

KRISTJAN PULK

Influencing personal financial decisions
with information provision



DISSERTATIONES RERUM OECONOMICARUM
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UNIVERSITY OF TARTU
Press

School of Economics and Business Administration, University of Tartu, Estonia

The dissertation is accepted for the defence of the degree of Doctor of Philosophy (in Economics) on the 29th of May 2024, by the Council of the School of Economics and Business Administration, University of Tartu.

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The public defence of the dissertation is on the 28th of June 2024 at 14.00 in room 1018 at Narva mnt 18, University of Tartu.

The publication of this dissertation is granted by the Doctoral School of Economics and Innovation of University of Tartu created under the auspices of European Social Fund and by University of Tartu School of Economics and Business Administration.

Language editor: Michael Haagenen (English)

ISSN 1406-1309 (print)
ISBN 978-9916-27-556-6 (print)
ISSN 2806-254X (pdf)
ISBN 978-9916-27-557-3 (pdf)

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University of Tartu Press
www.tyk.ee

TABLE OF CONTENTS

LIST OF AUTHOR'S ORIGINAL STUDIES AND CONFERENCE PRESENTATIONS	6
1. INTRODUCTION	8
1.1. Motivation for the research	8
1.2. Aim, research questions, and research scope of the thesis	11
1.3. Structure of the thesis	16
1.4. Brief overview of the studies	16
1.5. Author's contribution to the publications	19
1.6. Acknowledgements	19
2. THEORETICAL BACKGROUND	21
2.1. A behavioural view of personal financial decision-making	21
2.2. Models for influencing behaviour	25
2.3. Information provision interventions in the context of personal financial decisions	29
3. METHODOLOGY AND METHODS	31
3.1. Methodological background for the studies	31
3.2. Experiments in economics	31
3.3. Methods and techniques employed in the studies	36
4. EMPIRICAL STUDIES	39
5. DISCUSSION	120
5.1. Findings of the studies	120
5.2. Contributions to theory	127
5.3. Policy and practical recommendations	128
5.4. Limitations and suggestions for further research	130
6. REFERENCES	133
SUMMARY IN ESTONIAN	151
CURRICULUM VITAE	158
ELULOOKIRJELDUS	161

LIST OF AUTHOR'S ORIGINAL STUDIES AND CONFERENCE PRESENTATIONS

1. Original published papers

1. **Pulk, K., Riitsalu, L.** Youth in individualistic countries have higher financial literacy: Evidence from PISA. *Journal of Consumer Affairs*, (ahead-of-print). <https://doi.org/10.1111/joca.12582>
2. **Pulk, K., & Riitsalu, L.** (2024). How explicit consumer credit information affects intent to purchase on credit: An experiment. *International Journal of Bank Marketing*, (ahead-of-print). <https://doi.org/10.1108/IJBM-06-2023-0347>
3. **Pulk, K., Uusberg, A., & Riitsalu, L.** (2022). How am I doing financially compared to expectations? An experimental comparison of messaging strategies in investor newsletters. *International Journal of Bank Marketing*, 41(1), 107–129. <https://doi.org/10.1108/IJBM-06-2022-0267>

2. Conference presentations

- The European Commission, Belgian Financial Services and Markets Authority (FSMA), and KU Leuven Research Centre LEER (Leuven Economics of Education Research) Conference “Financial literacy research – Pathways to becoming financially competent”. 21.02.2024, Brussels, Belgium. Presentation: “Youth in Individualistic Countries have Higher Financial Literacy: Evidence from PISA.”
- Sapienza University of Rome Summer School on Experimentics & Behavioral Economics. 17.07.2023 – 23.07.2023, Soletto, Italy. Presentation: “Debt Literacy Does Not Affect Consumer Credit Preferences: Experimental Evidence from an Online Trial.”
- International Association for Research in Economic Psychology / Society for the Advancement of Behavioral Economics Joint Conference. 07.06.2023 – 10.06.2023, Nice, France. Presentations: “Individualism leads to higher financial literacy. Evidence from PISA.” & “Consumer Perception of Caloric Content in Fast Food Meals: The Role of Expertise”
- Research in Behavioural Finance Conference. 08.09.2022, Amsterdam, the Netherlands. Poster presentation: “An experimental comparison of messaging strategies in investor newsletters.”
- Academy of Management Annual Conference. 08.08.2022, Seattle, United States. Presentation: “Employing Tallying and Take-the-Best Heuristics in the Personnel Selection Decision-Making Process.”
- International Association for Research in Economic Psychology Conference. 10.06.2022 – 12.06.2022, Kristiansand, Norway. Presentations: “Nudging consumer credit decisions with framing the cost” & “How am I doing financially – compared to me? An experimental comparison of messaging strategies in investor newsletters.”

- International Association for Research in Economic Psychology Early Career Workshop. 09.06.2022, Kristiansand, Norway. Presentation: “The Effect of Choice Architecture on the Decision to Take Early Retirement.”

1. INTRODUCTION

This PhD thesis is based on three original studies published in international peer-reviewed journals, each referred to in this thesis using the following numbers:

1. **Pulk, K., Riitsalu, L.** Youth in individualistic countries have higher financial literacy: Evidence from PISA. *Journal of Consumer Affairs*, (ahead-of-print). <https://doi.org/10.1111/joca.12582>
2. **Pulk, K., & Riitsalu, L.** (2024). How explicit consumer credit information affects intent to purchase on credit: An experiment. *International Journal of Bank Marketing*, (ahead-of-print). <https://doi.org/10.1108/IJBM-06-2023-0347>
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1.1. Motivation for the research

Despite the significant implications that personal financial decisions have for individuals, these decisions are often not a product of deliberate action (Agarwal et al., 2007; Campbell, 2006; Choi et al., 2002). We can observe signs of dubious financial decisions in many areas of life. According to the US Consumer Financial Protection Bureau, there has recently been a sharp rise in consumer debt (personal debt held by consumers) and around one fifth of people in the US with a credit score have debts in collections (*CFPB Annual Report*, 2023). Most households in the United States lack the savings to cover a financial shock that is less or equal to one month's income (Despard et al., 2020; Stavins, 2021). Similar tendencies exist in other countries (Cesar Leandro & Botelho, 2022; Karlan et al., 2014; Topa et al., 2009).

Poor financial management is associated with numerous adverse effects. Carrying excessive debt has a detrimental impact on individual well-being and mental health (Białowolski et al., 2019; de Bruijn & Antonides, 2020; Drentea & Reynolds, 2015; Gathergood, 2012; Netemeyer et al., 2018). Choosing when or how to retire greatly influences happiness and life satisfaction (Barrett & Kecmanovic, 2013; Horner, 2014; Wise, 2009). Even when a person objectively has enough money to cover their basic needs, subjective feelings of financial constraints have severe adverse effects on their well-being (Martin & Hill, 2015) and mental health (Dijkstra-Kersten et al., 2015; Sommet et al., 2018; Sommet & Spini, 2022), highlighting the importance of financial decisions in people's lives.

Therefore, how people interact with money is vital to individuals themselves and, consequently, the state. Here, we need to address financial behaviour, i.e. the

actions of individuals when it comes to their finances. Individuals who are knowledgeable about money and behave accordingly by planning their finances and assembling an emergency savings fund are also more resilient to health and income shocks (Lusardi et al., 2021). On the other hand, if people are myopic in spending their money and therefore rely on the state to provide for them in their retirement, then this behaviour pattern increases the need for a state social security budget, which would not be the case if the general population was more self-sufficient (Chybalski, 2016; Marcinkiewicz & Chybalski, 2014). The increased costs associated with providing for dependent people constrain the state budget; therefore, other necessary services receive less funding. Similar to mandating the use of motorcycle helmets in preventing serious injuries, states often prudently curtail risky financial behaviour by restricting access to consumer credit (Agarwal et al., 2015; Campbell, 2016), mandating informational disclaimers (McHugh & Ranyard, 2012) and limiting how individuals can choose to decumulate their retirement savings, such as a forced annuitization period (Asher et al., 2017; Gerrard et al., 2006). Such regulations make little to no sense for the *homo economicus*, a model of humans who can infinitely compute rational decisions and have impeccable self-control but matter greatly for regular people.

There are numerous ways to regulate or otherwise influence financial behaviour. One traditional answer has been to increase financial literacy through education (Alsemgeest, 2015; Lusardi, 2019). After all, if people are simply ignorant about which financial decisions are prudent, the cure is providing the necessary knowledge and skills to empower them to make more deliberate decisions. Indeed, financial literacy is a component in more prudent saving decisions (Jappelli & Padula, 2013), planning for retirement (Lusardi & Mitchell, 2011), higher stock market participation (van Rooij et al., 2011) and is correlated with greater wealth (Hastings & Mitchell, 2020). However, whether financial literacy truly has a relevant impact on financial behaviour has been repeatedly called into question (Mandell & Klein, 2009; Stolper & Walter, 2017; Willis, 2008), nor are the benefits reaped equally – people with low income or in debt see considerably less improvement from financial education (Kaiser & Menkhoff, 2016). Therefore, it is unclear whether (or which type) financial education impacts prudent financial behaviour, warranting further research. This thesis addresses financial literacy and how it relates to heterogeneous reactions to information provision.

In addition to education, the conventional method of economic policy is to combat financial self-sabotaging with economic tools, generally through taxes. However, the financial incentive approach that requires an active choice from the individual is unlikely to make people better off in retirement (Börsch-Supan, 2009) and is inefficient in terms of cost (Chetty et al., 2014); the vast majority of people are not likely to react to a marked change in the pension incentives structure, with the benefits being shared mainly by the wealthy (Lindeboom & Montizaan, 2020). Likewise, in the sphere of credit decisions, placing hard economic regulation (such as interest caps) has shown to be ineffective and, at times, counterproductive to reducing consumer overuse of credit (Cuesta &

Sepulveda, 2021; Maimbo & Henriquez Gallegos, 2014; Zinman, 2010). There is evidence that taxing banks tends to increase the cost and reduce access to credit (Dia & VanHoose, 2018; Kang et al., 2021). Therefore, influencing financial behaviour via taxes tends to be expensive and inefficient. Influencing financial behaviour through economic tools is a relevant consideration but out of the scope of this thesis – instead, the thesis focuses on specific “softer” tools, which are discussed next.

Minor changes to the decision-making environment can also help guide behaviour. Over recent years, numerous behavioural insights groups, sometimes dubbed “nudge units”, have formed to do exactly that – now providing counsel to governments and organisations on the best approaches in directing behaviour (Halpern, 2016). Others reject this classification and have focused on advancing individuals’ decision-making skills in the form of “boosts” (Grüne-Yanoff et al., 2018; Hertwig & Grüne-Yanoff, 2017; Hertwig & Ryall, 2020). Generally, the effect of behavioural interventions is significant in the desired direction (Mertens et al., 2022) and cost-effective (e.g., Banerjee et al., 2021), but the effect size is relatively small (DellaVigna & Linos, 2022) and context-dependent (Hummel & Maedche, 2019). Behavioural interventions need to consider the specific circumstances where they are applied to influence financial behaviour sufficiently, and more research is required to map these contextual influences. This thesis seeks to do precisely that and clarify how (information-based) behavioural interventions can be effective while addressing contextual factors not thoroughly studied in the literature.

Small but relevant changes to the decision-making environment can be made in many ways (Benartzi et al., 2017; Sunstein, 2014). For example, the decision-making environment could be changed by pre-filling one specific option (defaults, e.g. Beshears et al., 2006), providing a salient disclaimer message that makes sure the person understands their choice (warnings, e.g. Cheng & Wu, 2010; Steenbergh et al., 2004), by sending an additional message to call attention to the desired action (reminders, e.g. Karlan et al., 2016), reducing the effort required to carry out the desired action (simplification, e.g. John & Blume, 2018), and many more. There are plenty of ideas and options for influencing behaviour through changes to the decision-making environment, too many to recount in the scope of this thesis alone (but see one classification in Chapter 2.2). Instead, the thesis addresses one particular method – influencing behaviour through information provision.

Information provision refers to the role of information in decisions (Haaland et al., 2023). Examining the influence of information on decision-making is relevant to policymakers and market participants, as it facilitates the assessment of the causal effects of information on decision-making. Information provision also provides an interesting method that is capable of addressing potential problems that influencing behaviour often has, namely having a one-size-fits-all approach that can be detrimental to a possibly relevant fraction of the population (Lades & Delaney, 2022; Statman, 2013) and problems with the reduction of individual agency and autonomy (Beshears et al., 2013). It could be argued that

relevant information can empower people to make more informed decisions themselves (Hertwig & Grüne-Yanoff, 2017; Hertwig & Ryall, 2020). Therefore, information provision, for example in newsletters (Maslowska, et al., 2011) or relevant information provided at the time and place the decision is made (the decision point) (McHugh & Ranyard, 2016), could be efficient methods of influencing financial behaviour. For these reasons, the thesis focuses on information provision influences.

There is a significant research gap in understanding the connection between information provision and financial decisions. Providing salient information about credit conditions can have a positive effect on people making more informed credit decisions (McHugh & Ranyard, 2016) and reduces the use of payday loans (Bertrand & Morse, 2011), but other studies see little to no effect on credit behaviour at all (Adams et al., 2021, 2022; Seira et al., 2017). Therefore, the literature on credit information influencing credit decisions is unclear. Likewise, investment newsletters (or online posts, e.g. Dewally, 2003) can influence the investment decisions that people make (their investment behaviour) (Brown et al., 2013), even if they have no real predictive power (Graham & Harvey, 1997), and can potentially produce counterproductive results through herding behaviour (Graham, 1999). These conflicting results show that investment newsletters, especially the personalisation of such newsletters (Maslowska, et al., 2011), is not yet well understood. In addition, as discussed previously, it is unclear whether financial education is the answer to resolving issues in financial behaviour (Alsemgeest, 2015; Disney & Gathergood, 2013; Kaiser & Menkhoff, 2016; Stolper & Walter, 2017) and understanding the contextual complexity behind financial literacy scores, such as national culture (Ahunov & Van Hove, 2020; De Beckker et al., 2020). Therefore, it is unclear when and which interventions to provide information influence financial behaviour. In addition, they should ideally be controlled for financial literacy effects.

In this thesis, I provide a case in favour of implementing behaviourally informed interventions to influence financial behaviour. However, the scope of financial decisions is extensive, as are the methods designed to influence them. As such, the scope of the examined set of financial decisions and intervention methods must be limited. The precise aim and scope of the thesis will be addressed in the following section.

1.2. Aim, research questions, and research scope of the thesis

This thesis aims to provide an in-depth understanding of how information provision influences personal financial decisions. The theoretical motivation for the aim is a research gap in the literature, as it is unclear whether information provision interventions can significantly affect financial behaviour. The thesis is also motivated by practical considerations – consequential financial decisions are often made without thorough consideration. Still, these decisions could be more

deliberate when supported by providing relevant information. Exploring this topic is worthwhile for regulators, financial service providers, and practitioners in the financial market.

The scope of this thesis is situated in the intersection of two larger domains of research – behavioural economics and tools for influencing behaviour, as depicted in Figure 1. As noted before, the complete picture of financial decisions is much more extensive, including the breadth of consumption and insurance decisions. Furthermore, behaviour among specific products within these broader categories can be markedly different, such as differences in the use of mortgages and the use of credit in purchasing consumer goods. The thesis here focuses on one specific form of credit decision – namely purchasing on credit, where a person typically takes on credit with the singular purpose of buying a specific consumer product, and they pay the sum back in regular instalments. Therefore, the scope of financial decisions is necessarily limited, and here, I focus on decisions related to investment, savings, and purchasing on credit. As shown previously, these financial decisions are of great importance to individual well-being and health (de Bruijn & Antonides, 2020; Gathergood, 2012; Netemeyer et al., 2018), and therefore warrant further examination.

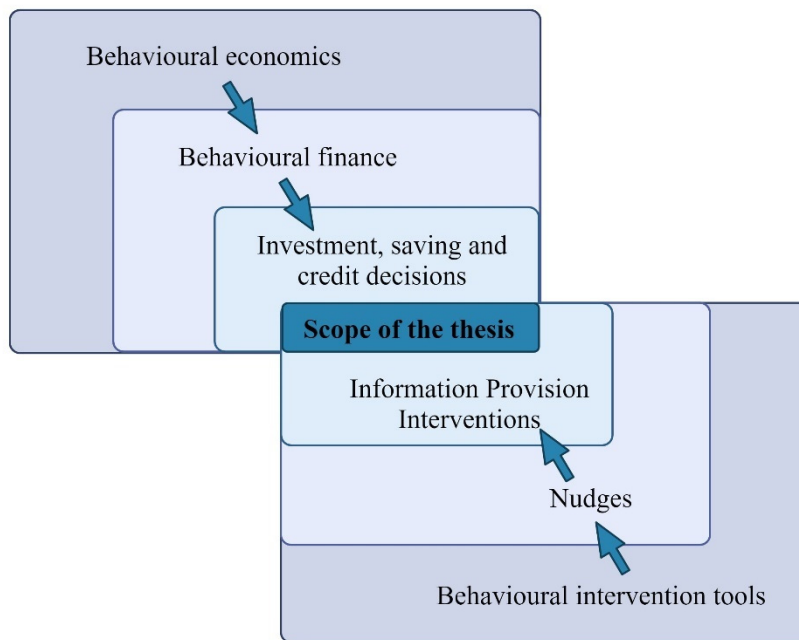


Figure 1. The research scope of the thesis
Source: compiled by the author.

In addition, there is a large number of ways to influence financial behaviour, too many for one thesis, and so the specific behavioural interventions addressed are limited to information provision nudges (Thaler & Sunstein, 2009), as this intervention method is cost-effective for governments and companies to apply (Hudák et al., 2017; Lutz et al., 1999; McHugh & Ranyard, 2016). As such, the thesis is primarily concerned with how information provision interventions affect investment, saving, and credit decisions.

