Does prevention as an investment strategy explain the intention to purchase guarantees for unit-linked life insurance?

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Abstract The present paper examines the relationship between prevention as an investment strategy and the perceptions about unit-linked insurance on the intention to purchase interest rate guarantees for such products. We propose a framework in which the relationship between adopting prevention as an investment strategy, and the intention to purchase interest rate guarantees is moderated by the level of financial literacy of the individual and this interaction is mediated by the perceptions regarding unit-linked insurance. We find support for our conceptual model by testing it on a sample of 1017 financial decision makers in Germany using a moderated mediation analysis. The paper therefore offers insights into the decision-making process of financial consumers in Germany and presents practical implications for designing products for age-old provision.

Keywords Investment guarantees · Attitudes · Life insurance · Decision making

Introduction

Interest rate guarantees have been a ubiquitous feature for endowment life insurance products in Europe for decades. In recent years, the level of interest rate guarantees has been steadily declining, as the costs encountered by life insurers in order to finance the guarantees are considerable. At the same time, a new type of insurance product has been

steadily growing in popularity on the international market: the unit-linked life insurance, which allows consumers to combine the cover of biometric risk with an investment component.¹ This investment component allows individuals to accumulate wealth which is paid back to them in case of survival at the end of the insurance contract or in case of death to their beneficiaries. Therefore, such insurance contracts also classify as a private pension plan, where individuals can freely choose how their money is invested. Comparable to other long-term saving products such as endowment life insurance, interest rate guarantees are also present in some unit-linked products. Their purpose is to ensure asset preservation rather than growth: i.e., the guaranteed amount is paid back to the investor upon expiration of the contract or to the beneficiaries in case of death. In light of this new development, it is worth asking what the drivers behind the intention to purchase guarantees in life insurance from a customer's perspective are.

The demand for guarantees for long-term saving products such as unit-linked insurance has so far only been analyzed under a theoretical framework. In so far, expected utility theory, prospect theory and multi-cumulative prospect theory have all failed to fully explain the demand for guarantees in life insurance products (see, e.g., Døskeland and Nordahl 2008; Ebert et al. 2012; Braun et al. 2017; Ruß and Schelling 2017). In this paper, we propose an

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¹ For example, in Germany the premium income from participating life insurance contracts with mandatory interest rate guarantee has declined 5.4% for the year 2015–2016, whereas the premium income from unit-linked insurance has grown 3.1% over the same period (cf. Gesamtverband der Deutschen Versicherungswirtschaft 2017). At a European level, EIOPA (2013) reports an increase in the share of unit-linked as a percentage of the life insurance market, with total gross written premium for unit-linked of EUR 277 mn in 2015 (cf. EIOPA 2017).

alternative approach, in which we investigate the impact of the investment strategy, in particular the propensity of focusing on prevention of negative outcomes in an investment strategy, the impact of financial literacy of customers and the perceptions about unit-linked life insurance on the decision to purchase interest rate guarantees for unit-linked insurance products. In contrast to previous studies which try to explain the demand for such products within financial theory, we design our hypotheses by combining elements from the previous research in marketing, economics and psychology.

The present paper brings a contribution to both the existing theory and practice. To the best of our knowledge, this is the first article that examines the relationship between prevention and the decision to purchase interest rate guarantees. In order to establish this relationship, we draw on two main theories from psychology: the regulatory focus theory which states that people are either motivated to achieve desired states or to avoid undesirable outcomes (see, e.g., Higgins 1998; Brockner and Higgins 2001). On the other hand, we draw on the theory of reasoned action in which the intention to engage in a certain behavior is influenced by the attitudes regarding that behavior (see, e.g., Ajzen 1991, 2005). In this sense, we highlight the fact that our concept of prevention, which has been previously tested in the marketing literature, is also closely related to the concept of prudence which has been gaining popularity in the insurance economics literature. Previous studies have shown that prudence is a necessary trait for increased prevention strategies (see, e.g., Jullien et al. 1999; Dionne and Li 2011), as risk aversion alone is not sufficient to explain investment in prevention (see, e.g., Dionne and Eeckhoudt 1985; Briys and Schlesinger 1990). Therefore, our work adds to the literature on financial decision making by analyzing the relationship between investment strategy, perceptions about a specific product and the intention to purchase an additional safety characteristic for said financial product. We highlight that prevention as an investment strategy is not only crucial for the intention to purchase interest rate guarantees, but also important in determining the perceptions regarding unit-linked insurance. The influencing role of financial literacy is in accordance with recent literature that stresses its importance in financial decision making (see, e.g., Lusardi and Mitchell 2007, 2009, 2011a, b). To our knowledge, the present study is the first to include financial literacy in a framework which analyzes the relationship between perception and intention to engage in a behavior. The mediating role of perceptions regarding unit-linked insurance is also new in the literature, although Huber and Schlager (2018) have previously analyzed the role of perceptions about life insurance on the intention to purchase life insurance. Moreover, to our knowledge, the present study is the first to

analyze the decision-making process that drives consumers to purchase interest rate guarantees.

In general, knowledge of the decision-making process regarding the purchase of interest rate guarantees presents great interest for several stakeholders. In light of current developments in the life insurance and pension markets, where demographic developments shift more responsibility of pension provision toward individuals, the question of what drives individuals' intention to purchase interest guarantees is of utmost importance, since the costs of guarantees are usually high and can significantly impact an individual's retirement account (see, e.g., Lachance and Mitchell 2003; Finkelstein et al. 2003; Sinha and Renteria 2005; Renz and Stotz 2015; Gale et al. 2016). If customers are willing to purchase guarantees alongside their contracts in order to have a guaranteed return at the end of the investment period, the costs of the guarantees can be covered by individuals directly. If, in turn, individuals are not willing to purchase guarantees, the high costs of guarantees must either be transferred to the government, in order to ensure the stability of the pension system, or the insurer or pension provider must discontinue the provision of such guarantees if the risk management costs associated with their provision cannot be covered.

