Saving for a rainy day… or a trip to the Bahamas? How the framing of investment communication impacts retail investors

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Abstract

Little is known to date regarding how the framing of investment communication impacts retail investor propensity to engage with financial products. To explore this lacuna, we apply insights from regulatory focus theory and construal level theory, and we vary investment communications in terms of the motivation (protect versus achieve) and the time-horizon (distant versus near) presented in a 2x2 quasi-experimental design. We also include an analysis of investor characteristics and find that communication of 'short-term achieve' investments attract particularly risk-tolerant and sensation-seeking individuals, posing questions of responsibility towards potentially vulnerable groups. We also find that negative attitudes towards finance may be troublesome as they can stop individuals from engaging with 'long-term' investment products. Positive attitudes towards finance, on the other hand, lead investors to engage with 'protect' products of both 'short-' and 'long-term' horizon, highlighting benefits for individuals and society from interventions aimed at financial education and exposure. The study concludes by discussing insights for the literature and practitioners from the application of new theory and new data to the management of investment communications.

Keywords
Retail investors, communication, investment motivation, time-horizon, responsibility, framing

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INTRODUCTION

Choosing how to invest personal assets and for how long can be a difficult task for retail investors[1] (Bluethgen, Meyer and Hackethal, 2008; Bluethgen *et al*., 2008; Locke, Lowe and Lymer, 2015). Financial products are often advertised through eye-catching images. Graphs are used to indicate the potential future performance of investments based on past performance, while pictures and headlines are used to display the general motivation of the investment (e.g. a picture of an umbrella symbolising protection in stormy times, or a picture of a yacht symbolising excellent financial performance permitting investors the opportunity of purchasing luxury items).

However, investment communication is receiving criticism from regulatory bodies amid concerns over an ever increasing and confusing array of products on the market and a lack of knowledge of how the framing[2] of investment communication impacts investors' decision-making (Diacon and Hasseldine, 2007; FCA, 2017; Hunt, Stewart and Zaliauskas, 2015). Regulators such as the UK Financial Conduct Authority are trying to control potential pitfalls, for example through requests for clarifying written statements.[3] It has been questioned, however, whether small print textual information is as salient as images and headlines, and whether differently portrayed motivations can indeed manipulate investor reactions (Agnew and Szykman, 2005; Diacon and Hasseldine, 2007; Locke, Lowe and Lymer, 2015). Communicating investment options responsibly is a key management challenge for many organisations (Blankespoor, 2018; FCA, 2017; Kumar and Goyal, 2015; Wright *et al*., 2016). For example, since 2014, pensioners in the UK have had the option to self-invest or spend in entirety their pensions, and investment choices can impact their livelihood dramatically (Brown, 2011; FCA, 2017). Concerns have also been raised about potentially vulnerable groups, such as individuals attracted to seeking risks, individuals with low self-esteem, or individuals holding negative emotions towards the area of finance (Chaterjee, Finke and

Harness, 2011; Cobb-Clark *et al.*, 2013; FCA, 2017). From a practical and policy perspective, our research focusses on the impact of 'how' investment information is communicated, and to 'whom'. As choices around the framing and recipients of investment communication constitute variables under the control of communicators, we aim to generate actionable insights.

Theoretically, our study is positioned in the academic discussion of regulatory focus theory and construal level theory, as well as their interplay. The former theory informs the motivation that investment communications may display as promotion (achieve) versus prevention (protect) focused, while the latter theory informs the time-horizon framing of investment communications as distant (long-term) versus near (short-term). The application and empirical testing of the impact of these two theories is currently scarce in investment communication research. Our study thus contributes psychological theory to the debate in an increasingly important area of behavioural finance, namely in a broad sense how investors make choices between different types of assets (Brooks *et al.*, 2018, 2019; Browning and Finke, 2015; Costa, Carvalho and Moreira, 2019; Kannadhasan *et al.*, 2016; Nguyen and Noussair, 2014). While traditional economic models assume that investors are rational and operating in a world of full information, the evidence is strongly that at best they make decisions in a boundedly rational way since in the financial context the data is particularly hard to interpret (Fellner, Gueth and Maciejovsky 2009; Forgas, 1995).

This underlies the importance of context in financial decision-making processes and highlights how the assessment of investment communications related to risk and predicted return outcomes is subjective. This assessment can vary across people depending on investor characteristics and demographics as well as the current emotional state of the individual (Fehr-Dua *et al.*, 2011; Forgas and Bower, 1987; Mayer, DiPaolo and Salovey, 1990; Wright and Bower, 1992). In our study, we demonstrate the extent to which these factors can affect how

the framing and presentation of information can impact upon financial decision-making (Laskin, 2017; Petersen, Kushwaha and Kumar, 2015; Sivaramakrishnan, Srivastava and Rastogi, 2017; Whitehouse, 2017).

Our research also contributes to the behavioural finance literature on how people perceive discount rates and how they trade-off short-term versus long-term risk-return characteristics, building on existing work such as those by Sharpe (2011) and Anderson and Settle (1996). Given that almost all of finance values assets using some sort of risk-adjusted discounted cashflow analysis, our findings have potentially important implications regarding how retail investors choose between assets where they can quickly get their money back without losses compared with those where they may need to be willing to hold on for a prolonged period.

As framing effects may be particularly important when communicating with vulnerable groups, we explore the impact of investor characteristics to nuance our findings (Agnew and Szykman, 2005; Kotlikoff, Johnson and Samuelson, 2001; Tegarden, 1999). Previously, scholars have proposed person-related variables (such as self-esteem, sensation-seeking, positive and negative emotions towards life – see e.g. Grable, Britt and Webb, 2008; Sivaramakrishnan, Srivastava and Rastogi, 2017) as well as finance-related variables (such as financial literacy, financial satisfaction, attitude towards financial risk – see e.g. Grable and Joo, 2004; Hillenbrand *et al*., 2019, Perry and Morris, 2005) as important factors in this context, but have not experimentally explored how such characteristics may result in different responses to the same communication stimuli (Blankespoor, 2018; Petersen, Kushwaha and Kumar, 2015; West *et al*., 2016). We also address concerns that the study of emotions, both positive and negative, tends to be neglected in the behavioural finance literature, which often focuses on cognitive and behavioural variables (Brooks *et al*., 2018, 2019; Browning and Finke, 2015; Costa, Carvalho and Moreira, 2019; Kannadhasan *et al*., 2016). We include the analysis of a range of

positive and negative emotions as felt by retail investors towards their current life and the area of finance, as well as emotions felt towards financial products.

On the following pages, we review literature to develop the overarching theoretical framework that guides the methodology of the two empirical studies, before offering a discussion and conclusions from our findings.

THEORETICAL FRAMEWORK

To develop our theoretical framework and hypotheses, we draw on regulatory focus theory (Florack, Keller and Palcu, 2013, Higgins, 1998) and construal level theory (Trope and Liberman, 2000, 2010). We explore whether investment communication (from here on abbreviated as IC) that is varied in terms of the motivation and time-horizon, while the actual investment detail is kept constant, impacts retail investor propensity to engage with financial products (study 1).[4] Furthermore, we explore whether investor characteristics have an impact on this interplay (study 2). Figure 1 graphically summarises our theoretical framework and signals the elements that constitute the foci for studies 1 and 2.

-Figure 1 about here-

Investment motivation

Investment motivation is defined as a general reasoning that a message portrays as the aim of the investment, i.e. achieving gains versus protecting against losses (Kahneman, 2011; Levin, Schneider and Gaeth, 1998). We build on the psychological theory of regulatory focus (Avnet and Higgins, 2006; Higgins, 1998), which differentiates between a promotion-focus (on accomplishments and gains) and a prevention-focus (on safety and responsibilities in human decision-making). Petersen *et al*. (2015) pointedly observe that the marketing efforts of

financial services firms either encourage customers to avoid risk or to leverage opportunities. By framing investment messages as "achieve/protect", this study speaks to the application of regulatory focus theory in economic contexts (Cesario and Higgins, 2008; Florack, Keller and Palcu, 2013; Lee and Aaker, 2004). The current literature lacks a theoretical and empirical examination of the nuanced emotional, cognitive and behavioural responses of retail investors to IC framing based on regulatory focus theory (Holler *et al*., 2008; Levin, *et al*., 2002; Spiegel, Grant-Pillow and Higgins, 2004).[5]

Building on established measurement approaches for positive and negative affect in the psychology literature (Crawford and Henry, 2004), a range of both positive and negative emotions appear relevant to our study's context. Emotional responses to different IC frames may vary from positive emotions such as excitement and enthusiasm to negative emotions such as fear and irritation. By including but separating a number of positive and negative emotions we aim to gain a differentiated insight into framing effects. Similarly, cognitive engagement with financial products can range from assessment of IC as informative and attractive to dull or confusing (Kahneman, 2011). Behavioural engagement in a consumer-type context is often linked to intended responses such as actively engaging with a product (e.g. following up with an information session) or advocacy behaviour (e.g. recommending the product to others) (Hillenbrand *et al*., 2019).

Among the few available studies, Wytykowska and Gabińska (2015) and Fürst, Ghisletta and Lubart (2016) find generally that a promotion orientation can lead to greater cognitive engagement and can also spurt emotional engagement processes such as feelings of curiosity. Psychologically, a focus on possible accomplishments and gains is likely to broaden one's imagination and trigger vivid thoughts and strong emotions, while a focus on possible losses is said to often limit cognitive agility and engagement (Dóci and Hofmans, 2015; Dóci *et al*.,

2020; Fredrickson, 2004). We thus believe that it is in line with current knowledge to hypothesise that ICs with an "achieve" motivation will lead to a deeper emotional response (whether positive or negative) and more cognitive engagement. In terms of behavioural engagement, Ganzach and Karsahi (1995) find that prevention framing has a stronger effect on individuals' behaviours related to credit card use compared to promotion framing. As people generally tend to behave in a more risk-tolerant fashion when motivations are framed negatively (i.e., as loss protection) than if motivations are framed positively (i.e., as gain or achievement) (Kahnemann, 2013; Kühberger, 1998; Levin, Schneider and Gaeth, 1998), one may expect that 'protect' motivations elicit stronger behavioural responses (such as booking advisor sessions or recommending the product) than 'achieve' motivations (Holler *et al.*, 2008). We thus formulate the following hypotheses:[6]

Hypothesis 1a: The framing of IC as "achieve" motivation has a stronger impact on retail investor propensity to engage with financial products ***emotionally*** (both positively and negatively) than "protect" motivation framing.

Hypothesis 1b: The framing of IC as "achieve" motivation has a stronger impact on retail investor propensity to engage with financial products ***cognitively*** than "protect" motivation framing.

Hypothesis 1c: The framing of IC as "protect" motivation has a stronger impact on retail investor propensity to engage with financial products ***behaviourally*** than "achieve" motivation framing.

Time-horizon

Time-horizon is defined as the timespan over which an individual investor expects to hold the financial product that they have purchased (Shafi *et al.*, 2011, p. 347). Time-horizon has been

suggested to have a significant impact on investment behaviour (Benartzi and Thaler, 1999; Siebenmorgen and Weber, 2004), although with inconclusive empirical findings as to its nature and directionality. For example, Klos, Weber and Weber (2005) find that individuals who have long-term time-horizons tend to choose riskier investments (see also Anderson and Settle, 1996; Benartzi and Thaler, 1999; Schooley and Worden, 1999) while scholars such as Albrecht, Maurer and Ruckpaul (2001) suggest that retail investors become less risk tolerant with longer time-horizons. Despite contradictory empirical findings, scholars widely agree that people depart from rationality in the sense that they do not follow linear behaviour across different time spans (Barberis, Huang and Thaler, 2006; Blankespoor, 2018).[7]

The psychological theory of construal level (Trope and Liberman, 2000, 2010) describes the phenomenon of inter-temporal discounting by explaining that individuals tend to have abstract thoughts on temporally distant objects and concrete thoughts on temporally close objects. As such, it seems plausible to assume that temporally close objects, i.e. ICs with a "short-term" time-horizon, will achieve higher cognitive engagement than those with a "long-term time-horizon", due to the more concrete nature of stimulated thoughts and the need for concrete action in the shorter term (i.e. a sense to make an urgent decision). Abstract thoughts, on the other hand, triggered by temporally distant objects, may not require the same intensity of immediate cognitive engagement (i.e. no urgent action required), but may still stimulate strong and well-articulated emotional reactions, such as a sense of desire or revulsion. Indeed, a vision of one's distant future may trigger strong emotional judgements of one's life journey and achievement, which can be very emotive, even if abstract. Interestingly, the existing literature does not offer much insight on the emotional responses to construal level theory. Based on our above reasoning, however, we believe it is plausible that ICs with "long-term" time-horizons may achieve weaker cognitive engagement, but strong emotional engagement, both positive and negative (Han, Duhacheck and Agrawal, 2014; Wiesenfeld *et al.*, 2017). In terms of

behavioural responses, different utilities attributed to outcomes in the near versus far future mean that people tend to discount (undervalue) future outcomes relative to near outcomes (Green and Myerson, 2004; Soman *et al*., 2005; Takahashi *et al*., 2009) However, construal level theory also suggests that people's discounting rates are affected by the amount of value placed on objects: Small perceived values are discounted faster than large perceived values. As "long-term" horizons normally increase the value exhibited in ICs, this may counter-balance the temporal discounting process and make behavioural responses - such as intentions to book advisory sessions or to recommend a financial product - similarly likely for near and distant ICs. As such, we hypothesise:

Hypothesis 2a: The framing of ICs with "short-term" time-horizons has a weaker impact on retail investor propensity to engage with financial products ***emotionally*** (both positive and negative) than "long-term" framing.

Hypothesis 2b: The framing of ICs with "short-term" time-horizons has a stronger impact on retail investor propensity to engage with financial products ***cognitively*** than "long-term" framing.

Hypothesis 2c: There is no significant difference in retail investor propensity to engage with financial products ***behaviourally*** due to "short-term" versus "long-term" framing of ICs.

The interplay between investment motivation and time-horizon

A small but informative number of studies specifically explore the interplay between construal level and regulatory focus theory – albeit across different contexts. Overall, there is a consensus emerging in the literature that promotion-focused approaches partner well with abstract/long-term construal while prevention-focused aligns well with concrete/short-term. Transferring this insight to the current study would suggest that the two framings "protect/short-term" and

"achieve/long-term" outperform the other two scenarios in terms of engaging retail investors. This hunch is supported by scholars such as Park and Morton (2015) who find in the context of advertising communication that individuals are more easily persuaded by "achieve"-type frames when making "long-term" decisions, than "protect"-type frames. Likewise, Sungyong and Hyo (2014) find in the context of financial consumer behaviour that promotion-focused consumers prefer investment products exhibited through abstract messaging, while prevention-focused consumers prefer investment and deposit-type financial products and concrete messaging.