The thesis must also necessarily limit the scope of the research object, focusing on personal financial decisions (i.e., financial decisions made by private individuals). This means that corporate financial decisions, for example, are not considered. However, individuals are still nested in groups at different levels, and attention should also be directed towards the country-level context. However, research on the effect that country-level context (e.g., culture) has on financial behaviour and financial literacy is still in its early stages (e.g., Ashqar & Lobão, 2021), deserving further research (Gathergood & Disney, 2011; Lusardi & Tufano, 2015). Based on the research gap and motivation, the thesis addresses the following four research questions:

1. How does the country-level context, especially financial literacy, interact with financial decisions? (Study 1)
2. Does financial literacy explain personal credit behaviour? (Study 2)
3. How effective is credit information provision in influencing intention to purchase on credit? (Study 2)
4. How effective is the provision of investment performance information in influencing personal investment and saving behaviour? (Study 3)

The conceptual-analytical framework provides an overview of how the studies and research questions are interlinked (Figure 2). This thesis focuses on the individual level but also considers the country-level context, including economic development and education levels. Study 1 provides the necessary background for recognising the context's role in financial literacy scores, answering the first research question (RQ1). The Study also discusses how financial literacy interacts with financial decision-making on the individual level, thereby providing a basis for Study 2. The key causal relationship on the individual level between information provision and personal financial decisions is examined in Studies 2 and 3. The results from the second study feed directly into answering research question two (RQ2) on the link between literacy, attitudes, and personal financial behaviour. Attitudes here are considered in a broader sense than just disposition towards an object or idea (Triandis, 1971). Study 2 also answers the third research question (RQ3), while Study 3 answers the fourth (RQ4). Note that the hypotheses in each empirical study are not considered in the main body text of this thesis; they are found in the respective studies (see Subchapter 1.3 for an overview). The conclusions from these studies and the thesis contribute to understanding the effect of information provision and provide additional insights into effectively designing and implementing tools for influencing or changing behaviour, specifically nudges and boosts.

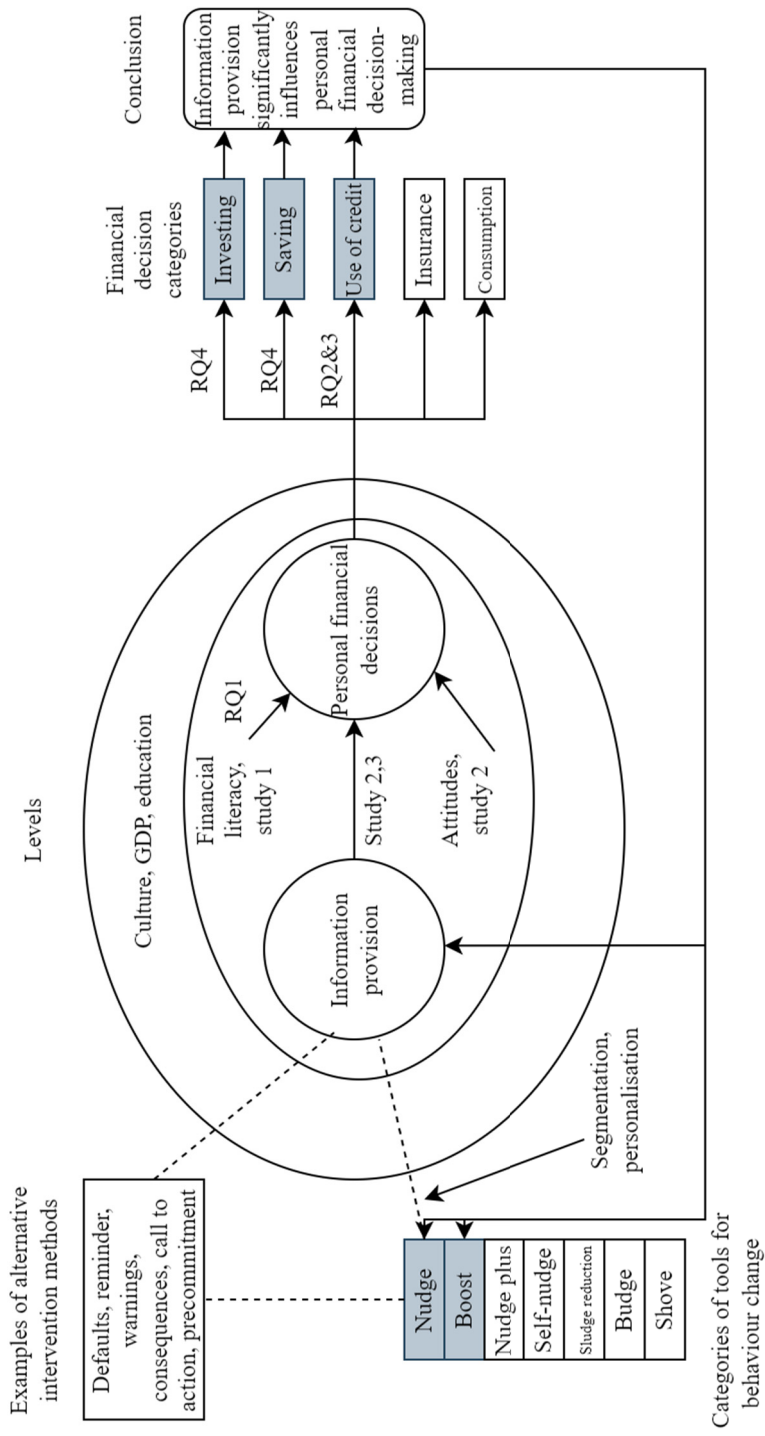


Figure 2. The conceptual-analytical framework of this thesis
Source: compiled by the author.

The ontological view of this thesis is rooted in objectivism, as the thesis addresses the objectively observed personal financial behaviour of individuals instead of the inner psychological mechanisms of individuals. In the case of Study 2, behaviour is inferred from revealed preference. As experiments on financial behaviour have significant ethical considerations, behaviour is not always directly possible to research, and intention to act (a plan) is employed as a proxy instead (Ajzen, 1991). Therefore, this thesis is placed epistemologically into empiricism, seeking to understand phenomena based on experimentation.

The methodological approach in this thesis is positivist, accomplishing the aim through two experiments on financial behaviour, which provide evidence for information provision effects, and one study on financial literacy that contextualises the results. Experiments are perhaps the most common method in measuring whether the presented information influences decision-making (Haaland et al., 2023). Information provision experiments are typically either randomised controlled trials (RCTs) or field experiments in which treatment groups receive different degrees of information and are then asked to make a decision. RCTs offer increased internal validity through better control over the information provided to the participant (Athey & Imbens, 2017), while field trials provide external validity by applying experimental conditions in a real-life setting (Levitt & List, 2009). Therefore, a comprehensive approach would combine laboratory and online experiments with field experiments to obtain both benefits, and this approach is taken in the thesis.

The experiments included in this thesis (Study 2 and Study 3) were conducted in Estonia. Estonia was chosen as a suitable case study for analysis, as 1) there are considerable socio-economic problems in the country that are associated with financial behaviour (as detailed below), which the provided research can help address; and 2) as a context-dependent field of research, more international studies are required, and Estonia provides a less researched cultural and social environment. To illustrate the case of Estonia, let us examine avenues in which financial behaviour benefits from further study across three broad categories – retirement finances, use of credit, and investing. First, according to Eurostat’s 2021 data, the share of retirement-aged people who continue working in Estonia is the highest in Europe (32.5%, *Eurostat*, 2023), while the retirement income replacement rate for Estonia is one of the lowest in the OECD, with the average pension substituting 34% of pre-retirement income OECD, 2021). This shows that a large proportion of the Estonian population is unprepared for retirement. Second, the Estonian Financial Supervisory Authority assessed that in 2022, 22% of the credit contracts from non-bank lenders were overdue (*FI*, 2023). The high delinquency rate indicates that many credit decisions are not carefully considered. Finally, we can observe from the 2021 data provided in the Estonian Household Finance and Consumption Survey (HFCS) that Estonians hold a significantly lower proportion of financial assets than is typical in the eurozone, indicating low stock market participation. Indeed, not all these problems directly result from poor financial management, but the situation is unlikely to change without intervention.

1.3. Structure of the thesis

This thesis consists of four chapters in addition to the introduction (Chapter 1). After providing a brief overview of the empirical studies and the authors' contribution to Chapter 2 provides a theoretical background and offers a deeper understanding of the concepts addressed in this thesis. The theoretical background chapter begins with an overview of the contrasts between the behavioural view and the neoclassical view of financial decision-making (subchapter 2.1), which is then followed by a review of the literature on influencing behaviour (2.2) before moving on to the narrower topic of information provision interventions (2.3), a specific type of intervention designed to influence behaviour. After the theoretical background, I give an overview of the methodological background of the empirical studies (3.1) and open a discussion on experiments in economics (3.2) before explicitly addressing the methods and techniques applied in this thesis (3.3). The empirical studies themselves are included in Chapter 4. The discussion chapter (chapter 5) reflects on the findings (5.1), outlines contributions to theory (5.2), and offers practical and policy recommendations (5.3). The research limitations and suggestions for further studies are also addressed (5.4). The thesis concludes with a summary in Estonian and the authors' curriculum vitae in both English and Estonian.

1.4. Brief overview of the studies

This subchapter provides a brief overview of the studies included in the empirical chapter of this thesis (Chapter 4). See Table 1 for details about the data, methods, results, and implications of each study.

Table 1. Overview of the studies included in this thesis.

Study	Objective	Research gap	Data and methods	Rationale	Results	Importance of the results
1	To examine national-level differences in youth financial literacy scores.	The role of cultural dimensions is understudied, with mixed results when it comes to the relationship between individualism and financial literacy	The 2018 wave of PISA financial literacy survey of 107174 individual 15–16-year-old students from 20 countries.	To provide the broader context for how financial literacy differs internationally, allowing for the contextualisation of experimental results.	The Study outlines how youth financial literacy scores vary and depend on many factors.	The results call for an interdisciplinary approach to addressing financial literacy problems.
2	To assess the effect of providing credit information on the intention to purchase on credit.	Mixed results in the literature on whether credit information affects personal credit decisions	Experiment and survey with a representative sample of 1204 adults in Estonia.	Many people struggle with debt; providing credit information could help reduce the irresponsible use of credit.	Credit information provided at the decision point greatly influences the intention to purchase on credit. Debt literacy did not play a role in the intent to purchase on credit, but attitudes towards debt did.	The results highlight the importance of the choice architecture and presenting information in consumer credit decisions.
3	To nudge investment and saving behaviour via information provision.	Mixed results on the effectiveness of newsletters and the personalisation of newsletter content on personal financial behaviour	Experiment featuring real-life transaction data from 4782 clients over five months at an Estonian retail bank.	People often neglect saving and investing; the Study explores ways that could help them invest and save.	Overall, newsletters did not significantly affect investment and saving decisions. That said, there was a positive influence on investment and savings account balances in a few specific investor subgroups.	Investor behaviour analysis is paramount for creating effective newsletters. A newsletter attempting to influence investment behaviour will likely not be effective unless personalised and targeted to specific investor groups.

Source: compiled by the author.

Study 1, “Youth in individualistic countries have higher financial literacy: Evidence from PISA”, is included in this thesis to examine national-level differences in youth financial literacy scores. The Study carried out a multilevel analysis of PISA 2018 financial literacy scores. This approach addresses the country-level context of countries rather than the individual level to provide a comparison of aggregate effects over several countries. The Study addresses country-level culture as an important factor in youth financial literacy scores, but as the thesis focuses on behaviour and how to influence it, a thorough examination of cultural dimensions on the national level is not considered in the body text. It is discussed only within the respective empirical article. Study 1 serves an essential role in the context of this thesis – to illustrate how people can be highly financially literate in Estonia but still not always behave according to that knowledge. The Study contributes to understanding the multifaceted nature of financial literacy, warranting interdisciplinary research, and the findings have practical implications for developing financial literacy education programmes.

Study 2, “How explicit consumer credit information affects intent to purchase on credit: An experiment.” assessed the effect of credit information provision on the intention to purchase on credit. Previous studies have shown mixed results in the effects that information provision can have on credit behaviour – some have been quite encouraging (McHugh & Ranyard, 2012, 2016; see mechanism from Ranyard, 2017) while others observe little to no effect at all (Adams et al., 2021, 2022; Seira et al., 2017). Given that credit decisions are incredibly influential in a person's life, the Study contributes to resolving this important gap in the research. The chosen method for Study 2 was an online vignette experiment and survey conducted on a representative sample of adults in Estonia (n=1204). The Study addressed four hypotheses regarding purchasing on credit: 1) depicting the total cost and duration (or the APR) of the credit agreement will reduce intent to purchase on credit; 2) people with higher debt literacy are less likely to purchase on credit; 3) attitudes towards credit can predict intent to purchase on credit; and 4) people with chronic debt are more likely to purchase on credit. The evidence provided in the Study shows that intent to purchase on credit (i.e. the intention of using credit to purchase the depicted product) was substantially affected by information provision. The Study also found evidence in support of the third and fourth hypotheses, showing that attitudes toward debt were good predictors of the intent to purchase on credit, and people already in chronic debt were still more likely to purchase on credit. There was no evidence to support the second hypothesis, as debt literacy did not interact with the intention to purchase on credit. Therefore, the Study contributes to understanding the role of financial literacy (particularly debt literacy) and attitudes in credit decisions.

Study 3, “How am I doing financially compared to expectations? An experimental comparison of messaging strategies in investor newsletters.” investigated the effects of different messaging strategies on the investment amounts of bank customers. Investments and savings are essential to wealth accumulation and financial resilience, but previous studies have provided mixed results, as there are possible benefits of sending out newsletters (Byrne & Lemay, 2006; Kumar,

2021; Müller et al., 2008). However, the effect on behaviour is still unclear (Maslowska, Putte, et al., 2011; Maslowska, Smit, et al., 2011). The Study featured a field experiment incorporating newsletters that informed Estonian retail bank clients about their investment results. The Study proposed four hypotheses regarding the newsletter intervention: 1) the intervention will increase the average sum invested by the intervention group; 2) the intervention will increase the average account balances in savings and securities accounts; 3) investors' financial behaviour is influenced by salient information regarding their past performance; 4) praising messages will have a greater impact on increasing investments compared to a scolding message. The Study showed null results for the first two hypotheses, the differences in the average sums invested by the control and treatment groups were not statistically significant. However, the newsletter did increase investments for clients who had not yet made their regular contribution. The results for the third and fourth hypotheses were inconclusive. Past comparisons mainly influenced account balances when the investor contributed much more than usual but not markedly in other groups (sans one group).

1.5. Author's contribution to the publications

All three empirical studies in this thesis are co-authored with Leonore Riitsalu, while Study 3 also includes Andero Uusberg as a co-author. Kristjan Pulk is the first author of all three studies. In all three studies, the author of this thesis wrote the manuscripts, conducted the empirical analysis, and was the corresponding author responsible for submitting the manuscripts and necessary revisions to the journals during the publication process. The details of the contribution of each individual study are outlined below.

In Study 1, Leonore Riitsalu contributed to the financial literacy section and helped find international discussants to validate the initial manuscript findings. She also provided suggestions that helped clarify the manuscript. The experiment in Study 2 was co-designed with Leonore Riitsalu, who also suggested revisions to the manuscript and gave helpful suggestions in contextualising the results.

In Study 3, Andero Uusberg and Leonore Riitsalu advised the bank where the Study was conducted in designing the experiment and dealt with most of the communication regarding the private sector partner. Both co-authors contributed by revising the manuscript. Additionally, Andero Uusberg suggested analytical methods to analyse the data, while Leonore Riitsalu helped contextualise the findings within the discussion and implications sections.

1.6. Acknowledgements

This thesis would not have been completed without help. I would like to extend my sincere gratitude to my supervisors, Maaja Vadi and Anne Aidla, for their

support and guidance throughout the entirety of my doctoral studies. Their encouragement and constructive feedback have been invaluable in shaping my research and my growth as a scholar, and their advice has impacted my life far beyond the confines of this thesis alone.

This thesis also would not be here without the help of my co-authors involved in the empirical studies. I would like to sincerely thank Leonore Riitsalu and Andero Uusberg for their expertise and commitment. I am very glad that our efforts have resulted in published papers that have a clear social impact and I hope for many more to come.

I am also thankful to my thesis opponents, Aaro Hazak, Peeter Peda, and Matti Keloharju, and committee members, Eve Parts, Andres Kuusik, and Mark Kantšukov, for their insightful comments and efforts in helping this thesis be the best it could be. Their feedback and suggestions have significantly enriched the quality and depth of this thesis.

I also extend my appreciation to my colleagues at the university, especially Krista Jaakson, Kurmet Kivipõld, and Urmas Varblane, and other faculty members in the economics department and beyond. I would also like to thank Siim Espenberg and Uku Varblane for our numerous applied research projects together, working with you has been a treat. Special thanks also to Anneli Kütt who has had to suffer dozens of my confused e-mails about paperwork.

I would also like to thank the people who impacted my research and inspired me to continue this path outside my home university. I am very grateful to Tore Kristensen and Gorm Gabrielsen from Copenhagen Business School, Paula Sarmiento from the University of Porto, David Comerford at the University of Stirling and Thomas Post at the University of Maastricht. I am glad that many of these visits and research stays, shorter or longer, have developed into research collaborations that will soon be published.

My thanks also go to my students. Your feedback and comments have kept me teaching. I am always happy to hear your thoughts and ideas for research, even though I regretfully haven't been able to give all of them my undivided time.

Finally, I am deeply indebted to my family for their support and encouragement. This is a team effort, and Kerda has been invaluable in this regard. I likely would not have been motivated to write a single page into this thesis without her support, as well as the essential emotional support from Ronja. I am grateful to my parents for always being excited and supportive of my efforts, and to my brother for always finding an alternative explanation to any idea I put forth. These thanks extend to my friends Mehis and Andres, who have kept me rocking on throughout the process, despite the occasional frustration. My family's and friends' belief in me has been a constant source of strength and motivation.