The remainder of this paper is organized as follows: In the first section, we introduce the theoretical framework and the relevant literature, deriving the hypotheses. In the second section, we present the methodology and the empirical results. Finally, we derive theoretical and practical implications in the discussion section, followed by limitations and potential future research. The last section draws the main conclusions.

Theoretical background and conceptual model

The antecedents of the decision-making process that leads customers to purchase interest rate guarantees has not been investigated so far. Huber and Schlager (2018) explore the antecedents of purchasing life insurance and find out that the presence of an interest rate guarantee moderates the relationship between risk avoidance and risk perception in the intention to purchase life insurance, whereas Hecht and Hanewald (2010) investigate the determinants of the demand for endowment life insurance in Germany. In contrast, we try to determine the antecedents of the decision to purchase interest rate guarantees and our conceptual model has its foundations in the regulatory focus theory, in which people are motivated either to achieve desired results or to avoid undesired results (see, e.g., Higgins 1998; Brockner and Higgins 2001), which has direct consequences on financial choices (see, e.g., Hamilton and Biehal 2005). Consumers who have prevention as an

investment strategy are more focused on avoiding losses rather than achieving gains and therefore should positively influence the decision to purchase interest rate guarantees. Moreover, we hypothesize that the perceptions about unit-linked mediate the relationship between prevention and intention to purchase interest rate guarantees, since we believe that the perception about riskiness, transparency and performance risk of the unit-linked can in part explain the intention to purchase an interest rate guarantee. Moreover, financial literacy is expected to moderate the relationship between investment strategy and the perceptions about unit-linked insurance. This second part of our conceptual framework in which attitudes about unit-linked influence the intention to purchase interest rate guarantees comes from the theory of reasoned action (see, e.g., Ajzen 1991, 2005), which states that perceptions and attitudes toward a certain behavior influence the intention to engage in such behavior. In doing so, we do not focus on the actual behavior, since the actual purchase behavior of interest rate guarantees might differ from the intention to engage in such behavior. For example, a customer might have the intention to purchase an interest rate guarantee, but might have insufficient willingness to pay for such a feature (see, e.g., Gatzert et al. 2011; Luca et al. 2017), and therefore, there would be a discrepancy between actual behavior and intention. However, regulators might be interested in which customers have an intention to purchase such a feature, since these customers are more likely to need financial protection.

Prevention as an investment strategy and the intention to purchase interest rate guarantees

The main premise of regulatory focus theory is that when pursuing a goal, humans are motivated to achieve pleasure and avoid pain (see, e.g., Higgins 1998; Brockner and Higgins 2001). In what regards an investment strategy, this would translate into investors being motivated to achieve desired end states and avoid undesired states. In other words, the investment strategy of consumers determines the amount of risk that they are willing to accept in a financial product. Investors with promotion as an investment strategy seek growing their asset base, striving for positive outcomes and seeking to decrease the discrepancy between current and desired end states. On the other hand, consumers with prevention as an investment strategy seek financial safety, avoiding negative outcomes in order to decrease the discrepancy between current and undesirable end states. Financial investors who have prevention as a goal or investment strategy tend to focus on losses rather than gains, thereby exhibiting what behavioral finance calls

loss aversion and what represents the cornerstone of prospect theory (see, e.g., Kahneman and Tversky 1979).

In financial theory, loss aversion has been previously investigated as a means to explain optimal design strategies for portfolio insurance, strategies that seek to minimize the downside risk in an investment portfolio. Dichtl and Drobtz (2011) show that in the framework of prospect theory, loss aversion is a prerequisite for investors which prefer financial products with guaranteed returns over other investment strategies, in spite of the reduced returns. Similarly, multi-cumulative prospect theory extends this framework to incorporate the subjective (dis)utility that investors gain from interim changes in their portfolio and find that the demand for guarantees can be explained in such a setup (see, e.g., Braun et al. 2017; Ruß and Schelling 2017).

Leimberg et al. (2012) states that an important part of the background analysis of consumers is determining the amount of financial risk they are willing to accept in a financial plan. In particular, a financial consumer who has prevention as a strategy might be more willing to purchase an interest rate guarantee than someone who has asset growth as a strategy, since guarantees are meant to protect investors against negative developments in the financial markets that could affect their payout at maturity of the contract. Following this reasoning, we expect a positive relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees in life insurance, as follows:

H₁ Prevention as an investment strategy has a positive effect on the intention to purchase interest rate guarantees.

Mediating role of perceptions regarding unit-linked insurance

The role of perceptions has been previously investigated in the context of financial decision making, in particular in the framework of theory of planned behavior. For example, Ruefenacht et al. (2015) find that the perceptions about long-term savings can impact a financial consumers' involvement in long-term savings, whereas the perceptions about a certain financial product play an important role in the intention to purchase said financial product (see, e.g., Huber and Schlager 2018). We take this reasoning a step further and hypothesize that the perceptions about unit-linked insurance mediate the effect of prevention on the decision to purchase interest rate guarantees, as follows:

H_{2a} Perceived protection mediates the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees.

H_{2b} Perceived transparency mediates the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees.

H_{2c} Perceived performance risk mediates the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees.

