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# FINANCIAL BEHAVIOURAL INTENTIONS IN CORRELATION WITH CONTEXTUAL CUES AND FINANCIAL LITERACY – A HUNGARIAN EMPIRICAL STUDY

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## Abstract

Efforts to improve financial literacy often deal with enhancing financial knowledge, but this approach's long-term effectiveness is limited (Fernandes et al., 2014). Our study examined how financial behaviour can be influenced by nudge interventions and how their efficacy depends on financial literacy levels. We used three interventions: defaults, priming, and pre-commitment strategies (Thaler and Sunstein, 2008). We expected that people with lower levels of financial literacy would be more impacted by contextual cues. While a lot of studies have been conducted focusing on various aspects of financial literacy, to our knowledge, there have been no studies examining the effectiveness of nudge interventions with regard to the level of financial literacy. We surveyed 158 Hungarian adults using a questionnaire about financial literacy (OECD / INFE Toolkit for Measuring Financial Literacy and Financial Inclusion, 2018). Subjects were divided into groups with different interventions. In case of defaults, participants were shown a hypothetical investment portfolio overweight in either stocks or bonds and asked whether they would invest new money in stocks or bonds, expecting them to consider the overweight asset class. For priming, one group saw positive financial

market images, while another saw negative images. Based on the priming effect of visual cues we expected those exposed to positive images to prefer investing in risky assets (stocks) and those exposed to negative images to prefer safer investments. With pre-commitment, participants chose between saving for their children's education or investing in risky assets. Group 1 made no commitment to their partners, while Group 2 did. We expected those who pre-committed to be more likely to save money. Results showed defaults had the most impact on decisions. In the case of priming, more people chose the expected option but, similar to pre-commitment strategies, did not prove to be statistically significant. Surprisingly, people with high financial literacy were as influenced by nudges as those with lower literacy. In conclusion, defaults effectively influence financial decisions, and people with high financial literacy are equally susceptible to contextual cues. Our study's limitation was the generally high financial literacy for more representative results.

Keywords: nudge, behavioural finance, financial literacy, dual processing

### **1. INTRODUCTION**

In today's complex world, people have more and more difficulties with managing their day-to-day challenges. It also applies to financial matters: the increasingly wide variety of new financial products is rapidly impacted by information spreading around the globally connected financial markets (Lusardi and Mitchell, 2023). In this turbulent environment with "persistently elevated inflation and interest rates" (World Economic Forum, 2024, 4.), it is difficult to make proper financial decisions. The importance of improving financial literacy is unquestionable, as it helps families preserve their financial well-being and make sound financial decisions (OECD, 2005).

The most efficient way to help people improve their financial literacy and achieve better financial well-being is a much-discussed topic (Hadar et al., 2013; Lusardi and Mitchell, 2007). Historically, there has been significant emphasis on improving financial literacy through financial education. However, the effectiveness of these programs has been increasingly challenged: in their metaanalysis, Fernandes et al. (2014) found, based on 201 studies published in 168 papers, that interventions aimed at increasing financial literacy explain only 0.1 percent of the variance in financial behaviour and this is even lower in the case of individuals with low-income status. Based on extensive research, the limited effectiveness of these programs comes from an excessive focus on enhancing financial knowledge, which corresponds weakly with the long-term development of financial literacy (Kaiser and Menkhoff, 2017). Our research aimed to explore alternative tools that could positively influence financial decisions. We sought various strategies that might provide a more effective tool for improving financial behaviour, beyond traditional financial education programs. By doing so, we hoped to uncover new insights and practical solutions that can help individuals make more informed and beneficial financial choices in the long term: the nudge toolbar

developed by Nobel laureate Richard H. Thaler and his coauthor Cass R. Sunstein provides an excellent opportunity to channel people's decision in the right direction (Thaler and Sunstein, 2008). Our study examined the impact of contextual cues on financial behaviour in an adult Hungarian sample and tested whether these contextual cues also work for people with higher levels of financial literacy.

While a lot of studies have addressed the behavioural component of financial literacy, like, among others, willingness to learn and act proactively (Vlašić et al., 2022) or pension literacy (Anđelinović et al., 2023), to our knowledge, there have been no studies examining the effectiveness of nudge interventions with regards to the level of financial literacy, which highlights the novelty of our research.

#### 2. LITERATURE OVERVIEW

### 2.1. Behavioural finance and financial literacy

Behavioural finance is the part of behavioural economics that puts the everyday person at the centre of the investigation instead of homo oeconomicus characterised by full rationality, non-biased decision-making, infinite resources, and self-control to resolve problems, which is the centre of neoclassical economics (Mullainathan, 2007). Behavioural finance has its focus on non-rational decision-making during the investment process. In many aspects, it can be considered as a response to the efficient-market hypothesis (EMH) by Eugene F. Fama, which claims that the price of any security on the market fully and perfectly reflects all information available on the market at a given point of time (Fama, 1969). According to behavioural finance scholars, this is very often not the case due to irrational behaviour during the decision-making process (Sherif, 2016).