However, little is known to date about why these interactions may be particularly impactful. In this study we aim to shed light on the question of whether they trigger particularly strong emotional, cognitive and behavioural responses (Penningtona and Roeseb, 2003; Raue, Streicher and Lerner, 2015; Read, 2004; Soman *et al*., 2005). In the financial context, achieving high gains is typically more likely in the long-term (unless one is strikingly lucky). Hence, a long-term time-horizon puts an "achieve" frame of mind in focus and may trigger strong responses on all fronts: emotionally due to a sense of excitement; cognitively due to hopeful assessment of high achievements; behaviourally due to an urge to actively make such outcomes possible. Likewise, in the short-term, a "protect" aspiration may be deemed important, particularly in financially uncertain times, and may appear emotionally, cognitively and behaviourally appealing. Indeed, Berezowska, Fischer and van Trijp (2018) find in a health context a strong effect on cognitive and behavioural responses of prevention-focused individuals for "short-term" communications, and Kim and Kim (2018) find similar results in consumer online communication. From the available evidence, the following hypotheses can be derived.

Hypothesis 3a: The "protect/short-term" framing is expected to yield stronger impacts on the emotional, cognitive and behavioural engagement of retail investors than the two direct comparison framings "achieve/short-term" and "protect/long-term".

Hypothesis 3b: The "achieve/long-term" framing is expected to yield stronger impacts on emotional, cognitive and behavioural engagement of retail investors than the two direct comparison framings "achieve/short-term" and "protect/long-term".

Investor characteristics

Scholars have previously suggested to include investor characteristics that relate to context and personality-type variables (Estelami, 2016; Grable, Britt and Webb, 2008; Grable and Roszkowski, 2008; Holler *et al*., 2008; Kannadhasan *et al*., 2016; Lerner *et al*., 2015; Perry and Morris, 2005). We focus on conceptualising and empirically comparing the impact of investor characteristics under different framing conditions. We use the summary terms 'person-related' (referring to personality and general life characteristics) and 'finance-related' variables (referring to domain-specific and investment-related characteristics of investors) (Hillenbrand *et al*., 2019).

Person-related and finance-related variables

Scholars exploring person-related variables in investor decision-making (see for example Hirshleifer and Shumway, 2003; Kamstra, Kramer and Levi, 2003; Lerner *et al*., 2015), suggest self-esteem (Arch, 1993; Grable, Britt and Webb, 2008; Judge *et al*., 1999), sensation seeking[8] (Grable and Joo, 2004; Wong and Carducci, 1991) and general positive/negative emotions towards life as relevant factors (Lerner *et al*., 2015; Loewenstein *et al*., 2001). Relevant finance-related factors have been suggested to include attitude towards financial risk (MacCrimmon, Wehrung and Stanbury, 1988; Sung and Hanna, 1996; Weber, Blais and Betz,

2002; Yao, Hanna and Lindamood, 2004), financial satisfaction (Grable, Britt and Webb, 2008; Hira and Mugenda, 1998; Porter and Garman, 1993; Robb and Woodyard, 2011), and the positively/negatively felt emotion towards finance/investment (Lerner *et al*., 2015).

We could not find any existing literature that discusses the impact of the above-mentioned characteristics on the interplay between IC constructs building on construal level and regulatory focus theory. The closest empirical studies are those by Grable and colleagues (for example, Grable (2000), Grable and Joo (2004), Grable, Britt and Webb (2008) and Grable and Roszkowski, 2008), which, however, focus on risk aversion. The exploration of the impact of person- and finance-related variables in our study is thus exploratory in nature due to the lack of existing literature to discuss specific hypotheses. In line with other scholars including exploratory elements in quantitative studies, we aim to provide initial empirical insights as to which investor characteristics may hold practically relevant findings (Suzuki and DeKeyser 2017; Van Dun, Hicks and Wilderom, 2017).

STUDY 1

Methodology

Our experimental design follows a classic 2x2 ANOVA approach (Cook, Campbell and Day 1979). We systematically vary the product description and imagery in terms of investment motivation and time-horizon[9] and measure impacts on our outcome variable 'retail investor propensity to engage with financial products' (conceptualised in terms of emotional, cognitive and behavioural engagement).[10]

To avoid biases towards existing financial products, all information is created specifically for this study. In consultation with experts in the field, our ICs are designed as investment portfolios with a range of actual market specifications. The ICs differ between experimental

groups as to the length of time for the investment, and whether the product can be described as an income ('protect') or growth ('achieve') portfolio, supported by images of protective hands ('protect') or growing plants ('achieve'). The ICs as well as the name of the financial advisory firm (DeltaInvest) are invented for the purpose of the study and respondents are fully debriefed.[11] Four ICs deliberately manipulate the investment motivation and time-horizon:[12] (1) achieve/short-term (AS); (2) achieve/long-term (AL); (3) protect/short-term (PS); and (4) protect/long-term (PL) – see appendix 1 for all manipulation presentations.[13] The investment detail (i.e., the suggested growth rates of the investment in good/bad market states) are calibrated using actual market data at the time of collecting data (summer 2017) to be realistic and constant.

Sampling. Respondents are UK retail investors recruited by Qualtrics in June 2017 who hosted our 15-minute survey on their online platform. Participants were recruited to represent an equal spread in key demographics (see table 1) and were randomly assigned to one of four experimental conditions. To avoid sample selection bias, Qualtrics employs routers which are proportioned to the general population. More importantly, each router was randomised for data collection, avoiding self-selection and/or source bias. We also include a set of screening questions to ensure an equal distribution of age of participants, gender and income.

- Table 1 about here -

Measures. Measures of emotional engagement with ICs are adapted from the PANAS scale (Watson, Clark and Tellegen, 1988); cognitive engagement is measured as positive evaluations and credibility (Baker and Churchill, 1977; MacKenzie and Lutz, 1989). Measures for behavioural engagement are adapted from the literature (Helm, 2007; Sen, Bhattacharya and Korschun, 2006) – see appendix 2 for all items. All measures utilise five-point Likert-type scales and are pre-tested and piloted.

Manipulation checks. Participants are asked a set of questions to evaluate the motivation and time-period of each portfolio (i.e. "*the offered portfolio is aimed at lucrative returns/protecting money"; "(…) over short/long period of time"*). Results confirm significant main effects of the 'achieve' , $F(1, 785)=10.516$, $p=0.001$, $\eta^2_{partial}=0.013$ ($M_{achieve}=3.22$, $SD=0.612$) and 'protect' manipulation, $F(1, 785)=28.632$, $p<0.001$, $\eta^2_{partial}=0.035$ ($M_{protect}=3.21$, $SD=0.667$), as well as a significant main effect of the 'short-term', $F(1, 785)=46.331$, $p<0.001$, $\eta^2_{partial}=0.056$ ($M_{short}=3.05$, $SD=0.768$) and 'long-term' manipulations, $F(1,785)=25.809$, $p<0.001$, $\eta^2_{partial}=0.032$ ($M_{long}=3.49$, $SD=0.634$).

Results

Utilising SPSS Statistics 24, the data are assessed for missing values,[14] outliers and normality. This led to the exclusion of 'straight-liners' and outliers, with a final sample of N=787. The data are analysed using a series of 2x2 ANOVAs conducted separately for each manipulation scenario. All of the main effect results are summarised in table 2, grouped into emotional, cognitive and behavioural outcome variables.

- Table 2 about here -

In addition to the main effects, 2x2 ANOVAs reveal a significant interaction effect under 'cognitive evaluation of IC' for 'dull/interesting', $F(1, 785)= 4.503$, $p=0.034$, $\eta^2_{partial}=0.006$: participants who are exposed to the PS/AL frames evaluate product information as significantly more interesting than individuals who are exposed to PL/AS (see table 3). Furthermore, appendix 3 outlines a summary of the analysis of control variables in study 1.

- Table 3 about here -

Summary study 1

Our findings partially support hypotheses 1a and 1c and reject hypothesis 1b. Specifically, products with a 'protect' framing are more likely to be recommended to family and friends and are seen as more trustworthy and less biased. As people typically have the best interest of their family and friends at heart, the 'protect' framing may provide as a safe and trusted choice. Products with 'achieve' framing are perceived as more eye-catching, while also eliciting more negative emotions of fearfulness and nervousness. Hence, in terms of attracting attention and eliciting emotions, even if mixed positive and negative emotions, the 'achieve' framing seems more compelling and exciting. Products with a 'short-term' time-horizon framing elicit more negative emotional engagement, by evoking emotions such as shame, sadness and anger but are also perceived cognitively as more believable than 'long-term' products. As such, our findings reject hypothesis 2a, partially support hypothesis 2b (as 'short-term' framing elicits significantly stronger cognitive engagement on the believability item, but not on others) and support hypothesis 2c (as no significant differences between behavioural responses are found due to time-horizon framings).

Finally, our findings partially support hypotheses 3a and 3b as participants exposed to 'short-term/protect' and 'long-term/achieve' frames evaluate the product information as significantly more interesting than competing frames.

STUDY 2

Methodology

The aim of study 2 is to explore and compare the predictive relevance of person-related and finance-related factors across the four different experimental conditions. The data for study 2 were collected in June 2017 alongside those for study 1. The specific data analysis for study 2 includes model assessment with regression modelling as well as multi-group analyses. Partial

least squares structural equation modelling (PLS-SEM) is used for a number of reasons (Hair *et al*. 2019a, Sarstedt *et al*. 2016; Chin et al. 2020): (1) the complex conceptual nature of the models with eight exogenous latent variables in 2x2 experimental conditions; (2) the purpose of identifying key drivers in different framing conditions; (3) the occurrence of some non-normal data distribution properties when assessing z-values for skewness/kurtosis; and (4) the use of a single-item measure (see also Hair *et al*., 2017, 2019b; Hair, Ringle and Sarstedt, 2013; Ringle, Sarstedt and Straub, 2012; Vinzi *et al*., 2010). PLS-SEM is operationalised within the software SmartPLS 3.3.2 (Ringle, Wende and Becker, 2015), group differences are tested with nonparametric PLS-MGA (Henseler, Ringle and Sinkovic, 2009; Sarstedt, Henseler and Ringle, 2011).[15] Investment motivation is kept constant to test short-term versus long-term time-horizon differences (AL versus AS and PL versus PS). Time-horizon is kept constant to test for differences between the 'achieve'/'protect' motivations (AL versus PL and AS versus PS). We control for age, gender and financial experience.

Measures. Scales for sensation-seeking, self-esteem and financial satisfaction are derived from previously published and peer-reviewed research – see appendix 2 for references and a full record of items. Attitude towards financial risk is measured using an industry-relevant measure developed by Distribution Technology (DT), a UK-based provider of financial planning tools. Harman's single factor test (Harman, 1976) and the Lindell and Whitney's (2001) test suggest that the data collected are not likely to suffer from common method bias.

Measurement assessment Results are obtained from separate statistical models (emotional, cognitive and behavioural engagement with the financial product as three separate outcome variables – see appendix 4 for images of the final model set-up). Assessments of measurement attributes with Cronbach's Alpha (Cronbach, 1951), Composite Reliability (Jöreskog, 1971), Consistent reliability coefficient (rho_A) (Dijkstra and Henseler, 2015), Average Variance

Extracted (AVE) and HTMT (Franke and Sarstedt, 2019; Henseler, Ringle and Sarstedt, 2015) reveal satisfactory levels of reliability and validity (see appendix 5 for full reports).[16] Bootstrapping procedures with 5,000 subsamples, bias-corrected and accelerated bootstrap confidence intervals[17], are applied to assess the significance of the path relationships proposed (Hair, Ringle and Sarstedt, 2011; Hair *et al*., 2016). As a result, the structural attributes are deemed satisfactory with acceptable levels of predictive accuracy. Specifically, for emotional engagement as the outcome, the coefficient of determination is moderate: $R^2_{positive}$=0.485 and $R^2_{negative}$=0.396, with eight of 16 paths significant. For cognitive engagement, the coefficient of determination is weak in size, R^2=0.189; with two of eight paths significant. For behavioural engagement, the coefficient of determination is weak-to-moderate in size, R^2=0.315; with four out of eight paths significant.

Having established the model's in-sample explanatory power (R^2), we apply PLSpredict (Dolce *et al*., 2017, Shmueli, 2010; Shmueli and Koppius, 2011; Shmueli *et al*., 2016) to establish out-of-sample predictive power. Following Shmueli *et al*. (2019), PLSpredict analysis is run with k=10 folds (given the total sample size of 787) and repetitions r=1 (i.e. predictions are based on a single model, i.e. not on a group of models) (Shmueli *et al*., 2016). Comparisons of PLS-SEM values and means (linear model regression – LM) are conducted. The analysis of the $Q^2_{predict}$ index confirms that predictions outperform the most naïve benchmark (above 0) (Shmueli *et al*., 2019). Root mean squared error (RMSE) is compared across PLS-SEM and LM benchmark values given low levels asymmetry of distributions (Hair, Howard and Nitzl, 2020; Shmueli *et al*., 2019). Mean absolute error (MAE) values are also reported (see appendix 6 for full reports).

The results of PLSpredict[18] reveal low predictive power for the 'positive emotional engagement' outcome variable, high predictive power for 'negative emotional engagement'

and medium predictive power for 'cognitive engagement'. The 'behavioural engagement' outcome variable shows a lack of predictive power but is retained for reasons of transparency. Unsatisfactory out-of-sample prediction results could be caused by the explanatory context of the models (Chin et al., 2020; Shmueli, 2010).

Multi Group Analysis Before conducting multi-group analysis (PLS-MGA), measurement equivalence is assessed using the measurement invariance of composite models (MICOM) procedure (Henseler, Ringle and Sarstedt, 2016). MICOM includes three steps: (1) configural invariance, (2) compositional invariance and (3) equality of composite means and variances assessments (Henseler, Ringle and Sarstedt , 2016; Matthews, Hair and Matthews, 2018). Step 1 is ensured by (a) identical measurement and structural model configuration for each of the models tested; (b) the same full data set used for each comparison; (c) identical algorithm settings. For steps two and three, we find partial MICOM established across group comparisons within all models with the exception of a few occurrences where compositional invariance is not confirmed. Variables that lack compositional invariance are not included in the subsequent PLS-MGA analysis (see a full report with MICOM results in appendix 7). PLS-MGA is run with 1,000 bootstrap samples, given the complexity of the three models and the number of groups of comparison. Appendix 8 contains a summary of the group-specific results across the three outcome variables; appendix 9 contains the full MICOM and group-specific results reports from the analysis of control variables age, gender and financial experience. The findings are organised by investment motivation and time-horizon below.