Moderating role of financial literacy

Financial literacy is a topic which has been growing in importance in the last couple of years (see, e.g., Lusardi and Mitchell 2011b; Lusardi et al. 2014). Recent research shows that it can impact saving and borrowing behavior (see, e.g., Lusardi and Tufano 2015), retirement planning (see, e.g., Lusardi 2004; Lusardi and Mitchell 2007, 2011a), investment behavior (see, e.g., van Rooij et al. 2011) and the need for consumer protection in financial services (see, e.g., Bühler et al. 2016). In line with this literature, we expect the level of financial literacy to also impact the intention to purchase interest rate guarantees as an additional safety feature for a unit-linked insurance contract. In particular, the level of financial literacy moderates the relationship between prevention as investment strategy and the perceptions about unit-linked insurance. This is in line with Lusardi and Mitchell (2007), who show that those who are more financially knowledgeable are more likely to plan their retirement, since their ability to understand interest compounding is critical for establishing saving plans. Following this reasoning, we expect financial consumers with different levels of financial literacy to have different perceptions about unit-linked insurance. We expect a higher level of financial literacy to positively affect the level of perceived protection from a unit-linked insurance, since a higher level of literacy leads to a better understanding of the product. Moreover, a higher level of literacy should also positively affect the level of perceived transparency, since consumers' better understanding of financial products leads to lower perceived opacity regarding the products. Last but not least, a higher degree of financial literacy leads to a better understanding of the risks associated with purchasing a unit-linked insurance contract, thereby having a negative effect on the perceived performance risks. The following hypotheses formalize the relationship between financial literacy and the perceptions regarding unit-linked insurance:

H_{3a} Financial literacy moderates the relationship between prevention as an investment strategy and the perceived protection from unit-linked life insurance, such that higher levels of financial literacy lead to a positive effect on perceived protection and low levels lead to a negative effect on perceived protection.

H_{3b} Financial literacy moderates the relationship between prevention as an investment strategy and the perceived transparency of unit-linked life insurance, such that higher levels of financial literacy lead to a positive effect on perceived transparency and low levels lead to a negative effect on perceived transparency.

H_{3c} Financial literacy moderates the relationship between prevention as an investment strategy and the perceived performance risk of unit-linked life insurance, such that higher levels of financial literacy lead to a negative effect on perceived performance risk and low levels lead to a positive effect on perceived performance risk.

We therefore build a research model in which the perceived protection, perceived transparency and perceived performance risk of a unit-linked insurance contract mediate the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees as an additional safety feature for a unit-linked contract and the financial literacy of the consumer moderates the relationship between prevention and the perceptions about unit-linked insurance. Figure 1 summarizes the conceptual framework. As a consequence of this model, we can further hypothesize that the financial literacy also moderates the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees. In this moderated mediation, the indirect effect of prevention on the intention to purchase interest rate guarantees via perceptions can be summarized as follows:

H_{4a} The direction of the mediated relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees via the perceived protection toward unit-linked life insurance varies according to the level of financial literacy: The indirect effect of prevention via perceptions toward unit-linked life insurance is negative for high levels of financial literacy and positive for low levels of financial literacy.

H_{4b} The direction of the mediated relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees via the perceived transparency toward unit-linked life insurance varies according to the level of financial literacy: The indirect effect of prevention via perceptions toward unit-linked life insurance is negative for high levels of financial literacy and positive for low levels of financial literacy.

H_{4c} The direction of the mediated relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees via the perceived performance risk toward unit-linked life insurance varies according to the level of financial literacy: The indirect

Fig. 1 Conceptual framework

effect of prevention via perceptions toward unit-linked life insurance is positive for high levels of financial literacy and negative for low levels of financial literacy.

Covariates

Consistent with the previous literature (see, e.g., van Rooij et al. 2011; Campbell 2006), we have taken into consideration socio-demographic variables such as age, gender, number of children, income, education and wealth. We have also considered unit-linked product knowledge and extant knowledge of financial products. Previous studies (see, e.g., Diacon and Ennew 2001) have shown that the poor product knowledge can influence consumer's perception of financial risk, whereby Nepomuceno et al. (2014) show that product knowledge can reduce perceived risk. We therefore believe that a consumer's knowledge of unit-linked can affect their intention to purchase interest rate guarantees. We also complement the knowledge about unit-linked with extant knowledge regarding financial investments.

Methodology

Sample and procedure

We rely on an original dataset of 1017 financial decision makers in Germany. Before starting the survey, customers were asked whether they were involved in the financial decision-making process in their families. We have only surveyed those people which stated that they were either the main financial decision maker in the family or involved in the decision-making process to a certain degree. The

data were collected through a Web-based survey distributed over a period of 3 weeks in Germany, and the respondents were recruited through a market research firm. Participation in the study was incentivized by offering participants credit for online purchases. Respondents are representative of the German population in terms of gender and residence. In terms of age, we have imposed a restriction between 20 and 54 years old, since life insurance is long-term contracts that have a minimum term of 10 years. A total number of 1180 people received the questionnaire, out of which we have eliminated 163 respondents (14%) due to low involvement or click-through pattern, thus retaining a total of 1017 respondents in the sample. The descriptive statistics of the sample are summarized in Table 1.