In the 1970s, the representatives of cognitive theory also appeared in economics. Herbert Simon, the father of behavioural finance, described the main obstacles to perfect rationality in his study on bounded rationality (Simon, 1972). His intellectual legacy was subsequently advanced by Daniel Kahneman and Amos Tversky. They showed in their empirical studies that human decision-making deviates from being driven solely by statistical probabilities and expected utility. Rather, it is often governed by cognitive shortcuts, commonly referred to as heuristics, which encompass simplifications and rules of thumb. Noteworthy illustrations from the realm of finance include the phenomenon termed the gambler's fallacy (Tversky and Kahneman, 1974): this cognitive bias elucidates how individuals, influenced by recent patterns they have encountered (thus embodying the representativeness heuristic), frequently arrive at erroneous determinations when assessing the likelihood of events. For instance, following an extended sequence of consecutive heads in a series of coin tosses, individuals anticipate tails to balance the distribution of heads and tails. Or, on the roulette table, an extended succession of red outcomes might lead individuals to expect a forthcoming occurrence of black. The same phenomenon is observable when

investors, after a significant market drop, try 'to buy the dip', and anticipate that prices will increase again. As a consequence, they start buying stocks, most often too soon. Similarly, when prices are rising, they sell the goods too early, as they don't believe prices will continue to increase (Stöckl et al., 2015).

Literature on the topic of financial literacy is very complex. There is not one generally accepted definition. After reviewing various studies on this subject, Hung et al. (2009) came up with the below definition mainly based on the definition of PACFL (Presidents Advisory Council on Financial Literacy, 2008): "Financial literacy: the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being." (Hung et al., 2009, p. 5).

The above definition is in line with that of the OECD, which states that financial literacy is "a combination of financial awareness, knowledge, skills, attitudes and behaviours necessary to make sound financial decisions and ultimately achieve individual financial well-being" (OECD, 2023, p. 6). Based on this, the OECD has developed its tool to measure financial literacy (Toolkit for Measuring Financial Literacy and Financial Inclusion, 2018), which we introduce in detail in the later part of this article. Lusardi and Mitchell also concluded with a similar definition: Financial literacy, which refers to "people's knowledge of and ability to use fundamental financial concepts in their economic decision-making, matters and is more important than ever." (Lusardi and Mitchell, 2023, 137)

Financial attitude indicates one's attitude to money and planning for the future, whereas financial knowledge is the combination of all those elements that enable people to assess various financial products and make a well-informed decision that best serves their interests for financial well-being (Atkinson, 2012).

The definition of financial behaviour is multifaceted. It includes management of savings and expenditures, controlling and accomplishing personal financial goals, short- and long-term investments, appropriate management of expenses, accounting for cash and loans, and acquiring insurance, which all impact one's financial well-being (Rahman et al., 2021). Adequate financial knowledge enables people to properly manage their financial situation and react to news that might have a bearing on their financials.

Based on the relevant literature (Van Rooij et al., 2011; Stango et al., 2007), people with higher levels of financial literacy are more characterised by positive financial behaviour (i.e., purchasing stocks) and less characterised by negative financial behaviour (i.e., debt accumulation).

#### 2.2. Nudge

A significant contributor to the field of behavioural finance is Richard Thaler, whose book titled "Nudge" (2008), which he wrote together with Cass Sunstein, opened a new chapter in the field of behavioural finance.

Per the essence of nudge, the choice architect (the agent who employs nudge to influence others to choose something) does not prohibit any choice or apply any direct interventions. People make the decisions they deem best. Instead, the choice architect, knowing the way people think and the impact of contextual cues on their thinking, provides people with alternatives in a way that they choose the socially desired option with the greatest likelihood (Thaler and Sunstein, 2008). For example, if we would like children to consume more vegetables in self-service restaurants, these foods need to be placed in sight, and sweets at the bottom of the shelves (Broers et al., 2017).

For this reason, the approach proposed by Thaler and Sunstein is called libertarian paternalism: in their model, the architect who designs the choice situation (e.g., the government) has a strong view as to what behaviour people should follow (hence paternalist) but does not impose financial or other restrictions (libertarian). In sum, nudge has three main characteristics that differentiate it from classical persuasion (Thaler and Sunstein, 2008): (1) Nudge aims to promote the common good; (2) The decision maker is free to make any choice; (3) There is no economic or other cost involved.

Research in the field has concluded that nudges are a significant tool for improving the effectiveness of financial education programs (Smith et al., 2020). The most well-known nudge in finance is the Save More Tomorrow (SmarT) programme (Thaler and Benartzi, 2004). Employees opt now what proportion of their next salary increase they would like to use for retirement savings. As the current decision impacts the future, people do not feel it is a loss. Furthermore, they are free to revert this at any time. This programme proved to be very successful in increasing retirement savings not only in the US (Benartzi and Thaler, 2013), but in other countries as well (García and Vila, 2020).