Investment motivation results

'Achieve' versus 'protect' for the 'short-term' time-horizon (AS vs PS). We find two significant differences for emotional engagement: (1) positive emotions towards life and (2) self-esteem both link significantly more strongly to emotional engagement with financial product in PS

than in AS (β_{PS}=0.203***, β_{AS}=0.067 n.s., p=0.908 AND β_{PS}=-0.217**, β_{AS}=0.040 n.s., p=0.031 respectively). For cognitive engagement: (1) attitudes towards financial risk and (2) positive emotions towards life both link significantly more strongly to cognitive engagement with the financial product in AS than in PS (β_{AS}=0.208**, β_{PS}=-0.055 n.s., p=0.030 AND β_{AS}=0.184**, β_{PS}=-0.036 n.s., p=0.046 respectively), and (3) positive emotions to finance has stronger links in PS than in AS (β_{PS}=0.440**, β_{AS}=0.132 n.s., p=0.978).

'Achieve' versus 'protect' for the 'long-term' time-horizon (AL vs PL). We find one significant difference for emotional engagement: negative emotions to finance links more strongly to negative emotional engagement towards the financial product in PL than in AL (β_{PL}=0.685***, β_{AL}=0.411***, p=0.950). For cognitive engagement towards the financial product: positive emotions to finance link more strongly to cognitive engagement towards financial product in PL than in AL (β_{PL}=0.393***, β_{AL}=0.156 n.s., p=0.957). For behavioural engagement towards the financial product: for individuals high on sensation-seeking, the path is stronger in AL than in PL (β_{AL}=0.156**, β_{PL}=0.034 n.s., p=0.099).

Time-horizon results

'Short-term' versus 'long-term' in 'achieve' (AS vs AL). We find three significant differences for emotional engagement: (1) the path from negative emotions towards life to negative emotional engagement towards the financial product is significantly stronger for AS than for AL (β_{AS}=0.206***, β_{AL}=0.010 n.s., p=0.933[19]); (2) the path between positive emotions towards life and positive emotional engagement towards the financial product is significantly stronger for AL than for AS (β_{AL}=0.223**, β_{AS}=0.067 n.s., p=0.074); and the path from sensation seeking to positive emotional engagement towards the financial product is significantly stronger for AS than for AL (β_{AS}=0.178***, β_{AL}=-0.051 n.s., p=0.995). Finally, we find one significant difference for cognitive engagement: the link from positive emotions towards life

to cognitive engagement with the financial product is significantly stronger for AS than for AL (β_{AS}=0.183**, β_{AL}=-0.009 n.s., p=0.911).

'Short-term' versus 'long-term' in 'protect' (PS vs PL). We find two significant differences for emotional engagement: the path from positive emotions towards life to positive emotional engagement with the financial product is significantly stronger for PS than PL (β_{PS}=0.203***, β_{PL}=0.067 n.s., p=0.902); (2) the path between self-esteem and positive emotional engagement is significantly stronger but negative for PS than for PL (β_{PS}=-0.217**, β_{PL}=-0.019 n.s., p=0.072).

Summary study 2

To ease understanding of our results, a summary of the significant findings with suggested interpretations is offered in table 4.[20]

- Table 4 about here -

The largest number of significant differences is found with emotional engagement as the outcome variable – an interesting theoretical finding considering that much of the behavioural finance literature focuses on cognitive/behavioural studies. Particularly noteworthy is the role that positive emotions towards life and finance play in eliciting positive emotional engagement under various framing conditions. This is especially true for long-term time-horizons, which poses the question as to whether it may be essential for ICs to elicit emotional engagement to attract retail investors to long-term investments. At the same time, retail investors with positive emotions towards life also exhibit particularly strong cognitive and behavioural engagement under short-term achieve conditions. From a theoretical perspective, the differentiated role that positive emotions towards life play in triggering emotional engagement with products (long-term), and cognitive/behavioural engagement (short-term achieve frame), stresses the vital importance of including and differentiating between emotional/cognitive/behavioural variables

under different time-frames. The findings suggest that the mechanism to build cognitive/behavioural engagement can indeed complement as well as vary from the route to emotional engagement.

Retail investors with high sensation seeking scores seem to be particularly driven by an achievement orientation, whereby their emotional interest is particularly piqued by the prospect of short-term achievements. Individuals with high attitude towards financial risk scores also show significantly stronger cognitive engagement with short-term achieve financial products. Hence retail investors with a tendency to accept financial risks and seek sensations may be vulnerable to risks associated with short-term achieve IC and may not benefit adequately from financial products that are of a longer-term protective nature. On the contrary, retail investors who are highly financially satisfied tend to engage emotionally more strongly with long-term protect than long-term achieve frames.

Furthermore, noteworthy is the finding that retail investors with negative emotions towards finance respond particularly negatively to long-term protect ICs, thereby raising questions of potential vulnerability of different groups of investors. Negative emotions towards life, on the other hand, seem to keep investors away from short-term achieve products. The former finding is interesting from a practical perspective as attitudes towards finance can be influenced through educational interventions and related policy activities, while the latter finding may indicate a spill-over effect of negative life emotions to other areas, and may be useful to consider in the broader context of mental health as a wider protective mechanism (see Kooij-de Bode, van Knippenberg and van Ginkel (2010) on the 'good effects of bad feelings').

Control variables

The findings that stand out as particularly noteworthy from the analysis of the control variables include that female investors tend to engage emotionally more strongly with financial product that their male counterparts. Risk-seeking older participants are more likely to engage cognitively with financial product than younger investors. Participants who are inexperienced financially are more likely to feel negative towards ICs when they feel negative towards life as well. Interestingly, however, inexperienced participants are less likely to engage behaviourally even if they are feeling particularly positive towards finance, while experienced participants are more likely to engage behaviourally if they are positive towards finance.

DISCUSSION OF THE CONTRIBUTIONS FROM BOTH STUDIES

Theoretical contributions

In the light of what we have found, we see three key areas for theoretical contributions. First, our findings advance regulatory focus theory by suggesting that promotion/prevention frames of ICs elicit nuanced emotional, cognitive and behavioural outcomes. Our findings also advance construal level theory by finding stronger effects of "long-term" IC framing on some emotional and cognitive engagement variables, but no difference on behavioural engagement outcomes. While previous work has debated the potential relevance of investment motivation and time-horizon in principle (Klos, Weber and Weber, 2005; Malkoc and Zauberman, 2006; Petersen, Kushwaha and Kumar, 2015; Stathopoulos and Voulgaris, 2016), this is the first study that applies insights from both regulatory and construal level theory to IC while also differentiating between emotional/cognitive/behavioural outcomes. To the best of our knowledge, our study is also the first empirical work in the area of IC that confirms the particular strength of "achieve/long-term" and "protect/short-term" framing interactions.

Second, we challenge the theory in behavioural finance that utilises a "one-size-fits-all" conceptual approach. Building on the work of previous scholars (such as Grable, Britt and Webb, 2008; Holler *et al*., 2008; Lerner *et al*., 2015), we find that the framing of ICs interacts with the characteristics of the individual investor, thereby offering a theoretical explanation as to why the same IC may be perceived differently by different groups of individuals. Our findings outline how investor characteristics can help to make previously unanticipated consequences of organisational communication more anticipatable and allow for a theoretically grounded understanding of the responsible and differentiated management of IC (Money *et al*., 2012; Petersen, Kushwaha and Kumar, 2015).

Third, we suggest shifting the focus of the behavioural finance literature, that to date often focuses on cognitive and behavioural elements, to include the explicit examination and understanding of emotional factors (Ahlers *et al*., 2017; Damasio, 1994; Han, Lerner and Keltner, 2007; Lerner *et al*., 2015). Our findings suggest that retail investor emotional engagement emerges as the outcome with the highest number of statistically significant differences between experimental groups; we believe this provides a strong indication that the study of emotion-related factors (whether felt towards the area of finance or more generally in life) offers a promising base to theorise in a more informed way about investor propensity to engage with financial products (Barsade, 2002; Costa, Carvalho and Moreira, 2019; FCA, 2017; Newell, Lagnado and Shanks, 2007; Sivaramakrishnan, Srivastava and Rastogi, 2017; Staddon, 2017).

Practice and policy implications

From a practice and policy perspective, a consolidated summary of findings is provided in table 5 to illustrate in a simplified manner which predictor variables emerge as particularly important

differentiators between groups (summarised across outcomes for ease of reading). This high-level presentation can aid practitioners wanting to understand which IC frames are likely to be particularly attractive as well as problematic for specific groups of retail investors.

- Table 5 about here -

As table 5 illustrates, individuals high on sensation-seeking scores are particularly likely to engage with 'achieve'-oriented ICs. Likewise, while emotions towards life (positive and negative) play a particularly dominant role under 'achieve' conditions, emotions towards finance (positive and negative) emerge as particularly dominant under 'protect' conditions. This may suggest that retail investors who feel emotionally strongly about life are attracted to 'achieve'-type ICs, while retail investors who feel emotionally strongly about finance seem particularly attracted to 'protect'-type ICs. In order to provide specific guidance to managers and policy-makers wishing to communicate the features of financial products responsibly, we now discuss a number of scenarios emerging from our findings.

While individuals prone to sensation-seeking are likely to engage particularly strongly with achieve-frame motivations, it is interesting to note that this effect is felt even more strongly by female investors as well as by experienced retail investors. Likewise, individuals prone to accepting financial risks (high attitude to risk scores) show a particular appetite for achieve short-term ICs, a finding that is again more pronounced for female and younger investors. These two findings not only highlight the potential vulnerability of individuals taking financial risks or seeking sensations (which appears to be 'in-character'), but caution managers to be mindful in particular when communicating achieve short-term conditions to female investors, young investors and, interestingly, experienced investors, who may also be seeking higher risks and sensations. The latter group may feel particularly drawn to achievement scenarios due to a sense of excitement or potential investment successes they had before, while the former groups may generally feel more tempted by the possibility of large gains, possibly without appreciating

the potential for losses associated with riskier investments. It would be advisable for managers to more fully understand issues such as the motivation, financial knowledge and loss-bearing capacity of retail investors and how to engage retail investors in longer-term financial planning process (Bluethgen, Meyer and Hackethal, 2008; Bluethgen *et al*., 2008; Corter and Chen, 2006; Estelami, 2016). Policy makers and financial service organisations may collaborate to offer retail investors more comprehensive portfolios of products to manage the risks associated with one specific type of product (Agnew and Szykman, 2005; Barberis, Huang and Thaler, 2006).

Importantly, both male and female investors are more attracted to long-term investments if they feel positive towards the area of finance. In educational terms, this highlights the crucial role that financial education and exposure to financial decision-making has, suggesting that schools and other institutions play an important role to engage and inform young generations about financial matters (Hira 2012). Interestingly, this suggestion is in line with our finding that inexperienced investors also tend to feel more negative towards ICs overall, which again highlights the importance of providing retail investors with knowledge, experience and positive encounters. Young investors tend to engage more when they are financially satisfied – so the specific challenge is to engage with investors who are young, not financially satisfied, and need to gain knowledge and positive experience (Kannadhasan *et al*. 2016; Locke, Lowe and Lymer, 2015).

Limitations and areas for future research

A limitation of our research relates to the fact that we stop short of measuring actual behaviour, due to the experimental design of a fictitious investment company. However, the design ensured that the results are not confounded by the legacy and practice of a specific company, and allowed us to control our experimental conditions, which is an important factor

underpinning the theoretical importance of our work and sets the theoretical foundation for future work.

A further limitation of our research relates to the fact that, due to the number of variables in the design of our study, it is not possible to elaborate on the three-way interaction effects between IC frames, retail investor characteristics and control variables. While all significant results at the 2x2 experimental design level are displayed and the most pertinent results from the control variables are also included in our discussion, a detailed study of specific three-way interaction effects offers significant opportunities for future research.

Conclusions

Our research explores an issue of high importance for management theory and practice in the UK context and beyond – the impact that the framing of ICs can exert on retail investor engagement with financial products, with a nuanced exploration of how person-related and finance-related variables interact with motivation and time-horizon framings. In summary, our studies find significant framing effects of ICs on retail investor engagement and significant differences on the impact of investor characteristics. We believe that our studies provide ample grounds for further investigation and future theorising.

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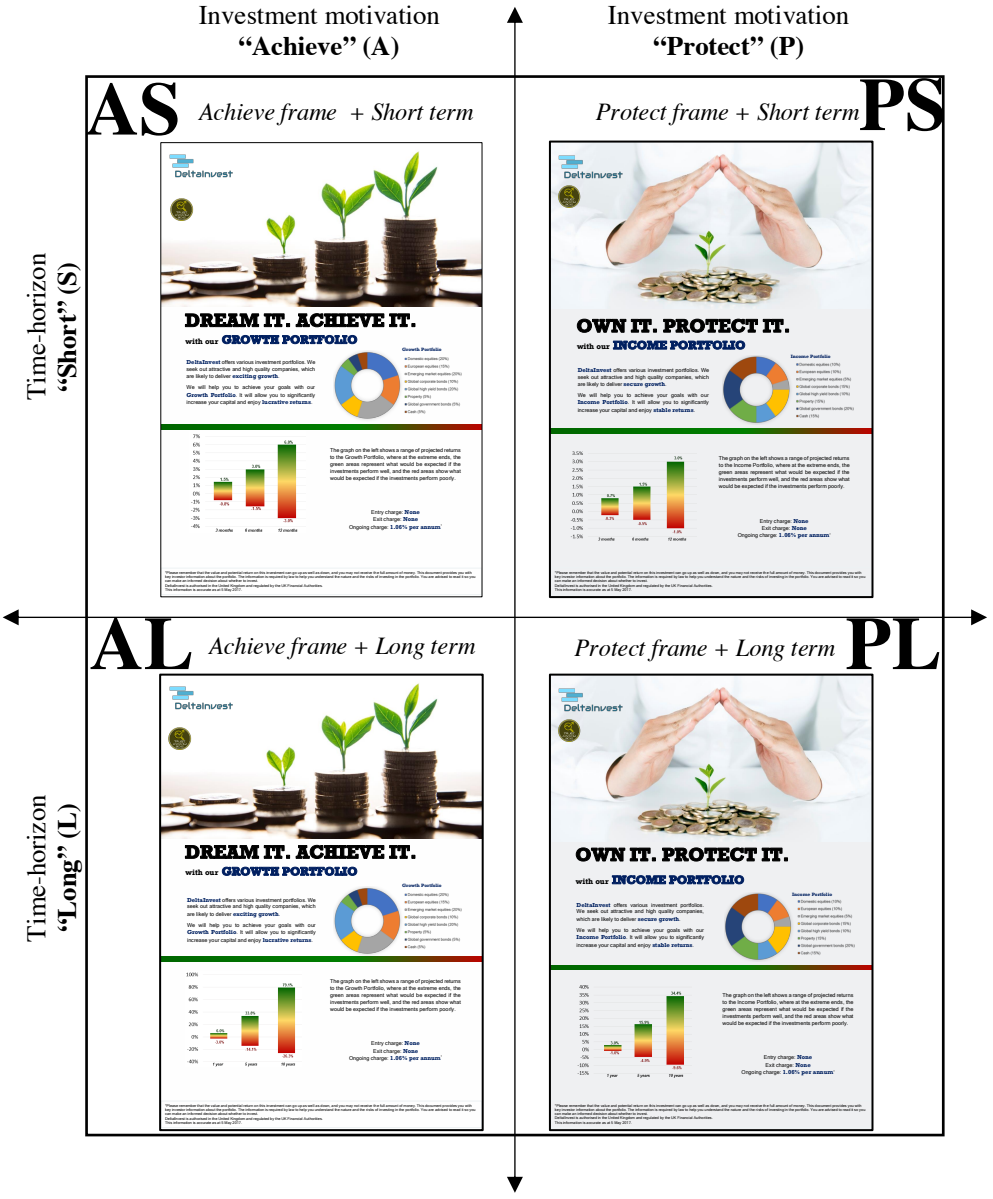
Appendix 1: Summary of experimental stimuli