Measures

The measurement scales were selected in line with the existing literature, while the wording and appearance for some constructs was slightly adapted in order to fit our research question and context. The summary of the scales and their origin is given in Table 2. For prevention, we have excluded some of the items in the original scale which do not exceed the thresholds in the CFA, thus retaining the scale with the four items reported. For the financial literacy measure, we use a measure of financial literacy that counts the number of questions that the respondent has answered correctly regarding basic numeracy questions (see, e.g., Lusardi and Mitchell 2007; Lusardi and Tufano 2015; Lusardi and Mitchell 2011a, b; van Rooij et al. 2011; Lusardi et al. 2014). Single-item measures were used for some of the control variables such as age, gender, income, number of children, education and wealth. Table 3

Table 1 Descriptive statistics

Demographics	Level	Male		Female		Total	
		Count	%	Count	%	Count	%
Age	Born after 1990	31	6	71	13	102	10
	Born between 1980 and 1989	116	24	162	31	278	27
	Born between 1970 and 1979	162	33	135	26	297	29
	Born before 1970	181	37	159	30	340	33
No. children	0	286	58	264	50	550	54
	1	90	18	116	22	206	20
	2	94	19	110	21	204	20
	3	16	3	25	5	41	4
	4	3	1	8	2	11	1
	5	0	0	4	1	4	0
	More than 5	1	0	0	0	1	0
Monthly household income	< EUR 500	8	2	13	2	21	2
	EUR 500–EUR 1.000	40	8	33	6	73	7
	EUR 1.000–EUR 1.500	43	9	72	14	115	11
	EUR 1.500–EUR 2.000	64	13	52	10	116	11
	EUR 2.000–EUR 2.500	58	12	74	14	132	13
	EUR 2.500–EUR 3.000	53	11	58	11	111	11
	EUR 3.000–EUR 3.500	51	10	46	9	97	10
	EUR 3.500–EUR 4.000	48	10	34	6	82	8
	EUR 4.000–EUR 4.500	32	7	24	5	56	6
	EUR 4.500–EUR 5.000	21	4	27	5	48	5
	EUR 5.000–EUR 10.000	27	6	22	4	49	5
	≥ EUR 10.000	7	1	4	1	11	1
	No income	2	0	3	1	5	0
	No answer	36	7	65	12	101	10
Education	Still in vocational training	10	2	14	3	24	2
	On the job training/internship	1	0	8	2	9	1
	Prevocational training year	1	0	4	1	5	0
	Apprenticeship or similar	126	26	151	29	277	27
	Vocational training completed	116	24	125	24	241	24
	Technical degree	60	12	39	7	99	10
	University of applied sciences degree (Bachelor, Master)	57	12	39	7	96	9
	University degree (Bachelor, Master)	86	18	103	20	189	19
	PhD	3	1	6	1	9	1
	Professor	2	0	0	0	2	0
	Preparatory service	0	0	3	1	3	0
	No vocational degree	19	4	15	3	34	3
	No answer	9	2	20	4	29	3
Wealth	No assets	125	26	186	35	311	31
	≤ EUR 2.500	38	8	60	11	98	10
	EUR 2.500–EUR 10.000	68	14	91	17	159	16
	EUR 10.000–EUR 50.000	111	23	82	16	193	19
	EUR 50.000–EUR 100.000	48	10	38	7	86	8
	EUR 100.000–EUR 250.000	58	12	29	6	87	9
	EUR 250.000–EUR 500.000	24	5	32	6	56	6
	EUR 500.000–EUR 1 Mio.	9	2	2	0	11	1
	≥ EUR 1 Mio.	9	2	7	1	16	2

summarizes the items and the reliability measures [factor loadings (FL), composite reliability (CR) and average variance extracted (AVE)]. We further report the means, standard deviations and correlations between the items in Table 4.

Measurement model

The first step in our analysis was to test the reliability of the measurement model, for which we have performed a confirmatory factor analysis (CFA). Overall, the fit measures indicate a good fit of the model (RMSEA = 0.045, CFI = 0.980, TLI = 0.977). In particular, the incremental fit indices (CFI and TLI) indicate that the default model is significantly different from the independence model, whereas the RMSEA indicates a close model fit. Moreover, all factor loadings (FL) were above the 0.6 threshold suggested by Bagozzi and Yi (2012). As regards the reliability of the individual latent variables, the CR and AVE were used as measures. All values exceed the recommended thresholds of 0.7 for CR and 0.5 for AVE. Our CFA therefore confirms our measurement model, since we have obtained good convergent and discriminant validity measures.

Hypotheses testing

The main effect of prevention on the intention to purchase interest rate guarantees was tested by means of a regression analysis, and our results indicate that there is a significant positive direct effect (H_1 , $\beta = 0.168$, $p < .001$) of prevention on the intention to purchase guarantees. In order to test the mediating role of perceptions, we have employed a mediation analysis (see, e.g., Hayes 2015; Preacher and Hayes 2008) with 10,000 simulations in order to bootstrap the values for the confidence intervals and p values (see, e.g., Edwards and Lambert 2007). The mediation effects of perceptions were as follows: First, there were a negative effect of prevention on perceived protection ($\beta = -0.238$, $p < .001$), a positive effect of prevention on perceived transparency ($\beta = 0.170$, $p < .001$) and a positive effect of prevention on perceived performance risk ($\beta = 0.367$, $p < .001$). The effects of perceived protection ($\beta = 0.536$, $p < .001$), perceived transparency ($\beta = 0.198$, $p < .001$) and perceived performance risk ($\beta = -0.084$, $p < .01$) on the intention to purchase interest rate guarantee were also significant. In contrast, the direct effect of prevention on the intention to purchase interest rate guarantee was insignificant ($\beta = 0.059$, n.s.) and changed sign, suggesting mediation. In order to test the indirect effects, we have employed the methodology presented in Preacher and Hayes (2008) and found significant indirect effects of perceived protection (H_{2a} , $\beta = 0.134$), perceived

transparency (H_{2b} , $\beta = 0.031$) and perceived protection risk (H_{2c} , $\beta = -0.033$), thereby supporting our hypotheses that the perceptions about unit-linked insurance mediate the relationship between prevention as investment strategy and the intention to purchase interest rate guarantee.