Numerous further studies have confirmed the effectiveness of nudges in the financial sector. Choi (2015), based on US-defined contribution pensions, Van Zyl and Van Zyl (2016), on South Africa's retirement schemes, and Nunes (2018), based on British data, concluded that defaults are an effective tool for increasing retirement savings. Baicker et al. (2015) demonstrated the success of nudges in influencing financial behaviour in the context of insurance, while Agarwal et al. (2015) showed the significant impact of selective information disclosure specifically, how showing customers the exact cost of paying only the minimum amount on their credit card debt can influence their behaviour.

Since its first publishing, there have been a lot of attempts to categorise nudge tools. In the below summary, we provide an overview of nudges employed in our study, based on their work mechanism (Barker et al., 2021; Szántó and Dudás, 2017). We chose these tools because quite a few studies have already proven their effectiveness in the field of finance (Default: Cai, 2019; Choi, 2015; Nunes, 2018; Van Zyl and Van Zyl, 2016; Priming: Meunier et al, 2024; Precommitment: Roll et. al 2020; Thaler and Benartzi, 2004).

*Defaults*: people tend to hang on to the present situation, this is what Kahneman, Knetch, and Thaler (1991) based on the works of Zeckhauser and

Samuelson (1988) refer to as "status quo bias". It is perhaps the most well-known and used nudge technique. It is activated if the decision maker exercises no effort to change and stays with the original (default) options (Thaler and Sunstein, 2008). As Samson (2014) points out, this technique is most effective if there is a lot of inertia in the decision-making process. *Priming*: a psychological mechanism where people get prior stimuli that would impact their decision-making process later (Mirsch et al., 2017 in Henkel et al., 2019). *Pre-commitment* strategies: when decision makers publicly commit themselves, they are much more likely to keep to their commitment as they are sort of "locked into doing it" (The Behavioural Insights Team., 2014, p.5).

### 2.3. Higher knowledge and contextual cues

As detailed above, nudge is an effective tool in fields such as finance (e.g. Save More Tomorrow –SmarT – programme, Thaler and Benartzi, 2004). When considering contextual cues, an emerging question is whether they affect only decision-makers who lack attentiveness or if they also influence people with higher knowledge.

According to dual-process models of human information processing (e.g., Chaiken and Trope, 1999; Kahneman, 2011; Petty and Cacioppo, 1986), which differentiate between thorough (deep, deliberate, logical) and superficial (*contextual*, simplifying, associative) processing, deliberate information processing (leading to financial decisions more aligned with rational norms) is more likely when decision-makers are strongly motivated to make sound choices and possess the capability to do so.

As financial literacy consists of financial behaviour, knowledge, and attitude, we expect a more financially literate person to have a more positive attitude and stronger motivation. Based on the dual-process model, this stronger motivation leads to thorough information processing and lower reliance on contextual cues.

The literature on applied decision-making is, however, rich in examples where people with higher knowledge use heuristics in decision-making and commit decision biases: among others judges from the field of the jurisdiction (Radelet and Bedau, 1998); physicians (Koehler, 1991; Lerner and Tetlock, 1999; Redelmeier and Shafir, 1995) or professional athletes (Bar-Eli et al., 2007; Haynes and Gilovich, 2010). Eddy (1982) and more recently others (Wegwarth and Gigerenzer, 2013) pointed out that when working with probabilities, doctors are just as prone to errors when they interpret positive test results as ordinary people.

#### 2.4. Hypotheses

Based on nudge literature, contextual cues influence behaviour. Per our hypothesis, this is not different for financial behaviour either. Nudge techniques used in our experiment impact financial behaviour (H1).

Based on the dual-process models of information processing, according to which capability and motivation are necessary prerequisites of deliberate decision-making, people with higher levels of financial literacy are influenced by contextual cues in their financial decision-making to a lesser extent than people with lower levels of financial literacy (H2).

## 3. METHOD

#### 3.1. The procedure of data collection and the sample

We registered responses through an online survey and randomly assigned test subjects into two groups. They got different defaults and primes, and one group was made pre-committed while the other was not.

We recruited the convenience sample online: we have asked those of our acquaintances who met the criteria of being a Hungarian citizen above 18 years) to fill in the questionnaire through Google Forms. Answering all the questions took about 15 minutes. We collected our data between March 2022 and January 2023. Subjects participated in the study voluntarily and did not receive any remuneration.

Before commencing the questionnaire, all participants were made aware of the terms and conditions (informed consent) and agreed to these terms. In a lack of consent, the questionnaire did not start. The United Hungarian Ethical Committee for Research in Psychology (EPKEB) approved the study at number 2022-46.

One hundred and sixty-one people participated in our study. We filtered out three persons as they answered our control questions inconsistently, resulting in a final sample of 158 people. Regarding gender split, 126 women and 32 men participated in our study, so the ratio was 80-20 percent.