This thesis would not have been possible without the collective support, encouragement, and contributions of all those mentioned above. I'm very sorry if I omitted you by accident! Thank you.

2. THEORETICAL BACKGROUND

2.1. A behavioural view of personal financial decision-making

In this section, I address two main conceptualisations of economic decision-making – the traditional theory of neoclassical economics and the behavioural view of economics. This is to provide an understanding of the fundamental agent in financial decision-making, the individual. I discuss the main components of each of these two conceptualisations and how they differ, and then proceed to give a few examples on unfinished *puzzles* when it comes to understanding financial behaviour.

In traditional economic theory, decision-makers maximise their utility according to rational principles and according to their consistent preferences and beliefs, while naturally subject to constraints, such as income (Ackert, 2014; McQuillin & Sugden, 2012; Statman, 2017). This idea can be traced back to Adam Smith in 1776 (Smith, 2002). However, of course each person has a subjective personal utility curve, as not everyone derives identical utility from the same good. Formulating these preferences and beliefs into workable models has raised the theory of subjective expected utility as perhaps the key understanding underlining this conceptual view (Savage, 1954; Steele & Stefánsson, 2020). As a further elaboration, the *rational actor* corresponds to the Neumann-Morgenstern expected utility maximisation rule (Neumann & Morgenstern, 1944) and the four axioms of rational choice, so that decision-makers are: 1) able to assess the complete utility of a choice (completeness), 2) always have a consistent preference between options (transitivity), 3) prefer more to less (non-satiation), and 4) correctly calculate their trade-offs between different amounts of substitutive sets (decreasing marginal rate of substitution).

The concept of rationality has been applied to arrive at influential theories of personal financial behaviour. The life-cycle hypothesis describes consumption and saving decisions (Ando & Modigliani, 1963; Modigliani, 1966), which predicts that individuals smooth their consumption curve over their life, so that a rational consumer increases savings in periods of high income (typically when they are middle-aged), and borrows when income is low, typically when they are young. As for investments, rationality alleges an informationally efficient market – that individual actions by rational investors, who construct their portfolios to be mean-variance maximised and balanced in asset correlation (Markowitz, 1991) lead capital market prices to be reflective of the true objective value of the asset (Fama, 1970; Fama & French, 2004), so that the associated risk of the asset is the only differentiator between asset prices (Sharpe, 1964, 1991). As such, an individual investor will maximise utility by obtaining as much expected gain from their investments as possible, to maximise their life-time wealth. However, traditional economic theory offers only one side of the story of how people make financial decisions.

Behavioural economics takes a different approach (see Table 2 for an overview). Behavioural economics could be understood as a subject incorporating findings from both traditional economic theory and a wider range of other (social) sciences (Baddeley, 2018). Behavioural finance is also a subset of behavioural economic theories that focus specifically on financial decisions. Generally, behavioural theories serve as a necessary compliment to traditional theories – offering valid descriptive observations of how people make economic decisions, but not which decisions they should normatively make.

Table 2. The main differences between traditional and behavioural economic decision-making theories

Aspect	Traditional economics	Behavioural economics
Key theory	Rational choice theory, expected utility hypothesis	Dual-system theory
Mechanism	Consistent (stable) rational utility maximisation	Inconsistent (unstable) satisficing under bounded rationality
Decisions	Deliberate, calculated choices without systematic deviation from rationality	Emotional, heuristic choices with systematic biases
Result	Optimal (normative) decision	Adequate decision

Source: compiled by the author based on Baddeley (2018), Kahneman and Tversky (1979), Kahneman (2011), Markowitz (1991), Modigliani (1966), Simon (1955), Statman, (2017), Steele and Stefánsson (2020).

Behavioural economic theories acknowledge that people are not completely rational. Instead, decision-makers are limited in terms of cognitive ability, time, information, and more, leading to the concept of bounded rationality (Simon, 1955, 1982). Bounded rationality views humans as satisficers instead of utility maximisers, meaning decisions are based on finding a satisfactory option instead of an optimal one. This results in an adequate, or “good enough” decision. As an example, when deciding on a company to invest in, a rational investor would first obtain as much information about the companies on the market as possible, and then make an informed decision by maximising their expected utility from future gains. A satisficing investor would perhaps look at just enough information to feel good about their decision so that they are satisfied they have found a stock that is “good enough”. How a person arrives at these satisfactory decisions is often described with the help of dual-system theory.

Dual-system theory (sometimes also referred to as dual-process or two-system theory) is a decision-making concept that is closely linked to bounded rationality. In dual-system theory, cognition is believed to operate in two broad modes: System 1, which is quick, intuitive, emotional, and System 2, which is slow, deliberate, and requires effort (Evans, 2003; Kahneman, 2011; Kahneman &

Frederick, 2002). Other terminology is sometimes used, but the concept remains largely the same (e.g., Fudenberg & Levine, 2006; Sloman, 1996). It is worth noting that dual-system theory is by no means uniformly accepted – the main alternatives to the dual-system theory propose either more modes (k-system models), a single mode of cognition, or depart from the modal categorisation all together, instead focusing on how cognition solves specific tasks (Grayot, 2020; Keren & Schul, 2009). However, as cognition is not the focus of this thesis, we will not delve too deeply into this discussion, but instead adopt the standard dual-system approach.

Dual-system theory contends that most decisions are made via System 1, so that a decision is reached fast and with minimal effort. Likewise, bounded rationality also suggests that people consider less information and spend less time and effort on making decisions by satisficing. Therefore, behavioural theories generally conclude that most decisions are reached through emotions and mental shortcuts, referred to as heuristics (Tversky & Kahneman, 1974; Shah & Oppenheimer, 2008; Simon, 1955), which allow for rapid decision-making.

Heuristics form the foundation of how most economic decisions are reached within the behavioural view – people employ simple “rules of thumb” and rely on emotional cues. It is generally thought that heuristics are essential to decision-making but sometimes lead to suboptimal decisions, as there is a higher risk of bias when less information is considered (Kahneman, 2003). On the other hand, scholars such as Gigerenzer and Gaissmaier (2011) posit that the use of heuristics results in decisions that are much quicker and also no less accurate than their more thoughtful counterparts, forming the centre of the “fast-and-frugal” view of heuristics (Gigerenzer & Todd, 1999). Others still propose their own valid frameworks of how heuristics exactly function (Shah & Oppenheimer, 2008). In any case, there is evidence for both sides of the debate, with heuristics arriving at nearly optimal (or equivalent to complicated analytic methods) decisions (Artinger et al., 2015; Gigerenzer & Brighton, 2009; Luan et al., 2019; Marewski & Gigerenzer, 2012) and there is no shortage of papers documenting the heavy toll that biased decisions have (Dancey & Sheagley, 2013; Kelman, 2011; Statman, 2017; Sunstein, 2003; Tversky & Kahneman, 1974). Therefore, whether a heuristic is suitable to the decision-making environment or produces harmful errors in decisions is a debate for each specific decision.

The concepts in behavioural economics, such as bounded rationality and heuristics, have been influential in changing how economics conceptualises financial decisions. From the behavioural perspective, investors do not always prefer to maximise their wealth, but are highly susceptible to the relative changes of their prospects (Kahneman & Tversky, 1979), such as the initial stock purchasing price instead of re-evaluating through market value. In their seminal paper on prospect theory, Kahneman and Tversky (1979) also introduce some of the more pervasive concepts in the field, such as loss aversion (see also: Gal & Rucker, 2018; Novemsky & Kahneman, 2005) and subjective probability weighing (see also: Guilbault et al., 2004). As such, behavioural economics seeks

to describe the decisions that humans, which is to say regular consumers and investors, make.

Behavioural finance shows that investors do not seem to construct their portfolios as mean-variance maximising (Oehler & Horn, 2021; Shefrin & Statman, 2000), but with simple, easy to apply cognitive rules such as dividing their wealth equally between asset classes (Brighton & Gigerenzer, 2012; Gigerenzer & Brighton, 2009). There is also an overwhelming number of studies documenting specific investor behaviour biases and the lost gains that result from suboptimal decisions, including lack of self-control (Thaler & Shefrin, 1981), myopia in risk perception (Benartzi & Thaler, 1995), trading in excessive amounts (Barber & Odean, 2000), or counter-productively to increasing wealth (Weber & Camerer, 1998), the hazard of overconfidence in poor financial decisions (Grežo, 2020; Pikulina et al., 2017), and much more. An extensive list is outside the scope that this thesis can reasonably accomplish, but the take-away is that people often err in making exactly optimal financial decisions.

Perhaps some of the personal financial decisions outlined here can indeed be explained rationally. Investors could place a greater utility value on the thrill and excitement that accompanies investing (Dorn & Sengmueller, 2009; Gao & Lin, 2015), so one could argue that it is completely rational to lose some of the potential gains in order to have an entertaining time when investing. People could also be completely rational in choosing not to save for retirement (Ando & Modigliani, 1963; Modigliani, 1966; Scott et al., 2020). Therefore, there is significant heterogeneity in individuals, and a normative one-size-fits-all type of single best solution for everyone can not emerge without also harming some. What is rational for one person might be suboptimal for someone else – people in poverty often cannot afford to save at all, so even though it is rational for most people to have an emergency fund of savings, needing to make ends meet in the present takes precedence over that. As such, economic rationality is best understood based on individual circumstances.

That said, even if not saving is rational for some, it still leaves a large proportion of people who do have sufficient disposable income and still do not save. Even high-income households often do not adhere to basic prudent financial behaviours such as having an emergency fund (in about 25% of cases of households with an income over 100, 000 USD per year, see Despard et al., 2020). There is a long-standing puzzle in the field dubbed the credit-card debt puzzle focused on understanding why people simultaneously hold high-interest credit card debt and have savings in low-interest savings accounts (Gorbachev & Luengo-Prado, 2019; Laibson et al., 2000; Telyukova, 2013).

Numerous other financial behaviour puzzles exist (Gilbert, 2011; Jensen, 1978), many of which are provided by Richard Thaler in a series titled “Anomalies”, where he outlined economic behaviour that is difficult to rationalise using traditional economic theory. For example, it is unclear why stock prices tend to increase specifically in January, on Fridays, and before holidays, but tend to decrease over the weekend and on Mondays (Thaler, 1987ab), temporal anomalies that still persist in a debate in international stock market analysis

(Chiah & Zhong, 2019; Miss et al., 2020; Stosic et al., 2022). In other reviews in the same series, Thaler et al. argue that fairness is a primary motivator instead of personal monetary gain in ultimatum and dictator games (Camerer & Thaler, 1995), why the fungibility of money as an assumption of life-cycle consumption theories does not hold water (Thaler, 1990), or how auctions do not correspond to rational behaviour, thus creating the *winner's curse* effect (Thaler, 1988). Again, these observations of *anomalous* financial behaviour can be somewhat rationalised, but the extent to which this is possible requires borderline unreasonable assumptions about individuals.

As such, there are numerous instances of patterned peculiarities when it comes to individual decisions, and while some of them can be rationalised, many cannot. Another classic example in this case is the reversal of risk attitudes, as shown by Kahneman and Tversky (1979); when people face uncertain gains they are risk averse, but when facing equal uncertain losses they flip to being risk seeking. Simply framing the task in terms of gains or losses should not affect an economically rational person in this manner, so that their attitude towards risk is completely flipped. It is also likely that people simply do not fully understand how their decisions, such as not paying off credit card debt even when the required funds are available, can be counterproductive (Scholnick et al., 2013). Even though neoclassical theories of financial decision-making are unlikely to be replaced (Frankfurter & McGoun, 2001), it is also clear that we simply do not have a complete understanding of many of the financial decisions people make.

The focus of this section was on detailing the fundamental differences in how two schools of thought, traditional and behavioural economics, characterise the individual decision-maker. How we think about the individual is critical; there is considerable debate about whether financial behaviour can or should be influenced, whether *mistakes* in financial decisions are errors or preferences. On the one hand, if we assume that a capable rational agent maximises their utility according to their preferences, then people should not be overly disrupted in their financial activities. In this case, influencing financial behaviour is the straightforward act of modifying financial incentives – if people are not saving for retirement, then make saving more attractive through subsidies; if they are not active on the stock market, then hand out a tax credit. On the other hand, we can often see people struggling to corral their own financial decisions, by either overspending on vices, disregarding their financial situation in the future, or by carelessly wrapping themselves in debt. Perhaps people could use some guidance to make more considered financial decisions.

2.2. Models for influencing behaviour

This section moves forward from examining the agent to the process of influencing financial behaviour. In this section, I review two broad categorisations of

how behaviour can be influenced and delve deeper to reveal more specific techniques. The section concludes with a discussion of choice architecture and the potential of nudges and boosts.

Effective behaviour change is not limited to financial incentives alone. On the most general level, harking back to dual-system theory discussed earlier, behaviour can be influenced by addressing higher-order (beliefs and attitudes) or lower-order cognition (habits, innate or reflexive behaviour) (Dolan et al., 2012; Vlaev & Dolan, 2015), as expressed in Figure 3. A typical approach to changing thoughts, beliefs and attitudes is through an educational intervention or campaign, designed to make a person more aware and perhaps update their beliefs on a given subject, referred to as the cognitive model (Dolan et al., 2012). In essence, this method assumes that the main driver behind behaviour is conscious thought and effort.

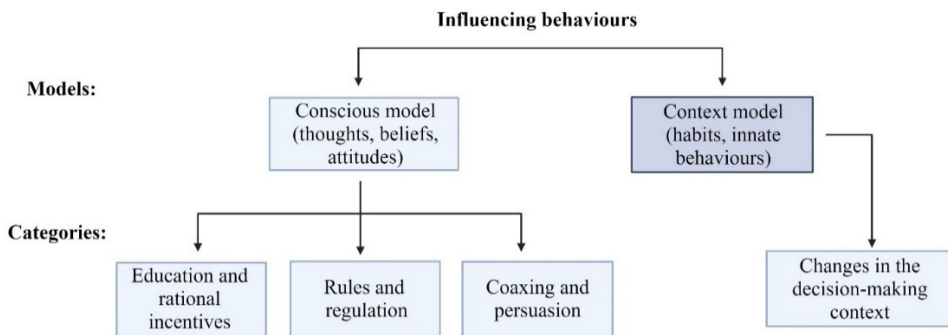


Figure 3. Overview of the two main behaviour influencing models, with the models addressed in the thesis highlighted in dark grey

Source: compiled by the author based on Vlaev and Dolan (2015)

The educational approach can be effective, as numerous studies have documented relevant change in behaviour when subjected to an educational intervention – from reducing the amount of payday loans (Harvey, 2019), reducing residential waste (Grodzińska-Jurczak et al., 2006) and lowering the use of e-cigarettes (McCauley et al., 2023). Therefore, one general pathway to influencing behaviour is trying to improve the decision-making capabilities of individuals and supplying them with relevant information about a particular decision (Hertwig & Grüne-Yanoff, 2017). An informed person is empowered to make decisions that suit their needs best.

Influencing behaviour through lower-order cognition processes is markedly different – here the focus is on influencing behaviour through changes in the decision-making environment (Vlaev & Dolan, 2015), dubbed the context model of behaviour change (Dolan et al., 2012). The context model relies heavily on the realisation that most decisions are not a result of careful deliberation, but a product of the context (Bandura, 1986) or the decision-making environment,

referred to as the *choice architecture* (Thaler & Sunstein, 2009). Choice architecture is premised on this insight that “people’s preferences [...] can differ across ostensibly equivalent choice situations” (Camilleri & Larrick, 2015, 2). As such, the elements of the environment, even seemingly unimportant ones, are of critical importance to the decisions that people make.

Importantly, instead of encouraging individuals to reflect on their decisions, the *choice architect* (the person creating the choice environment; Thaler et al., 2012) decides how the individual ought to behave. Changing minute details of the decision-making context have produced large changes in behaviour – such as increasing organ donation rates (Johnson & Goldstein, 2003) and increasing retirement savings (Beshears et al., 2006) to name just a few, and the person is largely unaware they are being swayed. In fact, it could be argued that revealing the intention behind the contextual change can reduce the effect the change has on behaviour (Thaler & Sunstein, 2009), although recent experiments (e.g., Bruns et al., 2018) have achieved similar results with disclosed information.

The two general level approaches remain somewhat vague, and there are numerous attempts to categorize how to influence behaviour more specifically in either the cognitive or context model categories. Behaviour could be influenced by altering the present incentives and information, mandating regulatory rules, persuasion, or making changes in the choice architecture (Dolan et al., 2012; Soman, 2015). This fits into the framework above, as information or persuasion requires conscious thought or a change of attitude or beliefs, while regulatory rules also require awareness of the change in regulations. For example, one could set out to attempt to influence car insurance purchasing decisions by giving out leaflets that detail the average cost of common accidents compared to the insurance payment (information), giving a tax credit or making car insurance mandatory (mandates), trying to persuade insurance take-up through colourful commercials (persuasion), or by making subtle changes to the context in which the decision to purchase insurance is made, making sure that the process of purchasing insurance is effortless and less time consuming (choice architecture). To be more specific, Lades and Nova (2022) classified tools for behaviour change as nudge, nudge plus, self-nudge, boost, sludge reduction, budge, and shove.

Let us consider nudges first, and then move on to the other counterparts – boosts and nudge-like interventions. A nudge is “any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler & Sunstein, 2009, p. 6). Meta-studies indicate nudges to have a generally small but relevant effect on behaviour (Antinyan & Asatryan, 2019; Arno & Thomas, 2016; DellaVigna & Linos, 2022; Mertens et al., 2022), although there is a significant publication bias problem that ought to limit optimism (Maier et al., 2022). Nudges adopt an attitude of “liberal paternalism”, helping people avoid mistakes and more easily arrive at reasonable choices. Clearly, people often make mistakes, but here the reasonable course of action, however, is one set by the choice architect.