Furthermore, to compute the moderating effect of financial literacy, we have used floodlight analysis (see, e.g., Hayes 2017, 2012) to identify regions where financial literacy would impact the effect of the independent variable on the dependent variable (see, e.g., Johnson and Neyman 1936; Johnson and Fay 1950). The Johnson–Neyman points for the various mediators are reported in Table 5. For perceived protection, we have found one Johnson–Neyman point for the interaction effect of prevention and financial literacy on perceived protection, which indicates a significant positive effect of the interaction on perceived protection below the value of 3.75. Similarly, for perceived transparency, we have also found one Johnson–Neyman point for the interaction effect of prevention and financial literacy on perceived transparency, indicating a positive significant effect below the value of 2.90. For perceived performance risk, there are no significant transition points using the Johnson–Neyman technique, indicating that the effect of the interaction between financial literacy and perceived performance risk is insignificant throughout the region. Therefore, we have found first evidence of support for H_{3a} and H_{3b} , but not for H_{3c} . To illustrate our results, we present the conditional indirect effects of prevention on perceived protection, perceived transparency and perceived performance risk in Table 6. This provides us with prima facie evidence of mediation of an indirect effect, and we therefore follow up with a formal test of moderated mediation. After estimating the conditional indirect effects, we proceed with an inferential test (see, e.g., Hayes 2015) of moderated mediation, the results of which are presented in Table 7. The inferential test confirms that the index of moderated mediation for perceived protection and perceived transparency are significantly different from zero, thereby indicating a moderated mediation. In contrast, the indirect effect of perceived performance risk is linearly unrelated to the level of financial literacy. Lastly, we have tested hypotheses 4 (H_{4a} , H_{4b} , H_{4c}) using the bootstrap method (10,000 simulations) in PROCESS. The conditional indirect effect of prevention on the intention to purchase interest rate guarantee via perceived protection (H_{4a}), perceived transparency (H_{4b}) and perceived performance risk (H_{4c}) moderated by financial literacy was tested at one standard deviation above and below the mean. Our results presented in Table 8 indicate that the indirect effect of perceived protection is positive and significant at low values of the moderator (financial literacy) (conditional indirect effect = 0.1932, SE = 0.03. CI = [0.134, 0.255]) and becomes insignificant for higher values of financial literacy

Table 2 Measurement model

Items and constructs	Measurement	Source
<i>Prevention (Investment strategy)</i>		Appears in Bruner (2009); first developed by Hamilton and Biehal (2005)
I would like to create a combination of investments/ select an investment that would protect against large declines in value	1 = “strongly disagree” to 7 = “strongly agree”	
My primary goal is to preserve my assets	1 = “strongly disagree” to 7 = “strongly agree”	
When considering an investment opportunity, I focus on what I have now	1 = “strongly disagree” to 7 = “strongly agree”	
I want to select investments that would minimize my expected losses	1 = “strongly disagree” to 7 = “strongly agree”	
<i>Perceived protection</i>		Bosmans and Baumgartner (2005)
A unit-linked insurance can protect me against financial difficulties in the future	1 = “strongly disagree” to 7 = “strongly agree”	
With unit-linked life insurance I obtain a sense of financial security	1 = “strongly disagree” to 7 = “strongly agree”	
Unit-linked life insurance is able to protect me against adverse financial situations	1 = “strongly disagree” to 7 = “strongly agree”	
<i>Perceived transparency</i>		Huber and Schlager (2018)
I know exactly what service I get from unit-linked life insurance	1 = “strongly disagree” to 7 = “strongly agree”	
I know exactly what I have to pay for unit-linked life insurance	1 = “strongly disagree” to 7 = “strongly agree”	
I have a clear overview about the product’s costs	1 = “strongly disagree” to 7 = “strongly agree”	
I feel well informed about unit-linked life insurance	1 = “strongly disagree” to 7 = “strongly agree”	
<i>Perceived performance risk</i>		Nepomuceno et al. (2014)
If I were to purchase a unit-linked life insurance, I would be concerned that the item will not provide the level of benefits that I would be expecting	1 = “strongly disagree” to 7 = “strongly agree”	
If I were to purchase a unit-linked life insurance, I would be concerned that I would not get my money’s worth	1 = “strongly disagree” to 7 = “strongly agree”	
The thought of purchasing a unit-linked insurance causes me to be concerned for how really reliable that product will be	1 = “strongly disagree” to 7 = “strongly agree”	
<i>Intention to purchase an interest rate guarantee</i>		Appears in Bruner (2009) and originates from the work of Burton et al. (1999) and Kozup et al. (2003)
Would you be more likely or less likely to purchase an interest rate guarantee, given the information shown?	1 = “more likely” to 7 = “less likely”	
Given the information shown, how probable is it that you would consider the purchase of a guarantee?	1 = “very probable” to 7 = “not probable”	
How likely would you be to purchase a guarantee, given the information shown?	1 = “very unlikely” to 7 = “very likely”	
<i>Unit-linked product knowledge</i>		Nepomuceno et al. (2014)
The information search I have performed on unit-linked life insurance is:	1 = “very weak” to 7 = “very strong”	
I don’t have much experience purchasing unit-linked life insurance	1 = “strongly disagree” to 7 = “strongly agree”	
In general, my knowledge of unit-linked life insurance is	1 = “very weak” to 7 = “very strong”