The average age was 36.8 years (SD =13.2 years), 34 people lived in the capital, 98 people lived in other cities and 26 people lived in smaller villages. In terms of education, university graduates predominated, with 67 people representing 42.4 percent of the total sample. They were followed by those with a high school diploma or other secondary school education (43 people), then college graduates (42 people), and finally respondents with a PhD degree (6 people). In terms of marital status, the majority were married and in a relationship (120 people), and 38 people were single, divorced, or widowed.

### 3.2. Measurements

#### 3.2.1. Demographics

We recorded some socio-demographic attributes: age, sex, residence, educational attainment, and marital status.

#### **3.2.2.** Measuring financial literacy

To measure financial literacy, we followed the guidance of the OECD and used their toolkit (OECD / INFE Toolkit for Measuring Financial Literacy and Financial Inclusion, 2018). Financial literacy is the sum of scores received for financial behaviour, attitude, and knowledge. Based on the original English version, we formulated the questions in Hungarian.

The questionnaire consisted of 3 main parts. The sum of scores for financial knowledge, financial attitude, and financial behaviour made up the total financial literacy score as follows: Seven questions related to financial knowledge (e.g., 'You lend \$25 to a friend one evening, and he gives you \$25 back the next day. How much interest has he paid on this loan?'). Each correct answer resulted in 1 point (with 7 points as the maximum on the knowledge subscale). Eight questions pertained to financial behaviour, to be replied with yes or no (e.g., 'I set long-term financial goals and strive to achieve them'). A total of 9 points could be received since one question out of the eight resulted in 2 points). Three questions related to financial attitude (e.g.,' Money is there to be spent"). The agreement with the items was measured on a 5-point Likert scale. The average scores for the three questions are the attitude points (with 5 as the maximum). The total maximum score from the three sub-scales was 21.

#### 3.2.3. Contextual cues and behavioural purposes

In the next part of the questionnaire, we divided subjects randomly into two groups, each receiving different defaults and primes. Regarding precommitment, one group received an instruction involving pre-commitment, while the other group did not receive this information. In the three decision problems, they reported their behavioural purposes regarding what to choose.

In the case of different *defaults*, participants were given a hypothetical investment portfolio according to which they had either 30 percent stocks and 70 bonds (Group 1) or 70 percent stocks and 30 percent bonds (Group 2). They had to reveal their (hypothetical) behavioural intention concerning whether to invest in stocks or bonds. We expected that subjects would consider stock or bond overweight as default and continue to invest in the dominant asset class (bonds for Group 1 and stocks for Group 2).

In the case of priming, participants were shown positive (Group 1) or negative (Group 2) images about financial markets (e.g., successful brokers celebrating or desperate ones losing all their money). Based on the priming effect of visual cues, we expected subjects exposed to positive images to invest more in risky assets (stocks) and ones exposed to negative images to choose safer investments (bonds, savings accounts, pension accounts).

Regarding pre-commitment, participants had to decide if they put aside significant amounts of money for their children's education or invest money into

risky assets. In Group 1, they did not promise their partners to save money for education, whereas in Group 2, they did. We expected that subjects who precommitted would be more inclined to save money.

#### 3.3. Results

Data was analysed using Rstudio (Version 1.3.1093). The results of the reliability test of the attitude scale showed that the scale is reliable and there was no need to omit items ( $\alpha = 0.71$ ). The measured variables (knowledge, attitude, behaviour) proved to be not normally distributed according to the Shapiro-Wilk tests (Ws > 0.89, ps < 0.01).

Comparing our results to those of the OECD (2020), the level of financial literacy is significantly higher in our data than in the original OECD study: our results indicate a financial literacy of 15.5 (out of the maximum of 21), while the OECD study was 12.4. The difference comes mainly from financial behaviour (1.5 points) and financial knowledge (1.1 points). Financial attitude shows results similar to the original study (0.5 points difference). We believe that the reason for this discrepancy was the method of sampling and data recording: we have asked our acquaintances in an online manner, which can be considered a sort of pre-filtering: this requires a higher level of digital readiness and, as a result, higher levels of consciousness, while the original study was registered offline on a representative sample.

The first hypothesis focused on the effectiveness of different nudge techniques. We tested the various influences using binomial and chi-squared testing. As can be seen from the below tables 1. and table 2. below, the default effect was significant (p < 0.001). However, based on our results, priming and precommitment strategies did not influence choices (ps > 0.380).

Table 1

Technique	Measured success		No	p-value	Random?
Default	Subjects invest into the asset class (stock, bond) that is currently overweight in their portfolios		46	< 0.001	No
Priming	Subjects are more likely to invest in risky assets when exposed to positive visual stimulus and in less risky in the case of a negative one.		73	0.38	Yes

The effectiveness of the applied contextual cues: default and priming

Per the definition of pre-commitment technique subjects who are precommitted to their children's education are more likely to stick to their financial plans and save money than those who are not pre-committed.