Boosts, sometimes also referred to as *signposts* (Camilleri et al., 2019), empower individuals to autonomously make better decisions (Grüne-Yanoff & Hertwig, 2015; Hertwig & Grüne-Yanoff, 2017). Boosts attempt to target the “individual’s skills and knowledge, the available set of decision tools, or the environment in which decisions are made” (Grüne-Yanoff & Hertwig, 2015, p. 152) without guiding the individual with an explicit direction in mind. In this case, boosts can help people understand their decision-making deficiencies and be better equipped to address them, while a nudge would take advantage of these biases to guide a person towards what the choice architect judges to be prudent.

The other nudge-like tools (nudge plus, self-nudge) are in between of the two major methods of nudges and boosts. A nudge plus incorporates a reflection component into the nudge, such as disclosing that the choice architecture is being knowingly manipulated (Lades & Nova, 2022). On the other hand, self-nudges inject people with the capabilities to take control of their decision-making environments themselves, incorporating the behavioural findings of both nudges and boosts to empower individuals (Reijula & Hertwig, 2022). Differentiating between the minutia between nudges, nudge plus and so on is often difficult in practice (Sims & Müller, 2019), as interventions could be argued to contain some elements of numerous categories of interventions.

Nudges are very common in attempting to help individuals make more considered financial decisions. Success has been found in a multitude of cases – nudges can influence consumption decisions to be more sustainable (Lehner et al., 2016; Sunstein, 2015), increase retirement savings (Thaler & Benartzi, 2004), reduce consumer debt (Jones et al., 2015), and much more. However, the efficacy of nudges is not always clear cut. Having a set savings target can increase a person’s saving behaviour (Croy et al., 2010), but people can also respond by saving less when the normative target seems out of reach (Beshears et al., 2015). Similar backfire effects have been found with various financial decisions (Meder et al., 2018; Thunström et al., 2018) – interventions sometimes have no effect at all (Adams et al., 2021; Keys et al., 2016) or produce a counterproductive effect, such as increasing credit card debt (Holzmeister et al., 2022; Wang & Keys, 2014). Therefore, it is important to test interventions for backfire effects.

Nudging financial behaviour often involves changing the default setting or the default option presented in the decision (Dobrescu et al., 2018), and following the pre-selected choice set by the choice architect. Defaults have been incredibly popular and influential in many areas of life (Jachimowicz et al., 2019), such as increasing considered health insurance decisions (Johnson et al., 2013), promoting regular saving habits (García & Vila, 2020), and increasing retirement savings by having the person automatically included in a retirement scheme – a default opt-in instead of an opt-out scheme (Benartzi et al., 2017; Thaler & Benartzi, 2004). People tend to make weighty financial decisions still considering where there is least resistance (Riitsalu, 2018), and a default setting fits that criteria well. Altering the default is common, but there are many other options, such as reminders, displaying warnings, and offering direct feedback (Sunstein,

2014; Thaler et al., 2012; Thaler & Sunstein, 2009). The focus of this thesis is on information provision; therefore, other nudges are considered mostly in passing.

Even so, having a one-size-fits-all approach to a default reduces individual autonomy (Lades & Delaney, 2022). Automatic enrolment in a pension scheme, although effective (Madrian & Shea, 2001), reduces agency from people, the decision is made for them (Beshears et al., 2013). It could also be argued that trying to nudge people without savings to start doing so is both difficult and perhaps also unreasonable – possibly reducing welfare for an already financially struggling individual (Statman, 2013). As another example, emphasising the financial benefits of retiring later (or the costs of retiring early) increases the age when individuals prefer to retire (Greenberg et al., 2023; Liebman & Luttmer, 2015), but neglects to consider how people can have valid reasons for retiring early – possibly guiding people to make a suboptimal choice for their particular situation. These critiques have led to a distrust of defaults and a focus on active choice (Carroll et al., 2009), but the problem here is that the active choice approach does not provide guidance on a prudent decision.

Another option is to guide individuals to reflect on their financial situation and goals and encourage deliberate choices, which has been found to be a successful tool in increasing savings rates (Bajtelsmit & Coats, 2023; Knoll et al., 2015). This harks back to the discussion on boosts versus nudges, as discussed previously. The next section details how such an effect could be achieved through information provision.

2.3. Information provision interventions in the context of personal financial decisions

Information provision interventions entail changing either the content or the timing of information (Beshears et al., 2013; Clark et al., 2014; Goda et al., 2014), often involving content simplification (Beshears et al., 2013), timing the information to a specific (life) event (Beshears et al., 2021), displaying warnings, or giving direct feedback (Sunstein, 2014). A typical approach to measuring the effect of providing information involves an experiment where some participants receive information while others do not, or by framing the same information in a different way or within a different context (e.g., Dobson & Poels, 2020; Niehaus & Shrider, 2014). Generally, information provision interventions provide information at either the decision-point in the choice architecture, or as a regularly appearing message, such as in a newsletter. First, the more general view of financial behaviour is considered, and then the more specific information provisions are considered.

It is unclear how effective interventions to provide information are for influencing financial behaviour. On the one hand, supplying additional information or framing credit decisions in a different way can increase debt repayment (Hershfield et al., 2015; Jones et al., 2015; McHugh & Ranyard, 2012, 2016). On the other hand, supplying additional information alone is not always sufficient to

reduce debt (Adams et al., 2021; Agarwal et al., 2015; Booiij et al., 2012; Darolia & Harper, 2018; Hershfield & Roese, 2015; Seira et al., 2017) or can even be counterproductive (Holzmeister et al., 2022). It can be that people simply do not pay any attention to the provided information (Jones et al., 2015; Scholnick et al., 2008). As such, message salience is a necessary concern to address.

As an example of information framing effects on retirement behaviour, labelling a retirement age as *normal* after a retirement age reform can induce people to take retirement at that age, rather than sooner (Gruber et al., 2022; Lalive et al., 2023). Informational messages can also increase retirement savings, although the effect is highly heterogeneous (Clark et al., 2014). However, sometimes people might just not pay attention to the included social norm (Dur et al., 2021). As such, including relevant information as a prompt could be effective in influencing behaviour, but again, this is context-dependent and likely heterogeneous.

To be more specific, one option is to provide information via newsletters, typically as (online) magazines, or regular e-mails. Newsletters can be cost-effective in influencing behaviour (Hudák et al., 2017; Lutz et al., 1999; Seibold et al., 1983) and are popularly considered for personal investment decisions (Anthony & Rennie, 1989; Brown et al., 2013; Graham & Harvey, 1997; Kumar, 2009). The positive effects of newsletters include increasing the perceived quality of information (Byrne & Lemay, 2006), increased brand perception and loyalty (Merisavo & Raulas, 2004; Müller et al., 2008) and higher customer retention (Ting & A, 2012). As such, it is expected that companies make regular use of newsletters in directing behaviour. That said, newsletters can also be counterproductive in increasing informed decisions by inducing herding behaviour (Graham, 1999). Therefore, there is a significant research gap in designing effective newsletters for influencing financial behaviour.

From the literature review chapter we can conclude that there are two opposing main views on human behaviour, whether we consider people as rational agents or boundedly rational individuals. This theoretical distinction is important going forward, as how we conceptualise behaviour has implications on whether behaviour ought to be influenced through more rational *hard* measures, such as taxes and subsidies, or rather *softer* measures, such as education and behavioural interventions. This thesis focuses on behavioural interventions, of which the theoretical review section detailed mainly nudges, but also touched upon boosts and nudge-like tools. There is an abundance of choice for how to exactly implement nudges, such as changing the default setting or sending out reminder messages, but this thesis focuses on information provision interventions, an overview of which was given in this subchapter. Information provision is a promising intervention type, but there is a significant research gap in understanding when and which type of information is actually relevant to the receiver and impactful in influencing behaviour. This thesis seeks to address that research gap. Next, the methodology and methods of the studies included in the thesis are addressed.

3. METHODOLOGY AND METHODS

3.1. Methodological background for the studies

The studies included in this thesis include quantitative methods in the form of surveys and experiments. The methodology for the surveys is considered in this subchapter while experiments are addressed in the next. The first and second studies feature surveys – the first as an international panel data survey conducted by the OECD Programme for International Student Assessment (PISA), while the second is a survey compiled and conducted by the authors of the study.

Surveys are a suitable way to measure financial literacy and financial behaviour. Typical surveys measuring financial literacy include exercises for the participant to solve, such as in Lusardi and Mitchell (2011) who employ a 3-question measurement (interest rate, inflation, diversification) or variations on a similar idea with additional questions on basic financial and economic concepts (Hastings et al., 2012). An abundance of studies in this field have made use of these questions and show how knowledge of financial concepts is low (e.g. Lusardi & Mitchell, 2011). Other organisations instead look at measuring through a much wider lens, including PISA and OECD/INFE, which also include questions on financial behaviour, confidence and attitudes (PISA, 2024; OECD, 2024). The advantage of surveys over qualitative approaches (e.g., Bamforth et al., 2018) is that it allows for the use of visuals and numbers, which are often necessary in assessing knowledge of financial concepts, and makes it possible to gather a representative sample when conducting research at the national level (Nardi, 2018). For these reasons, surveys have emerged as the primary method in financial literacy research.

Surveys are also quite efficient in collecting data on financial behaviour, although with some caveats. The survey method has been applied in research into financial behaviour involving self-reported behaviour (Fünfgeld & Wang, 2009; Rai et al., 2019), such as whether a person keeps a budget, how often they use credit, or whether they actively plan and save for retirement (van Raaij, 2016; van Rooij et al., 2011). This provides easily quantifiable information on a large population, which is highly relevant for policymakers. However, collecting self-reported data on behaviour might not be especially precise (Madeira et al., 2022), as the participants might not be too willing to admit to *improper* financial behaviour that they know they should not be engaging in. In addition, survey data does not address problems with causality between attitudes, knowledge and behaviour. Experiments can help solve some of these issues, as discussed next.

3.2. Experiments in economics

As two of the empirical papers discussed in this thesis feature experiments, it is prudent to address a few key details about this research method. This section details a brief overview of the use of experiments in economics, discussing the

advantages and disadvantages of the method. After doing so, a categorisation of experiment types is provided, while the focus remains on the types of experiments relevant to the studies included in the thesis.

Experiments in economics are by no means a novelty (Levitt & List, 2009; Roth, 1988), but the method has only gained wide-spread acceptance and popularity during the last 50-60 years (Sugden, 2005). A salient way of conceptualising experiments is through contemplating how clinical trials are conducted in medicine – in human trials, researchers must prove that their medicine has an effect by running a trial in which some individuals receive the drug, while others receive a placebo.

The use of experiments has contributed to the creation of two subfields in economics – behavioural economics and experimental economics. While there is considerable overlap between these two subfields, there are also a few key differences. Loewenstein (1999) argues that the main difference lies in orientation – behavioural economists employ various other methods to complement experiments, such as field research, interviews and surveys, often conducted with more heterogeneous samples, while experimental economists are usually tied to the laboratory setting where students take part in economic games. Experimental economists often conduct experiments in computer classrooms with a relatively small sample (often around 50 participants), repeat tests numerous times, and pay a financial incentive to the participants (Davis & Holt, 2021; Feltovich, 2011). Behavioural economists are instead more inclined to gathering data from a larger and more varied sample, are more often focused on measurements between groups and often either do not pay the participants or only offer a small lottery (Loewenstein, 1999). The focus of this research is also somewhat different from these two subfields, as behavioural economics usually tries to describe or influence behaviour, while experimental economics primarily concerns itself with testing formal economics models. Therefore, both subfields try to accomplish the same goal of examining economic behaviour, but still have a different focus and often employ different methods. The studies in this thesis fall within the behavioural economics subfield.

Experiments are a research method that is particularly helpful in disentangling causality. The experimental method attempts to assess causal effects largely through randomisation, a process involving sorting participants into groups based on random chance. Perhaps the most prominent option is a randomised controlled trial (RCT) in which the experimenter has no control over which group the participant is randomised into and the participant is unaware of the specific group they are in (Adams et al., 1992). However, not all experiments need to depend on randomisation to achieve their aim of explaining causal effects. Instead, treatment groups can be pre-assigned according to specific traits of individuals, this approach is referred to as a quasi-experiment (Meyer, 1995) and is also featured in Study 3. Most experiments, however, can be categorised into laboratory, field, and natural experiments, as depicted in Figure 4 below.

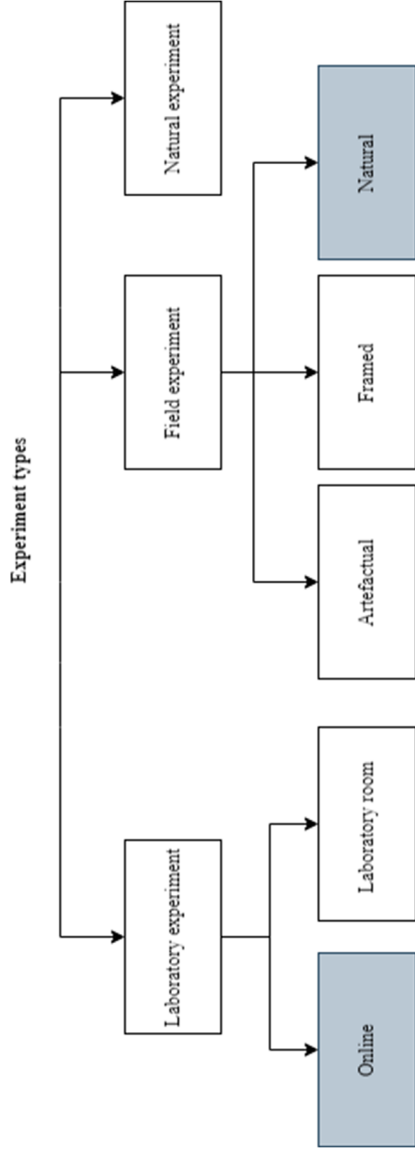


Figure 4. Overview of experiment methods in economics, with the specific methods of the studies included in the thesis highlighted in dark grey
Source: compiled by the author based on Harrison and List (2004), Levitt & List (2009), Roth (1988).

Laboratory (lab) experiments feature a controlled environment in which participants are divided into specific groups that receive differing stimuli. It is generally accepted that lab experiments provide excellent internal validity, meaning that measurements within the lab setting do in fact measure the cause and effect between the stimulus and the outcome (Slack & Draugalis, 2001). Despite the name, laboratory experiments are often not actually conducted in a physical lab, although this is very popular in experimental economics, and often necessary in neuroeconomics (Fehr & Rangel, 2011). Instead, the sample for the experiment can be gathered online without a significant reduction in the quality of the results (Arechar et al., 2018; Buso et al., 2021). Therefore, while lab experiments offer the highest level of control over participants, an online experiment accomplishes a similar result with the benefit of it being easier to reach the sample. The studies presented in this thesis also feature online experiments.

However, lab and online experiments suffer from poor external validity, meaning that the results obtained in the lab are difficult to generalise outside the laboratory setting (Loewenstein, 1999). It is argued that participants in the lab are overly influenced by the experimenter or are affected by social desirability bias (Levitt & List, 2007b), or that the experimental situation simulated in the lab is too detached from reality, limiting generalisability (Levitt & List, 2007a). That said, Levitt and List (2007ab) do seem to be overly critical of laboratory experiments, as the method still provides fairly generalisable results (Camerer, 2011). As such, context dependency is a potential issue, but not a *coup de grâce* for making use of the method.

Field experiments can also help in alleviating some of the limitations that laboratory experiments have (Banerjee, 2020; Just & Roe, 2009). Field experiments can be categorised into artefactual, framed and natural experiments (Harrison & List, 2004; Levitt & List, 2009). An artefactual field experiment is in essence a laboratory experiment that employs a non-standard sample pool collected from a more varied setting than is common for lab experiments (e.g., see Burks et al., 2009 or Cummings et al., 2009). Framed field experiments try to simulate a real-world scenario as closely as possible, but the participants are still aware they are taking part in a survey or experiment. For example, the experimenter could ask a business expert to estimate the price of real-life websites (Hoffman, 2016), provide a physical booth with actual information about specific products (Lusk et al., 2006), or simulate the *frame* of the decision in virtual reality (Innocenti, 2017). Therefore, artefactual and framed field experiments can be useful in increasing the validity of laboratory experiments.

Finally, a natural field experiment (not to be confused with natural experiments) is a field experiment where the participants are going about their regular activities in a real-life setting and are unaware that they are participating in an experiment. For example, a natural field experiment could involve gathering data on charitable giving in a real-life setting for real decisions without explicitly asking for consent (DellaVigna et al., 2012; Karlan & List, 2007). One needs to be especially cognizant of ethical considerations when it comes to conducting

natural field experiments that do not collect informed consent from the participant. In addition, natural field experiments can often be expensive to run, more often than not require intense collaboration between numerous (private and public) partners, and are timing and location dependent (Levitt & List, 2009). This entails that natural field experiments are also very hard if not impossible to replicate.

Since lab experiments are well complemented by field experiments, some studies do include both methods by first conducting one or two rounds of laboratory experiments to establish the initial design and measure an internally valid causal effect, and then a field experiment that assesses the real-life effects (Carlsson et al., 2013). Such an approach can help in addressing the replicability (Camerer et al., 2016, 2018) and validity concerns that experiments have.

The third category, natural experiments, are different in that the researcher does not specifically intervene and construct experiment groups, but rather exploits the differences caused by *natural* changes, such as policy changes that are rolled out in waves of individual counties or states (Meyer, 1995). Natural experiments can provide evidence of phenomena that are very difficult to otherwise capture, providing answers to important questions such as whether economics education makes people more selfish (Frey & Meier, 2003). However, natural experiments often have problems with the identification and differentiation of the causal mechanism (Rosenzweig & Wolpin, 2000). Due to identification and data availability issues, suitable natural experiments are also notoriously hard to find, often instead focusing on historic events (Cantoni & Yuchtman, 2021). Therefore, most researchers in both behavioural and experimental economics focus on conducting controlled experiments either in the lab or the field.