Experimental conditions



Experimental condition 'Achieve Short':

Experimental condition 'Achieve Long':

Experimental condition 'Protect Short':

Experimental condition 'Protect Long':

Appendix 2: Measures

Self-esteem: Rosenberg (1965) adapted by Grable and Joo (2004)	*I take a positive attitude toward myself.* *I feel that I'm a person of worth, at least on an equal basis with others.* *I feel that I have a number of good qualities.* *I certainly feel useless at times.* *I am able to do things as well as most other people.* *On the whole, I am satisfied with myself.*
Sensation Seeking*: Arnett (1994) adapted by Grable and Joo (2004)*	*It's fun and exciting to perform or speak before a group.* *I would like to ride the roller coaster or other fast rides at an amusement park.* *I would like to travel to places that are strange and far away.*
Financial Satisfaction*: Grable and Joo (2004)*	*Overall, how financially satisfied are you at this point of your life?*
Attitude towards financial risk *is measured using an industry-relevant measure developed by Distribution Technology (DT), a UK-based provider of financial planning and front office wealth management systems.*	*The scale includes questions such as: "Compared to the average person, I take lower financial risks"; "I do not feel comfortable with financial uncertainty"; "Taking financial risks is important to me"*
PANAS*: Watson, Clark and Tellegen (1988; 1994)*	*Positive emotions: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active* *Negative emotions: distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid*
Cognitive engagement with financial product (attitudes): Baker and Churchill (1977)	*Dull–Interesting* *Unappealing–Appealing* *Unimpressive–Impressive* *Unattractive–Attractive* *Uninformative–Informative* *Confusing–Clear* *Not eye catching–Eye catching* *Ordinary–Distinctive*
Cognitive engagement with financial product (credibility): Flanagin and Metzger (2000)	*Inaccurate–Accurate* *Not trustworthy–Trustworthy* *Biased–Not biased* *Unbelievable–Believable* *Incomplete–Complete*
Behavioural engagement with financial product (adapted from related measures for the purpose of this study, see references in text)	*I would be interested to invest in the offered portfolio.* *I would be interested to receive more information regarding the offered portfolio from DeltaInvest.* *I would be interested to book a session with an advisor from DeltaInvest regarding the offered portfolio.* *I would recommend this portfolio to friends/family.* *I would be interested to talk to someone I trust about the portfolio.* *I would like to search for more information about the company DeltaInvest and the portfolio.*
Financial experience: (self-reported)	*Have you ever held a stocks and shares ISAs (Individual Savings Account) or put money into a unit trust or any other investment?*

Appendix 3: Analysis of control variables Study 1

Main effect for Investment Motivation

FRAME	GENDER		AGE				EXPERIENCE
	Biased (Cognitive engagement): F(1,783)=4.66, p=0.031, η^2=0.006		***Sad*** (Emotional engagement): F(1,783)=4.779, p=0.029, η^2=0.006		***Eye-catchy*** (Cognitive engagement): F(1,783)=4.740, p=0.030, η^2=0.006		
	Female	*Male*	*<50*	*>50*	*<50*	*>50*	
Achieve	3.07 (SD 1.003)	2.87 (SD 1.061)	1.31 (SD 0.748)	1.27 (SD 0.680)	3.32 (SD 1.104)	3.46 (SD 1.010)	n.s.
Protect	3.04 (SD 0.999)	3.15 (SD 0.988)	1.44 (SD 0.906)	1.17 (SD 0.507)	3.35 (SD 1.024)	3.16 (SD 1.137)	

Main effect for Time-Horizon

HORIZON	GENDER	AGE				EXPERIENCE			
		Appealing (Cognitive engagement): F(1,783) , p=0.026, η^2=0.006		***Informative*** (Cognitive engagement): F(1,783)=4.046, p=0.045, η^2=0.005		***Ashamed*** (Emotional engagement): F(1,783)=6.967, p=0.008, η^2=0.009		***Angry*** (Emotional engagement): F(1,783)=4.082, p=0.044, η^2=0.005	
		<50	*>50*	*<50*	*>50*	*Experienced*	*Unexperienced*	*Experienced*	*Unexperienced*
Short	n.s.	3.28 (SD 1.107)	3.19 (SD 1.180)	3.64 (SD 1.046)	3.62 (SD 1.044)	1.18 (SD 0.570)	1.32 (SD 0.759)	1.23 (SD 0.580)	1.45 (SD 0.944)
Long		3.51 (SD 1.046)	3.06 (SD 1.153)	3.80 (SD 0.900)	3.49 (SD 1.020)	1.19 (SD 0.527)	1.11 (SD 0.458)	1.20 (SD 0.572)	1.22 (SD 0.685)

Interaction effect motivation x time-horizon

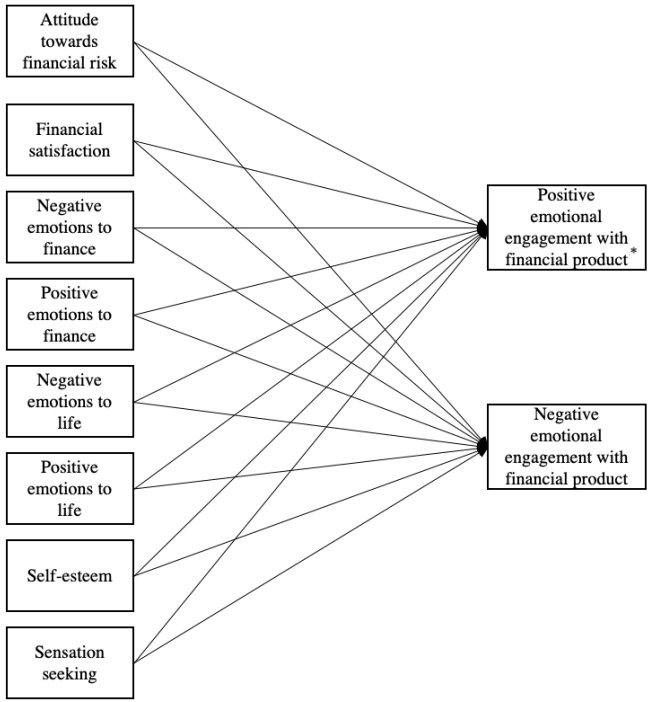
FRAME x HORIZON x GENDER ***Fearful*** (Emotional engagement): $F(1,779)=4.006$, $p=0.046$, $\eta^2=0.005$				
Achieve	Female	Long	1.92	(SD 1.063)
		Short	2.06	(SD 1.103)
	Male	Long	1.84	(SD 0.967)
		Short	1.74	(SD 1.065)
Protect	Female	Long	1.95	(SD 0.994)
		Short	1.84	(SD 0.993)
	Male	Long	1.44	(SD 0.713)
		Short	1.65	(SD 0.926)

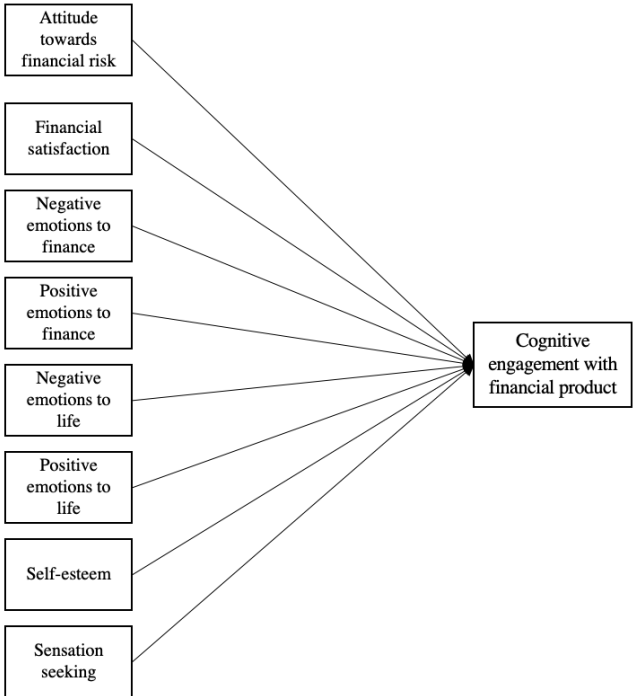
FRAME x HORIZON x AGE ***Distinctive*** (Cognitive engagement): $F(1,779)=4.899$, $p=0.027$, $\eta^2=0.006$				
18-49	Long	Achieve	3.11	(SD 1.075)
		Protect	3.35	(SD 0.978)
	Short	Achieve	3.24	(SD 1.054)
		Protect	3.17	(SD 1.030)
50+	Long	Achieve	3.38	(SD 0.830)
		Protect	3.05	(SD 1.028)
	Short	Achieve	3.34	(SD 0.990)
		Protect	3.34	(SD 1.067)

FRAME x HORIZON x EXPERIENCE ***Sad*** (Emotional engagement): $F(1,779)=3.793$, $p=0.052$, $\eta^2=0.005$				
Long	Unexperienced	Achieve	1.27	(SD 0.789)
		Protect	1.21	(SD 0.688)
	Experienced	Achieve	1.20	(SD 0.524)
		Protect	1.26	(SD 0.707)
Short	Unexperienced	Achieve	1.32	(SD 0.768)
		Protect	1.48	(SD 0.951)
	Experienced	Achieve	1.36	(SD 0.781)
		Protect	1.24	(SD 0.596)

FRAME x HORIZON x EXPERIENCE ***Complete*** (Cognitive engagement): $F(1,779)=4.025$, $p=0.045$, $\eta^2=0.005$				
Long	Unexperienced	Achieve	3.14	(SD 1.097)
		Protect	3.38	(SD 0.960)
	Experienced	Achieve	3.31	(SD 1.043)
		Protect	3.21	(SD 1.071)
Short	Unexperienced	Achieve	3.25	(SD 1.064)
		Protect	3.29	(SD 1.024)
	Experienced	Achieve	3.26	(SD 1.028)
		Protect	3.25	(SD 1.025)

Appendix 4: Images of final model set-up in study 2





NOTE: (*) indicates constructs not taken into account in the final group specific models for MGA-PLS analyses due to unsatisfactory MICOM tests.

Appendix 5: Measurement Model Assessments Study 2

EMOTIONAL ENGAGEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Attitude towards financial risk										
(2) Financial Satisfaction	0.230									
(3) Negative emotions to finance	0.164	0.203								
(4) Negative emotions to life	0.143	0.293	0.492							
(5) Negative emotional engagement	0.102	0.058	0.725	0.331						
(6) Positive emotions to finance	0.625	0.235	0.086	0.082	0.113					
(7) Positive emotions to life	0.293	0.347	0.124	0.216	0.066	0.602				
(8) Positive emotional engagement	0.347	0.132	0.130	0.103	0.158	0.735	0.448			
(9) Self-esteem	0.289	0.415	0.268	0.579	0.098	0.365	0.716	0.206		
(10) Sensation seeking	0.546	0.209	0.163	0.255	0.065	0.583	0.624	0.447	0.521	
Cronbach's Alpha	0.902	1.000	0.830	0.893	0.856	0.908	0.910	0.937	0.873	0.504
rho_A	0.959	1.000	0.833	0.905	0.859	0.913	0.932	0.937	0.930	0.506
Composite Reliability	0.913	1.000	0.898	0.912	0.912	0.935	0.924	0.955	0.900	0.749
AVE	0.541	1.000	0.746	0.537	0.776	0.783	0.552	0.841	0.565	0.499

COGNITIVE ENGAGEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Attitude towards financial risk									
(2) Cognitive engagement	0.272								
(3) Financial Satisfaction	0.230	0.142							
(4) Negative emotions to finance	0.414	0.180	0.326						
(5) Negative emotions to life	0.147	0.106	0.286	0.572					
(6) Positive emotions to finance	0.625	0.436	0.235	0.234	0.083				
(7) Positive emotions to life	0.293	0.295	0.347	0.221	0.222	0.602			
(8) Self-esteem	0.289	0.233	0.415	0.400	0.576	0.365	0.716		
(9) Sensation seeking	0.546	0.291	0.209	0.306	0.263	0.583	0.624	0.521	
Cronbach's Alpha	0.902	0.920	1.000	0.794	0.888	0.908	0.910	0.873	0.504
rho_A	0.938	0.927	1.000	0.833	0.918	0.910	0.926	0.909	0.518
Composite Reliability	0.913	0.932	1.000	0.848	0.909	0.935	0.924	0.901	0.746
AVE	0.541	0.534	1.000	0.531	0.557	0.783	0.553	0.569	0.497

BEHAVIOURAL ENGAGEMENT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Attitude towards financial risk									
(2) Financial Satisfaction	0.230								
(3) Behavioural Engagement	0.465	0.109							
(4) Negative emotions to finance	0.603	0.368	0.249						
(5) Negative emotions to life	0.146	0.283	0.092	0.431					
(6) Positive emotions to finance	0.625	0.235	0.532	0.350	0.088				
(7) Positive emotions to life	0.293	0.347	0.301	0.268	0.204	0.602			
(8) Self-esteem	0.299	0.416	0.184	0.429	0.529	0.383	0.716		
(9) Sensation seeking	0.546	0.209	0.477	0.385	0.231	0.583	0.624	0.548	
Cronbach's Alpha	0.902	1.000	0.921	0.796	0.866	0.908	0.910	0.863	0.504
rho_A	0.933	1.000	0.925	0.876	0.890	0.911	0.924	0.908	0.507
Composite Reliability	0.916	1.000	0.939	0.905	0.877	0.935	0.925	0.895	0.748
AVE	0.551	1.000	0.719	0.826	0.506	0.783	0.555	0.590	0.498

Appendix 6: PLSpredict Results Study 2

Emotional Engagement	PLS-SEM			LM			PLS–LM		
	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$
LPANAS6N	0.590	0.332	0.286	0.601	0.363	0.261	-0.010	-0.031	0.025
LPANAS3N	0.508	0.265	0.253	0.512	0.306	0.241	-0.004	-0.040	0.012
LPANAS5N	0.594	0.342	0.332	0.611	0.373	0.292	-0.017	-0.030	0.040
LPANAS2P	0.892	0.705	0.385	0.890	0.697	0.387	0.002	0.008	-0.002
LPANAS9P	0.901	0.717	0.412	0.902	0.703	0.411	-0.001	0.014	0.001
LPANAS4P	0.879	0.706	0.412	0.871	0.693	0.423	0.009	0.013	-0.011
LPANAS7P	0.895	0.722	0.373	0.892	0.702	0.377	0.003	0.020	-0.004

Notes: LPANAS6N, LPANAS3N, LPANAS5N: Negative Emotional Engagement with financial product indicators; LPANAS2P, LPANAS9P, LPANAS4P, LPANAS7P: Positive Emotional Engagement with financial product; LM: Linear model regression. Predictive validity is established when the PLS–LM columns are negative for errors (RMSE and MAE) and positive for Q^2.