#### Table 2

	pre-committed	not pre-committed	Result of Chi-squared test $x^2 = 0.002$ , $n = 0.06$	
Save money	44	31	$\kappa$ $\gamma_1$	
Invest in risky assets	49	34		

The effectiveness of the applied contextual cues

Table 1 presents that default is an efficient influencing tool since participants invested in the asset class (stock, bond) dominant in their portfolios.

Priming, however, did not work as expected: participants' choices did not align with the positive/negative stimuli regarding the decision to invest in risky or safer assets. Additionally, pre-commitment was also ineffective, as pre-committed participants did not choose to save money for children more often than those without pre-commitment.

For the second hypothesis, we examined whether people with higher levels of financial literacy (whose financial literacy scores are higher than the median value in our sample, M = 16) are less susceptible to contextual cues. We present the results in Tables 3 and 4.

Table 3

	Low levels of financial literacy		High levels of financial literacy		
	Nudge worked	Nudge did not work	Nudge worked	Nudge did not work	
Default	60	25	52	21	
Priming	44	41	41	32	

Effectiveness of contextual cues per levels of financial literacy

Table 4

#### Effectiveness of pre-commitment per levels of financial literacy

	Pre-com	nitted	Not pre-committed		
	Low level of	High level of	Low level of	High level of	
	financial literacy	financial literacy	financial literacy	financial literacy	
Putting aside money for children	26	18	20	11	
Invest money into risky assets	21	28	18	16	

For the statistical analysis of the results, we performed Chi-square tests so that the levels of financial awareness in the contingency table are the columns and the contextual cues in the rows. Based on the results of the test, there is no correlation between the level of financial awareness and the contextual cues in any of the cases (default:  $\chi 2 = 0.01$ , df = 1, p = .98; priming:  $\chi 2 = 0.31$ , df = 1, p = 0.58; low financial literacy:  $\chi 2 = 0.06$ , df = 1, p = 0.81; high financial literacy:  $\chi 2 = 0.02$ , df = 1, p = 0.90).

### 4. **DISCUSSION**

Financial literacy, which indicates how well one can interpret and use information on one's finances (Huston, 2010), is a competence of large importance in today's turbulent market environment.

Using an internationally accepted toolkit (OECD, 2018), we examined financial literacy in our sample. Results indicated a surprisingly high level of financial literacy: 15.5 points out of a maximum of 21, far higher than the 12.4 in the original OECD study. We believe the reason for this is in the characteristics of the sample: people filling in the questionnaire online are much more digitally savvy and finance-conscious than would represent the entire Hungarian population in a representative way.

Nudge techniques offer an excellent opportunity to promote the common good, using choice architecture to influence people's decision-making in the spirit of libertarian paternalism (Thaler and Sunstein, 2008). Our research aimed to examine if contextual cues could influence financial decisions and whether this influence is more present in people with lower levels of financial literacy.

Our results indicate that defaults are an adequate tool to nudge financial behaviour. Nudging means guiding people into decisions considered to be desirable by the choice architect. The present study shows that financial behaviour is nudgesensitive, even if we did not claim the desirability of one or the other behaviour option.

Numerous previous studies proved that people with higher knowledge are not exempt from cognitive bias either (Bar-Eli et al., 2007; Radelet and Bedau, 1998; Croskerry and Norman, 2008; Haynes and Gilovich, 2010; Lerner and Tetlock, 1999; Redelmeier and Shafir, 1995). Based on this, our area of focus was whether people with lower levels of financial literacy are more exposed to contextual cues. Our results indicate that defaults represent a significant opportunity to nudge financial behaviour, and people with higher levels of financial literacy are just as susceptible to contextual cues as people with lower levels. However, in the case of priming and pre-commitment, we could not detect significant differences between the conditions. Consequently, based on the present study, we cannot conclude that they are adequate tools to influence financial behaviour. The relatively small sample size may contribute to this ineffectiveness. Furthermore, our experimental design could also contribute to the inefficiency of priming and pre-commitment techniques: participants were first exposed to default, then priming, and finally to pre-commitment techniques. Thus, our experiment did not balance the interaction between the questions, which is why we cannot exclude the possibility that people used the first question (default) as an anchor when answering the subsequent ones.

A further limitation of our study is that the financial literacy levels of our participants were uniformly high. It would be useful to include into the study people with lower levels of financial literacy and to include real financial experts as well.

In summary, our research has significantly contributed to the field of behaviour finance by providing insight into financial literacy in Hungary and ways of nudging financial behaviour. To date, programmes were focused mainly on how financial knowledge could be improved, while attitude and financial behaviour were much less at the centre of attention (Lusardi, 2019). Even individuals with high financial knowledge and a positive attitude towards finance can benefit from the application of default techniques in shaping future financial behaviour.