There are also significant constraints to what the participants within the experiment can do, it is not ethical to have the participant take on credit just for the sake of an experiment. As such, laboratory experiments often rely on proxies of actual decisions, such as planned behaviour. The theory of planned behaviour states that attitudes, norms and self-control contribute to the intention to behave in a certain way, and this intention leads to actual decisions (Ajzen, 1991, 2011). There is evidence to show that eliciting plans and directing attention towards a certain behaviour, even if it just filling a survey, can have an effect on actual decisions (Crossley et al., 2017). The theory of planned behaviour is an essential part of the design of the experiments included in this thesis.

All in all, experiments offer a valuable tool in disentangling causality between cause and effect but are somewhat limited in internal (for field experiments) or external validity (for laboratory experiments), as the real-life decision is generally observed through a proxy and often in an artificial setting. In this subchapter, I reviewed the literature on the typology of experiments in economics, showing recent development in methodology. The specific methods of the studies included in this thesis are discussed in the next section.

3.3. Methods and techniques employed in the studies

This subchapter details the specific methods and approaches to analysis employed in each of the three studies that complete the thesis. Study 1 is a multilevel analysis based on individual data. Studies 2 and 3 involve experiments, with Study 2 additionally featuring a 20-question survey. Study 1 made use of secondary data while Studies 2 and 3 collected primary data.

Study 1 includes a multilevel analysis (also referred to as a random-intercept model) of individual-level data from over 100,000 15-16-year-old students in the Program for International Student Assessment (PISA) financial literacy scores (PISA, 2018). PISA financial literacy scores are calculated based on the 10 individual plausible financial literacy scores, which are weighted depending on the proportion of the sample (Silinskas et al., 2023). Plausible values necessitate constructing 10 separate models, one for each plausible value, and then averaging the model results obtained. The financial literacy scores obtained for each individual student serve as the main dependent variable for Study 1. The analysis in Study 1 involves assessment of the models via the Intraclass Correlation Coefficient (ICC). The ICC is calculated as a ratio of variance between countries divided by the total variance, which is the sum of variance between both individuals and countries (De Beckker et al., 2020; Liljequist et al., 2019). As such, the ICC indicator assesses how much of the variation between financial literacy scores is explained by the country alone. Therefore, lower ICC values indicate that the model provides a better description of unknown variance. In addition, the financial literacy models presented in the Study also include GDP per capita PPP (*World Bank, 2023*), the latest GINI coefficient, and life expectancy and percentage of internet users in the population (De Beckker et al., 2020) as control variables. Including the control variables allows the model to exclude possible alternative explanations.

Study 2 involves an online vignette experiment (in the form of RCT) and a survey of a representative sample of 1,204 respondents from the adult population in Estonia, controlling for respondent age, gender, region, nationality/language, and having non-mortgage debt. The participants are randomised into one of the three information provision conditions and asked whether they would purchase a product on credit or not, which forms the main dependent variable for the Study. Group A does not receive any relevant additional information (control group), Group B sees the total payment and period of the credit purchase, Group C sees the annual percentage rate of the credit purchase.

The survey allows for the measurement of key elements required to predict purchasing on credit rates. First, the survey includes three questions regarding the debt literacy of the participants' by measuring their understanding of simple interest, instalment purchases and annual percentage rate, adapted from financial literacy research into the debt context (Gathergood & Disney, 2011; Lusardi & Tufano, 2015; van Ooijen & van Rooij, 2016). Second, there are five questions using five-point Likert scales (Białowolski et al., 2020) and one question for a descriptive preference on consumer credit. Third, the measurement of chronic

debt (Townley-Jones et al., 2008) is included via two questions detailing how often the participant needs to use credit to supplement their income to cover regular expenses or to repaying previous credit obligations.

The analysis in Study 2 consists of binary logistic regressions with the intention to purchase on credit as the dependent variable. The independent variables are obtained through the survey, featuring debt literacy, chronic debt, attitudes to debt and preferences regarding purchasing on credit, and the control variables include age, gender, region, nationality/language, and having non-mortgage debt.

Study 3 features a natural field experiment carried out in an Estonian retail bank; the participants are not aware they are taking part in an experiment. It is a quasi-experiment, as the participants are not blindly randomised into the specific treatment groups – instead, the experiment design requires the allocation of participants into certain treatment groups depending on the preconditions of their consistency in investing and the relative amount they have invested compared to their previous period sum. This was necessary in serving relevant messages that depend on the person's past investment behaviour. In addition, the intervention consisted of a pre-post structure where the baseline investment behaviour was measured first without any information provision. The data is obtained from real-life transactions from 4,782 clients over five months, measuring changes in investments, savings and securities accounts. The control group does not receive an information newsletter, while the participants in the treatment group receive one of five newsletters depending on their previous behaviour.

- Praising investment consistency message (message 1)
- Scolding investment consistency message (message 2)
- Praising investment amount message (message 3)
- Scolding investment amount message (message 4)
- Scolding fear-of-missing-out type investment amount message (message 5)

The quasi-experiment design necessitated a case-controlled method to eliminate the sample bias. To accomplish this, the control group participants were recoded into separate message groups as if they had received the newsletter that they qualified to receive but had not received it due to being randomised into the control. The advantage of this method is that it allows for the measurement of the actual changes in investor behaviour between the case-controlled group and those who actually received the newsletter, as the results between the control and the various intervention groups are not directly comparable.

The dependent variable in Study 3 is the absolute difference between initial account balance changes in the pre-phase compared to the subsequent changes after the information provision, with a separate analysis conducted for each of the three account balances. As absolute changes are highly sensitive to outliers, and investing is often characterised by large outliers in the sample pool, participants with portfolios over three standard deviations above the mean were discarded. In addition, cells with abnormal changes in account balances were also discarded,

such as large relative changes that amounted to over 100 times the initial balance of the account.

The main analysis in Study 3 is conducted with repeated measures using general linear models (GLM). The GLM was chosen as the repeated measurements were carried out in consistent intervals over a relatively short period of time. In addition, the Study carries out the analysis via t-tests to check group differences in account balances, and one-way Analysis of Variance (ANOVA) to assess whether specific message types had an effect on investor behaviour. Finally, the relationship between the background data available (participant age, income, gender, language or time they have had an account open with the bank) and the effect of the treatment was assessed using chi-square tests.

4. EMPIRICAL STUDIES

5. DISCUSSION

5.1. Findings of the studies

The aim of this thesis was to provide an in-depth understanding of how information provision influences personal financial decisions. To fulfil this aim, the thesis included three empirical studies and argues that information provision can be a useful tool in influencing personal financial decisions, but consideration needs to be given to the role of context, recipient segmentation, as well as message personalisation. As depicted in Figure 5, this thesis relied on four research questions, with the first addressing the interaction between country-level context and financial literacy. This research question is answered by Study 1. The second research question related to examining the connection between financial literacy and credit behaviour, while the third research question examined the effect of information provision in influencing intention to purchase on credit. These two research questions are answered by Study 2. Finally, the thesis examines in Study 3 how effective providing investment performance information is in influencing investment and saving behaviour. Next, the specific results for each research question are detailed, before moving on to outlining their contribution to the thesis as a whole.

The first research question related to the linkage between country-level context (especially financial literacy) and financial decisions. On the broader level, financial education seems to be one key component in more prudent saving decisions (Alsemgeest, 2015; Jappelli & Padula, 2013; Lusardi, 2019). However, financial education might not translate directly into financial behaviour (Mandell & Klein, 2009; Stolper & Walter, 2017; Willis, 2008), as people can be very well-versed in the concepts of economics and finance in the classroom but still make poor financial decisions in the real world. Study 1 showed that our understanding of how financial literacy is connected to other country-level variables is uncertain, and that financial literacy is much more multifaceted than is often considered in the literature (Lusardi, 2019; Lusardi & Tufano, 2015). For example, a narrow view of financial literacy is often measured through the Big-3 questions, featuring objective knowledge questions about inflation, compound interest, and diversification (Lusardi & Mitchell, 2011). It is true that this view has been thoroughly expanded with the inclusion of behaviour, attitudes, and motivation, such as in the PISA dataset, but the approach could still be finetuned by including additional control variables.

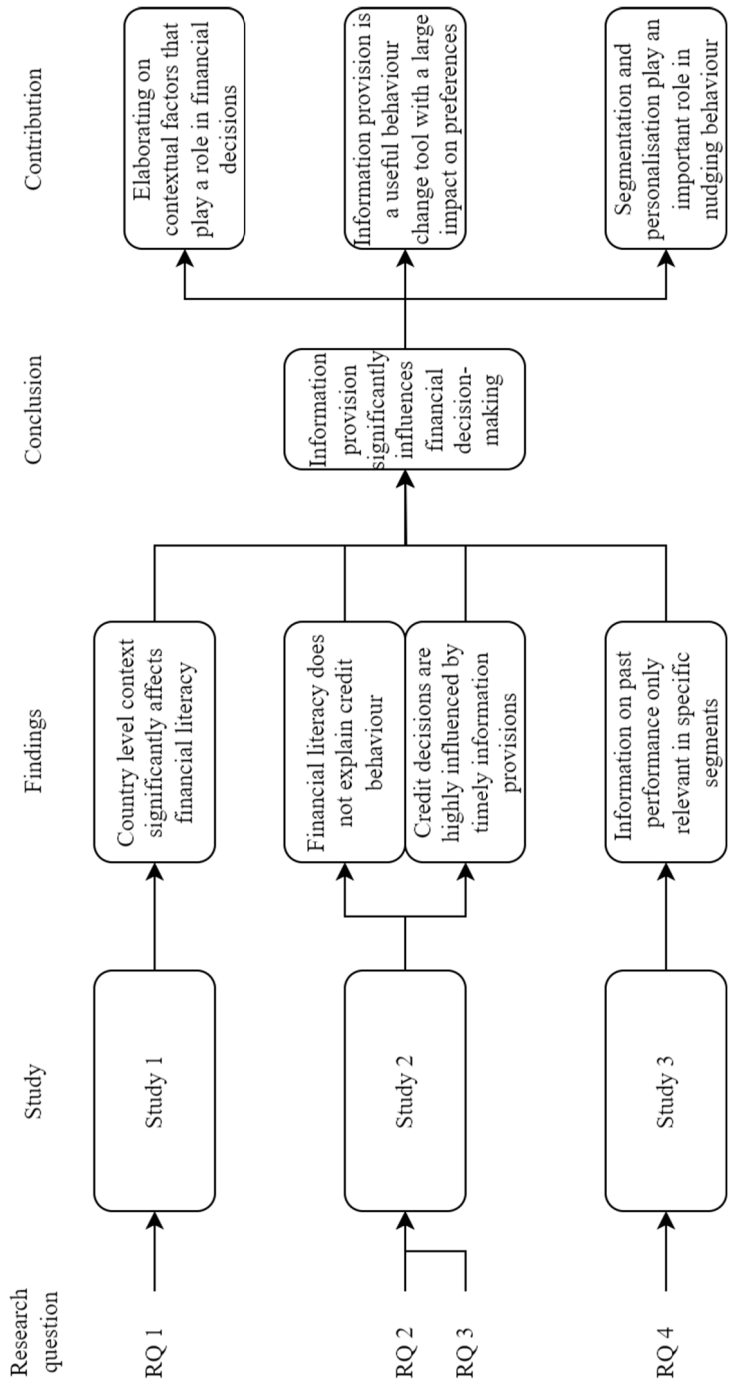


Figure 5. Findings of the studies and their contribution to the research
 Source: compiled by the author.

It is worth contextualising the results from Study 1 with other data sources, such as the OECD/INFE 2023 report (*OECD/INFE International Survey of Adult Financial Literacy*, 2023). This is done for two reasons. First, the PISA dataset includes youth data while the experiments considered in this thesis were conducted on adults. Even though the PISA data is based on 2018 results, meaning the 15-year-old participants would already be young adults by the time the experiments were conducted, it is still worthwhile studying a more varied adult population, to validate the results. Second, the OECD/INFE questionnaire allows for additional financial behaviour questions that can be used to triangulate the results of Study 1.

Estonia had the highest average financial literacy score in the PISA dataset, and the third highest minimum target financial knowledge score in the OECD/INFE dataset. The scores are percentages of the participants who answered at least five of the seven knowledge questions correctly. This goes to show that the knowledge score is one of the highest in the adult dataset, corroborating the findings from Study 1. However, the key point is that this is a measure of knowledge alone, and the picture is quite different when looking at financial behaviour scores – here Estonia scores below average (a score of 49 out of 100, compared to the OECD average of 52). Other countries that score quite low on knowledge – Indonesia, for example, with the lowest knowledge score of all the countries measured, scores well above average in terms of financial behaviour (74 out of 100). This is certainly not conclusive proof that a link between financial literacy and behaviour does not exist, as research has demonstrated the link numerous times (Disney & Gathergood, 2013; Hastings et al., 2012; van Ooijen & van Rooij, 2016). But it presents an interesting avenue of research for conducting experiments in order to ascertain the causal mechanism between financial literacy and financial behaviour (see also e.g., García & Vila, 2020). **Therefore, the answer to the first research question is as follows: The country-level context plays a significant role in the personal financial decisions that people make, but much of the link between financial literacy and financial behaviour is unclear. The Study reveals that there is a large share of unexplained variation within the composition of financial literacy.** Next, I focus on a particular type of financial literacy – debt literacy – and its effect on credit behaviour, which was addressed in the second research question.

As established, there is contention over the connection between financial literacy and financial behaviour, especially when it comes to credit decisions (Białowolski et al., 2020; Lusardi & Tufano, 2015; Lyons et al., 2007; van Ooijen & van Rooij, 2016). For example, Disney and Gathergood (2013) find that people with low financial literacy hold more expensive credit, such as payday loans, and are more averse to learning about finances. At the same time, debt literacy is not associated with seeking debt advice (Cwynar et al., 2020), creating an interesting question for the role of knowledge and attitudes in credit decisions (Białowolski et al., 2020). In other words, do people with a better understanding of financial concepts (traditionally measured through the big-3 financial literacy questions) actually make more informed credit decisions?

Surprisingly, the results from Study 2 indicate that there is no connection between financial literacy and intention to purchase on credit. This result indicates not only that consumers sometimes do not understand credit products or credit conditions (Brown et al., 2011; Karlan & Zinman, 2008; Lusardi & Tufano, 2015), but also that individuals with higher financial literacy scores (specifically debt literacy) do not necessarily make more considered credit decisions. This could be for several reasons. For example, it could be financial education provided in the classroom is too detached from real situations or because the anticipation of receiving something desirable somehow clouds rational decision-making. Indeed, a common argument here relies on the concept of self-control, where some consumers cannot stop themselves from taking on credit to purchase a product, even if they possess the necessary skills (financial literacy) to make a more informed choice. This idea relates more to the decisive role of attitudes towards credit, as discussed previously (Białowolski et al., 2020).

Instead, the results from Study 2 indicate that highlighting only the most relevant credit information in a salient manner can increase comprehension. As such, Study 2 argues that a significant link between knowledge about debt and prudent behaviour does not exist, further elaborating on the point made about financial literacy in Study 1. One could critically comment that perhaps this is due to a measurement issue, since most measures of financial literacy pay surprisingly little attention to objective knowledge about debt, although this is a research gap that is already addressed by Lusardi and Tufano (2015). However, Study 2 employed a set of financial literacy questions directly related to purchasing on credit – knowledge about instalment purchases, loan interest rates and the concept of the annual percentage rate. Sometimes, it is difficult to detect sufficient effects due to low variation in the sample, but here, the Study included over 1,000 participants, there was suitable variation in answering the literacy questions correctly, and the sample was representative of Estonia across all measured socio-demographic variables. So finding a non-significant effect is likely not due to measurement error or sample bias. Instead, the Study shows how attitudes toward credit seem to be the driving factor in choosing to purchase on credit, such as thinking life is more carefree with debt. **Therefore, financial literacy does not explain credit behaviour well on its own, and in this case not at all.** However, the results from the experiment in Study 2 suggest that credit information provided at the decision point can assist in reducing consumer debt. This finding is considered next.

Study 2 also answers the third research question detailing the effectiveness of providing credit information to influence the intention to purchase on credit; in other words, whether providing salient and relevant information about the credit contract can alter people's intent to take on consumer credit in order to purchase a product. The interventions in Study 2 caused a massive alteration in intention to purchase on credit. Nearly a third of the participants seeing the current status quo of credit information presentation in Estonian e-commerce stores (only monthly payments) intended to purchase the depicted product on credit, while the share of participants intending to do so in response to the total cost and duration

dropped to 4%, and in response to the annual percentage rate condition to 8%. **The results from Study 2 clearly show that information provision can have a large impact on the intention to purchase on credit, thus answering the third research question.**

It is worth considering the above result in relation to findings in the literature. First, effect sizes for behavioural interventions such as this usually range from a somewhat small effect, typically around a few percentage points, to an 8 percentage point effect on average (DellaVigna & Linos, 2022). The average effect size in Study 2 was 28 percentage points, far above the typical average. It could be argued that the current decision-making environment in Estonian e-commerce stores is particularly slanted towards encouraging more credit purchases, as most of the relevant information is not disclosed to the consumer up front, typically only depicting the monthly payment. This stands in stark contrast to the decision-making environment in neighbouring Finland, where a similar shop lists the monthly payment, interest rate, total cost, and total period of the credit agreement. As such, some of this result might be due to being implemented in a particular environment. Whether or not this result directly translates to other contexts in other countries is uncertain, as decision-making environments can be more or less conducive to purchasing on credit. Therefore, timely information provision is perhaps acutely suitable for purchasing on credit decisions. However, it is worth reiterating that this result is likely context dependent. It would be interesting to see how results differ for another type of credit, such as mortgages.