Cognitive Engagement	PLS-SEM			LM			PLS–LM		
	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$
Cog1_2	0.876	0.706	0.117	0.887	0.710	0.093	-0.012	-0.004	0.024
Cog2_6	1.001	0.790	0.021	1.007	0.795	0.008	-0.006	-0.004	0.012
Cog2_3	0.924	0.747	0.112	0.931	0.743	0.098	-0.007	0.005	0.014
Cog2_2	1.060	0.865	0.127	1.082	0.882	0.091	-0.022	-0.017	0.037
Cog1_5	1.046	0.839	0.024	1.039	0.833	0.038	0.007	0.006	-0.014
Cog2_7	0.975	0.787	0.120	0.996	0.798	0.083	-0.021	-0.012	0.037
Cog2_7	1.048	0.852	0.044	1.070	0.864	0.004	-0.022	-0.012	0.041
Cog3	0.986	0.796	0.043	0.989	0.787	0.038	-0.003	0.009	0.005
Cog2_1	1.017	0.832	0.094	1.038	0.851	0.057	-0.021	-0.019	0.037
Cog1_1	0.783	0.639	0.096	0.786	0.630	0.088	-0.003	0.009	0.008
Cog2_4	0.987	0.784	0.088	1.001	0.793	0.063	-0.014	-0.009	0.026
Cog2_5	1.010	0.818	0.106	1.011	0.817	0.103	-0.001	0.002	0.002

Notes: Cog1_2 to Cog2_5 Cognitive Engagement with financial product indicators. LM: Linear model regression.
Predictive validity is established when the PLS–LM columns are negative for errors (RMSE and MAE) and positive for Q^2.

Behavioural Engagement	PLS-SEM			LM			PLS–LM		
	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$	RMSE	MAE	$Q^2_{predict}$
INT4	0.962	0.798	0.169	0.933	0.769	0.217	0.028	0.029	-0.048
INT1	0.912	0.734	0.265	0.880	0.699	0.316	0.032	0.035	-0.051
INT6	1.115	0.913	0.204	1.096	0.888	0.232	0.020	0.025	-0.028
INT5	1.095	0.898	0.195	1.076	0.881	0.223	0.019	0.017	-0.028
INT2	1.070	0.870	0.212	1.054	0.838	0.237	0.017	0.032	-0.024
INT3	1.016	0.835	0.227	0.997	0.813	0.257	0.019	0.022	-0.029

Notes: INT1 to INT6 Behavioural Engagement with financial product indicators. LM: Linear model regression. Predictive validity is established when the PLS–LM columns are negative for errors (RMSE and MAE) and positive for Q^2.

Appendix 7: MICOM Results study 2

Emotional Engagement with financial product

AS vs PS	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.988	0.943	0.471	Yes	-0.117	[-0.200;0.186]	0.253	Yes	0.077	[-0.216;0.248]	0.496	Yes
(2) Financial Satisfaction	1.000	1.000		No	0.064	[-0.191;0.202]	0.484	Yes	-0.281	[-0.281;0.273]	0.046	No
(3) Negative emotions to finance	1.000	0.996	0.904	Yes	-0.047	[-0.194;0.199]	0.673	Yes	-0.129	[-0.457;0.469]	0.577	Yes
(4) Negative emotions to life	0.995	0.985	0.602	Yes	-0.070	[-0.190;0.188]	0.5	Yes	-0.221	[-0.314;0.305]	0.185	Yes
(5) Negative emotional engagement	1.000	0.998	0.855	Yes	-0.017	[-0.187;0.205]	0.876	Yes	-0.028	[-0.544;0.616]	0.925	Yes
(6) Positive emotions to finance	1.000	0.999	0.573	Yes	-0.085	[-0.195;0.193]	0.413	Yes	-0.056	[-0.204;0.205]	0.578	Yes
(7) Positive emotions to life	0.997	0.995	0.346	Yes	-0.064	[-0.206;0.187]	0.533	Yes	0.037	[-0.245;0.262]	0.772	Yes
(8) Positive emotional engagement	1.000	1.000	0.366	Yes	0.001	[-0.193;0.196]	0.995	Yes	0.052	[-0.206;0.200]	0.622	Yes
(9) Self-esteem	0.993	0.951	0.868	Yes	0.121	[-0.190;0.192]	0.233	Yes	-0.206	[-0.340;0.355]	0.233	Yes
(10) Sensation seeking	0.982	0.939	0.423	Yes	-0.019	[-0.209;0.192]	0.863	Yes	0.156	[-0.252;0.252]	0.230	Yes

AL vs PL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.993	0.988	0.236	Yes	-0.002	[-0.208;0.199]	0.98	Yes	0.093	[-0.237;0.241]	0.429	Yes
(2) Financial Satisfaction	1.000	1.000	0.218	Yes	-0.007	[-0.192;0.178]	0.929	Yes	-0.006	[-0.266;0.275]	0.971	Yes
(3) Negative emotions to finance	0.997	0.990	0.387	Yes	-0.080	[-0.185;0.207]	0.426	Yes	-0.401	[-0.538;0.628]	0.171	Yes
(4) Negative emotions to life	0.986	0.876	0.808	Yes	0.097	[-0.195;0.205]	0.339	Yes	-0.073	[-0.412;0.441]	0.717	Yes
(5) Negative emotional engagement	0.999	0.994	0.416	Yes	0.026	[-0.181;0.203]	0.79	Yes	-0.078	[-0.747;0.793]	0.837	Yes
(6) Positive emotions to finance	1.000	0.999	0.631	Yes	0.142	[-0.211;0.191]	0.159	Yes	0.057	[-0.209;0.210]	0.597	Yes
(7) Positive emotions to life	0.999	0.994	0.750	Yes	-0.036	[-0.200;0.189]	0.711	Yes	-0.085	[-0.274;0.312]	0.549	Yes
(8) Positive emotional engagement	1.000	1.000	0.034	No	0.055	[-0.191;0.181]	0.575	Yes	0.050	[-0.208;0.201]	0.630	Yes
(9) Self-esteem	0.985	0.954	0.462	Yes	-0.046	[-0.195;0.198]	0.687	Yes	-0.120	[-0.333;0.359]	0.502	Yes
(10) Sensation seeking	0.976	0.897	0.494	Yes	0.068	[-0.188;0.195]	0.493	Yes	-0.009	[-0.238;0.250]	0.946	Yes

AS vs AL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.973	0.975	0.044	No	0.084	[-0.214;0.198]	0.441	Yes	0.040	[-0.227;0.214]	0.713	Yes
(2) Financial Satisfaction	1.000	1.000		No	-0.040	[-0.198;0.208]	0.673	Yes	0.171	[-0.288;0.291]	0.232	Yes
(3) Negative emotions to finance	1.000	0.990	0.934	Yes	-0.163	[-0.199;0.207]	0.107	Yes	-0.452	[-0.575;0.501]	0.091	Yes
(4) Negative emotions to life	0.996	0.968	0.934	Yes	0.041	[-0.192;0.204]	0.698	Yes	0.165	[-0.356;0.345]	0.393	Yes
(5) Negative emotional engagement	0.999	0.996	0.370	Yes	-0.155	[-0.191;0.203]	0.115	Yes	-0.435	[-0.650;0.688]	0.204	Yes
(6) Positive emotions to finance	1.000	0.999	0.408	Yes	0.085	[-0.208;0.192]	0.415	Yes	0.025	[-0.206;0.199]	0.808	Yes
(7) Positive emotions to life	0.996	0.994	0.215	Yes	0.004	[-0.226;0.189]	0.966	Yes	-0.077	[-0.268;0.264]	0.570	Yes
(8) Positive emotional engagement	1.000	1.000	0.097	Yes	-0.027	[-0.194;0.186]	0.778	Yes	0.021	[-0.199;0.182]	0.843	Yes
(9) Self-esteem	0.995	0.949	0.882	Yes	-0.162	[-0.205;0.194]	0.101	Yes	0.204	[-0.354;0.380]	0.279	Yes
(10) Sensation seeking	0.991	0.941	0.656	Yes	0.008	[-0.220;0.205]	0.921	Yes	-0.030	[-0.255;0.232]	0.835	Yes

PS vs PL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.998	0.968	0.930	Yes	-0.033	[-0.193;0.198]	0.742	Yes	0.000	[-0.254;0.221]	1.000	Yes
(2) Financial Satisfaction	1.000	1.000	0.189	Yes	0.031	[-0.201;0.195]	0.796	Yes	-0.103	[-0.249;0.270]	0.440	Yes
(3) Negative emotions to finance	0.999	0.997	0.588	Yes	-0.125	[-0.185;0.202]	0.228	Yes	-0.201	[-0.493;0.537]	0.453	Yes
(4) Negative emotions to life	0.990	0.981	0.305	Yes	-0.122	[-0.201;0.209]	0.219	Yes	0.025	[-0.336;0.328]	0.881	Yes
(5) Negative emotional engagement	0.997	0.998	0.009	No	-0.194	[-0.183;0.194]	0.043	No	-0.397	[-0.612;0.567]	0.199	Yes
(6) Positive emotions to finance	1.000	0.999	0.451	Yes	-0.143	[-0.199;0.183]	0.153	Yes	-0.088	[-0.227;0.199]	0.406	Yes
(7) Positive emotions to life	0.999	0.994	0.928	Yes	-0.025	[-0.206;0.193]	0.811	Yes	0.042	[-0.242;0.258]	0.728	Yes
(8) Positive emotional engagement	1.000	1.000	0.444	Yes	-0.082	[-0.205;0.183]	0.433	Yes	0.022	[-0.232;0.204]	0.883	Yes
(9) Self-esteem	0.981	0.920	0.522	Yes	0.002	[-0.201;0.193]	0.979	Yes	0.122	[-0.314;0.359]	0.454	Yes
(10) Sensation seeking	0.964	0.885	0.371	Yes	-0.109	[-0.193;0.192]	0.286	Yes	0.131	[-0.232;0.240]	0.302	Yes

Cognitive Engagement with financial product

MICOM Step 2					MICOM Step 3							
AS vs PS												
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.984	0.936	0.345	Yes	0.119	[-0.197;0.200]	0.269	Yes	-0.113	[-0.237;0.236]	0.374	Yes
(2) Cognitive engagement	0.999	0.995	0.745	Yes	0.089	[-0.219;0.215]	0.405	Yes	-0.100	[-0.276;0.259]	0.491	Yes
(3) Financial Satisfaction	1.000	1.000	0.401	Yes	-0.064	[-0.212;0.201]	0.478	Yes	0.281	[-0.273;0.261]	0.034	No
(4) Negative emotions to finance	0.911	0.777	0.232	Yes	-0.005	[-0.211;0.202]	0.955	Yes	-0.029	[-0.339;0.328]	0.859	Yes
(5) Negative emotions to life	0.534	0.368	0.069	Yes	0.096	[-0.208;0.213]	0.362	Yes	0.273	[-0.341;0.319]	0.115	Yes
(6) Positive emotions to finance	1.000	0.998	0.941	Yes	0.087	[-0.203;0.198]	0.418	Yes	0.058	[-0.200;0.202]	0.569	Yes
(7) Positive emotions to life	0.995	0.989	0.476	Yes	0.068	[-0.218;0.209]	0.523	Yes	-0.039	[-0.264;0.255]	0.778	Yes
(8) Self-esteem	0.981	0.948	0.433	Yes	-0.111	[-0.210;0.208]	0.274	Yes	0.198	[-0.326;0.326]	0.228	Yes
(9) Sensation seeking	0.783	0.848	0.017	No	0.018	[-0.229;0.210]	0.856	Yes	-0.162	[-0.248;0.244]	0.166	Yes

MICOM Step 2					MICOM Step 3							
AL vs PL												
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.993	0.979	0.436	Yes	-0.010	[-0.201;0.197]	0.922	Yes	-0.087	[-0.233;0.244]	0.524	Yes
(2) Cognitive engagement	0.998	0.992	0.543	Yes	-0.050	[-0.211;0.200]	0.645	Yes	0.175	[-0.263;0.238]	0.192	Yes
(3) Financial Satisfaction	1.000	1.000	0.199	Yes	0.007	[-0.188;0.201]	0.970	Yes	0.006	[-0.275;0.265]	0.974	Yes
(4) Negative emotions to finance	0.952	0.749	0.446	Yes	0.048	[-0.199;0.195]	0.635	Yes	0.309	[-0.362;0.341]	0.094	Yes
(5) Negative emotions to life	0.908	0.271	0.561	Yes	-0.089	[-0.206;0.199]	0.384	Yes	0.061	[-0.389;0.365]	0.789	Yes
(6) Positive emotions to finance	0.999	0.998	0.237	Yes	-0.144	[-0.209;0.205]	0.171	Yes	-0.048	[-0.211;0.199]	0.648	Yes
(7) Positive emotions to life	0.990	0.978	0.239	Yes	0.025	[-0.210;0.196]	0.803	Yes	0.112	[-0.290;0.266]	0.404	Yes
(8) Self-esteem	0.975	0.961	0.131	Yes	0.044	[-0.200;0.191]	0.666	Yes	0.102	[-0.352;0.353]	0.579	Yes
(9) Sensation seeking	0.928	0.729	0.465	Yes	-0.082	[-0.202;0.205]	0.416	Yes	0.003	[-0.245;0.252]	0.975	Yes