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#### REFERENCES

Agarwal, S., Chomsisengphet, S., Mahoney, N., & Stroebel, J. (2015). Regulating consumer financial products: evidence from credit cards. *The Quarterly Journal of Economics*, 130, 111-164. https://doi.org/10.1093/qje/qju037

Atkinson, A., Messy, F. (2012). Measuring Financial Literacy: Results of the OECD / International Network on Financial Education (INFE) Pilot Study. *OECD Working Papers on Finance, Insurance and Private Pensions*, 15. https://doi.org/http://dx.doi.org/10.1787/5k9csfs90fr4-en

Baicker, K., Mullainathan, S., & Schwartzstein, J. (2015). Behavioural hazard in health insurance. *The Quarterly Journal of Economics*, 130, 1623-1667. https://doi.org/10.1093/qje/qjv029

Bar-Eli, M., Azar, O. H., Ritov, I., Keidar-Levin, Y., & Schein, G. (2007). Action bias among elite soccer goalkeepers: The case of penalty kicks. *Journal of Economic Psychology*, 28 (5), 606-621. https://doi.org/10.1016/j.joep.2006.12.001

Barker, H., Shaw, P. J., Richards, B., Clegg, Z., & Smith, D. (2021). What nudge techniques work for food waste behaviour change at the consumer level? A systematic review. *Sustainability*, 13. https://doi.org/10.3390/su131911099

Benartzi, S., Thaler, R.H. (2013). Behavioural economics and the retirement savings crisis. *Science*, 339, 1152-1153. https://doi.org/10.1126/science.1231320

Broers V., De Breucker C., Van den Broucke S., & Luminet, O. (2017) A systematic review and meta-analysis of the effectiveness of nudging to increase fruit and vegetable choice. *The European Journal of Public Health*, 27 (5), 912-920. https://doi.org/10.1093/eurpub/ckx085

Cai, Cynthia. (2019). Nudging the financial market? A review of the nudge theory. *Accounting and Finance*, 60. https://doi.org/10.1111/acfi.12471

Chaiken, S., & Trope, Y. (1999). Dual-process theories in social psychology. Guilford Press.

Choi, J. J. (2015). Contributions to defined contribution pension plans. *Annual Review* of Financial Economics, 7, 161-178. https://doi.org/10.1146/annurev-financial-111914-041834

Croskerry, P., & Norman, G. (2008). Overconfidence in clinical decision making. *The American Journal of Medicine*, 24 (9). https://doi.org/10.1016/j.amjmed.2008.02.001

Eddy, D. M. (1982). Probabilistic reasoning in clinical medicine: Problems and opportunities. In D. Kahneman, D., P. Slovic, & A. Tversky (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge University Press. https://doi.org/10.1017/CBO9780511809477.019

Fama, E. F. (1969). Efficient capital markets: a review of theory and empirical work. *The Journal of Finance*, 25 (2), 383-417. https://doi.org/10.2307/2325486

Fernandes, D., Lynch, J., & Netemeyer, R. (2014). Financial literacy, financial education, and downstream financial behaviours. *Management Science*. https://doi.org/10.1287/mnsc.2013.1849

García, J. M., & Vila, J. (2020). Financial literacy is not enough: The role of nudging toward adequate long-term saving behaviour. *Journal of Business Research*, 112, 472-477. https://doi.org/10.1016/j.jbusres.2020.01.061

Hadar, L., Sood, S., & Fox, C. R. (2013). Subjective knowledge in consumer financial decisions. *Journal of Marketing Research*, *50* (3), 303-316. https://doi.org/10.1509/jmr.10.0518

Haynes, G., & Gilovich, T. (2010). "The ball don't lie": How inequity aversion can undermine performance. *Journal of Experimental Social Psychology*, 46 (6), 1148-1150. https://doi.org/10.1016/j.jesp.2010.05.008

Henkel, C., Seidler, A., Kranz, J., & Fiedler, M. (2019). How to Nudge Pro-Environmental behaviour: an Experimental Study. *European Conference on Information Systems*.

Hung, A., Parker, A. M., & Yoong, J. (2009): Defining and Measuring Financial Literacy. *Rand Working Paper Series*. http://dx.doi.org/10.2139/ssrn.1498674

Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs*, 44 (2), 296-316. https://doi.org/10.1111/j.1745-6606.2010.01170.x

Kahneman, D. (2011). Thinking Fast and Slow. Farrar, Straus and Giroux.

Kahneman, D., Knetsch J., & Thaler, R. H. (1991). Anomalies: the endowment effect, loss aversion, and status quo bias. *Journal of Economic Perspectives*, 5 (1), 193-206. https://doi.org/10.1257/jep.5.1.193

Kaiser, T., & Menkhoff, L. (2017). Does financial education impact financial literacy and financial behaviour, and if so, when?. *The World Bank Economic Review*, 31 (3). https://doi.org/10.1093/wber/lhx018

Koehler, D. J. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin*, *110* (3), 499-519. https://doi.org/10.1037/0033-2909.110.3.499

Lerner, J. S., & Tetlock, P. E. (1999) Accounting for the effects of accountability. *Psychological Bulletin*, 125, 255-275. https://doi.org/10.1037/0033-2909.125.2.255

Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss Journal of Economics and Statistics*, 155, 1-8. https://doi.org/10.1186/s41937-019-0027-5