Table 2 continued

Items and constructs	Measurement	Source
Would you consider yourself uninformed or informed about unit-linked life insurance?	1 = “very uninformed” to 7 = “very informed”	Hofstetter et al. (2013)
Compared to experts in this area, my knowledge of unit-linked life insurance is:	1 = “weaker” to 7 = “stronger”	
<i>Extant knowledge of financial investments</i>		
Concerning financial investments, I consider myself. . .	1 = “not knowledgeable” to 7 = “knowledgeable”	
Concerning financial investments, I consider myself. . .	1 = “not competent” to 7 = “competent”	
Concerning financial investments, I consider myself. . .	1 = “not expert” to 7 = “expert”	
Concerning financial investments, I consider myself. . .	1 = “not trained” to 7 = “trained”	
Concerning financial investments, I consider myself. . .	1 = “not experienced” to 7 = “experienced”	

(3.57) (conditional indirect effect = 0.0602, SE = 0.03, CI = [−0.0061, 0.1287]). Similarly, the conditional effect of prevention on intention to purchase via perceived transparency moderated by financial literacy is positive and significant for low levels of financial literacy (conditional indirect effect = 0.0619, SE = 0.015, CI = [0.0365, 0.0964]), decreases for an intermediate level of financial literacy (2.3422) (conditional indirect effect = 0.0274, SE = 0.0098, CI = [0.0117, 0.0512]) and becomes insignificant for high levels of financial literacy (conditional indirect effect = −0.0071, SE = 0.01, CI = [−0.0326, 0.0168]). For perceived performance risk, the conditional effects remain significant at all values of financial literacy, but the effect becomes less pronounced, from −0.0384 for a moderator value of 1.1131, to an effect of −0.0261 for a moderator value of 3.5713. Therefore, H_{4a} and H_{4b} were partially supported, while we have found no support for H_{4c} . Table 9 summarizes the results, while in Table 10 we summarize the effects of the covariates on the intention to purchase IRG and we discover that only age has a negative significant impact on the intention to purchase interest rate guarantee ($\beta = -0.027$, $p < 0.001$).

Implications and discussion

The present article examined whether and how financial literacy affects the relationship between prevention as an investment strategy and the perceived protection, perceived transparency and perceived performance risk of unit-linked life insurance and the effect of these perceptions on the intention to purchase interest rate guarantees for life insurance contracts. The results indicate a mediating role of perceived protection, perceived transparency and perceived performance risk in the relationship between prevention as

an investment strategy and the intention to purchase interest rate guarantees. Financial literacy is shown to moderate the relationship between prevention and the perceived protection, perceived transparency and perceived performance risk and indirectly moderates the relationship between prevention and the intention to purchase interest rate guarantees through perceived protection and perceived transparency.

These findings bring several contributions to the current understanding of how prevention as an investment strategy affects the intention to purchase interest rate guarantees for life insurance. To the best of our knowledge, the present paper is the first to investigate the direct relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees. The previous research in the multi-cumulative prospect theory (MCPT) has shown that demand for investment guarantees for long-term saving products such as life insurance can only be explained if one takes into account the fact that investors care about the interim changes in their portfolio (see, e.g., Ruß and Schelling 2017; Braun et al. 2017) and in particular about the negative developments in their portfolio. Departing from this idea from MCPT, we have settled on an existing construct that has been previously used in the marketing literature, namely prevention as an investment strategy, to investigate whether the fact that investors care about interim changes in their portfolio can explain the demand for interest rate guarantees. In particular, we draw from existing theories about what motivates individuals in achieving their goals and how perceptions about a particular financial product can influence the decision to purchase said financial product.

First, we have established a direct positive effect of prevention on the intention to purchase interest rate guarantees. However, after taking into account the mediating

Table 3 Reliability model

Items and constructs	FL	CR	AVE
<i>Prevention (Investment strategy)</i>		0.868	0.627
I would like to create a combination of investments/ select an investment that would protect against large declines in value	0.62		
My primary goal is to preserve my assets	0.884		
When considering an investment opportunity, I focus on what I have now	0.915		
I want to select investments that would minimize my expected losses	0.71		
<i>Perceived protection</i>		0.923	0.857
A unit-linked insurance can protect me against financial difficulties in the future	0.869		
With unit-linked life insurance I obtain a sense of financial security	0.927		
Unit-linked life insurance is able to protect me against adverse financial situations	0.924		
<i>Perceived transparency</i>		0.954	0.837
I know exactly what service I get from unit-linked life insurance	0.880		
I know exactly what I have to pay for unit-linked life insurance	0.903		
I have a clear overview about the product's costs	0.945		
I feel well informed about unit-linked life insurance	0.931		
<i>Perceived performance risk</i>		0.929	0.813
If I were to purchase a unit-linked life insurance, I would be concerned that the item will not provide the level of benefits that I would be expecting	0.862		
If I were to purchase a unit-linked life insurance, I would be concerned that I would not get my money's worth	0.895		
The thought of purchasing a unit-linked insurance causes me to be concerned for how really reliable that product will be	0.946		
<i>Intention to purchase an interest rate guarantee</i>		0.975	0.929
Would you be more likely or less likely to purchase an interest rate guarantee, given the information shown?	0.953		
Given the information shown, how probable is it that you would consider the purchase of a guarantee?	0.966		
How likely would you be to purchase a guarantee, given the information shown?	0.973		
<i>Unit-linked product knowledge</i>		0.964	0.844
The information search I have performed on unit-linked life insurance is:	0.822		
I don't have much experience purchasing unit-linked life insurance	0.944		
In general, my knowledge of unit-linked life insurance is	0.958		
Would you consider yourself uninformed or informed about unit-linked life insurance?	0.944		
Compared to experts in this area, my knowledge of unit-linked life insurance is:	0.92		
<i>Extant knowledge of financial investments</i>		0.965	0.846
Concerning financial investments, I consider myself 1 = "not knowledgeable," 7 = "knowledgeable"	0.933		
Concerning financial investments, I consider myself 1 = "not competent," 7 = "competent"	0.921		
Concerning financial investments, I consider myself 1 = "not expert," 7 = "expert"	0.929		
Concerning financial investments, I consider myself 1 = "not trained," 7 = "trained"	0.889		
Concerning financial investments, I consider myself 1 = "not experienced," 7 = "experienced"	0.925		