MICOM Step 2					MICOM Step 3							
AS vs AL												
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.969	0.956	0.108	Yes	0.088	[-0.190;0.176]	0.414	Yes	0.032	[-0.225;0.238]	0.784	Yes
(2) Cognitive engagement	0.996	0.992	0.312	Yes	0.036	[-0.212;0.194]	0.719	Yes	-0.251	[-0.277;0.261]	0.078	Yes
(3) Financial Satisfaction	1.000	1.000		No	-0.040	[-0.198;0.198]	0.653	Yes	0.171	[-0.288;0.273]	0.221	Yes
(4) Negative emotions to finance	0.958	0.064	0.861	Yes	-0.091	[-0.215;0.201]	0.366	Yes	-0.152	[-0.312;0.288]	0.313	Yes
(5) Negative emotions to life	0.664	-0.157	0.428	Yes	0.114	[-0.191;0.205]	0.247	Yes	0.229	[-0.398;0.407]	0.301	Yes
(6) Positive emotions to finance	1.000	0.997	0.998	Yes	0.085	[-0.197;0.193]	0.406	Yes	0.025	[-0.201;0.216]	0.794	Yes
(7) Positive emotions to life	0.987	0.979	0.132	Yes	0.014	[-0.196;0.197]	0.884	Yes	-0.091	[-0.272;0.271]	0.513	Yes
(8) Self-esteem	0.983	0.905	0.568	Yes	-0.159	[-0.194;0.202]	0.130	Yes	0.203	[-0.392;0.393]	0.336	Yes
(9) Sensation seeking	0.941	0.863	0.254	Yes	0.009	[-0.207;0.185]	0.928	Yes	-0.034	[-0.270;0.253]	0.808	Yes

PS vs PL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.995	0.972	0.704	Yes	0.039	[-0.208;0.186]	0.721	Yes	0.002	[-0.235;0.261]	0.989	Yes
(2) Cognitive engagement	0.999	0.996	0.620	Yes	0.096	[-0.199;0.193]	0.345	Yes	-0.006	[-0.274;0.272]	0.960	Yes
(3) Financial Satisfaction	1.000	1.000	0.423	Yes	-0.031	[-0.195;0.201]	0.776	Yes	0.103	[-0.251;0.285]	0.469	Yes
(4) Negative emotions to finance	0.982	0.912	0.493	Yes	0.079	[-0.206;0.187]	0.439	Yes	0.007	[-0.316;0.335]	0.966	Yes
(5) Negative emotions to life	0.984	0.947	0.461	Yes	0.115	[-0.211;0.185]	0.281	Yes	-0.074	[-0.358;0.350]	0.682	Yes
(6) Positive emotions to finance	0.999	0.999	0.043	No	0.142	[-0.205;0.198]	0.165	Yes	0.085	[-0.201;0.217]	0.417	Yes
(7) Positive emotions to life	0.996	0.987	0.601	Yes	0.020	[-0.203;0.200]	0.849	Yes	-0.044	[-0.262;0.274]	0.760	Yes
(8) Self-esteem	0.978	0.973	0.095	Yes	-0.009	[-0.201;0.211]	0.933	Yes	-0.127	[-0.338;0.335]	0.427	Yes
(9) Sensation seeking	0.846	0.740	0.159	Yes	0.108	[-0.207;0.192]	0.297	Yes	-0.121	[-0.221;0.229]	0.306	Yes

Behavioural Engagement with financial product

AS vs PS	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.999	0.988	0.797	Yes	0.125	[-0.194;0.194]	0.211	Yes	-0.080	[-0.237;0.232]	0.511	Yes
(2) Financial Satisfaction	1.000	1.000	0.287	Yes	-0.064	[-0.202;0.201]	0.519	Yes	0.281	[-0.274;0.281]	0.043	No
(3) Behavioural Engagement	0.999	0.999	0.110	Yes	0.114	[-0.208;0.195]	0.277	Yes	-0.102	[-0.231;0.228]	0.384	Yes
(4) Negative emotions to finance	0.972	0.970	0.057	Yes	-0.065	[-0.196;0.190]	0.508	Yes	0.007	[-0.247;0.243]	0.967	Yes
(5) Negative emotions to life	0.200	-0.026	0.131	Yes	-0.043	[-0.201;0.192]	0.667	Yes	0.025	[-0.305;0.316]	0.878	Yes
(6) Positive emotions to finance	1.000	0.999	0.573	Yes	0.083	[-0.187;0.182]	0.404	Yes	0.053	[-0.188;0.204]	0.614	Yes
(7) Positive emotions to life	0.995	0.992	0.257	Yes	0.061	[-0.186;0.190]	0.555	Yes	-0.043	[-0.257;0.290]	0.746	Yes
(8) Self-esteem	0.910	0.947	0.014	No	-0.122	[-0.191;0.189]	0.216	Yes	0.203	[-0.310;0.324]	0.227	Yes
(9) Sensation seeking	0.923	0.944	0.016	No	0.018	[-0.199;0.193]	0.836	Yes	-0.161	[-0.251;0.238]	0.191	Yes

AL vs PL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.999	0.993	0.832	Yes	0.011	[-0.198;0.191]	0.905	Yes	0.101	[-0.242;0.244]	0.398	Yes
(2) Financial Satisfaction	1.000	1.000	0.237	Yes	-0.007	[-0.192;0.188]	0.934	Yes	-0.006	[-0.284;0.275]	0.975	Yes
(3) Behavioural Engagement	1.000	0.999	0.516	Yes	-0.075	[-0.200;0.190]	0.471	Yes	0.123	[-0.232;0.238]	0.319	Yes
(4) Negative emotions to finance	1.000	0.968	0.840	Yes	-0.007	[-0.208;0.199]	0.955	Yes	-0.211	[-0.279;0.253]	0.121	Yes
(5) Negative emotions to life	0.779	0.159	0.403	Yes	0.061	[-0.204;0.182]	0.553	Yes	-0.180	[-0.450;0.374]	0.396	Yes
(6) Positive emotions to finance	1.000	0.998	0.944	Yes	0.143	[-0.203;0.194]	0.157	Yes	0.057	[-0.210;0.205]	0.640	Yes
(7) Positive emotions to life	0.988	0.970	0.379	Yes	-0.034	[-0.195;0.210]	0.729	Yes	-0.092	[-0.276;0.282]	0.517	Yes
(8) Self-esteem	0.972	0.663	0.671	Yes	-0.067	[-0.202;0.183]	0.489	Yes	-0.085	[-0.354;0.350]	0.651	Yes
(9) Sensation seeking	0.958	0.901	0.297	Yes	0.076	[-0.180;0.209]	0.459	Yes	-0.001	[-0.228;0.243]	0.998	Yes

AS vs AL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.997	0.992	0.264	Yes	-0.100	[-0.193;0.199]	0.322	Yes	-0.043	[-0.229;0.231]	0.713	Yes
(2) Financial Satisfaction	1.000	1.000	0.144	Yes	0.040	[-0.188;0.208]	0.670	Yes	-0.171	[-0.293;0.287]	0.227	Yes
(3) Behavioural Engagement	1.000	0.999	0.617	Yes	-0.010	[-0.187;0.203]	0.912	Yes	0.074	[-0.221;0.227]	0.510	Yes
(4) Negative emotions to finance	0.997	0.970	0.506	Yes	0.068	[-0.197;0.194]	0.537	Yes	0.112	[-0.256;0.260]	0.404	Yes
(5) Negative emotions to life	0.799	0.136	0.415	Yes	0.014	[-0.199;0.196]	0.895	Yes	-0.025	[-0.306;0.349]	0.872	Yes
(6) Positive emotions to finance	1.000	0.999	0.632	Yes	-0.084	[-0.187;0.192]	0.411	Yes	-0.021	[-0.210;0.207]	0.840	Yes
(7) Positive emotions to life	0.985	0.989	0.013	No	-0.010	[-0.185;0.201]	0.920	Yes	0.085	[-0.266;0.252]	0.525	Yes
(8) Self-esteem	0.973	0.951	0.150	Yes	0.171	[-0.178;0.195]	0.071	Yes	-0.213	[-0.341;0.372]	0.245	Yes
(9) Sensation seeking	0.966	0.949	0.114	Yes	0.011	[-0.194;0.190]	0.914	Yes	0.035	[-0.236;0.242]	0.781	Yes

PS vs PL	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.996	0.987	0.418	Yes	0.036	[-0.212;0.182]	0.322	Yes	0.000	[-0.261;0.251]	0.998	Yes
(2) Financial Satisfaction	1.000	1.000	0.405	Yes	-0.031	[-0.205;0.191]	0.670	Yes	0.103	[-0.252;0.280]	0.442	Yes
(3) Behavioural Engagement	1.000	0.998	0.526	Yes	0.035	[-0.217;0.195]	0.912	Yes	0.100	[-0.248;0.242]	0.438	Yes
(4) Negative emotions to finance	0.984	0.967	0.172	Yes	-0.011	[-0.210;0.195]	0.537	Yes	-0.085	[-0.255;0.260]	0.483	Yes
(5) Negative emotions to life	0.393	0.052	0.293	Yes	0.034	[-0.187;0.195]	0.895	Yes	-0.266	[-0.348;0.369]	0.141	Yes
(6) Positive emotions to finance	1.000	0.999	0.765	Yes	0.143	[-0.203;0.199]	0.411	Yes	0.086	[-0.227;0.205]	0.437	Yes
(7) Positive emotions to life	0.996	0.981	0.778	Yes	0.008	[-0.210;0.203]	0.920	Yes	-0.040	[-0.248;0.255]	0.739	Yes
(8) Self-esteem	0.966	0.490	0.745	Yes	-0.003	[-0.211;0.191]	0.071	Yes	-0.087	[-0.294;0.309]	0.556	Yes
(9) Sensation seeking	0.913	0.890	0.088	Yes	0.103	[-0.203;0.195]	0.914	Yes	-0.119	[-0.250;0.275]	0.359	Yes

Appendix 8: MGA results across all manipulation groups Study 2

Emotional engagement with financial product	**AS paths**	**AL paths**	**p-value (AS vs AL)**	**PS paths**	**PL Paths**	**p-value (PS vs PL)**	**AS paths**	**PS paths**	**p-value (AS vs PS)**	**AL paths**	**PL Paths**	**p-value (AL vs PL)**
Attitude towards financial risk -> Positive emotional engagement	-0.023n.s.	0.111n.s.	0.092	-0.074	-0.028	0.310	-0.023	-0.074	0.303	0.111n.s.	-0.028n.s.	0.072
Financial Satisfaction -> Positive emotional engagement	-0.050	-0.094	0.703	0.021	0.103	0.143	-0.050	0.021	0.822	-0.094n.s.	0.103*	0.986[2]
Negative emotions to finance -> Positive emotional engagement	0.132	0.060	0.857	0.044	0.051	0.471	0.132	0.044	0.130	0.060	0.051	0.450
Negative emotions to life -> Positive emotional engagement	0.098	0.079	0.573	0.047	-0.007	0.671	0.098	0.047	0.296	0.079	-0.007	0.239
Positive emotions to finance -> Positive emotional engagement	0.556	0.517	0.633	0.632	0.697	0.259	0.556	0.632	0.765	0.517***	0.697***	0.945[3]
Positive emotions to life -> Positive emotional engagement	***0.067n.s.***	***0.223****	***0.074***	***0.203*****	***0.067n.s.***	***0.902***	***0.067n.s.***	***0.203*****	***0.908***	0.223**	0.067n.s.	0.080[4]
Self-esteem -> Positive emotional engagement	0.040	-0.073	0.853	***-0.217****	***-0.019n.s.***	***0.072***	***0.040n.s.***	***-0.217****	***0.031***	-0.073	-0.019	0.674
Sensation seeking -> Positive emotional engagement	***0.178*****	***-0.051n.s.***	***0.995***	0.067	0.032	0.667	***0.178*****	***0.067n.s.***	***0.103***	-0.051	0.032	0.845
Attitude towards financial risk -> Negative emotional engagement	0.047	-0.074	0.876	0.085	0.080	0.519	0.047	0.085	0.641	-0.074n.s.	0.08n.s.	0.921
Financial Satisfaction -> Negative emotional engagement	0.088	0.057	0.608	-0.007	0.036	0.303	0.088	-0.007	0.155	0.057	0.036	0.407
Negative emotions to finance -> Negative emotional engagement	0.567	0.411	0.802	0.695	0.685	0.537	0.567	0.695	0.894	***0.411*****	***0.685*****	***0.950***
Negative emotions to life -> Negative emotional engagement	***0.206*****	***0.010n.s.***	***0.933***	0.092	0.007	0.734	0.206	0.092	0.145	0.010	0.007	0.498
Positive emotions to finance -> Negative emotional engagement	0.054	0.046	0.536	-0.064	-0.010	0.310	0.054	-0.064	0.140	0.046	-0.010	0.348
Positive emotions to life-> Negative emotional engagement	-0.047	0.094	0.158	-0.014	0.023	0.376	-0.047	-0.014	0.620	0.094	0.023	0.319
Self-esteem -> Negative emotional engagement	0.035	-0.012	0.589	0.066	0.081	0.462	0.035	0.066	0.600	-0.012	0.081	0.671
Sensation seeking -> Negative emotional engagement	0.108	0.011	0.763	0.038	0.005	0.648	0.108	0.038	0.201	0.011	0.005	0.484

Cognitive engagement with financial product	**AS paths**	**AL paths**	**p-value (AS vs AL)**	**PS paths**	**PL Paths**	**p-value (PS vs PL)**	**AS paths**	**PS paths**	**p-value (AS vs PS)**	**AL paths**	**PL Paths**	**p-value (AL vs PL)**
Attitude towards financial risk -> Cognitive engagement	0.208	0.207	0.506	-0.055	0.058	0.189	***0.208****	***-0.055n.s***	***0.030***	0.207	0.058	0.105
Financial satisfaction-> Cognitive engagement	0.034	-0.108	0.896	-0.030	0.073	0.180	0.034	-0.030	0.281	-0.108n.s.	0.073n.s.	0.942
Negative emotions to finance -> Cognitive engagement	-0.027	0.057	0.282	-0.113	-0.122	0.534	-0.027	-0.113	0.218	0.057	-0.122	0.111
Negative emotions to life -> Cognitive engagement	-0.143	0.112	0.140	-0.084	-0.054	0.392	-0.143	-0.084	0.669	0.112	-0.054	0.188
Positive emotions to finance -> Cognitive engagement	0.132	0.156	0.441	0.440	0.393	0.630	***0.132n.s.***	***0.440****	***0.978***	***0.156n.s.***	***0.393*****	***0.957***
Positive emotions to life -> Cognitive engagement	***0.183****	***-0.009n.s.***	***0.911***	-0.036	0.062	0.229	***0.183****	***-0.036n.s.***	***0.046***	-0.009	0.062	0.676
Self-esteem -> Cognitive engagement	-0.032n.s.	0.174n.s.	0.084	0.027	0.031	0.490	-0.032	0.027	0.676	0.174	0.031	0.178
Sensation seeking -> Cognitive engagement	0.050	-0.024	0.718	0.138n.s.	-0.026n.s.	0.914	0.050	0.138	0.780	-0.024	-0.026	0.482