Lusardi, A., & Mitchell O. S. (2007). Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education, *Business Economics*, 42 (1), 35-44. https://doi.org/10.2145/20070104

Lusardi, A., & Mitchell O. S. (2023). The Importance of Financial Literacy: Opening a New Field. *Journal of Economic Perspectives*, 37 (4), 137-154. https://doi.org/10.1257/jep.37.4.137

Meunier, L., Ohadi, S., & Tatarnikova, O. (2024). Stock Market Participation: When No Priming Works Best. *Journal of Behavioral Finance*, 1-22. https://doi.org/10.1080/15427560.2024.2340519

Mullainathan, S. (2007). Psychology and Development Economics. In P. Diamond, & H. Vartiainen (Eds.), *Behavioural Economics and Its Applications*, 85-113. Princeton University Press. https://doi.org/10.2307/j.ctvd58v0s.7

Nunes, B. F. (2018). Participation in workplace pension schemes and the effect of provision: evidence from the United Kingdom. *Fiscal Studies*, 39, 189-206. https://doi.org/10.1111/j.1475-5890.2017.12152

OECD (2005). Improving Financial Literacy Analysis of Issues and Policies. https://doi.org/10.1787/9789264012578-en

OECD (2018). OECD/INFE Toolkit for Measuring Financial Literacy and Financial Inclusion. https://www.oecd.org/financial/education/2018-INFE-FinLit-Measurement-Toolkit.pdf

OECD (2023). OECD/INFE 2023 international survey of adult financial literacy. https://read.oecd.org/10.1787/56003a32-en?format=pdf

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in experimental social psychology*, 19, 123-205. https://doi.org/10.1016/S0065-2601(08)60214-2

President's Advisory Council on Financial Literacy (PACFL) (2008). Annual Report to the President. https://www.academia.edu/6708140/Presidents\_Advisory\_Council\_on\_ Financial Literacy 2008 Annual Report to the President

Rahman, M., Isa, C., Masud M., Sarker M., & Chowdhury N. (2021). The role of financial behaviour, financial literacy, and financial stress in explaining the financial well-being of B40 group in Malaysia. *Future Business Journal*, 7 (1), 52. https://doi.org/10.1186/s43093-021-00099-0

Radelet, M. L., & Bedau, H. A. (1998). The execution of the innocent. Law and Contemporary Problems, 61 (4), 105-124. https://doi.org/10.2307/1192431

Redelmeier, D., & Eldar S. (1995). Medical decisions making in situations that offer multiple alternatives. *Journal of the American Medical Association*, 273 (4), 302-305. https://doi.org/10.1001/jama.1995.03520280048038

Roll, S., Grinstein-Weiss, M., Gallagher, E., & Cryder, C. (2020). Can pre-commitment increase savings deposits? Evidence from a tax-time field experiment. *Journal of Economic Behavior and Organization*, 180, 357-380. https://doi.org/10.1016/j.jebo.2020.10.011

Samson, A. (2014). A simple change that could help everyone drink less. *Psychology Today*. http://www.psychologytoday.com/blog/consumed/201402/simple-change-could-help-everyone-drink-less

Sherif, M. (2016). Behavioural finance vs. traditional finance. https://www.researchgate.net/publication/311970631 Behavioural Finance Vs Traditional Finance

Simon, H. A. (1972): Theories of bounded rationality. In C. B. McGuire, & R. Radner (Eds.), *Decision and Organization*, 161-176. North-Holland Publishing Company.

Smith, R. C., Loibl, C., Imam, K., & Jones, L. (2020). Improving Financial Behaviours Through Nudges. *The Journal of Extension*, 58 (1), Article 2. https://doi.org/10.34068/joe.58.01.02

Stango, V., Zinman, J., Bernard, A., Benjamin, D., Gabaix, X., Gustman, A., Lusardi, A., Shapiro, J., Skinner, J., & Staiger, D. (2007). Fuzzy Math and Household Finance: Theory and Evidence. *The Review of Financial Studies*, *24* (2), 506-534. https://doi.org/10.1093/rfs/hhq089

Stöckl T., Huber J., Kirchler M., Lindner F. (2015). Hot hand and gambler's fallacy in teams: Evidence from investment experiments. *Journal of Economic Behaviour and Organization*, 117, 327-339. https://doi.org/10.1016/j.jebo.2015.07.004

Szántó R., & Dudás L. (2017). A döntési helyzetek tudatos tervezésének háttere: A Nudge fo-galma, módszerei és kritikái. *Vezetéstudomány*, 48 (10), 48-57. https://doi.org/10.14267/VEZTUD.2017.10.06

Thaler, R. H., & Benartzi, S. (2004). Save More Tomorrow (TM): Using Behavioural Economics to Increase Employee Saving. *Journal of Political Economy*, 112, S164-187. https://doi.org/10.1086/380085

Thaler, R. H., & Sunstein, C. (2008). Nudge. Penguin Books.