Table 4 Means, standard deviations and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8
1. Prevention (investment strategy)	5.09	1.26	1.00							
2. Perceived protection	3.97	1.44	0.18	1.00						
3. Perceived transparency	3.70	1.65	0.11	0.60	1.00					
4. Perceived performance risk	4.54	1.59	0.31	-0.02	-0.04	1.00				
5. Financial literacy	2.34	1.23	0.03	0.03	0.03	0.01	1.00			
6. Intention to purchase IRG	3.40	1.68	0.10	0.62	0.47	-0.10	0.01	1.00		
7. UL product knowledge	3.30	1.44	0.00	0.50	0.82	-0.05	0.01	0.44	1.00	
8. Extant knowledge of financial investments	3.62	1.56	0.01	0.43	0.70	0.01	0.12	0.37	0.85	1.00

Table 5 Johnson–Neyman significance regions

Moderator	Value	% below	% above
Perceived protection	3.75	79.15	20.85
Perceived transparency	2.90	52.02	47.98
Perceived performance risk	No statistically significant transition points		

Table 6 Conditional indirect effect of X on Y

Mediator	Index	SE(Boot)	BootLLCI	BootULCI
Perceived protection	0.1334	0.0244	0.0881	0.1828
Perceived transparency	0.0308	0.0105	0.0134	0.0544
Perceived performance risk	– 0.0328	0.0119	– 0.0582	– 0.0115

Table 7 Index of moderated mediation

Mediator	Index	SE(Boot)	BootLLCI	BootULCI
Perceived protection	– 0.0541	0.0179	– 0.0894	– 0.0197
Perceived transparency	– 0.0281	0.0078	– 0.0464	– 0.0151
Perceived performance risk	0.005	0.0039	– 0.0007	0.0154

Table 8 Conditional indirect effects

Mediator	Financial literacy	Effect	Boot SE	BootLLCI	BootULCI
Perceived protection	1.1131	0.1932	0.0310	0.1337	0.2550
Perceived protection	2.3422	0.1267	0.0241	0.0814	0.1768
Perceived protection	3.5713	0.0602	0.0342	– 0.0061	0.1287
Perceived transparency	1.1131	0.0619	0.0150	0.0365	0.0964
Perceived transparency	2.3422	0.0274	0.0098	0.0117	0.0512
Perceived transparency	3.5713	– 0.0071	0.0123	– 0.0326	0.0168
Perceived performance risk	1.1131	– 0.0384	0.0142	– 0.0705	– 0.0138
Perceived performance risk	2.3422	– 0.0322	0.0117	– 0.0578	– 0.0115
Perceived performance risk	3.5713	– 0.0261	0.0108	– 0.0521	– 0.0088

role of perceptions about life insurance, the direct effect disappears. Therefore, we have advanced the mediating role of perceptions about life insurance on the relationship between prevention and the decision to purchase interest rate guarantees, and we have found evidence that financial literacy influences this relationship through the perceptions about life insurance. So far, financial literacy has been shown to influence the behavior of individuals with respect to their savings and retirement decisions (see, e.g., Lusardi and Mitchell 2007), as well as the amount of debt taken (see, e.g., Lusardi and Tufano 2015). This present paper provides evidence that financial literacy can moderate the relationship between prevention as an investment strategy and the perceptions about a financial product. Moreover, the paper shows that the indirect effect of prevention as

investment strategy on the intention to purchase a guarantee through the perceptions of unit-linked insurance depends on the level of financial literacy. This adds to the literature on financial literacy, demonstrating that its level can influence perceptions about a specific product and therefore influence the intention to purchase an additional safety feature for such a product. This is especially important since life insurance with a savings component is usually used for old-age provision and the previous research has shown that the presence of a guarantee can significantly impact the capital available for retirement, due to the high costs associated with the provision of guarantees (see, e.g., Lachance and Mitchell 2003; Sinha and Renteria 2005; Finkelstein et al. 2003; Renz and Stotz 2015).

Table 9 Summary of results

Variables	Perceived protection		Perceived transparency		Perceived performance risk		Intention to purchase IRG	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	2.755***	2.321***	2.834***	2.000***	2.670***	1.328**	2.537***	1.624***
Prevention	− 0.238***	0.467***	0.170***	0.521***	0.367***	0.481***	0.168***	0.059
Financial literacy		0.495***		0.713***		0.314*		
Prevention x financial literacy		− 0.096***		− 0.148***		− 0.058*		
Perceived protection								0.536***
Perceived transparency								0.198***
Perceived performance risk								− 0.084**
R ²	0.043	0.064	0.017	0.063	0.084	0.095	0.016	0.395

Significance: *** $p < .001$; ** $p < .05$; * $p < .01$

Last but not least, we have also tested the effects of covariates on the intention to purchase interest rate guarantees. The effects of gender, number of children, income, education, wealth and the extant knowledge of financial investments have proved to be statistically insignificant, as presented in Table 10. On the other hand, age has a negative effect on the intention to purchase interest rate guarantee ($\beta = -0.027$, p value = 0.000), whereas the knowledge of unit-linked products has a positive effect on the intention to purchase interest rate guarantees ($\beta = 0.121$, p value = 0.029). These results indicate that financial consumers who are familiar with unit-linked contracts are more willing to purchase interest rate guarantees. Further research could focus on why this might be the case.