Behavioural engagement with financial product	**AS paths**	**AL paths**	**p-value (AS vs AL)**	**PS paths**	**PL Paths**	**p-value (PS vs PL)**	**AS paths**	**PS paths**	**p-value (AS vs PS)**	**AL paths**	**PL Paths**	**p-value (AL vs PL)**
Attitude towards financial risk -> Behavioural engagement	0.295	0.302	0.472	0.262	0.266	0.490	0.295	0.262	0.375	0.302	0.266	0.371
Financial satisfaction-> Behavioural engagement	-0.113	-0.049	0.245	0.001	0.090	0.182	-0.113	0.001	0.895	-0.049n.s.	0.090n.s.	0.918
Negative emotions to finance -> Behavioural engagement	-0.033	0.052	0.195	0.022	-0.118	0.888	-0.033	0.022	0.705	0.052n.s.	-0.118n.s.	0.071
Negative emotions to life -> Behavioural engagement	0.115	0.140	0.410	0.090	0.262	0.170	0.115	0.090	0.465	0.140	0.262	0.818
Positive emotions to finance -> Behavioural engagement	0.282	0.265	0.552	0.171	0.217	0.362	0.282	0.171	0.179	0.265	0.217	0.363
Positive emotions to life -> Behavioural engagement	0.113*	-0.074n.s.	0.921[5]	0.038	0.039	0.495	0.113	0.038	0.258	-0.074	0.039	0.785
Self-esteem -> Behavioural engagement	0.104	0.021	0.721	0.006	0.001	0.532	0.104	0.006	0.267	0.021	0.001	0.435
Sensation seeking -> Behavioural engagement	0.117	0.156	0.331	0.134	0.034	0.846	0.117	0.134	0.580	***0.156****	***0.034n.s.***	***0.099***

All significant MGA results are highlighted in grey.
The significance levels applied: ***<0.01; **<0.05; *<0.1.

[2] This result was not included in the PLS-MGA analysis as the compositional invariance was not established for the Positive Emotional Engagement with financial product construct.
[3] This result was not included in the PLS-MGA analysis as the compositional invariance was not established for the Positive Emotional Engagement with financial product construct.
[4] This result was not included in the PLS-MGA analysis as the compositional invariance was not established for the Positive Emotional Engagement with financial product construct.
[5] This result was not included in the PLS-MGA analysis as the compositional invariance was not established for the Positive emotions to life construct.

Appendix 9: MICOM and PLS- MGA for control variables Study 2
MICOM Emotional Engagement with financial product

Gender	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.948	0.985		No	0.657	[-0.140;0.132]		No	-0.135	[-0.164;0.155]	0.107	Yes
(2) Financial Satisfaction	1.000	1.000	0.304	Yes	0.173	[-0.136;0.143]	0.014	No	-0.205	[-0.177;0.198]	0.033	No
(3) Negative emotions to finance	1.000	0.997	0.931	Yes	0.054	[-0.147;0.134]	0.464	Yes	0.097	[-0.368;0.347]	0.598	Yes
(4) Negative emotions to life	0.997	0.987	0.791	Yes	-0.090	[-0.137;0.133]	0.202	Yes	-0.105	[-0.241;0.263]	0.429	Yes
(5) Negative emotional engagement	0.999	0.999	0.062	Yes	0.228	[-0.136;0.139]	0.002	No	0.642	[-0.428;0.445]	0.006	No
(6) Positive emotions to finance	1.000	1.000	0.490	Yes	0.428	[-0.142;0.131]		No	-0.204	[-0.141;0.153]	0.002	No
(7) Positive emotions to life	0.998	0.997	0.111	Yes	0.157	[-0.133;0.145]	0.027	No	-0.298	[-0.174;0.190]	0.001	No
(8) Positive emotional engagement	1.000	1.000	0.242	Yes	0.197	[-0.137;0.139]	0.002	No	0.045	[-0.138;0.153]	0.516	Yes
(9) Self-esteem	0.995	0.978	0.732	Yes	0.159	[-0.130;0.147]	0.027	No	-0.284	[-0.244;0.242]	0.017	No
(10) Sensation seeking	0.916	0.958	0.001	No	0.436	[-0.136;0.143]		Yes	-0.274	[-0.183;0.173]	0.003	No

Age	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.981	0.982	0.049	No	0.399	[-0.157;0.170]		No	-0.046	[-0.197;0.182]	0.632	Yes
(2) Financial Satisfaction	1.000	1.000		No	-0.060	[-0.159;0.164]	0.489	Yes	-0.011	[-0.230;0.203]	0.920	Yes
(3) Negative emotions to finance	0.999	0.996	0.582	Yes	0.384	[-0.164;0.168]		No	0.750	[-0.489;0.408]	0.001	No
(4) Negative emotions to life	0.998	0.980	0.959	Yes	0.478	[-0.158;0.159]		No	0.444	[-0.311;0.261]	0.005	No
(5) Negative emotional engagement	0.999	0.998	0.260	Yes	0.375	[-0.154;0.162]		No	0.812	[-0.571;0.506]	0.004	No
(6) Positive emotions to finance	0.999	1.000		No	0.481	[-0.154;0.157]		No	0.137	[-0.165;0.157]	0.110	Yes
(7) Positive emotions to life	0.997	0.996	0.157	Yes	0.077	[-0.160;0.165]	0.361	Yes	0.177	[-0.249;0.208]	0.126	Yes
(8) Positive emotional engagement	1.000	1.000	0.727	Yes	0.616	[-0.142;0.169]		No	0.122	[-0.169;0.163]	0.149	Yes
(9) Self-esteem	0.994	0.956	0.725	Yes	-0.221	[-0.164;0.168]	0.009	No	0.363	[-0.276;0.257]	0.010	No
(10) Sensation seeking	0.975	0.939	0.245	Yes	0.520	[-0.145;0.165]		No	-0.264	[-0.217;0.201]	0.010	No

Experience	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.926	0.986		No	-0.726	[-0.141;0.146]		No	-0.005	[-0.160;0.163]	0.958	Yes
(2) Financial Satisfaction	1.000	1.000		Yes	-0.641	[-0.139;0.141]		No	0.402	[-0.206;0.187]		No
(3) Negative emotions to finance	1.000	0.997	0.918	Yes	0.300	[-0.144;0.147]		No	0.578	[-0.386;0.337]	0.001	No
(4) Negative emotions to life	0.994	0.988	0.289	Yes	0.071	[-0.153;0.138]	0.336	Yes	0.120	[-0.266;0.260]	0.377	Yes
(5) Negative emotional engagement	1.000	0.999	0.728	Yes	0.118	[-0.132;0.145]	0.098	Yes	0.473	[-0.442;0.421]	0.033	No
(6) Positive emotions to finance	1.000	1.000	0.822	Yes	-0.650	[-0.136;0.135]		No	0.097	[-0.161;0.138]	0.182	Yes
(7) Positive emotions to life	0.998	0.997	0.311	Yes	-0.455	[-0.131;0.144]		No	0.094	[-0.193;0.194]	0.361	Yes
(8) Positive emotional engagement	1.000	1.000	0.442	Yes	-0.327	[-0.143;0.141]		No	-0.259	[-0.142;0.147]		No
(9) Self-esteem	0.990	0.975	0.357	Yes	-0.377	[-0.136;0.148]		No	0.207	[-0.282;0.234]	0.109	Yes
(10) Sensation seeking	0.903	0.960		No	-0.488	[-0.141;0.135]		No	0.109	[-0.170;0.168]	0.219	Yes

MICOM Cognitive Engagement with financial product

Gender	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.997	0.995	0.136	Yes	0.675	[-0.146;0.138]		No	-0.159	[-0.169;0.166]	0.065	Yes
(2) Cognitive engagement	1.000	1.000	0.280	Yes	0.173	[-0.150;0.143]	0.016	No	-0.205	[-0.197;0.189]	0.040	No
(3) Financial Satisfaction	1.000	0.999	0.939	Yes	0.161	[-0.138;0.144]	0.026	No	-0.160	[-0.154;0.148]	0.039	No
(4) Negative emotions to finance	0.998	0.986	0.454	Yes	-0.597	[-0.138;0.135]		No	-0.452	[-0.192;0.171]		No
(5) Negative emotions to life	0.976	0.207	0.955	Yes	0.011	[-0.141;0.132]	0.881	Yes	-0.010	[-0.253;0.230]	0.932	Yes
(6) Positive emotions to finance	1.000	0.999	0.197	Yes	0.432	[-0.147;0.131]		No	-0.204	[-0.151;0.135]	0.005	No
(7) Positive emotions to life	0.997	0.994	0.509	Yes	0.162	[-0.135;0.142]	0.018	No	-0.304	[-0.190;0.186]	0.002	No
(8) Self-esteem	0.973	0.964	0.114	Yes	0.185	[-0.135;0.132]	0.011	No	-0.235	[-0.229;0.241]	0.052	No
(9) Sensation seeking	0.989	0.962	0.446	Yes	0.442	[-0.142;0.142]		No	-0.265	[-0.184;0.176]	0.004	No

Age	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.980	0.964	0.099	Yes	-0.381	[-0.158;0.152]		No	0.048	[-0.179;0.221]	0.669	Yes
(2) Cognitive engagement	0.998	0.996	0.278	Yes	-0.329	[-0.161;0.166]		No	0.240	[-0.204;0.220]	0.025	No
(3) Financial Satisfaction	1.000	1.000	0.514	Yes	0.060	[-0.170;0.165]	0.457	Yes	0.011	[-0.208;0.227]	0.914	Yes
(4) Negative emotions to finance	0.973	0.710	0.485	Yes	-0.351	[-0.165;0.162]		No	-0.261	[-0.268;0.296]	0.068	Yes
(5) Negative emotions to life	0.995	0.455	0.997	Yes	-0.390	[-0.162;0.154]		No	-0.371	[-0.279;0.311]	0.010	No
(6) Positive emotions to finance	0.996	0.999		No	-0.480	[-0.161;0.152]		No	-0.138	[-0.164;0.183]	0.135	Yes
(7) Positive emotions to life	0.998	0.988	0.858	Yes	-0.067	[-0.171;0.156]	0.425	Yes	-0.177	[-0.204;0.223]	0.105	Yes
(8) Self-esteem	0.998	0.964	0.941	Yes	0.234	[-0.156;0.167]	0.005	No	-0.372	[-0.253;0.314]	0.011	No
(9) Sensation seeking	0.887	0.836	0.104	Yes	-0.549	[-0.163;0.170]		No	0.258	[-0.183;0.202]	0.015	No

Experience	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.974	0.980	0.033	No	0.747	[-0.140;0.137]		No	-0.033	[-0.161;0.185]	0.720	Yes
(2) Cognitive engagement	0.998	0.997	0.262	Yes	0.298	[-0.146;0.141]		No	-0.031	[-0.177;0.206]	0.749	Yes
(3) Financial Satisfaction	1.000	1.000	0.455	Yes	0.641	[-0.136;0.134]		No	-0.402	[-0.198;0.190]		No
(4) Negative emotions to finance	0.848	0.898	0.022	No	-0.612	[-0.144;0.144]		No	-0.482	[-0.220;0.242]		No
(5) Negative emotions to life	0.948	0.661	0.361	Yes	-0.061	[-0.145;0.143]	0.394	Yes	-0.125	[-0.238;0.257]	0.303	Yes
(6) Positive emotions to finance	1.000	0.999	0.516	Yes	0.653	[-0.133;0.139]		No	-0.100	[-0.144;0.157]	0.198	Yes
(7) Positive emotions to life	0.993	0.993	0.047	No	0.464	[-0.138;0.153]		No	-0.113	[-0.189;0.182]	0.254	Yes
(8) Self-esteem	0.989	0.978	0.271	Yes	0.379	[-0.145;0.144]		No	-0.212	[-0.236;0.251]	0.086	Yes
(9) Sensation seeking	0.909	0.892	0.079	Yes	0.477	[-0.145;0.143]		No	-0.103	[-0.172;0.172]	0.250	Yes

MICOM Behavioural Engagement with financial product

Gender	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.999	0.988	0.797	Yes	0.125	[-0.194;0.194]	0.211	Yes	-0.080	[-0.237;0.232]	0.511	Yes
(2) Financial Satisfaction	1.000	1.000	0.287	Yes	-0.064	[-0.202;0.201]	0.519	Yes	0.281	[-0.274;0.281]	0.043	No
(3) Behavioural Engagement	0.999	0.999	0.110	Yes	0.114	[-0.208;0.195]	0.277	Yes	-0.102	[-0.231;0.228]	0.384	Yes
(4) Negative emotions to finance	0.972	0.970	0.057	Yes	-0.065	[-0.196;0.190]	0.508	Yes	0.007	[-0.247;0.243]	0.967	Yes
(5) Negative emotions to life	0.200	-0.026	0.131	Yes	-0.043	[-0.201;0.192]	0.667	Yes	0.025	[-0.305;0.316]	0.878	Yes
(6) Positive emotions to finance	1.000	0.999	0.573	Yes	0.083	[-0.187;0.182]	0.404	Yes	0.053	[-0.188;0.204]	0.614	Yes
(7) Positive emotions to life	0.995	0.992	0.257	Yes	0.061	[-0.186;0.190]	0.555	Yes	-0.043	[-0.257;0.290]	0.746	Yes
(8) Self-esteem	0.910	0.947	0.014	No	-0.122	[-0.191;0.189]	0.216	Yes	0.203	[-0.310;0.324]	0.227	Yes
(9) Sensation seeking	0.923	0.944	0.016	No	0.018	[-0.199;0.193]	0.836	Yes	-0.161	[-0.251;0.238]	0.191	Yes