Second, it was unclear in the literature how information provision influences credit decisions. For example, in a similar study about credit card repayment, McHugh and Ranyard (2012) varied whether the consumer could see the total cost and/or the duration of the payment, or neither, finding that the provided information increases repayment rates. However, a study by Adams et al. (2021) sees very limited effects between information disclosure and credit decisions, with other studies echoing these findings (e.g., Seira et al., 2017). However, it is true that the study by Adams et al. (2021) was a field experiment, while Study 2 in this thesis and the study by McHugh and Ranyard (2012) are survey-based experiments, and therefore perhaps not directly comparable. For example, when completing the online study there is a lot less demands for attention and less distractions from multiple sources than in a real-world setting, which means that the individual can concentrate better on the task at hand, perhaps unrealistically so. In addition, the vignette featured in the study offers a hypothetical scenario, and people could be too psychologically detached from the person depicted in the description. As all treatment groups saw the same text about a hypothetical person (and the sample was balanced between groups) we can rule out such a large effect due to different psychological distance within the groups alone, but it could interfere somewhat with the accuracy of the results. It could be useful to test the intervention in Study 2 in the field, specifically when it comes to purchasing on credit decisions.

Therefore, we can see that the standard informational structure for purchasing on credit decisions can be conducive to the overuse of credit, especially in the

case of Estonia. On the one hand, consumers overusing credit is beneficial for the credit providers, as this increases their revenue. In other words, consumers not understanding the implications of their credit actions can favour the credit industry. On the other hand, according to the responsible use of credit principles, the creditor needs to make sure that the consumer understands the obligations of the credit contract, which can also have a positive effect on credit portfolio quality. Since we see that awareness of credit conditions is generally low, a regulation detailing the standards of the information context presented ought to be considered, but access to credit should not be diminished. The view of this thesis is that consumers need additional protection, a point which is further discussed in subsection 5.3.

The final research question assessed the effectiveness of the provision of investment performance information for influencing investment and saving behaviour. The newsletter information intervention designed in Study 3 did not have an overall effect on investor account balances, echoing similar null results in other studies (Clark et al., 2014; Dur et al., 2021), but did have significant results in specific client segments. Similarly, heterogeneous effects were documented in Study 2, where individuals in chronic debt (Ong et al., 2019) have a difficult time altering their credit behaviour (Gathergood, 2012b; Grohmann & Hamdan, 2021). Furthermore, it was not debt literacy but attitudes towards debt and credit that seem to matter a great deal for whether a person intended to purchase on credit in the experiment (Almenberg et al., 2020; Białowolski et al., 2020). However, one should keep in mind that people have different backgrounds (e.g., financial literacy, past experiences, behavioural patterns), heterogeneous preferences, and hence different utility curves. Therefore, segmentation is an important consideration for effective communication, perhaps especially so for financial products. It is important to consider a person's past experiences and past behaviour in order to design effective messaging strategies that help them make more considered financial decisions. **Therefore, the answer to the fourth research question in this thesis is more nuanced – while information provision was not effective at influencing investment and saving behaviour on a broad client base, specific segments of investors were significantly influenced by the treatment.** This finding emphasises the role of knowing your client and the importance of personalised messaging.

Study 3 also contributes to filling a research gap when it comes to influencing investment decisions, particularly via information provision. First of all, there are studies that document whether investment performance newsletters influence investment decisions (e.g. Brown et al., 2013; Graham, 1999). That said, most of these studies are conducted on generalised newsletters supplied publicly to investors, but the study in this thesis instead offered personalised information particular to the individuals' own investment performance, rather than the whole market or in regard to specific stocks. Research in this particular type of messaging strategy is much more scarce, and the effect of the personalisation of such investment newsletters is unclear. For example, Maslowska et al. (2011) show that more personalised messages are not seen as more convincing than generalised

newsletters, but Study 3 shows that investment performance information is only relevant in specific investor groups.

Next, I move on to show how the results of each of the studies related to the overall conclusion of this thesis – that **information provision significantly influences personal financial decisions**. First, we need to recognise that how we think about and model personal financial behaviour matters. In this thesis, I reviewed two main streams of research regarding modelling behaviour, traditional economics and behavioural economics. These two views differ considerably – whether people are considered as rational, so that they maximise their utility as subject to (financial) constraints (e.g. rational portfolio theory by Markowitz, 1991), or are boundedly rational, not seeking to optimise every decision to its fullest, but rather satisfice and arrive at the first suitable decision (Simon, 1982). This distinction in terms of rationality has large implications for how companies and regulators seek to influence financial behaviour: purely rational individuals primarily care about direct financial costs and benefits, but boundedly rational individuals can be effectively directed through choice architecture.

The thesis finds that financial education in the classroom alone is likely not sufficient in fixing the various issues that stem from poor money management. Other *hard* economic measures, such as taxation, offer an alternative possibility, but if the cost-benefit structure of the decision does not change substantially, then people are likely to just ignore the changes (Börsch-Supan, 2009; Lindeboom & Montizaan, 2020), or even behave counter-productively to the intended result (Cuesta & Sepulveda, 2021; Maimbo & Henriquez Gallegos, 2014; Zinman, 2010). For example, Cuesta and Sepulveda (2021) show how a reduction in the interest rate cap (by 20 percentage points) in the case of Chile can lower consumer welfare in a monopolistic credit market, while also limiting access to credit. Therefore, intervention measures that rely purely on rational methods might not be too suitable in this context, as the behaviour of individuals is not always concurrent with the incentive. With this in mind, the thesis argues for the benefits of employing behavioural interventions instead, specifically information provision.

It is worth recounting that information provision is still just one specific type of behavioural intervention among many. In the field of financial behaviour, some other prominent methods are defaults, which change the status quo of how the choice architecture is set up by prefilling choices (or alternatively, changing the already prefilled options to a different one) (e.g. Beshears et al., 2006; or health related: Johnson & Goldstein, 2003), and reminders, which ping people to call attention to an action or activity that they ought to do, such as keeping a doctor's appointment or remembering to obtain their tax credit from pension contributions (e.g. Calzolari & Nardotto, 2017; Karlan et al., 2016). However, these intervention types are already well known and researched, and while effective, the toolbox of ways to influence financial behaviour ought to be expanded. This thesis shows how information provision could fulfil that role.

In the studies included in this thesis, I showed how information provision proved to be effective in changing preferences for credit products in our online

experiment and increased saving and investing behaviour in a natural field experiment. These results show that information provision interventions can be useful in helping guide people in their financial decisions. The results also highlight the importance of the decision-making environment and the context. Specifically, the thesis refers to recipient segmentation and message personalisation as important considerations in designing effective information provisions. The findings presented in this thesis have relevant societal value, as they show that relatively small changes to the context can be effective in influencing impactful financial behaviour, such as the overuse of credit and lack of saving. These are issues that plague numerous people, and context design via information provision can help. Contribution to theory and recommendations for policy-makers and business practitioners are considered in the following subchapters 5.2 and 5.3.

5.2. Contributions to theory

The thesis contributes to the literature in numerous ways. First, it provides a better understanding of why people might not act accordingly to their knowledge of prudent decisions, or the knowledge-behaviour gap (e.g. Chan & Stevens, 2008; Kennedy et al., 2004), especially in the context of financial literacy and financial behaviour. It is true that numerous studies have shown a significant relationship between financial literacy and prudent financial behaviour (Alessie et al., 2011; Lusardi et al., 2017; Rai et al., 2019; van Rooij et al., 2011). For example, van Ooijen and van Rooij (2016) find that individuals with lower financial literacy hold riskier mortgages, while Lusardi and Tufano (2015) show a significant connection between financial literacy and paying higher transaction fees, and taking on more high cost credit. However, the results outlined in this thesis suggest that it is not always the case. Rather, the results from this thesis supports research that find a negligible connection between the two, such as Stolper and Walter (2017), who find that educational efforts to increase financial literacy have not been effective and have low capability of influencing financial behaviour. The results are also more in line with Alsemgeest (2015), who shows that while basic financial literacy can indeed help with regular money management, emotions and other factors can derail financial literacy from having an effect on behaviour. Therefore, the thesis shows that financial literacy does not lead to better decisions about purchasing on credit, and instead provides an important complementary tool to financial literacy education, information provision interventions, and furthers understanding of how attitudes affect credit decisions (Białowolski et al., 2020).

Secondly, the thesis also contributes to the literature by examining theoretical predictions of investment and credit behaviour intervention techniques, while showing that effective interventions benefit from recipient segmentation. The thesis shows that an investor newsletter is only effective for specific groups of investors, contributing to understanding the mixed results found in newsletter effectiveness (Grinstein & Kronrod, 2015; Neapolitan, 1988). The thesis argues

that proper client segmentation is required. Therefore, the research outlined in the thesis is important for the stream of research examining how information can influence financial behaviour and why similar initiatives sometimes fail to do so.

5.3. Policy and practical recommendations

In this thesis I have reviewed literature on how financial decisions are not always thoroughly considered. People often overuse credit, fail to keep emergency savings, and neglect their long-term financial planning. Being careless with managing personal finances has considerable negative effects on health and well-being (Barrett & Kecmanovic, 2013; Białowolski et al., 2020; de Bruijn & Antonides, 2020; Horner, 2014; Martin & Hill, 2015; Netemeyer et al., 2018), while prudent financial decision-making is associated with increased happiness (DeLeire & Kalil, 2010; Frey & Stutzer, 2010) and considerably higher financial resilience (Lusardi et al., 2021). Therefore, individuals ought to be smart in their financial decisions, and yet financial decisions are often complicated and perhaps unpleasant to deal with (Choi et al., 2002). As such, people could use some help in making prudent financial decisions.

This thesis suggests several policy and practical recommendations:

1. The results are important for consumer protection and financial regulation agencies. If individuals do not fully understand the weight and implications of their financial decisions, then it is up to the financial regulators and consumer protection agencies to help safeguard consumers from dangerous decisions. It is not reasonable that consumers bury themselves in debt without understanding that purchasing on credit is actually a debt agreement (Brown et al., 2011; Karlan & Zinman, 2008, Estonian credit market..., 2021). A unified credit registry (which Estonia does not have at the time of writing) could contribute to solving part of the overuse of credit problem, as credit providers will have a more complete picture of the previous financial obligations of the client. In fact, Estonia is just about the only country in Europe without a credit registry, although one is scheduled to be instated in 2025 (ERR, 2023).
2. Information provided at the credit decision point can also serve to make consumers give greater consideration to the implications of their credit decisions. As such, the results suggest that consumer protection agencies could help consumers be better protected from the irresponsible use of credit by including the total cost, total duration, and the annual percentage rate of the credit agreement right at the decision point. Due to the large shift in the intention to purchase on credit when this information is presented to consumers, it could be argued that many credit decisions are not considered and instead more impulse-driven. Therefore, one idea to curb imprudent use of credit would be to instate a “cooling-off period” where a person who is applying for a consumer loan cannot sign the credit agreement before some time has passed, such as 24 or 48 hours. If the

consumer still wishes to purchase on credit after this period, then they could proceed with the credit decision. This may lower the proportion of credit decisions that are made on a whim. Although this approach can seem rather restrictive at first, less impulsive use of credit in the interest of consumer finance providers as well, as it can increase credit portfolio quality.

3. The results have important considerations for the role of financial education. It is true that not everybody needs to be a financial expert to sufficiently understand the consequences of their financial decisions – similar to how not every person needs to be a pharmacist or chemist to responsibly consume medication. We need to equip individuals with the necessary financial knowledge and skills that they are able to ask prudent questions regarding important financial decisions people commonly face, such as whether the interest rate quoted on a consumer credit contract is reasonable, or what opting out of the pension system practically means for their future finances. These financial capabilities ought to go beyond financial mathematics (Lusardi & Mitchell, 2007; Van Rooij et al., 2011), as shown in Study 2 and in previous research (Fernandes et al., 2014; Kaiser & Menkhoff, 2016; Miller et al., 2015). Individuals ought to be capable of critically evaluating financial decisions and know where to turn for advice, which in turn can help alleviate problems with financial fraud. Therefore, financial education in the form of practical, relevant, salient, simple information is an important building block in influencing financial decisions to be more prudent. One way to accomplish this is through a government-provided one-stop shop informational webpage where consumers can obtain relevant information regarding financial decisions, with different advice categories for each type of financial decision, but it should focus on more practical elements rather than mathematics.
4. There are also practical considerations that arise from the findings. Financial institutions seeking to influence responsible use of credit or activating savers into investors (or investing for retirement) could benefit from carefully considered newsletters and a well-crafted choice architecture. It is evident from Study 3 that general newsletters are not sufficient in activating owners of saving accounts to become active investors, but targeting specific investor groups could be successful. Rather, personalising the message and careful segmentation, or “knowing your customer”, is necessary. Furthermore, Study 2 shows that intention to purchase on credit is highly dependent on how and when the information about the decision is presented to the consumer – implying that financial institutions could improve the quality of their debt portfolios by being upfront with the credit conditions.

The results presented in this thesis have the potential for wider reach than Estonia alone. The experiment design presented in Study 3 could be easily adapted to

other contexts. Irresponsible credit decisions, particularly with buy-now-pay-later credit products are a prevalent problem in numerous countries and Study 2 shows how credit information provision could be influential in many countries with similarly lax information regulation contexts. All in all, there is potential for employing similar experiments in various countries and contexts.

5.4. Limitations and suggestions for further research

The limitations of each empirical study are discussed in this subchapter. Note that additional limitations are discussed also in the respective sections of each of the empirical studies.

Beginning with the theoretical limitations, this thesis was necessarily limited in scope to only specific financial decisions, which included saving and investment decisions and purchasing on credit decisions. However, the scope of financial decisions is broader, also including consumption and insurance decisions, which might not be generalisable. All the information provision experiments discussed in this thesis also featured text-based information, but naturally text is not the only way that relevant information could be provided. Further research could instead focus on different visualization methods, perhaps by conducting an experiment where treatment groups are provided similar information in various visual manners, such as video, pictures, games or virtual reality. As the scope of the studies discussed in the thesis focused on influencing behaviour, this interesting line of variation could not be sufficiently considered, and limits generalisability. Further research could focus on boosts and signposts, as opposed to nudges. These approaches have shown to be promising alternatives to nudges while also avoiding a few of the ethical problems that nudges often have, such as influencing participants in a direction that is not in their best interest. As such, the thesis is limited when it comes to assessing alternative constructs of similar interventions, but without the implicit intention of directing behaviour. This research avenue is left for future studies.

Next, the limitations of individual studies are considered. It could be argued that Study 1 misses key control variables, such as ethnicity or migrant status, since it focuses on country-level financial literacy outcomes instead of individual-level outcomes. However, taking in-depth individual heterogeneity into account would be a completely different approach, which typically zooms in on differences of individual groups within a single country or between a few countries (Bottazzi & Lusardi, 2021; Silinskas et al., 2023). This is done since a wide lens cross-country comparison study cannot sufficiently address very specific country-level details, as it requires precise in-depth knowledge of each country at hand and poses significant data concerns. Instead, future studies could have a more in-depth international approach, so that individual research collaborators from each country are included. It could also be argued that there is potential confounding behind financial literacy and individualism, and there indeed is a high correlation. The study addresses this concern by including country-level control variables and

four models of culture. The study is also limited by inherent limitations from employing cross-sectional country-level data, such as not being able to assess the channel of causality, concerns with confounding variables (as mentioned) and not offering any dynamic information. However, a database that offers a longitudinal measurement of financial literacy does not exist. If one is compiled in the future, it would provide very valuable insights and an interesting avenue for further research.

Study 2 addressed the intent to purchase on credit but could not connect intention to actual real-world behaviour. Although intention does at least somewhat indicate future behaviour (Ajzen, 2011), this is certainly not always the case. This is a necessary limitation that arises from having a hypothetical case for the person to evaluate, field experiments in the future could help in amending this concern. It could also be argued that the hypothetical situation proposed in Study 2 is too detached from the person reading it, so that they cannot really relate to the task at hand, perhaps instead causing them to focus on the credit decision and not the purchasing decision. As the study focuses specifically on purchasing on credit decisions then it cannot really address the magnitude of change in intention to purchase the item without relying on credit – this would remove an integral part of the hypothesis. Measuring this difference would require more than twice the sample size compared to what we could muster, so this relevant question remains available for further research.

Study 3 relied on a pseudo-controlled experiment design in measuring the main effects. It is true that the sample bias arising from this technique can affect the overall evaluation of the effectiveness of the newsletter. However, this concern does not influence the main conclusion of the experiment, as the group differences are calculated from case-matched individuals in treatment groups. This approach assures that the comparison remains valid despite the sampling issues within the control and treatment group. Study 3 is also conducted within a very specific context, one retail bank within one specific country. Further research replicating the effects would be required. However, finding a collaboration partner in the industry is rare, and natural field experiments are often limited in this manner (Levitt & List, 2009).

Even though this thesis outlined encouraging results about the potential of information provision in influencing financial behaviour, the interventions might not always succeed. If the information presented to the recipient does not match their needs or priorities, then the information could be disregarded as inconsequential. It could also be that an individual's financial situation is not conducive to be influenced at all, regardless of how effective the information is designed to be – it is difficult to think about saving and investing for retirement when present financial worries take precedent. As such, information provision alone does not substitute harder forms of regulation and government assistance in the form of redistribution and financial assistance.

Behavioural interventions are also often context dependent. Therefore, future research could address similar information provision experiments in a field setting, preferably in countries other than Estonia. Since the concepts of pension,

risk, investment, and credit can be interpreted differently in different cultures, then the results could vary considerably. Further research could therefore include countries with different approaches to pension systems, credit markets and attitudes towards investment. Including a greater number and more diverse countries will help to better establish the effectiveness and generalisability of the information provision interventions discussed in this thesis.