In addition to the theoretical implications of the paper, we would also like to address some practical implications. First, due to the mediating role of perceptions about life insurance on the relationship between prevention as an investment strategy and the intention to purchase interest rate guarantees, insurers should develop a strategy of enhancing the customers' perceptions about life insurance rather than trying to sell the customers products with guarantees. Not only would this be more beneficial for

customers, who would benefit from more upside potential in their retirement accounts, but this would also reduce the insurer's costs associated with the provision of guarantees. One possibility for insurers to enhance these perceptions (increased perceived protection, increased perceived transparency and decreased perceived performance risk) would be through adequate marketing strategies.

Moreover, given the moderating role of financial literacy on the relationship between investment strategy and intention to purchase interest rate guarantees via perceptions about life insurance, the intention to purchase interest rate guarantee can be influenced by changing the level of financial literacy of consumers. By addressing financial literacy directly through educational programs that specifically target the issues of life insurance transparency, performance risk and the actual risk covered by such a product, customers can be made aware of the real costs and benefits of such an interest rate guarantee and conversely their intention to purchase such an additional feature can be influenced. Thus, it is crucial not only for insurers, but also for regulators to adequately address this issue.

Limitations and future research

One of the shortcomings of our model framework is that it predicts purchase intention, which does not automatically translate into actual purchase behavior. The previous research has demonstrated that when confronted with additional measures of actual behavior, there is low correlation between actual behavior and purchase intention (see, e.g., Foxall 2003). For example, a customer who has a purchase intention might refrain from buying a product if their willingness to pay is below the price at which the insurer would be willing to offer such a feature for the life insurance product. Therefore, additional research is needed in order to see whether customers who have a purchase

Table 10 Control variables

Control Variable	β	p value
Age	− 0.027	0.000
Gender	0.069	0.429
Number of children	0.050	0.241
Income	− 0.004	0.755
Education	0.005	0.775
Wealth	0.033	0.142
UL product knowledge	0.121	0.029
Extant knowledge of financial investments	0.003	0.948

intention have sufficient willingness to pay in order to cover the cost of such products.

Moreover, our results indicate that financial consumers who have extant knowledge of unit-linked contracts are more willing to purchase interest rate guarantees. Future research could further integrate the unit-linked product knowledge in the conceptual framework and analyze its impact on the perceptions about unit-linked insurance. The relationship between financial literacy, prior experience with financial products and the knowledge of the financial product—such as unit-linked insurance in the present case—could be tested as well. These interactions and the role of the previous experience with financial products in particular provide promising avenues for future research regarding decision-making processes for financial products.

In the present study, we have questioned customers whether they would be willing to purchase an interest rate guarantee. In a real-world scenario, it is more difficult to disentangle the willingness to purchase interest rate guarantees from the willingness to purchase long-term saving products or life insurance. Additionally, the paper suffers from the usual shortcomings of the use of surveys as a data collection methodology, such as endogeneity and hypothetical bias. While we believe that the present study represents an initial step into establishing the role between prevention as an investment strategy and the intention to purchase an interest rate guarantee via perceptions about life insurance and the level of financial literacy, an incentive-aligned experiment might provide more accurate results.

Conclusions

The question of how prevention influences the perceptions about life insurance and how this in turn affects the customers' willingness to purchase interest rate guarantees for life insurance contracts (or guarantees for long-term saving products in general) is of paramount importance for insurers, regulators and consumers alike. Guarantees are expensive features which can have a great impact on an individual's retirement account and it is crucial to understand the factors which determine their demand. It is important for insurance companies and regulators to understand the drivers behind consumers' intention to purchase interest rate guarantees. In general, the tendency of regulators has been to ensure safety for all participants in the financial markets, and therefore, regulatory measures such as mandatory interest rate guarantees, for example in participating life insurance, were taken. However, recent research shows that the one-size-fits-all approach to regulation is outdated, since different customers have different needs when it comes to protection through financial

regulation (see, e.g., Bühler et al. 2016; Milanova and Schreiber 2017).

In this paper, we investigate the determinants of the intention to purchase interest rate guarantees, which can give us further information about what drives customers to purchase such features in order to be protected against financial adversity. In the current financial environment, it is important to understand to what extent people are willing to purchase such product features that ensure them against bearing financial risk. In particular, such features represent an additional cost layer for insurance companies, which need to employ costly risk management measures in order to be able to offer guaranteed returns. Therefore, it is interesting to see under which conditions consumers actually have the intention to purchase such products. So far, several economic theories have tried to explain the demand for guarantees in life insurance products. In particular, expected utility theory has used the concept of risk aversion, while prospect theory has used loss aversion in order to explain preferences for guarantees, but none of these theories offer a satisfactory explanation for the demand for interest rate guarantees. In this paper, we build on one of the theoretical assumptions underlying the multi-cumulative prospect theory, namely that investors also care about interim changes in their portfolio value, and therefore, they prefer prevention as an investment strategy, in which they try to minimize the fluctuations in their portfolio. Therefore, the paper tries to investigate whether the desire for stable financial returns explains the demand for interest rate guarantees, while also accounting for other factors such as the attitudes toward life insurance and the level of financial literacy.

The literature on guarantees for life insurance products has so far focused mainly on valuation of guarantees under various different frameworks. The present paper is the first one to our knowledge to survey potential customers on their intention to purchase interest rate guarantees and to analyze the antecedents of the decision-making process. In the context of a low-interest rate environment, where insurers face difficulties in financing such products and consumers face the risk of poverty during retirement, it seems sensible to us to investigate whether consumers actually want such products and which are the antecedents of such a decision-making process.

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