The Behavioural Insights Team (2014). EAST: Four Simple Ways to Apply Behavioural Insights. https://www.bi.team/publications/east-four-simple-ways-to-apply-behavioural-insights/

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1113. https://doi.org/10.1126/science.185.4157.1124

Van Rooij M., Lusardi A., & Alessie R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101 (2), 449-472. https://doi.org/10.1016/j.jfineco.2011.03.006

Van Zyl, N., & Van Zyl, D. J. J. (2016). The impact of behavioural economics and finance on retirement provision. *South African Actuarial Journal*, 16, 91-125. https://doi.org/10.4314/saaj.v16i1.4

Vlašić, G., Gugić, A., & Šubić, R. (2022). Financijska pismenost i spremnost na učenje o financijama kao čimbenici sklonosti pripadnika generacije z poduzetništvu i ulaganju na tržištu kapitala. *Ekonomska misao i praksa*, 31, 569-599. https://doi.org/10.17818/EMIP/2022/2.11

Wegwarth, O., & Gigerenzer, G. (2013). Less is more: Overdiagnosis and overtreatment: evaluation of what physicians tell their patients about screening harms. *JAMA Internal Medicine*, *173* (22), 2086-2088. https://doi.org/10.1001/jamainternmed.2013.10363

World Economic Forum (2024). The Global Risk Report 2024. 19th Edition. Insight Report.

Zeckhauser, R., & Samuelson, W. (1988). Status Quo Bias in Decision-Making. *Journal of Risk and Uncertainty*, 1, 7-59. https://doi.org/10.1007/BF00055564

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# NAMJERE FINANCIJSKOG PONAŠANJA U KORELACIJI S KONTEKSTUALNIM ZNAKOVIMA I FINANCIJSKOM PISMENOŠĆU – EMPIRIJSKA STUDIJA U MAĐARSKOJ

### Sažetak

Nastojanja za poboljšanje financijske pismenosti često se odnose na poticanje financijskog znanja, ali dugoročna je učinkovitost ovog pristupa ograničena (Fernandes et al., 2014). Naša studija ispiuje kako intervencije poticaja mogu utjecati na financijsko ponašanje i kako njihova učinkovitost ovisi o razinama financijske pismenosti. Koristili smo se trima intervencijama: zadanim opcijama (defaults), pripremljenošću (priming) i strategijama prethodne namjene (pre-commitment) (Thaler i Sunstein, 2008). Očekivali smo da će na ljude s nižom razinom financijske pismenosti više utjecati kontekstualni znakovi. Iako je provedeno mnogo studija s fokusom na različite aspekte financijske pismenosti, koliko znamo, nije bilo onih koje bi ispitivale učinkovitost intervencija poticaja u odnosu na razinu financijske pismenosti. Anketirali smo 158 odraslih Mađara s pomoću upitnika o financijskoj pismenosti (OECD/INFE Toolkit za mjerenje financijske pismenosti i financijske uključenosti, 2018). Ispitanici su bili podijeljeni u skupine s različitim intervencijama. U slučaju zadanih opcija sudionicima je pokazan hipotetski investicijski portfelj s pozitivnim predznakom (overweight) u dionicama ili obveznicama te su upitani bi li uložili novac u dionice ili obveznice, očekujući da će razmotriti kategoriju imovine s pozitivnim predznakom (overweight). U slučaju pripremljenosti jedna je skupina vidjela pozitivne slike o financijskom tržištu, dok je druga vidjela negativne slike. Na temelju učinka pripremljenosti vizualnim znakovima očekivali smo da će oni koji su bili izloženi pozitivnim slikama radije ulagati u rizičnu imovinu (dionice), a oni koji su bili izloženi negativnim slikama preferirati sigurnija ulaganja. Glede prethodne namjene sudionici su birali između štednje za obrazovanje svoje djece ili ulaganja u rizičnu imovinu. Grupa 1 nije se obvezala svojim partnerima, dok Grupa 2 jest. Očekivali smo da je veća vjerojatnost da će štedjeti novac oni koji su unaprijed odredili namjenu. Rezultati su pokazali da su zadane opcije imale najveći utjecaj na odluke. U slučaju pripremljenosti više je ljudi odabralo očekivanu opciju, ali se, slično strategijama prethodne namjene, nije pokazala statistički značajnom. Iznenađujuće, ljudi s visokom financijskom pismenošću bili su podjednako pod utjecajem poticaja kao i oni s nižom pismenošću. Zaključno, zadane opcije učinkovito utječu na financijske odluke, a ljudi s visokom financijskom pismenošću jednako su osjetljivi na kontekstualne znakove. Ograničenje naše studije bila je općenito visoka financijska pismenost sudionika, što sugerira da bi buduće studije trebale uključiti one s nižom pismenošću za reprezentativnije rezultate.

Ključne riječi: poticaj, bihevioralne financije, financijska pismenost, dvojna obrada.

JEL klasifikacija: G41, G53, D14, D91.