in bonds or portfolios of bonds • Typically medium-low risk and medium-low return expectation • Estimated annual return 2~3% (adjusted for inflation)
Savings	• Any money placed in a bank savings or cash account • Typically no risk and no to very low return expectation • Estimated annual return 0~1% (adjusted for inflation)

1) Stocks ________ euros
2) Bonds ________ euros
3) Savings ________ euros
4) Not Applicable

3. What goal is more important to you for the savings and investments you plan to make in 2023: to avoid losing money or to gain more money?
(0 means that you want to avoid losing money, 100 represents that you want to gain more money, and 50 means that both goals are equally important for you)

	Avoid losing money										Gain more money
	0	10	20	30	40	50	60	70	80	90	100
A more important goal for my savings and investments in 2023 is											

o Not applicable (if you chose 0 in the first question)

4. How do you plan to use the savings and investments that you make in 2023 (this can also be in later years)? Please tick all that apply.

1) Retirement
2) New car
3) Pay off home mortgage
4) Back-up savings for emergencies
5) Other large expense such as washing machine or holiday
6) Other ____________(Please specify)

____

Appendix D. Model with retirement purpose as covariate

Table 6 presents the overview of choices. Most people allocated their put-aside money in savings rather than in stocks or bonds. The average amount of the allocation for saving is €6,128.98, whereas for bonds it is only €463.87. The average allocation for saving when that has been chosen is €6,359.40, for bonds it is €2,954.50, and for stocks it is €7,543.31.

Table 6. Overview of choices

	Saving	Bond	Stock
Average allocation when available	6,128.98	463.87	2,177.36
Average allocation when chosen	6,359.40	2,954.50	7,543.31
Number of observations	798	130	239

Table 7. MDCEV model results: Discrete choice parameter ψ

Variable name	Stocks		Bonds	
	Coeff.	t-ratio	Coeff.	t-ratio
δ	-3.12**	-5.76	-3.15**	-5.78
General promotion focus	.49	1.49	.21	.59
Domain-specific promotion goal	1.37**	4.59	.52	1.49
Retire Purpose	1.22**	4.05	.45	1.40
General Promotion Focus * Retire Purpose	.62	.85	.12	.16
Domain-specific promotion goal * Retire Purpose	1.00	1.66	.17	.25
Male	.33	1.10	-.14	-.44
High education level	.32	1.06	.12	.38
40<=Age<50	.68	1.56	1.11*	2.45
50<=Age<60	.80	1.88	.88*	1.97
60<=Age<70	.16	.23	.56	.76
Married	-.92**	-3.17	-.58	-1.87

** p<0.01, * p<0.05
Savings is taken as the baseline and thus has all parameters fixed at 0.

Tables 7 presents the estimates of the utility (ψ) of the MDCEV model (eq. 2), which reflects the discrete choice part of the model. The negative baseline utility constants in the table show that participants are less likely to choose to invest in stocks (δ_{stock} = -3.15, *p* = .000), followed by bonds (δ_{bonds} = -3.12, *p* = .000) than in savings. As in Study 1, there is no significant effect of general regulatory orientation. However, also as in Study 1, participants with a retirement- investment-specific promotion goal are more likely to invest in stocks ($\psi_{goal.stock}$ = 1.37, *p* = .000) than those with a prevention goal. When only retirement purpose is added in the model, people who intend to use the amount put aside for retirement are more likely to invest in stocks ($\psi_{retire\_purpose.stock}$ = 1.22, *p* = .000).

As to the impact of socio-demographic characteristics, individuals aged between 40 to 50 and 50 to 60 are more likely to invest in bonds ($\psi_{age40-50.bond}$ = 1.11, *p* = .012; $\psi_{age50-60.bond}$ = .88, *p* = .012). Married persons are less likely to invest in stocks ($\psi_{married.stock}$ = -.92, *p* = .000).

Table 8. MDCEV model results: Continuous choice parameter γ

Variable name	Stocks		Bonds		Savings	
α_base			-14.59 (-.09)			
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
γ_base	6.51**	17.73	6.01**	14.86	8.99**	8.46
General promotion focus	-.13	-.52	.09	.32	-.62	.98
Domain-specific promotion goal	-.02	-.08	-.31	-.90	-1.88**	-3.09
Retire Purpose	.02	.06	.32	.86	-.01	-.02
General Promotion Focus * Retire Purpose	.42	.88	.10	.16	1.31	.83
Domain-specific promotion goal * Retire Purpose	-1.33*	-2.52	-.82	-1.30	1.73	1.42
Male	.24	.90	.92**	2.83	-1.20	-1.86
High education level	.17	.69	.82*	2.49	.50	.88
40<=Age<50	-.10	-.30	-.33	-.82	.88	1.31
50<=Age<60	-.32	-1.08	-.21	-.48	1.23	1.75
60<=Age<70	.57	.99	.09	.10	.33	.33
Married	.57*	2.27	.11	.35	-.46	-.85

** p<0.01, * p<0.05

The parameters in Table 8 explain the continuous choice (eq. 3). The satiation parameters of stocks, bonds, and savings show that investing in savings results in the lowest satiation ($\gamma_{base.saving}$ = 8.99, *p* = .000), followed by stocks ($\gamma_{base.stock}$ =6.51, *p* = .000) and then bonds ($\gamma_{base.bond}$ = 6.01, *p* = .000). In other words, ceteris paribus, participants would invest more in savings, followed by stocks and bonds. The results furthermore show no effect of general regulatory orientation on the amount that is allocated per investment product. The retirement-investment-specific promotion goal negatively affects the savings amount as expected ($\gamma_{goal.saving}$ = -1.88, *p* = .002). Retirement purpose seems to have no influence on the amount allocated to each category. In terms of socio-demographic characteristics, the effects are also limited. Men tend to invest more in bonds ($\gamma_{male.bond}$ = .92, *p* = .004), as do individuals with a higher education ($\gamma_{highedu.bond}$ = .82, *p* = .014). Married persons allocate more to stocks ($\gamma_{married.stock}$ = .57, *p* = .021).

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