Age	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.983	0.994	0.002	No	-0.339	[-0.160;0.163]		No	0.115	[-0.175;0.189]	0.245	Yes
(2) Financial Satisfaction	1.000	1.000		Yes	0.060	[-0.157;0.172]	0.465	Yes	0.011	[-0.208;0.253]	0.926	Yes
(3) Behavioural Engagement	0.998	0.999	0.007	No	-0.599	[-0.160;0.165]		No	0.201	[-0.188;0.206]	0.048	No
(4) Negative emotions to finance	0.997	0.977	0.369	Yes	-0.246	[-0.182;0.164]	0.009	No	-0.055	[-0.206;0.226]	0.610	Yes
(5) Negative emotions to life	0.834	0.182	0.405	Yes	-0.620	[-0.161;0.153]		No	-0.562	[-0.260;0.274]		No
(6) Positive emotions to finance	0.999	0.999	0.184	Yes	-0.481	[-0.152;0.163]		No	-0.136	[-0.154;0.186]	0.112	Yes
(7) Positive emotions to life	0.999	0.990	0.994	Yes	-0.065	[-0.157;0.164]	0.426	Yes	-0.182	[-0.210;0.231]	0.105	Yes
(8) Self-esteem	0.982	0.913	0.378	Yes	0.182	[-0.149;0.178]	0.033	No	-0.366	[-0.270;0.293]	0.012	No
(9) Sensation seeking	0.986	0.943	0.419	Yes	-0.519	[-0.165;0.152]		No	0.252	[-0.192;0.209]	0.013	No

Experience	MICOM Step 2				MICOM Step 3							
Composite	Correlation *c*	5.0% quantile	p-value	Compositional Invariance?	Difference of the composite's mean value	95% confidence interval	p-value	Equal mean values?	Logarithm of the composite's variance ratio	95% confidence interval	p-value	Equal variances?
(1) Attitude towards financial risk	0.967	0.994		No	0.756	[-0.146;0.140]		No	-0.037	[-0.177;0.173]	0.684	Yes
(2) Financial Satisfaction	1.000	1.000	0.261	Yes	0.641	[-0.141;0.144]		No	-0.402	[-0.182;0.195]		No
(3) Behavioural Engagement	1.000	0.999	0.129	Yes	0.476	[-0.147;0.144]		No	-0.214	[-0.161;0.165]	0.013	No
(4) Negative emotions to finance	0.981	0.984	0.032	No	-0.668	[-0.133;0.151]		No	-0.516	[-0.177;0.184]		No
(5) Negative emotions to life	0.855	0.237	0.424	Yes	-0.052	[-0.160;0.148]	0.488	Yes	-0.104	[-0.250;0.250]	0.392	Yes
(6) Positive emotions to finance	1.000	0.999	0.922	Yes	0.654	[-0.147;0.140]		No	-0.101	[-0.148;0.150]	0.204	Yes
(7) Positive emotions to life	0.998	0.993	0.728	Yes	0.459	[-0.144;0.136]		No	-0.114	[-0.194;0.186]	0.235	Yes
(8) Self-esteem	0.981	0.956	0.256	Yes	0.388	[-0.142;0.137]		No	-0.165	[-0.243;0.237]	0.179	Yes
(9) Sensation seeking	0.968	0.959	0.092	Yes	0.490	[-0.144;0.134]		No	-0.100	[-0.165;0.162]	0.253	Yes

PLS-MGA results across control variables

Emotional engagement with financial product	**GENDER** *Paths (Females)*	*Path (Males)*	*p-value*	**AGE** *Path (<50)*	*Path (50+)*	*p-value*	**FINANCIAL EXPERIENCE** *Path (Experienced)*	*Path (Unexperienced)*	*p-value*
Attitude towards financial risk -> Positive emotional engagement	0.023	0.051	0.634	-0.031	0.048	0.845	0.050	0.095	0.728
Financial Satisfaction -> Positive emotional engagement	-0.014	0.006	0.620	*-0.046n.s.*	*0.135****	*0.998*	0.015	0.003	0.419
Negative emotions to finance -> Positive emotional engagement	0.043	0.095	0.854	0.067	0.036	0.317	0.058	0.057	0.489
Negative emotions to life -> Positive emotional engagement	0.067	0.040	0.351	0.052	0.004	0.291	0.092	0.044	0.246
Positive emotions to finance -> Positive emotional engagement	**0.643*****	**0.496*****	**0.042**	0.617	0.554	0.280	0.549	0.558	0.545
Positive emotions to life -> Positive emotional engagement	**0.050n.s.**	**0.214*****	**0.977**	0.121	0.185	0.757	0.108	0.152	0.721
Self-esteem -> Positive emotional engagement	0.007	-0.119	0.070	-0.027	-0.130	0.130	-0.046	-0.052	0.459
Sensation seeking -> Positive emotional engagement	*0.125****	*0.005n.s.*	*0.027*	0.018	0.069	0.721	0.085	0.030	0.183
Attitude towards financial risk -> Negative emotional engagement	0.003	0.070	0.777	-0.006	0.131	0.944	0.078	0.049	0.339
Financial Satisfaction -> Negative emotional engagement	0.027	0.053	0.644	0.019	0.054	0.689	0.051	0.045	0.464
Negative emotions to finance -> Negative emotional engagement	0.573	0.607	0.649	**0.504*****	**0.749*****	**0.997**	0.537	0.636	0.875
Negative emotions to life -> Negative emotional engagement	0.130	0.084	0.303	0.126	-0.007	0.076	**0.012n.s.**	**0.184*****	**0.977**
Positive emotions to finance -> Negative emotional engagement	0.010	-0.045	0.262	0.013	-0.091	0.158	-0.036	-0.002	0.671
Positive emotions to life-> Negative emotional engagement	**-0.119****	**0.099n.s.**	**0.995**	-0.008	0.029	0.645	**0.128****	**-0.086***	**0.005**
Self-esteem -> Negative emotional engagement	**0.216*****	**-0.069n.s.**	**0.005**	0.127	-0.050	0.062	**-0.080n.s.**	**0.150****	**0.978**
Sensation seeking -> Negative emotional engagement	0.064	0.056	0.457	0.061	0.044	0.409	*-0.012n.s.*	*0.144****	*0.994*

Cognitive engagement with financial product	**GENDER** *Paths (Females)*	*Path (Males)*	*p-value*	**AGE** *Path (18-49)*	*Path (50+)*	*p-value*	**FINANCIAL EXPERIENCE** *Path (Experienced)*	*Path (Unexperienced)*	*p-value*
Attitude towards financial risk -> Cognitive engagement	0.093	0.136	0.695	**0.041n.s.**	**0.228****	**0.950**	0.135	0.101	0.341
Financial satisfaction-> Cognitive engagement	-0.027	0.022	0.725	-0.032n.s.	0.104n.s.	0.924	0.028	-0.025	0.261
Negative emotions to finance -> Cognitive engagement	-0.114	0.001	0.920	-0.071	-0.077	0.468	0.001	-0.114	0.089
Negative emotions to life -> Cognitive engagement	-0.052	-0.055	0.492	**-0.016n.s.**	**-0.155****	**0.050**	0.007	-0.115	0.071
Positive emotions to finance -> Cognitive engagement	0.345	0.235	0.127	*0.336****	*0.094n.s.*	*0.036*	0.279	0.250	0.386
Positive emotions to life -> Cognitive engagement	0.014	0.118	0.865	0.091	0.082	0.460	*-0.018n.s.*	*0.171****	*0.978*
Self-esteem -> Cognitive engagement	-0.006	0.001	0.528	-0.006	0.021	0.586	0.079	-0.070	0.068
Sensation seeking -> Cognitive engagement	0.058	0.027	0.357	0.004	-0.030	0.352	**0.104****	**-0.080n.s.**	**0.008**

Behavioural engagement with financial product	**GENDER** *Paths (Females)*	*Path (Males)*	*p-value*	**AGE** *Path (18-49)*	*Path (50+)*	*p-value*	**FINANCIAL EXPERIENCE** *Path (Experienced)*	*Path (Unexperienced)*	*p-value*
Attitude towards financial risk -> Behavioural engagement	0.342	0.241	0.089	0.293	0.327	0.642	*0.228****	*0.434****	*0.996*
Financial satisfaction-> Behavioural engagement	-0.007	-0.046	0.280	-0.059	0.039	0.885	-0.033	-0.010	0.640
Negative emotions to finance -> Behavioural engagement	-0.034	-0.020	0.573	-0.014	-0.005	0.545	*0.113**	*-0.086n.s.*	*0.011*
Negative emotions to life -> Behavioural engagement	0.137	0.080	0.243	0.017	0.092	0.669	0.098	0.097	0.587
Positive emotions to finance -> Behavioural engagement	0.242	0.234	0.462	*0.280****	*0.043n.s.*	*0.028*	**0.255*****	**0.111***	**0.050**
Positive emotions to life -> Behavioural engagement	-0.035	0.102	0.942	0.037	0.166	0.867	0.027	0.060	0.658
Self-esteem -> Behavioural engagement	0.049	-0.022	0.228	-0.023	-0.054	0.393	0.039	-0.019	0.248
Sensation seeking -> Behavioural engagement	0.163	0.069	0.079	0.063	0.136	0.769	0.145	0.048	0.072

All significant MGA results are highlighted in grey.
The results in italics were excluded from the analysis due to unestablished compositional invariance.
The significance levels applied: ***<0.01; **<0.05

[1] A retail investor is an individual who purchases securities for his or her own personal account rather than for an organisation (Investinganswers.com, 2020).

[2] The term 'framing' is used in this study in line with research in psychology and economics to describe the effect that a person's perception of information and subsequent decision-making can be altered depending on how information is portrayed. See for example Druckman (2001) or Tversky and Kahneman (1981) for an overview.

3 For example, through requests for accompanying statements to graphs indicating that past performance is not an indicator of future performance.

4 In this study, we only examine situations in which retail investors encounter an investment product for the first time and from a provider they have not dealt with before. As such, we do not study existing relationships that retail investors may hold with financial advisors or institutions or the relevance of brand or institutional names on retail investors.

5 Our study looks at the impact that the signalling of a "protect" versus "achieve" IC frame has on retail investor reactions, regardless of people's individual propensities, which have been studied elsewhere. From a managerial perspective, we believe it is important to understand how IC framing elicits responses widely, as measuring individual preferences to match IC individually would not constitute a doable practical approach.

6 In this study we focus on the direct links between our experimental conditions and emotional, cognitive and behavioural outcome variables. It is beyond the scope of this study to examine potential links between emotional, cognitive and behavioural responses. Future studies can build on the emerging evidence from the direct links in this study to hypothesise and test any further interrelations.

[7] Standard economic models (such as discounted utility models) have been shown to be problematic in explaining decisions made in inter-temporal space (i.e., discount rates were shown to not be stable, but to vary as a function of contextual and other variables) (Costa, Carvalho and Moreira, 2019; Estelami, 2016).

8 Sensation-seekers, as they are typically called in the psychology literature, are classically described as having a higher need for "varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences" (Zuckerman, 1979: p.10).

[9] Time-horizons are chosen to approximate real-life investment contexts (see Friesen and Sapp, 2007; Petersen, Kushwaha and Kumar, 2015).

[10] Retail investor propensity to engage with financial products is conceptualised following work in the literature suggesting that propensity to engage is best approximated in a number of ways by including emotional, cognitive and behavioural avenues to engagement (see, for example, Bowden, 2009; Brodie *et al.*, 2011; Chung, Wedel and Rust, 2016; Harmeling *et al.*, 2017; Helm, 2007; Pansari and Kumar, 2017; Sen, Bhattacharya and Korschun, 2006; So *et al.*, 2016). All three types of engagements are suggested in communication studies to be important in building interest and follow-on behaviour, but interestingly, the field of IC has a need to include, and differentiate between, emotional engagement and other forms of engagement (Grable, Britt and Webb, 2008). Indeed, much of the wider behavioural finance literature has often neglected emotional variables (Lucey and Dowling 2005; Michenaud and Solnik, 2008; Nguyen and Noussair, 2014).

[11] Prior to the commencement of data collection, the research design and research questions were approved through the authors' University research ethics process.

[12] Searching through adverts and leaflets for financial products that were available on the UK market when this study was conducted in spring 2017 showed that information about investment motivation and time-horizon are two key characteristics almost always displayed with financial products. It also became apparent that such information is typically portrayed through a mix of descriptions, graphics, headlines and pictures. Hence, we followed this current practice and also portrayed the financial product information of interest in this study through a mixture of words and pictures.

13 The achieve investment motivation condition 'Dream it. Achieve it' describes the financial product offered – Growth Portfolio – as a portfolio that would ensure exciting growth and provide lucrative returns. The protect investment motivation condition 'Own it. Protect it' described the financial product offered – Income Portfolio – as a product that is focused on secure income growth and stable returns. Time-horizons were implemented as bar graphs).

14 Since respondents were recruited by Qualtrics, the company ensured full completion of the survey.

15 Following Henseler (2007) and Henseler *et al.* (2009), we employ nonparametric PLS-MGA because it allows combining advantages of the parametric approach (Keil *et al.* (2000), the moderation approach (Baron and Kenny,1986), and the permutation approach (Chin, 2003) remaining one of most conservative approaches to group analysis within PLS-SEM (Sarstedt, Henseler and Ringle, 2011).

[16] The Sensation Seeking construct deemed the results borderline for reliability scores, including both rho_A and Cronbach's Alpha less than 0.7, whilst composite reliability was above 0.7. Provided that the composite reliability measure was deemed satisfactory, we followed Henseler, Ringle and Sinkovics (2009) and Nyide and Zunckel (2019), and the construct was kept to maintain face consistency for the other factors.

[17] Following Aguirre-Urreta and Rönkkö's (2018) suggestion with regard the use of percentile-based confidence intervals, we checked for, and confirmed, the results' stability when using percentile-based confidence intervals.

[18] For positive emotional engagement as the outcome, a minority of indicators had lower RMSE values compared to the naïve LM benchmark, indicating low predictive power. For negative Emotional Engagement with the financial product, all indicators in the PLS-SEM had lower RMSE values, providing support for a high predictive power. The majority of indicators for Cognitive Engagement yielded lower RMSE values in PLS-SEM compared to LM, suggesting a medium predictive power. Finally, the analysis of Behavioural Engagement demonstrated a lack of predictive power as none of the indicators outperformed the most naïve benchmark. A possible explanation for the lack of predictive power for the Behavioural engagement model lies within the initial aim of the Study 2, which is to identify key drivers of behavioural engagement with financial product under different framing conditions, rather than confirming.

[19] MGA-PLS is a non-parametric method to test for group differences using the PLS-SEM bootstrapping procedure. A result is considered to be significant if the p-value is smaller than 0.05 or larger than 0.95 for a specific path coefficient difference (Henseler, Ringle and Sinkovics, 2009; Sarstedt, Henseler and Ringle, 2011).

[20] The general importance of all predictor variables investigated has been argued and demonstrated elsewhere, see for example Grable, Britt and Webb (2008) and Hillenbrand *et al*. (2019).