If possible, further research could feature similar experiments in a field setting, similar to Study 3. It would be interesting and useful for both policymakers and financial institutions to examine whether preferences carry over to actual decisions. However, this information is very hard to obtain, as it is highly unethical to conduct laboratory experiments where participants actually take on credit or make real impactful decisions regarding their retirement. As such, while online experiments are useful in obtaining insights into what could be useful in influencing behaviour, field experiments would help confirm actual effect sizes in a real-world environment. Another interesting approach would be to gather qualitative data through interviews instead, which can offer insight into the inner mental workings behind these observed behaviour patterns addressed in the thesis.

Further research could also try to disentangle the specific information item effect with greater detail and granularity. Study 3 could not fully differentiate between the effects that very specific aspects of praise and scolding have, and a similar problem arose with assessing the role of depicting past performance. As these messages were interconnected and interdependent, it is unclear which message was driving most of the results. Similarly, Study 3 could not differentiate the specific effects that each of the items within the prompt had, which makes it difficult to assess the effects of each specific message. While disentangling the results for each specific piece of information is likely inefficient with experiments, instead researchers could look to other methods, such as eye-tracking or neurofinance, which could help gain further insight into the matter.

6. REFERENCES

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SUMMARY IN ESTONIAN

Eraisikute finantsotsuste mõjutamine informatsiooni pakkumise abil

Motivatsioon

Inimesed teevad üsna sageli finantsotsuseid ilma neid selgelt läbi kaalumata (Agarwal et.al., 2007; Campbell, 2006; Choi et.al., 2002). Näiteks on hiljuti USA tarbijakaitse ameti andmetel märkimisväärselt kasvanud eraisikute tarbimiskaalude jäägid, samal ajal nõutakse ligi viiendikult USA krediitdiskooriga inimestelt võlgu inkassode poolt sisse (CFPB, 2023). Lisaks puuduvad enamikul USA inimestest ka piisavad säästud (Despard et.al., 2020; Stavins, 2021). Sarnased mustrid esinevad mitmetes teistes riikides (Cesar Leandro & Botelho, 2022; Karlan et.al., 2014; Topa et.al., 2009).

Finantsotsustel on oluline mõju inimeste heaolule ning need mõjutavad tugevalt vaimset tervist (Białowolski et.al., 2019; de Bruijn & Antonides, 2020; Drentea & Reynolds, 2015; Gathergood, 2012; Netemeyer et.al., 2018). Seega on eraisikute finantsotsused olulised nii neile endile kui ka riigile tervikuna. Inimesed, kes rahaga teadlikult ning mõistlikult ümber käivad, on vastupidavamad ootamatustele (Lusardi et.al., 2021), teisalt on eraisikute lühinägelik rahaasjade haldamine ka riigile koormav. Näiteks kui inimesed loodavad riigi toele pensionieas, suurendab see riigi sotsiaalkindlustuse eelarve vajadust, mida rahaliselt iseseisvama üldpopulatsiooni puhul poleks vaja (Chybalski, 2016; Marcinkiewicz & Chybalski, 2014). Seega on oluline käsitleda, kuidas aidata inimestel enda rahaliste otsustega paremini toime tulla ehk kuidas finantskäitumist suunata.

Finantskäitumise suunamiseks ning rahaliste otsuste tegemise abistamiseks on mitmeid erinevaid viise. Üks traditsiooniline lahendus on finantskirjaoskuse (ehk rahatarkuse) tõstmine hariduse abil (Alsemgeest, 2015; Lusardi, 2019). Finantskirjaoskus on seotud näiteks säästmiskäitumisega (Jappelli & Padula, 2013), pensioni planeerimisega (Lusardi & Mitchell, 2011), aktsiaturul osalemisega (van Rooij et.al., 2011) ning suurema varade mahuga (Hastings & Mitchell, 2020). Siiski on ebaselge, kas finantskirjaoskus avaldab finantskäitumisele olulist mõju ning nende omavaheline seos ei pruugi nii üheselt mõistetav olla (Mandell & Klein, 2009; Stolper & Walter, 2017; Willis, 2008). Niisiis polegi hetkel täpselt selge, kuidas finantsharidus mõjutab mõistlikku finantskäitumist.

Maksude ning toetustega on samuti võimalik finantskäitumist suunata. Samas on nimetatud lahendused üsnagi ebaefektiivsed (Chetty et.al., 2014). Näiteks enamik inimesi ei reageeri muutustele pensioniks säästmise maksusoodustuse osas ning sellest saavad kasu pigem juba niigi jõukad inividid (Lindeboom & Montizaan, 2020). Seega ei pruugi finantskäitumise mõjutamine rahaliste vahenditega olla kuigi edukas ning jääb doktoritöö raamis käsitlemata. Selle asemel keskendub töö „pehmematele“ vahenditele, eelkõige otsustamiskeskonna muutmisele.

Väikesed muudatused otsustamiskeskkonnas (n-ö „müksud“) võivad mõjutada inimeste (finants)käitumist ning neid mõistetakse antud töös käitumuslike sekkumiste all. Üldiselt on käitumuslike sekkumiste mõju oluline (Mertens et.al., 2022) ja kuluefektiivne (nt Banerjee et.al., 2021), kuid mõju suurus on suhteliselt väike (DellaVigna & Linos, 2022) ja kontekstist sõltuv (Hummel & Maedche, 2019). Seega peavad käitumuslikud sekkumised arvestama konkreetseid asjaolusid, kus neid rakendatakse.

Käitumise nügimiseks on mitmeid võimalusi, liiga palju, et neid kõiki ühe doktoritöö raames käsitleda. Selle asemel käsitleb töö ühte konkreetset meetodit – käitumise mõjutamist informatsiooni pakkumise kaudu. Informatsiooni pakkumine viitab informatsiooni rollile otsuste tegemisel (Haaland et.al., 2023). Asjakohane teave võib anda inimestele võimaluse teha teadlikumaid otsuseid (Hertwig & Grüne-Yanoff, 2017; Hertwig & Ryall, 2020). Seega võivad informatsiooni pakkumine, näiteks uudiskirjades (Maslowska et.al., 2011) või asjakohase teabe pakkumine otsuse tegemise ajal (McHugh & Ranyard, 2016) olla tõhusad meetmed finantskäitumise mõjutamiseks.

Informatsiooni pakkumise ja finantsotsuste seose mõistmise osas on märkimisväärne uurimislõtk. Informatsiooni pakkumine krediitingimuste kohta võib suunata inimesi tegema teadlikumaid krediidiotsuseid (McHugh & Ranyard, 2016) ja vähendada kiirraenude kasutamist (Bertrand & Morse, 2011), kuid samas paljudes uuringutes antud efektid ei ilmne (Adams et.al., 2021, 2022; Seira et.al., 2017). Samuti võivad investeerimisnõuanded (või veebipostitused, nt Dewally, 2003) mõjutada inimeste investeerimisotsuseid (Brown et.al., 2013), isegi kui neil pole tegelikku olulist prognoosivõimet (Graham & Harvey, 1997), kuid pole selge, millal see täpselt toimub ning millal mitte. Eriti uudiskirjade personaliseerimine mõju (Maslowska et.al., 2011) pole veel hästi mõistetud. Lisaks ei ole kindel, kas finantsharidus on lahendus finantskäitumise probleemide lahendamiseks (Alsemgeest, 2015; Disney & Gathergood, 2013; Kaiser & Menkhoff, 2016; Stolper & Walter, 2017). Seetõttu ei ole selge, millised informatsiooni pakkumise viisid on finantskäitumise mõjutamiseks tõhusad ning ideaalis tuleks ka kontrollida finantskirjaoskuse rolli selle suhtes.

Eesmärk ja uurimisküsimused

Dokoritöö eesmärk on pakkuda põhjalikku arusaama informatsiooni pakkumise mõjust eraisikute finantsotsustele. Töö paikneb kahe suurema uurimisvaldkonna, käitumusliku majanduse ja käitumise mõjutamise, ristumiskohas. On selge, et finantsotsuste täielik pilt on väga ulatuslik ning hõlmab laia spektrit - seega peab töö olema uuritavate finantsotsuste osas piiratud. Seetõttu keskendutakse investeerimis-, säästmis- ning laenukäitumisele. Laenukäitumise puhul on fookus ühel konkreetsetel krediidiotsuse vormil – nimelt järeelmaksuga ostmisel, kus tarbija võtab krediiti kindla tarbekauba ostmiseks ja maksab summa tagasi regulaarsete osamaksetena. Need finantsotsused on olulise tähtsusega individuaalse heaolu ja tervise jaoks (de Bruijn & Antonides, 2020; Gathergood, 2012;

Netemeyer et.al., 2018) ning seetõttu väärivad edasist uurimist. Töö keskendub informatsiooni pakkumise müksudele (Thaler & Sunstein, 2009), kuna see sekumismetod on kulutõhus viis käitumise mõjutamiseks (Hudák et.al., 2017; Lutz et.al., 1999; McHugh & Ranyard, 2016).

Väitekiri otsib vastust järgmisele neljale uurimisküsimusele kasutades selleks kolme publitseeritud teadusuuringut:

1. Kuidas mõjutab riigi kontekst (eriti finantskirjaoskus) finantsotsuseid? (Uuring 1)
2. Kas finantskirjaoskus selgitab eraisikute krediidikäitumist? (Uuring 2)
3. Kui efektiivne on krediidiinfo esitamine järelmaksuga ostmise kavatsuse mõjutamisel? (Uuring 2)
4. Kui efektiivne on investeerimistulemuste info esitamine eraisikute investeerimis- ja säästmiskäitumise mõjutamisel? (Uuring 3)

Oluline on märkida, et Uuring 2 ja Uuring 3 on läbi viidud Eestis. Eesti on analüüsimiseks sobilik kuna: 1) riigis esineb märkimisväärseid sotsiaalmajanduslikke probleeme, mis on seotud finantskäitumisega (nagu allpool kirjeldatud), millele pakutav uurimistöö saab aidata lahendusi leida; ja 2) Eesti pakub uurimiseks võrdlemisi vähekajastatud kultuurilist ja sotsiaalset keskkonda, mis on kontekstitundlike uuringute puhul väga oluline.

Eesti näite illustreerimiseks tuuakse välja näited kolmes finantsotsuste kategoorias – pensioniks ettevalmistumise, krediidi kasutamise ja investeerimine. Esiteks, Eurostati 2021. aasta andmete kohaselt on Eestis töötavate pensionialiste inimeste osakaal Euroopas kõrgeim (32,5%, Eurostat, 2023), samas kui Eesti pensioni sissetuleku asendumäär on OECD-s üks madalamaid, keskmine pension asendab 34% eelnevast sissetulekust (OECD, 2021). See näitab, et suur osa Eesti elanikkonnast ei ole pensioniks ettevalmistunud. Teiseks hindas Eesti Finantsinspeksioon, et 2022. aastal oli mitte-pankadest laenuandjate laenulepingutest 22% viivises (FI, 2023). Kõrge viiviste määr näitab, et paljud krediidiotsused ei ole hoolikalt kaalutud. Viimasena võib 2021. aasta andmete põhjal (HFCS) koheselt märgata, et eestlastel on finantsvara osakaal nende koguarades märkimisväärselt madalama osakaaluga kui eurotsoonis keskmiselt, mis näitab vähest aktsiaturu osalemist. On selge et, kõik need probleemid ei tulene otsest kehvadest finantsotsustest, kuid olukord ei muutu tõenäoliselt ilma sekkumiseta.

Empiiriliste uuringute lühikokkuvõte

- Uuring 1 keskendub noorte finantskirjaoskuse riikidevaheliste erinevuste analüüsimisele PISA 2018 andmestikus. Uuring 1 täidab doktoritöö kontekstis olulist rolli ning näitab, kuidas inimesed võivad Eestis olla kõrge finantskirjaoskusega, kuid sugugi mitte käituda vastavalt oma teadmistele. Uuring aitab mõista finantskirjaoskuse mitmetahulist olemust, õigustades interdistsiplinaarset uurimist. Tulemustel on oluline praktiline väljund finantskirjaoskuse haridusprogrammide arendamisel.

- Uuring 2 hindas krediiditeabe pakkumise mõju järelmaksuga ostmisele. Uuringu raames viidi läbi küsitlus ja eksperiment esindusliku valimiga Eesti täiskasvanutest (n=1204). Uuring aitab mõista finantskirjaoskuse ja hoiakute rolli krediidiotsustes.
- Uuring 3 analüüsis erinevate sõnumistrateegiatega mõju panga klientide investeerimis- ja säästmiskäitumisele. Uuringus viidi läbi eksperiment, kus uudiskirjades teavitati Eesti jaepanga kliente nende investeerimistulemustest. Uudiskirjal ei olnud mõju kliendibaasile üldiselt, kuid olulised mõjud tuvastati teatud kliendigruppides. Tulemused markeerivad uudiskirjade personaliseerimise ning kliendibaasi segmenteerimise kriitilist tähtsust.

Arutelu

Doktoritöö tulemusena leiti, et informatsiooni pakkumine võib olla kasulik vahend eraisikute finantsotsuste mõjutamiseks, kuid tuleb arvestada konteksti, segmenteerimise ja personaliseerimise rolli. Väitekirjast tugines neljale uurimisküsimusele, mida käsitletakse järgnevalt.

Esimene uurimisküsimus käsitles seost finantskirjaoskuse ja finantsotsuste vahel. Uuringu 1 kohaselt on Eestis PISA andmete järgi keskmine finantskirjaoskuse skoor mõõdetud riikidest kõige kõrgem ning OECD/INFE küsitluses paremuselt kolmas. Siiski on tegemist ainult teadmiste mõõtmisega. Pilt on üsna erinev, kui vaadata finantskäitumise skoor – siin on Eestil keskmisest madalam skoor (49 punkti 100st, võrreldes OECD keskmisega 52). Teistes riikides, kus teadmiste skoorid on üsna madalad, näiteks Indoneesia, kus on kõigi mõõdetud riikide madalaim teadmiste skoor, on finantskäitumise osas keskmisest oluliselt kõrgemad tulemused (74 punkti 100st). See pole kindlasti lõplik tõend selle kohta, et seost finantskirjaoskuse ja käitumise vahel ei eksisteeri, kuna uuringud on näidanud seost mitmel korral (Disney & Gathergood, 2013; Hastings et al., 2012; van Ooijen & van Rooij, 2016). Siiski näitab antud tulemus, et tuleks läbi viia eksperimente finantskirjaoskuse ja finantskäitumise vahelise põhjusliku mehhanismi kindlakstegemiseks (vt ka nt García & Vila, 2020). **Seega vastus esimesele uurimisküsimusele on järgmine: riigi kontekst mängib olulist rolli isiklikes finantsotsustes, kuid suur osa seosest finantskirjaoskuse ja finantskäitumise vahel on ebaselge.**

Üllatavalt näitavad Uuringu 2 tulemused, et finantskirjaoskuse ja järelmaksuga ostmise kavatsuse vahel ei ole seost. See tulemus viitab, et tarbijad ei mõista mõnikord krediiditooteid või krediidingimusi (Brown et al., 2011; Karlan & Zinman, 2008; Lusardi & Tufano, 2015) ning paremate finantskirjaoskustega isikud ei tee tingimata kaalutletumaid krediidiotsuseid. Sellel võib olla mitu põhjust. Näiteks võib pakutud finantsharidus olla liiga kaugel reaalsest elust või võib soov millegi ihaldatava järele hägustada ratsionaalset otsustamist. Uuringu kohaselt on järelmaksuga ostmise juures määrav tegur hoopis suhtumine laenudesse, näiteks arvamus, et elu on võlgu olles muretum. **Seetõttu saab vastata teisele**

uurimisküsimusele: finantskirjaoskus ei selgita laenukäitumist piisaval määral.

Uuring 2 vastab ka kolmandale uurimisküsimusele, käsitledes krediidiinformatsiooni esitamise tõhusust krediidiga ostmise kavatsuse mõjutamisel; teis sõnu, kas asjakohase ja olulise teabe esitamine krediidilepingu kohta võib muuta inimeste kavatsust võtta tarbimislaenu. Eksperimendi käigus ilmnis, et ligi kolmandik osalejatest, kes nägid praegust krediiditeabe esitamise olukorda Eesti e-kaubanduse poodides (ainult kuumakset), kavatsesid osta kujutatud toote krediidiga, samas kui kogu kulu ja laenulepingu kestvuse näitamisel langes osalejate osakaal 4%-ni. Krediidikulukusemäära näidates langes laenusoovijate osakaal 8%-ni. **Seega on vastus kolmandale uurimisküsimusele järgmine: informatsiooni esitamine võib oluliselt mõjutada krediidiga ostmise kavatsust.** Lisaks võime täheldada, et järeelmaksu pakkumise tavapärane informatsioonipakkumise struktuur võib soodustada krediidi liigkasutamist, mis tuleb Eesti konteksti puhul väga ilmekalt esile.

Viimane uurimisküsimus oli seotud investeringute tulemuste teabe esitamise tõhususega investeerimis- ja säästukäitumise mõjutamisel. Uuringus 3 kavandatud uudiskirjateabe sekkumine ei mõjutanud investorkontode saldosid üldiselt, sarnaselt varem läbiviidud uuringutele (Clark et al., 2014; Dur et al., 2021). Kuid siiski avaldas uudiskiri olulist mõju teatud kliendisegmentidele. Uudiskiri suurendas investeringuid klientide seas, kes polnud veel oma regulaarset panust teinud, kui klient panustas enda tüüpilisest panusest oluliselt rohkem või kui klient oli küll varem investeerinud, kuid millegi pärast ei olnud sellega jätkanud. Seega on oluline arvestada inimese varasemate kogemuste ja varasema käitumisega, et kavandada tõhusaid sõnumistrateegiaid, mis aitavad inimestel teha kaalutletumaid finantsotsuseid. **See teeb vastuse neljandale uurimisküsimusele kompleksemaks: kuigi informatsiooni esitamine ei olnud laia kliendibaasi puhul tõhus investeerimis- ja säästukäitumise muutmiseks, mõjutas see siiski oluliselt konkreetseid investorite segmente.** Antud tulemus rõhutab kliendi tundmise ja personaliseeritud sõnumite olulisust.

Kokkuvõttes on näha, et informatsiooni pakkumine mõjutab oluliselt eraisikute finantsotsuseid. Siiski on informatsiooni pakkumine vaid üks konkreetne käitumuslike sekkumiste tüüp paljudest (nt Calzolari & Nardotto, 2017; Karlan et al., 2016). Kuigi mitmed sekkumistüübid on juba hästi tuntud ning tõhusad, tuleks laiendada finantskäitumise mõjutamise meetodite tööriistakasti. Doktoritöö arutleb, kuidas informatsiooni pakkumine võiks seda rolli täita.

Panus teoriasse

1. Väitekirjari annab parema arusaamise sellest, miks inimesed ei pruugi käituda vastavalt oma teadmistele (Chan & Stevens, 2008; Kennedy et al., 2004), eriti just finantskirjaoskuse ja finantskäitumise kontekstis. Autor leiab, et finantskirjaoskus ei pruugi tagada mõistliku finantskäitumist. Teadmiste asemel on mitmed muud komponendid, mis finantskäitumist olulisemalt mõjutavad,

näiteks hoiakud (Białowolski et al., 2020), mida on selle doktoritöö raames tarbimislauenu võtmise kavatsuse kontekstis selgitatud.

2. Väitekirja panustab investeerimise ja krediitkäitumise sekkumismeetodite arendamisse näidates, et tõhusad sekkumised vajavad sõnumi vastuvõtja suhtes segmenteerimisest. Investoritele suunatud uudiskiri on efektiivne ainult konkreetsete investorirühmade jaoks, aidates mõista uudiskirjade tõhususega seotud vastakaid tulemusi (Grinstein & Kronrod, 2015; Neapolitan, 1988). Samuti panustab töö mõistmaks sõnumite personaliseerimise rolli ehk kuidas informatsioon saab finantskäitumist mõjutada ning miks sarnased sekkumised ei pruugi alati õnnestuda.

Soovitused praktikutele ning poliitikakujundajatele

1. Tulemused on olulised tarbijakaitse- ja finantsregulatsiooniagentuuridele. Kui inimesed ei mõista täielikult oma finantsotsuste kaalu ja tagajärgi, on tarbijakaitseameti ülesanne inimesi abistada. Eestis takistab seda hetkel aga positiivse krediidiregistri puudumine. Ühtne positiivne krediidiregister võiks osaliselt lahendada krediidi ülekasutamise probleemi, kuna krediidiandjad saavad parema ülevaate kliendi varasematest finantskohustustest, mistõttu väheneb infopuudusest tehtavate vastutustundetute laenude osakaal.
2. Krediiditeave võib samuti aidata tarbijatel oma krediidiotsuste tagajärgedele suuremat tähelepanu pöörata. Krediidiinfo peaks sisaldama kohe otsuse tegemise keskkonnas (näiteks e-poes) krediidi kogukulu, koguperioodi ja krediidikulukusemäära. Teine võimalus impulsiivsete krediidiotsuste vähendamiseks on „jahtumisperioodi“ kehtestamine. Nimelt ei saaks tarbimislauenu taotlej inimene enne teatud aja möödumist, näiteks 24 või 48 tundi, krediidilepingut allkirjastada. Kui tarbija soovib pärast seda perioodi ikkagi toodet laenuga osta, võib ta jätkata krediidiotsusega.
3. Tulemusetel on olulisi kaalutlusi finantsariduse rolli osas. Tõsi, kõik inimesed ei peagi olema tipptasemel finantsasjatundjad, et piisavalt mõista oma finantsotsuste tagajärgi – sarnaselt sellega, kuidas igaüks ei pea olema apteeker, et vastutustundlikult ravimeid tarbida. Siiski peaksime pakkuma inimestele vajalikke finantsalaseid teadmisi ja oskusi, et nad suudaksid esitada olulisi küsimusi finantsotsuste kohta ning teaksid, kust abi saada. Näiteks peaks tarbija oskama hinnata, kas tarbijakrediidi lepingus pakutav intressimäär on mõistlik või mida pensionisüsteemist väljaastumine praktikas tähendab tema tulevastele finantsidele. Finantsoskused peaksid ulatuma kaugemale finantsmatemaatikast.
4. Finantsasutused, mis soovivad mõjutada vastutustundlikku krediidi kasutamist või aktiveerida säästjaid investoriteks (või mõjutada pensioniks investeerimist), võiksid kasutada hoolikalt läbimõeldud uudiskirju. Oluline on aga just kliendi tundmine ehk uudiskirja personaliseerimine ning kliendigruppide segmenteerimine.

Peamised piirangud ja edasised uuringud

1. Töö käsitleb piiritletud osa finantsotsustest ning võimalikest käitumuslikest mõjutusviisidest. On selge, et finantsotsuste alla käivad ka näiteks tarbimisotsused ja kindlustamine, lisaks võib iga krediiditoote puhul käitumine olulisel määral erineda – näiteks järelmaksuga seotud käitumine on tõenäoliselt erinev kodulaenu omast. Teisalt ei ole võimalik ühe doktoritöö raames kogu finantskäitumise amplituud avada ning seega oli vaja teha valik käsitletavate teemade osas.
2. Antud tulemused ei pruugi alati ilmnedagi, kuna sõltuvad olulisel määral kontekstist. Näiteks kui sama uuring korraldatakse kultuuriliselt ning majanduslikult erinevates keskkonnas, siis ei ole selge, kuidas täpselt uuringute tulemused edasi kanduksid. Edasised uuringud võiksid rakendada sarnaseid eksperimente erinevates riikides ja kultuurides. Selles doktoritöös läbiviidud eksperimente võiks korrata ka erinevate tekstide ning erinevate toodetega.
3. Doktoritöö käsitleb ainult tekstipõhist informatsiooni. Tulevased uuringud võiksid täpsemalt uurida visuaalse esitamiseviisi mõjulist.
4. Mõnel juhul ei olnud võimalik mõjutegureid väga selgelt eristada. Näiteks ei saanud Uuringus 2 kontrollida ainult kogukulu näitamise mõju ning Uuringus 3 kõikide sõnumitüüpide mõju eraldiseisvalt. Tulevased uuringud võiksid eksperimentid osaks jaotada, nii et mõju mõõtmine oleks eraldiseisvate komponentide lõikes selgem.
5. Doktoritöö tulemused ei asenda täielikult riigipoolseid rahalise sekkumise meetmeid. Näiteks ei saa loota, et kõik inimesed hakkavad informatsiooni pakkumise abil pensioniks säästma. Endiselt on vaja riiklike finantsmeetmeid finantskäitumise suunamiseks. Edasised uuringud võiksid mõelda Eesti näitel näiteks II või III pensionisamba maksusoodustuste mõju inimeste käitumisele ning võrrelda neid uudiskirjade saatmise mõjuga.

Inimesed võivad mõnikord ülemäära palju laenata, liiga vähe säästa ning ignoreerida pikemaajalist finantsplaneerimist. Hooletus isiklike rahaasjade haldamisel avaldab aga märkimisväärset negatiivset mõju tervisele ja heaolule (Barrett & Kecmanovic, 2013; Białowolski et al., 2020; de Bruijn & Antonides, 2020; Horner, 2014; Martin & Hill, 2015; Netemeyer et al., 2018). Seetõttu peaksid inimesed olema oma finantsotsuste tegemisel targad, kuid rahaga seotud otsused on sageli keerulised ja võivad olla ebameeldivad (Choi et al., 2002). Seega tuleks inimesi mõistlike finantsotsuste tegemisel abistada. Selleks otstarbeks käsitleti doktoritöös info pakkumise käitumuslike sekkumisi kui ühte edukat vahendit finantsotsuste suunamiseks.

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- University of Tartu – junior researcher
- Centre for Applied Social Sciences – analyst
- Random Choice OÜ; Pulk Analytics OÜ – Founder and CEO
- Smart Continent EE OÜ – Partner

Research topics: behavioural finance, decision-making, heuristics.

Research Publications:

- **Pulk, Kristjan;** Riitsalu, Leonore (2024). Youth in individualistic countries have higher financial literacy: Evidence from PISA. *Journal of Consumer Affairs*. <https://doi.org/10.1111/joca.12582>
- **Pulk, Kristjan;** Riitsalu, Leonore (2024). How explicit consumer credit information affects intent to purchase on credit: an experiment. *International Journal of Bank Marketing*. DOI: 10.1108/IJBM-06-2023-0347.
- **Pulk, Kristjan;** Uusberg, Andero; Riitsalu, Leonore (2023). How am I doing financially compared to expectations? An experimental comparison of messaging strategies in investor newsletters. *International Journal of Bank Marketing*. DOI: 10.1108/IJBM-06-2022-0267.

Media publications:

- **Pulk, Kristjan;** Muldma, Mehis. (2020) „Kelle kätte usaldada oma raha? Pilguheit III pensionisambasse.“ *Eesti Päevaleht*
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Kiired otsused ning tasapisi taipamine.“ *Postimees*.
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Jaatajad ja eitajad: karjamõtlemise varjuküljed.“ *Director*.
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Kui suure eine sina tellid?“ *Sirp*.

Stipends and awards

- Erich Rannu Family Scholarship (2024)
- Rein Otsason Fund Stipend (2023)
- Award for Exemplary Work of Interdepartmental Cooperation Within the University of Tartu (2023)
- Kristjan Jaagu stipend: the Netherlands (02-04.2023)
- Voldemar Jaanberg Stipend (2022)
- Dora Pluss stipend: the Netherlands (09. 2022)
- Dora Pluss stipend: Norway (06.2022)
- Dora Pluss stipend: Portugal (11.-12.2019)
- Dora Pluss stipend: Denmark (03.2019)
- Kristjan Jaagu stipend: Denmark (01.-02.2019)

Applied research projects as principal investigator or primary contributor

- PTU4 “Development of a longitudinal pension literacy measure and its pilot study” (1.10.2023–31.07.2024); Principal Investigator: **Pulk, Kristjan**. Team: Riitsalu, Leonore; Atkinson, Adele; Võrk, Andres; Vain, Kristiina; Trankmann, Sabina; Tubelt, Ene. University of Tartu, Faculty of Social Sciences, Johan Skytte Institute of Political Studies; Financier: Ministry of Social Affairs
- LSVJS21210 “Credit market research for the Ministry of Finance II” (22.03.2021–27.12.2021); Principal Investigator: Siim Espenberg. Team: **Pulk, Kristjan**; Riitsalu, Leonore; Trankmann, Sabina; Kõve, Villu; Krillo, Karolyn; Vain, Kristiina; Kubre, Mary-Ann. University of Tartu, Faculty of Social Sciences, Johan Skytte Institute of Political Studies; Financier: Ministry of Finance
- LSVJS20614 “Impact assessment of screening foreign direct investments” (1.10.2020–15.04.2021); Principal Investigator: Siim Espenberg. Team: **Pulk, Kristjan**; Varblane, Urmas; Varblane, Uku. University of Tartu, Faculty of Social Sciences, Johan Skytte Institute of Political Studies; Financier: The State Chancellery

Selected other applied research projects:

- MÜKS-PENSION1 Nudging the choices to retire before retirement age
- LHV Bank – the effect of a monthly newsletter on investor behaviour
- LSVJS20417 – The Impact of the Minimum Wage on Estonia's Socio-Economic Development
- RITA4/019 Governance model and monitoring system for smart specialization policy in Estonia
- SSVMJ19518T – „Smart“ Foreign Direct Investment Survey: Analysis of Foreign Companies in Estonia for Developing Criteria to Manage and Attract New Foreign Direct Investments

Teaching in the University of Tartu:

- Decision-making Models in Management (Exec-MA, course coordinator)
- Managerial Economics (MA, course coordinator)
- Principles of Management and Teamwork (BA)
- Decision Making and Choice Behaviour (MA)
- Data and Probabilities (BA)

Supervisions

- Master level: Oleg Monastyrskyy; Siim Nigulas; Kerli Lill & Ingrid Tivas; Robin Talisaar & Leo Daniel Sipria; Antti Kangro & Sirli Kikas; Kristin Lass; Iheanachor Obi; Laura Inno
- Bachelor level: Miikael Johan Tamm, Laura Karilaid, Olga Kalashnikova

ELULOOKIRJELDUS

Nimi: Kristjan Pulk
Sünniaeg: 1. aprill 1991, Tartu
Kodakondsus: Eesti

Haridus:

- Tartu Ülikool, 2020–2024, PhD (majandusteadus, lõputöö teema: finantskäitumine)
- Tartu Ülikool, 2019, MBA (lõputöö teema: tarbijakäitumine)
- Tartu Ülikool, 2017, BA (majandusteadus, lõputöö teema: ülikoolide ja ettevõtete koostöö)

Töökogemus

2019...

- Tartu Ülikool – nooremteadur
- Tartu Ülikooli Rakendusuuringute Keskus (RAKE) – analüütik
- Random Choice OÜ; Pulk Analytics OÜ – asutaja ja tegevjuht
- Smart Continent EE OÜ – partner

Uurimisteemad: käitumuslik rahandus, otsustamine, heuristika.

Teaduspublikatsioonid:

- **Pulk, Kristjan;** Riitsalu, Leonore (2024). Youth in individualistic countries have higher financial literacy: Evidence from PISA. *Journal of Consumer Affairs*. <https://doi.org/10.1111/joca.12582>
- **Pulk, Kristjan;** Riitsalu, Leonore (2024). How explicit consumer credit information affects intent to purchase on credit: an experiment. *International Journal of Bank Marketing*. DOI: 10.1108/IJBM-06-2023-0347.
- **Pulk, Kristjan;** Uusberg, Andero; Riitsalu, Leonore (2023). How am I doing financially compared to expectations? An experimental comparison of messaging strategies in investor newsletters. *International Journal of Bank Marketing*. DOI: 10.1108/IJBM-06-2022-0267.

Meediapublikatsioonid:

- **Pulk, Kristjan;** Muldma, Mehis. (2020) „Kelle kätte usaldada oma raha? Pilguheit III pensionisambasse.” Eesti Päevaleht
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Kiired otsused ning tasapisi taipamine.” Postimees.
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Jaatajad ja eitajad: karjamõtlemise varjuküljed.” Director.
- **Pulk, Kristjan;** Vadi, Maaja. (2020) „Kui suure eine sina tellid?” Sirp.

Stipendiumid ja auhinnad

- Erich Rannu perekonna stipendium (2024)
- Rein Otsasoni fondi stipendium (2023)
- Preemia Tartu Ülikooli instituutidevahelise teadustöö edendamise eest (2023)
- Kristjan Jaagu stipendium: Holland (02-04.2023)
- Voldemar Jaanbergi stipendium (2022)
- Dora Pluss stipendium: Holland (09. 2022)
- Dora Pluss stipendium: Norra (06.2022)
- Dora Pluss stipendium: Portugal (11.-12.2019)
- Dora Pluss stipendium: Taani (03.2019)
- Kristjan Jaagu stipendium: Taani (01.-02.2019)

Rakenduslikud teadusprojektid projektijuhi või peamise täitjana

- PTU4 „Pensionitarkuse longituudse mõõdiku väljatöötamine ja piloteerimine” (1.10.2023–31.07.2024); Vastutav täitja: **Pulk, Kristjan**. Meeskonnaliikmed: Riitsalu, Leonore; Atkinson, Adele; Võrk, Andres; Vain, Kristiina; Trankmann, Sabina; Tubelt, Ene. Tartu Ülikool, Sotsiaalteaduste valdkond, Johan Skytte poliitikauuringute instituut; Rahastaja: Sotsiaalministeerium
- LSVJS21210 „Krediidituru-uuring Rahandusministeeriumile II” (22.03.2021–27.12.2021); Vastutav täitja: Siim Espenberg. Meeskonnaliikmed: **Pulk, Kristjan**; Riitsalu, Leonore; Trankmann, Sabina; Kõve, Villu; Krillo, Karolyn; Vain, Kristiina; Kubre, Mary-Ann. Tartu Ülikool, Sotsiaalteaduste valdkond, Johan Skytte poliitikauuringute instituut; Rahastaja: Rahandusministeerium
- LSVJS20614 „Välisinvesteeringute taustauuringu mõjude hindamine” (1.10.2020–15.04.2021); Vastutav täitja: Siim Espenberg. Meeskond: **Pulk, Kristjan**; Varblane, Urmas; Varblane, Uku. Tartu Ülikool, Sotsiaalteaduste valdkond, Johan Skytte poliitikauuringute instituut; Rahastaja: Riigikantselei

Teised valitud rakendusuringud:

- MÜKS-PENSION1 Enne pensioniiga pensionile jäämise valikute nügimine
- LHV Pank – igakuise uudiskirja mõju investorite käitumisele
- LSVJS20417 – Alampalga mõju Eesti sotsiaalmajanduslikule arengule
- RITA4/019 Eesti nutika spetsialiseerumise poliitika juhtimismudel ja seiresüsteem
- SSVMJ19518T – Nutikate välisinvesteeringute uuring: Eestis tegutseva välisosalusega ettevõtete analüüs, et selgitada välja uute välisinvesteeringute maandamise fookus ja kriteeriumid.

Õpetamine Tartu Ülikoolis:

- Juhtimisalased otsustusmudelid (Exec-MA, vastutav õppejõud)
- Juhtimisökonomika (MA, vastutav õppejõud)

- Juhtimise ja meeskonnatöö põhimõtted (BA)
- Otsuste tegemine ja valikukäitumine (MA)
- Andmed ja tõenäosused (BA)

Juhendamine

- Magistriõpe: Oleg Monastyrskyy; Siim Nigulas; Kerli Lill ja Ingrid Tivas; Robin Talisaar ja Leo Daniel Sipria; Antti Kangro ja Sirli Kikas; Kristin Lass; Iheanachor Obi; Laura Inno
- Bakalaureuseõpe: Miikael Johan Tamm, Laura Karilaid, Olga Kalašnikova

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